APPLICATION TO PARTICIPATE IN AN IODP EXPEDITION

ESSAC Office ECORD Science Support & Advisory Committee
GEOMAR | Helmholtz Centre for Ocean Research Kiel
Wischhofstrasse 1-3
24148 Kiel, Germany
Hanno Kinkel (ESSAC Science Coordinator):
Tel: +49 431 600 2418
Fax:+49 431 600 2922
Web Page: http://www.essac.ecord.org Email: **essac@geomar.de**

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Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

1. PERSONAL INFORMATION

Family name: AGHIB

First name: Fulvia S.

Current Position: Researcher

Institution: CNR (National Research Council), IDPA (Institute for the Dynamics of the Environmental Processes)

Address: Via Mario Bianco, 9
Milan, I-20131, Italy

Tel. work: 0039 02 5031 5592
Tel. home: mobile: 0039 335 6670950
Fax: ---
Email: fulvia.aghib@idpa.cnr.it
fulvia.aghib@unimi.it

Country of citizenship: Italy/USA

Place of birth/date of birth: New York, NY, USA

Gender: Female

Education (highest degree, including year PhD was received / is expected):
Laurea in Geological Sciences at University of Milan (Italy), 1988
Student Fellowship at Woods Hole Oceanographic Institution, MA, USA, 1989-1990.

Are you currently a student? NO Expected Graduation Date: ----

2. EXPEDITION INFORMATION

Summary of proposed participation, including area of scientific interest, current research and participation plan (maximum 250 characters with space – more detail should be included in the Letter of Interest):

Extensive sediment characterization comprising logging of cores, description of facies and related depositional setting, sediment composition (biogenic vs non-biogenic components), early diagenesis of cements and carbonate micro/macrofossils.

Prior involvement with DSDP/ODP/IODP and nature of involvement (expedition number, shipboard/shore-based participation, co-chief, etc):

1990-92: ESCO (ESF Science Committee for ODP) Science Coordinator, University of Milan, Italy, and Maria Bianca Cita ESCO Chair.

On-ice sedimentologist during CRP2 (1998) and CRP3 (1999) drilling seasons.

Shipboard sedimentologist in several oceanographic cruises for a total of 251 days at sea.

Post-cruise science support to achieve the proposed scientific objectives 1) future funding scheme and 2) support from host institution (e.g. staff, facilities)

1- If I am selected, CNR ensures my research funding to take part to the shipboard activities and shore-based investigations.

2- At my home institution, CNR-IDPA, I have labs for performing studies of sediment composition, early diagenesis and provenance using REE trends. Lab facilities include a microscopy Lab (petrographic microscope coupled with Cathodoluminescence probe (CL), a Scanning electron microscope Lab (SEM coupled with an X-ray energy dispersive, EDS microprobe) and REEs geochemistry Lab.

Staff includes 2-3 researchers and one technician.

Three scientific and/or personal references:

Carlo Barbante, University of Venice, Italy

Larry Krissek, Ohio State University, Columbus, OH, USA

Isabella Premoli Silva, University of Milan, Italy

3. SCIENTIFIC EXPERTISE

For Scientist Jobs Descriptions visit: http://iodp.tamu.edu/participants/scientist_jobs.html

Please indicate your area(s) of expertise (maximum 3)

Discipline	Mark with X	Speciality
microbiologist		
organic and inorganic geochemist/biogeochemist		
physical properties specialist		
sedimentologist	X	Core logging, facies analysis, early diagenesis, sediment composition
structural geologist		
paleontologist		
paleomagnetist		
petrologist		
hydrogeologist		
Other	X	Diagenesis

4. ADDITIONAL DOCUMENTS

Please, provide the following documents:

- Letter of interest, including details about area of scientific interest, current research, expedition participation plan and post-cruise research
- CV and Publication list
- Letter of recommendation (for PhD students)
- See also: http://www.essac.ecord.org/flyer/Guidelines_for%20Applying_to_sail.pdf

Please, send your application form as *a MS Word document* and the additional documents in *PDF format* (preferably as one file) by email to Jan Behrmann and Hanno Kinkel at the ESSAC office: essac@geomar.de.

In addition to the ESSAC application, all applicants *must inform their national office* (if applicable) *and national delegate* and send a copy of the application documents. ECORD does not provide funds for participation; the national offices or national delegates can provide information regarding travel support, post-cruise funding opportunities, etc.

See http://www.essac.ecord.org/index.php?mod=about&page=ESSAC for a list of the national contact persons.

IODP Expedition 374: Ross Sea of West Antarctic Ice Sheet History

Expedition 374 represents a unique opportunity to investigate the Neogene-Quaternary record deposited in the outer continental margin of the Eastern Ross Sea to be compared to existing data from previous drillings in adjacent inner areas (Andrill, IODP, DSDP). The sedimentary strata from the six-site transect from the Ross Sea shelf to the rise will provide insights on the past Antarctic ice sheet variability under different climate forcings. An extensive sedimentological study comprising an early diagenesis characterization is then the first crucial approach for the interpretation of the sedimentary record. On the basis of my previous experiences of sedimentary records from the Antarctic continental margin, I am familiar with facies from marine ice-proximal setting where sedimentation reflects a complex interplay of marine sedimentation and glacial input with a large variety of marine/glacimarine/interglacial/glacial sediments. In the late nineties, I was on-ice sedimentologist during CRP drilling seasons, and the study of the CRP records allowed to improve the knowledge of the climate and tectonic evolution of the Victoria Land Basin. Recently I have performed studies on sediment cores recovered from the Coulman High area during the cruise of R/V N.B.Palmer 94-01. I have just been submitted the scientific results to the SCAR Science Conference 2016 and to the AGU Fall Meeting 2016. This study allowed to reconstruct the interactions between marine and glacial input on the basis of the sediment composition during the Last Glacial Maximum.

Aim of Expedition 374 is to recover sediment cores in a more distal marine area where the ocean input, climate dynamics and the sea level changes may have played a significant role on sedimentation.
Purpose of this research proposal is to reconstruct the ocean-ice sheet interactions, in particular to evaluate the role of the WAIS on marine sedimentation in the last 20 Ma along the outer Ross continental margin.
The interpretation of the different facies will clarify the depositional setting and related climate implications.
The discrimination of the sedimentary input from different sources (marine with biogenic and terrigenous components, glacimarine with Ice-Rafted Debris (IRD), gravity flow glacigenic sediments, subglacial till, ice distal record of glacial/interglacial cycles) may provide additional information concerning the fluctuations of the ice sheet (WAIS extent) along the outer Ross Sea continental margin from the shelf to the rise through time.
This study has a multi-proxy approach. Here I propose a comprehensive sedimentological study which comprises: a) lithostratigraphy (logging of the sediment cores, facies analysis), b) sediment characterization and evaluation of the ocean input in sediment composition (biogenic vs non-biogenic components); c) early diagenesis, studying preservation/dissolution and cementation of biogenic components (carbonate micro/macrofossils).

On-board investigations can be summarized as follows:

- to compile a lithostratigraphic log of the sediment cores;
- to identify facies and microfacies in order to reconstruct the original depositional setting;
- to evaluate biogenic vs non-biogenic components using smear slides in order to evaluate the different input, marine, glacimarine with IRD, sub-ice shelf conditions;

- to study the biogenic components (carbonate micro/macrofossils) and to identify the various stage of their preservation (alteration/dissolution, cementation) and the related stage of early diagenesis;
- to describe the main macroscopic diagenetic features vs depth (cementation, authigenic minerals..) in order to better define the depositional setting (marine vs glacimarine).

Close cooperation with scientists from the Science Team is crucial. The obtained data need to be integrated with data from other disciplines. For example, facies analysis and related changes are crucial for basin reconstruction. Main facies will be selected for dating in cooperation with biostratigraphers. Identification of major unconformities better constrains the downhole logging and geophysical interpretation.

Then, I propose the following shore-based studies, back to the labs of my home institution:

- sediment composition of the biogenic vs non-biogenic components to be determined using SEM coupled with an EDS microprobe;
- early diagenesis with the aim to describe the various stages of preservation of the biogenic tests (etching and pitting on skeletal grains due to alteration/dissolution), as reflected by microfabric and mineralogy under SEM coupled with an EDS microprobe;
- early diagenesis with the aim to clarify the subsequent carbonate cement generations of biogenic/non-biogenic carbonates and using a petrographic microscope attached to a cathodoluminiscence probe (CL);
- sediment source areas to be identified in cooperation with researchers from my institution (CNR-IDPA) using REEs patterns.

The data collected with this research proposal may contribute to the objectives of the IODP Expedition 374 in order to clarify: A) The sedimentary processes, and especially to evaluate the advance/retreat of the West Antarctic Ice Sheet during past glacial-interglacial climate optima on the basis of facies characterizations (Objectives 1, 2, 3, 4, 5). B) The sediment composition (biogenic vs non-biogenic) to document the ocean/ice-sheet interactions in the last few million years (Objectives 1, 2, 4, 5). C) The role of early diagenesis on preservation of carbonate micro/macrofossills and related paleoclimate implications (Objectives 1, 2, 3, 4, 5).
Moreover the resulting data may provide useful proxies for global-scale models for a future warmer world.

Milano, August 15th, 2016

Fulvia S. Aghib

Born in NewYork City, NY (U.S.A.), February 24, 1961.
Italian and U.S. citizenships.
Fluent English, written and spoken.
Address: Piazza Firenze 21, I-20149 Milano, Italy
e-mail: fulvia.aghib@idpa.cnr.it; fulvia.aghib@unimi.it

Present position

Researcher at CNR-IDPA (Instituto per le Dinamiche dei Processi Ambientali), via Mario Bianco, 9, I-20131 Milano, Italy.

Educational background

Laurea in Geological Sciences*,* 1988. University of Milano, Italy.

Student Fellowship (1989-1990) awarded by the Woods Hole Oceanographic Institution, MA, USA.

Research interests

With a background in marine geology and sedimentology, I study marine/glacimarine sedimentation on continental margins with special interest to polar regions in order to reconstruct the original depositional environment (marine vs glacial; glacial vs interglacial) related to the global climate changes. I also investigate the diagenesis of the sediments using a multi-proxy methodological approach, consisting of standard sedimentological techniques and investigations under petrographic microscope attached to a Cathodoluminescence probe, under SEM/SE/BS coupled with EDS microprobe, to be integrated with geochemical C, O isotope and REE proxies.

My main research interest can be summarized as follows:

- Paleoclimate implications of the marine Cenozoic successions in the Ross Sea area as reflected by facies analysis.
- Cenozoic marine sediment processes in the Ross Sea area, with special focus on sedimentary processes along the continental margins and the related ice sheet dynamics.
- Sediment composition and paleoclimate implications in marine ice-proximal settings.
- Formation of carbonates at high latitudes and relationship between the occurrence of biogenic carbonates and early diagenesis.
- Early diagenesis of calcareous and silica biogenic components from marine ice-proximal settings.
- Evaluation of glacial melting vs marine waters as reflected by early diagenesis and REEs trend.
- Early diagenesis of pelagic carbonates in the Mediterranean Sea and Atlantic Ocean.
- Geological setting of anoxic basins within the Mediterranean Ridge and their relationships with sedimentation and deep-seated hypersaline brines.

Previous Experiences as team sedimentologist

- **Participation to Antarctic drillings**

Cape Roberts Project. Participation as on-ice sedimentologist in 2 drilling seasons: CRP-2 (1998) and CRP-3 (1999).

- **Participation to oceanographic cruises**

Participation as shipboard sedimentologist in several oceanographic cruises on Italian and foreign research vessels in the North Atlantic and Mediterranean Sea. Total of 251 days of shipboard experience.

Main international research projects

- **Co-proponent** of the **PNRA Project** *"Climate and tectonic forcings in the West Antarctic Rift System of the South Victoria Land: a source to sink, multi-proxy study"* (2013-2016).
- **Short-Term Mobility CNR Grant 2014,** *"Study of LGM marine ice-proximal sediments from the Coulman High are, Ross Sea, Antactica".* I have spent a month at the Antarctic Marine Research Facility of Florida State University, FL, USA. December 2014.
- **Sedimentologist** on **PNRA/CLITEITAM Project** *(CLimatic-TEctonics Interactions along the TransAntarctic Mountains Front and comparison with the Arctic record in the Greenland-Svalbard region"* , PNRA 2009-2011.
- Sedimentologist on **CNR-FISR-CLIMAVAR** project. "Variazioni climatiche", PNRA 2004.
- **Proponent** of the **PNRA/CRISP** "**C**enozoic **RI**ft-related **S**ediment **P**rocesses:a *tool to paleoclimatic and tectonic histories, Ross Sea region, Antactica"* , PNRA, 2002-2003.
- **Proponent** of the **PNRA/Post-CRP project: Sedimentology and Diagenesis** "*Sedimentation and diagenesis of the Cenozoic sedimentary successions recovered at CRP site, Ross Sea, Antarctica",* PNRA 2000-2001.
- **Proponent** of the **PNRA/CRP project: "***Sedimentology and Diagenesis"* (1997-1999).
- **Science Coordinator** of the Italian Steering Commitee of the **Cape Roberts Project** (1997-2001).
- **Co-investigator** (Partner) of the **EEC-MAST II project** *"Marine biogenic and non-biogenic fluxes in the Mediterranean Ridge"* (MARFLUX), 1993-1996.
- **Co-investigator** (Partner) of the **EEC-MAST-I project** "*An Integrated Investigation of the Fluid Flow Regime of the Mediterranean Ridge"* (MEDRIFF), 1989-1992.
- **Science Coordinator** at the **ESCO** (ESF Scientific Consortium for the ODP) Secretariat, Dipartimento di Scienze della Terra, Universita' di Milano, 1990- 1992.

Recent Abstracts submitted to Science Conferences

- **Aghib, F.S**., Turetta C., Ferretti P., 2016. "Paleoclimate implications during LGM from cores collected off Coulman High, Ross Sea, Antarctica". *SCAR Open Science Conference 2016*, August 10-20, Kuala Lumpur, Malaysia.

- **Aghib, F.S.**, Turetta C., Ferretti P., Barbante, C., 2016. "Ice-proximal marine sedimentation in the Ross Sea during LGM: Ice-sheet and ocean interactions". *AGU Fall Meeting 2016,* December 12-16. American Geophysical Union, San Francisco.

Publications

20 on peer-reviewed international journals, 3 in preparation.

Selected publications

- **Aghib, F.S**., Bernoulli, D. & Weissert, H., 1991. "Hardground formation in the Bannock Basin (eastern Mediterranean)". *Marine Geology*, v. 100, 103-113, Amsterdam.
- Staffini, F., Spezzaferri, S., & **Aghib, F**., 1993. "Mud diapirs of the Mediterranean Ridge: sedimentological and micropaleontological study of the mud breccia". *Riv. It. Paleont. Strat*., v. 99, n.2, 225-254, Milano.
- **Aghib, F.S**., 1997. "Anoxic versus oxic sedimentation in the Bannock Basin area, 35,000 YRS B.P. to present". *Riv. It. Paleont. Strat*., v.102, (2), 293-302, Milano.
- Claps M. & **Aghib F. S**., 1998. "Carbonate diagenesis in Miocene Sediments from CRP-1, Victoria Land Basin, Antarctica". *Terra Antartica*, v.5, n.3, pp.655-660, Siena.
- **Aghib F.S.**, Alberti M., Anderson J., Armienti P., Askin R., Bannister S. et al,1999. "Initial Report on CRP-2/2A, Ross Sea, Antarctica". *Terra Antartica*, v. 6, n.1/2, 1-171, Siena.
- **Aghib F.S.**, Alberti M., Anderson J., Armienti P., Askin R., Bannister S. et al, 2000. "Initial Report on CRP-3, Ross Sea, Antarctica". *Terra Antartica*, v. 7, n.1/2, 1-209, Siena.
- **Aghib F. S**., Claps M.& Sarti M., 2000. "Preliminary report on the diagenetic features on the Oligocene Strata from CRP-2/2A core, Ross Sea, Antarctica". *Terra Antartica*, 7(3), 393-400, Siena.
- Wise, S. W. Jr., Smellie J., **Aghib F**., Jarrard R., Krissek L. 2001."Authigenic smectite clay coats as a possible indicator of fluid flow in CRP-3, Antarctica: A progress report". *Terra Antartica*, v.8, n.3, pp.281-298, Siena.
- Wallmann, K, **Aghib, F.S**., Castradori, D., Cita, M.B., Suess, E., 2002. "Sedimentation and formation of secondary minerals in the hypersaline Discovery Basin, eastern Mediterranean". *Marine Geology*, v.186, pp.9-28, Amsterdam.
- **Aghib F. S.**, Fielding C. R. & Frank T. D. 2003."Diagenesis of the Cenozoic sedimentary succession from the CRP-3 core, Ross Sea, Antarctica". *Terra Antartica*, **10**, 27-37, Siena.
- Bellanca A., **Aghib F. S.**, Neri R. & Sabatino N., 2005. "Bulk carbonate isotope stratigraphy from CRP-3 core (Victoria land Basin, Antarctica): evidence for Eocene-Oligocene paleoclimatic evolution". *Global and Planetary Change*, v. 45, 237-247, Amsterdam.
- Giorgetti G., **Aghib F. S.**, K. J. T. Livi, A.-C. Gaillot & Wilson T., 2007. "Newly-formed phyllosilicates in sediments and basement rocks from CRP-3 core (Antarctica): An electron microscopy study". *Clay Minerals*, v. 42, 21-43, London.

Milano, August 15th, 2016

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Please type information

Apply to Sail Application Form

Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

1. PERSONAL INFORMATION

Family name:	Dr. Bauersachs
First name:	Thorsten
Current Position:	Habilitand (~Assistant Professor)
Institution:	Christian-Albrechts-University, Institute of Geosciences, Department of Organic Geochemistry
Address:	Ludewig-Meyn-Straße 10
City, Postcode, Country:	Kiel, 24118, Germany
Tel. work:	+49 431 8803694
Tel. home:	+49 1573 6002636
Fax:	+49 431 8804376
Email:	thb@gpi.uni-kiel.de
Country of citizenship:	Germany
Place of birth/date of birth:	Cologne/01.12.1976
Gender:	Male

Education (highest degree, including year PhD was received / is expected): PhD awarded in 2010

Are you currently a student? No Expected Graduation Date: /

2. EXPEDITION INFORMATION

Summary of proposed participation, including area of scientific interest, current research and participation plan (maximum 250 characters with space – more detail should be included in the Letter of Interest):

I intend to participate at IODP Expedition 374 as onboard organic geochemist to study the climate, sea ice, paleoenvironmental and paleoecological history of the Ross Sea by using lipid paleothermometers, biomarkers and stable isotope techniques.

Prior involvement with DSDP/ODP/IODP and nature of involvement (expedition number, shipboard/shore-based participation, co-chief, etc):

I have been directly involved in three IODP Expeditions:

1. IODP Expedition 333: NanTRoSEIZE 2: Subduction Inputs and Heat Flow
   Offshore organic geochemist
2. Mission-specific IODP Expedition 347: Baltic Sea Paleoenvironment
   Offshore and onshore organic geochemist / Member of the post-cruise publication meeting
3. IODP Expedition 350: Izu-Bonin-Mariana Rear Arc
   Supervisor of Ann-Sophie Jonas, who participated at IODP Expedition 350 as offshore organic geochemist and currently investigates the evolution of the Kuroshio Current (NW Pacific) using samples collected during IODP Expeditions 333 and 350 during her PhD project at Christian-Albrechts-University.

Post-cruise science support to achieve the proposed scientific objectives 1) future funding scheme and 2) support from host institution (e.g. staff, facilities)

An initial screening of the bulk- and organic geochemical as well as the stable carbon and nitrogen isotope inventory of sediments collected during IODP Expedition 374 will be feasible through annual funds that are provided by the Christian-Albrechts-University to the Organic Geochemistry Department. Based on the initial screening results, I plan to submit a full research proposal to the IODP priority program of the Deutsche Forschungsgemeinschaft (DFG) to obtain funding for high-resolution biomarker and stable isotope studies of paleoclimate and paleoenvironmental change of the Ross Sea throughout the Neogene and Quaternary.

The Department of Organic Geochemistry at Christian-Albrechts-University maintains a fully equipped organic-geochemical laboratory with state-of-the-art analytical instruments (including EA, TOC analyzer, Rock-Eval, GC-FID, GC-MS, GC-MS/MS, HPLC-SingleQ/MS, HPLC-TriQ/MS, HPLC-TOF/MS, EA-IRMS, compound-specific GC-IRMS), in which all of the research outlined in the letter of interest can be conducted. The PI will receive assistance in the administration of the post-cruise science project by the department's secretary (Mrs. Janina Fischer).

Three scientific and/or personal references

1. Prof. Lorenz Schwark (Christian-Albrechts-University, Institute of Organic Geochemistry, Department of Organic Geochemistry; e-mail: ls@gpi.uni-kiel.de)

2. Prof. Dr. Jaap Sinninghe Damsté (Royal Netherlands Institute for Sea Research, Marine Microbiology and Biogeochemistry; jaap.damste@nioz.nl)

3. Prof. Dr. Stefan Schouten (Royal Netherlands Institute for Sea Research, Marine Microbiology and Biogeochemistry; stefan.schouten@nioz.nl)

3. SCIENTIFIC EXPERTISE

For Scientist Jobs Descriptions visit: http://iodp.tamu.edu/participants/scientist_jobs.html

Please indicate your area(s) of expertise (maximum 3)

Discipline	Mark with X	Speciality
microbiologist	x	
organic and inorganic geochemist/biogeochemist	x	organic geochemistry; geomicrobiology; aquatic biogeochemistry; intact polar lipids (IPLs); biomarkers (e.g. sterols, hopanols, fatty acids, alkanes, branched alkanes, alcohols, long-chain diols, HBIs, GDGTs, BHPs, etc.); lipid paleothermometers (TEX_{86}, $U^{K'}_{37}$, LDI, MBT/CBT); stable carbon and nitrogen isotopes; paleoenvironmental, paleoceanographic and paleoclimate research
physical properties specialist		
sedimentologist		
structural geologist		
paleontologist		
paleomagnetist		
petrologist		
hydrogeologist		
Other		

4. ADDITIONAL DOCUMENTS

Please, provide the following documents:

- Letter of interest, including details about area of scientific interest, current research, expedition participation plan and post-cruise research
- CV and Publication list
- Letter of recommendation (for PhD students)
- See also: http://www.essac.ecord.org/flyer/Guidelines_for_Applying_to_sail.pdf

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See http://www.essac.ecord.org/index.php?mod=about&page=ESSAC for a list of the national contact persons.

Research background: I am currently occupying a position as Habilitand (~Assistant Professor) in Organic Geochemistry and Geomicrobiology at the Christian-Albrechts-University (Kiel, Germany). My main research interests lie in reconstructing paleoceanographic, paleoenvironmental and paleoclimate changes throughout the Cenozoic and the impact of climate variation on marine and terrestrial microbial community structures and their productivity. To obtain information on past environmental changes (such as sea surface temperature (SST), salinity, redox conditions, water column stratification, composition of primary producers, etc.), I employ lipid paleothermometers (TEX_{86}, $U^{K'}_{37}$, LDI), biomarker distributions and bulk-geochemical as well as stable carbon and nitrogen isotope techniques.

Proposed research program: A primary goal of my envisioned research within the framework of IODP Expedition 374: Ross Sea West Antarctic Ice Sheet History will be to establish high-resolution records of water temperature changes from the Neogene to the Quaternary using the lipid paleothermometers TEX^{L}_{86}, $U^{K'}_{37}$ and LDI. These proxies are commonly employed in paleoceanographic studies and provide detailed information on the timing and rapidness of oceanic warming and cooling events. As such, they will be essential in studying the effect of global warming on the expansion and retreat of sea ice in the Ross Sea. Interestingly, the TEX_{86} has initially been proposed to reflect SSTs, but more recent evidence suggest that it may more likely reflect temperatures of deeper water masses. By contrast, the $U^{K'}_{37}$ and LDI are based on lipids synthesized exclusively by marine photoautotrophs that dwell in the sunlit surface waters of the global oceans. This may offer the exciting possibility to separately study temperature trends in the surface and subsurface water masses of the Ross Sea shelf area. The generation of detailed water temperature records will thus help to establish the expedition objectives 1, 2 and 3. Likewise, the distribution of branched GDGTs, which are derived from soil living bacteria, will be used to reconstruct mean annual air temperatures (MAAT) in form of the MBT/CBT index (objective 2). These components are introduced to the marine realm via run-off, riverine discharge and sea ice and may yield particularly valuable information on MAAT changes during the formation the ice sheet throughout the Neogene. In form of the branched tetraether index (BIT), branched GDGTs may also provide a means to estimate the amount of terrestrial organic matter and nutrients that are transported to the marine environment.

Another major aim of my research is to reconstruct the Neogene and Quaternary ice margin fluctuations of the Ross Sea by studying the sedimentary distribution of highly branched isoprenoids (HBIs) in sediments collected during IODP Expedition 374. A HBI diene unique to diatom genera that are exclusively found at the sea ice margin has recently been reported in high abundances from Antarctic surface sediments and proposed to be an indicator for determining past sea ice fluctuations in the Antarctic region; similar to the IP_{25} that is used to reconstruct the spatiotemporal distribution of sea ice in the Arctic. The presence and absence of the HBI diene in Ross Sea sediments may thus allow reconstructing the expansion and contraction of the ice sheet in high-resolution over time. When analyzed at sites drilled along a transect from the continental slope to the shelf region, this will allow studying the maximal expansion of the ice sheet and also to investigate the frequency of short-lived expansion and retreats of the ice sheet, which complies well with objectives 1 and 4 defined in the expedition proposal.

In addition, lipid biomarker distributions will be investigated to study the impact of climate warming on the paleoproductivity, the community composition of marine primary producers and the depositional environment in the Ross Sea. For example, HBI and sterol distribution patterns will be used to determine the productivity of diatoms, while heterocyst glycolipids and branched alkanes may provide information on cyanobacterial abundances and species composition over time. Other biomarkers are available for the majority of marine and

terrestrial primary producers and will be applied to determine shifts in the community composition of aquatic and terrestrial ecosystems related to climate change or nutrient status. In addition, lipid biomarkers also allow determining changes in the paleoenvironmental conditions (such as redox state, water column stratification) of the Ross Sea.
High resolution profiles of bulk-geochemical properties (TC, TOC, TN, TS, TOC/TN, TOC/TS) will be established to study the paleoproductivity of the Ross Sea and to determine organic matter sources. Rock-Eval analysis will be performed as a complementary means to identify the type and to investigate the maturity of the sedimentary organic matter. Bulk carbon and nitrogen isotopes will be applied on sediments from the Ross Sea to obtain information on variations in paleoproductivity and nutrient cycling over time. Shifts in the stable carbon isotope signal of marine organic matter to more enriched isotope values may indicate an increased primary productivity due to warmer water temperatures or increased nutrient loading from the land or through upwelling. Stable nitrogen isotopes, on the contrary, may provide information on shifts in the nutrient state, the type of primary producers and the rate of nitrogen removal from the ocean during ice sheet expansion and contraction in the Ross Sea. In addition to bulk stable isotope measurements, compound-specific stable isotope on the δD inventory of biomarkers exclusively attributed to an aquatic source may be used to reconstruct salinity variations in the Ross Sea over time, which are associated to melting of sea ice and an increased loading of freshwater to the Ross Sea. The diol index (DI), a biomarker proxy to study relative changes in salinity in aquatic environments will be used to complement δD analysis.
Although not directly related to the research objectives of IODP Expedition 374, I am also interested in studying the community composition and abundances of the deep biosphere in Ross Sea subsurface sediments using intact polar lipids. These components are derived from the cell membrane of eukaryotic and prokaryotic organisms and upon cell lysis rapidly degrade in the sedimentary environment and are not preserved over geological time scales. Therefore, they are considered to constitute markers for living cells in subsurface sediments and their study might yield valuable information on the composition and activity of the deep biosphere in polar regions. This study would be an important extension of my work on the deep biosphere that I currently conduct as part of my research within the framework of IODP Expedition 347: Baltic Sea Paleoenvironment.

Previous participations at IODP Expeditions: I have previously participated as off- and onshore organic geochemist at three IODP Expeditions. As part of my research related to IODP Expedition 333: NanTRoSEIZE Stage 2: Subduction Inputs and Heat Flow, we are currently investigating the impact of the variability in the strength and flow pattern of the Kuroshio Current on the climate development of the NW Pacific Ocean over the last 14 Ma using the lipid paleothermometers TEX^{H}_{86}, $U^{K'}_{37}$ and LDI. In combination with investigations of sediments obtained during IODP Expedition 350: Izu-Bonin-Mariana Rear Arc, at which my PhD student Ann-Sophie has participated as onboard organic geochemist, the data will greatly enhance our current understanding on the meridional transport of heat from the Western Pacific Warm Pool to northern mid-latitudes. The research program carried out within the framework of mission-specific IODP Expedition 347: Baltic Sea Paleoenvironment aims on studying the environmental controls (such as variation of SST) that trigger the formation of cyanobacterial blooms in the Baltic Sea but also to reconstruct the climate history of central northern Europe, in which among others the fluctuations of sea ice is investigated by using the IP_{25}. I am thus well familiar with the protocols and IODP-specific procedures regarding sample collection both as offshore and onshore organic geochemist.

Funding for post-cruise research work program: Initial analysis of the bulk- as well as organic-geochemical and stable isotope properties of sediments obtained during my possible

participation as offshore organic geochemist during IODP Expedition 374 will be possible by annual grants that are awarded to the Department of Organic Geochemistry by the Christian-Albrechts-University. Based on the initial screening results, I will submit a full proposal to the IODP priority program of the Deutsche Forschungsgemeinschaft (DFG) that aims on establishing high resolution profiles of SST and paleoenvironmental changes as well as sea ice fluctuations in the Ross Sea over time to determine the sensitivity of this region to global warming. I have previously submitted five research proposals (including two renewal proposals related to my current research within the framework of IODP Expeditions 333 and 347) to the IODP priority program, from which all got funded (funding rate of 100%).

Curriculum Vitae

Dr. Thorsten Bauersachs

Department of Organic Geochemistry • Institute of Geosciences • Christian-Albrechts-University •
Ludewig-Meyn-Straße 10 • 24118 Kiel • Germany • Phone: +49 431 8803694 •
Email: thb@gpi.uni-kiel.de

Personal Data

Born	1st December 1976, Cologne, Germany
Citizenship	German
Languages	German (native), English and Dutch (proficient), French (basic)

Education

2006-2010	Ph.D., Royal Netherlands Institute for Sea Research (NIOZ), Department of Marine Organic Biogeochemistry, Texel, The Netherlands
	Advisor: Prof. Dr. Jaap S. Sinninghe Damsté, Prof. Dr. S. Schouten
2002-2005	Diplom (~MSc) in Geology/Palaeontology, University of Cologne, Germany
1999-2002	Vordiplom in Geology/Palaeontology, University of Cologne, Germany

Research Experience

2010 – present	Christian-Albrechts-University, Kiel, Germany *Habilitation, Role of N_2-fixing cyanobacteria in global biogeochemical cycles*
2015	Harvard University, Cambridge, USA *Visiting scholar, Expression of ancient carbon fixation pathways in unicellular cyanobacteria*
2015	MARUM, Bremen, Germany *Visiting scholar, Structure and community composition of the deep biosphere in the Baltic Sea*
2011	Curtin-University, Perth, Australia *Visiting scholar, Biogeochemistry of stromatolites*
2008	Newcastle University, Newcastle upon Tyne, UK *Visiting scholar. BHP distribution in N_2-fixing cyanobacteria*
2006 – 2010	Royal Netherlands Institute for Sea Research, Texel, The Netherlands *Ph.D. candidate. Molecular and isotope organic (bio)geochemistry*
2000 – 2006	University of Cologne, Cologne, Germany *Diplom (~MSc) candidate. Geochemical characterization of the Messel oil shale*

Research Interests

Paleoenvironmental reconstructions using lipid biomarkers and stable isotopes
Development of the global carbon and nitrogen cycle over geological times
Proxy development
Microbial ecology in marine and lacustrine depositional environments
Function, diversity, and distribution of intact polar lipids in microorganisms
Microbiogeochemistry and diversity of microbial mat systems

Honours, Awards, Fellowships

2014	DAAD Travel Award
2013	Best poster award, IODP/ICDP Meeting, Freiberg, Germany
2011	EAOG Travel Scholarship Award (N_2 fixation of marine cyanobionts)
	DAAD Travel Award
2009	Best student poster award. NAC9, Feldhoven, The Netherlands
2006	Darwin Center for Biogeosciences Scholarship & Stipend Award

Funding (~500,000 € as PI and Co-PI since 2012)

2016 **Bauersachs, T.**, Schwark, L. Importance of N_2-fixing heterocystous cyanobacteria in the nitrogen cycling of the Holocene and Weichselian Baltic Sea
PI, IODP priority program, DFG, renewal proposal 81,896 €

Bauersachs, T., Schwark, L. Variability of the Kuroshio Current over the last 25 Ma
PI, IODP priority program, DFG, renewal proposal 77,246 €

2015 Larsen, T., **Bauersachs, T.**, Piatkowski, U., Andersen, N. Characterizing trophic links in pelagic ecosystems with stable isotope fingerprinting of amino acids
Co-PI, Future Ocean Cluster *42,000 €*

Schwark, L., Schmitz-Streit, R.A., Devey, C., **Bauersachs, T.** Ocean floor hard-rock as a bioreactor
Co-PI, Future Ocean Cluster 75,000 €

2014 **Bauersachs, T.**, Schwark, L. Importance of N_2-fixing heterocystous cyanobacteria in the nitrogen cycling of the Holocene and Weichselian Baltic Sea
PI, IODP priority program, DFG 195,750 €

Bauersachs, T., Schwark, L. Variability of the Kuroshio Current over the last 25 Ma
PI, IODP priority program, DFG 155,950 €

2012 **Bauersachs, T.** Variability of the Kuroshio Current over the last 8 Ma
PI. IODP priority program, DFG 40,000 €

Collaborators

Lucas Stal (NIOZ), Helen Talbot (Newcastle University), Ann Pearson (Harvard University), Scott Miller (University of Montana), Muriel Gugger (Pasteur Culture Collection), Rachel Foster (Stockholm University), Thomas Friedl (Göttingen University), Volker Thiel (Göttingen University), Bo Barker Jørgenson (Aarhuis University), Caroline Slomp (Utrecht University), Nadine Quintana Krupinski (Lund University), Ulrich Kotthoff (Hamburg University), James Russell (Brown University), Kai-Uwe Hinrichs (MARUM), Johan Yans (Namur University), Christophe Six (Roscoff Marine Station), Christoph Mayr (Ludwig-Maximilian-University), Mark Schmidt (GEOMAR), Ulf Riebesell (GEOMAR), Katrin Weidenbach (CAU), Opayi Mudimu (CAU), Thomas Larsen (Leibniz Laboratory), Christian Deusner (GEOMAR), Renato Salvatteci (CAU), Ruth A. Schmitz-Streit (Christian-Albrechts-University), Rüdiger Schulz (Christian-Albrechts-University)

Scientific Cruises

2013 IODP Expedition 347 (Baltic Sea Paleoenvironment)
2012 *RV Pelagia*, Microbial Ecology of Red Sea brine systems (GEOMAR)
2011 IODP Expedition 333 (NantroSEIZE 2: Subduction input and heat flow)

Committees and Symposia

2015 Session chair, 27th International Meeting on Organic Geochemistry (IMOG), Prague
Session 13: Earth Life Evolution

Conference Organisation Team
Early Career Scientists Conference for Marine and Climate Research (ECC), Kiel

Session chair, ECC, Kiel
Session 2: Pacific Ocean, Indian Ocean, Oceania, Asia and America

2011 Co-chair & convener, American Geophysical Union Fall Meeting session:
(B33) 4 billion years of marine nitrogen cycling

Professional Affiliation

2016 – present	Member of the Sonderforschungsbereich „Scales of Transformation: Human-environmental interaction in Prehistoric and Archaic Societies"
2013 – present	Member of the Cluster of Excellence, Kiel "The Future Ocean"
2011 - present	Member of the European Association of Organic Geochemists (EAOG)
2005 - present	Member of the German Society of Geosciences

Referee Activities

Journals	Environmental Microbiology and Environmental Microbiology Reports, Earth and Planetary Science Letters, Quaternary Sciences Reviews, Geochimica et Cosmochimica Acta, FEMS Microbiology Ecology, Biogeosciences, Limnology & Oceanography, Phytochemistry, Organic Geochemistry, Journal of Paleolimnology, Marine Biology, Journal of Chromatography A, Biochemical Systematics and Ecology
Grant Committees	European Research Council (ERC) consolidator grant

Teaching Experiences (4SWS since 2010)

Bachelor courses	Introduction to Geosciences Introduction to Organic Geochemistry Laboratory Classes in "Geochemistry of Marine Sediments" "Westerhever-Wattkurs" (3-day field trip)
Master courses	Biogeochemistry of Aquatic Ecosystems Chemistry of Sedimentary Rocks Methods for the Reconstruction of Fossil Environments Paleoecosystem Studies Crises in Earth History Laboratory Classes in "Chemistry of Sedimentary Rocks" Economic Geology Seminar of Marine Geosciences "Lagerstätten-Exkursion" (7-day field trip)

Oral Presentations

2016

Bauersachs, T. Chemotaxonomy of heterocystous cyanobacteria. Georg-August-University, Göttingen, Germany (**invited**)

Bauersachs, T., Lorbeer, N., Schwark, L. Climate variability controls the formation of cyanobacterial blooms in the Baltic Sea. IODP/ICDP Colloquium, Heidelberg, Germany (**plenary session**)

2015

Bauersachs, T., Lorbeer, N., Schwark, L. IODP Expedition 347 scientists. Progress on the organic- and inorganic geochemistry of the Baltic Sea. 2nd IODP Expedition 347 post-cruise meeting, Stockholm University, Sweden (**invited**)

Jonas, A.S., **Bauersachs, T.**, Schwark., L. 730 ka records of paleoceanographic and climate evolution of the Northwest Pacific Ocean. 27th International Meeting on Organic Geochemistry, Prague, Czech Republic (**plenary session**)

Bauersachs, T., Lorbeer, N., Schwark, L.. Reconstructing the late Pleistocene and Holocene Baltic Sea environment: A biomarker perspective from the Landsort Deep. Lund University, Sweden (**invited**)

Bauersachs, T. Heterocyst glycolipids: A novel tool to trace for blooms of N_2-fixing heterocystous cyanobacteria in aquatic environments. Centre of Environmental Research (UFZ), Magdeburg, Germany (**invited**)

Bauersachs, T. Novel insights into the biological function and distribution of heterocyst glycolipids in N_2-fixing heterocystous cyanobacteria. University of Massachusetts, Amherst, USA (**invited**)

2013 **Bauersachs, T**. Lipid profiling as a tool to unravel the evolution of life. Department of Plant Cell Physiology and Biotechnology, Christian-Albrechts-University, Kiel, Germany (**invited**)

Bauersachs, T., Strasser, M., IODP Expedition 333 Science Party. Preliminary results from IODP Expedition 333 (Nankai Through, Japan). IODP/ICDP Colloquium, Münster, Germany (**plenary session, invited**)

2010 **Bauersachs, T**. Heterocyst glycolipids – novel biomarkers to trace for N_2-fixing heterocystous cyanobacteria in natural environments. GEOMAR, Kiel, Germany (**invited**)

Bauersachs, T., Schouten, S., Hopmans, E.C., Sinninghe Damsté, J.S. The role of N_2-fixing cyanobacteria in the formation of marine black shales. North German Meeting on Organic Geochemistry, Hamburg, Germany (**plenary session, invited**)

2009 **Bauersachs, T.**, Schouten, S., Hopmans, E.C., Sinninghe Damsté, J.S. Fossilized intact polar lipids of photosynthetic organisms in ancient subsurface sediments. AGU Fall Meeting, San Francisco, USA

2008 **Bauersachs, T.**, Stal, L.J., Compaoré, J., Talbot, H., Schouten, S., Sinninghe Damsté, J.S. Distribution of bacteriohopanepolyols in cultures of N_2-fixing cyanobacteria. FOKUZ, Amsterdam, The Netherlands

Bauersachs, T., Stal, L.J., Compaoré, J., Schouten, S., Sinninghe Damsté, J.S. Nitrogen isotopic fractionation associated with nitrate and N_2 uptake in marine and freshwater cyanobacteria. 9th Netherlands Aardwetenschappelijk Congres, Feldhoven, The Netherlands

2007 **Bauersachs, T.**, Stal, L.J., Compaoré, J., Talbot, H., Schouten, S., Sinninghe Damsté, J.S. Nitrogen isotopes and bacteriohopanepolyols – specific tracers for N_2-fixing cyanobacteria. Darwin Meeting, Royal NIOZ, The Netherlands

Current and Former Advisees

2016 *Jan Weber* (M.Sc.), Facies reconstruction and chemostratigraphy of Lake Steißlingen – a kettle ice lake in southern Germany (ongoing).

Amira Antelmann (M.Sc.), Effect of environmental stress on toxin production in the hepatotoxic cyanobacteria *Microcystis* and *Anabaena* (ongoing).

Sebastian Lamp (M.Sc.), Reconstructed TEX^{H}_{86} meridional sea surface temperature gradients in a Cretaceous greenhouse world (ongoing).

2015 *Nina Lorbeer* (PhD), Importance of cyanobacterial blooms in the spread of hypoxic conditions in the Baltic Sea (ongoing).

Frederik Linsenmeier (B.Sc.), Distribution of free and ester-bound lipids in 22 species of the Chlorophyceae and Trebouxiophyceae.

Mareike Pohling (M.Sc.), Comparative study on sea surface temperature variation in the Santa Monica Basin using lipid paleothermometers (TEX_{86}, $U^{K'}_{37}$ and LDI) and oxygen isotopes.

Philipp Dieck (B.Sc.), Lipid distribution patterns in members of the Xanthophyceae and Euglenophyceae.

Johannes Dickemann (B.Sc.), Chemotaxonomy of eustigmatophytes based on long chain diols.

Jan Kraume-Fügel (B.Sc.), Global sea surface temperature variation during the Cretaceous warm house period using the TEX_{86} lipid paleothermometer.

2014	*Ann-Sophie Jonas* (PhD), Paleoceanography and paleoclimate variation of the NW Pacific based on lipid paleothermometers (TEX^{H}_{86}, $U^{K'}_{37}$ and LDI) (ongoing).
	Nina Lorbeer (M.Sc.), Holocene climate evolution of Central Europe inferred from sediment records of the Landsort Deep (Baltic Sea).
	Josh Rochelmeier (B.Sc.), Temperature-induced variation of cyanobacterial lipids in Lake Schreventeich (Kiel, Germany).
2014	*Nicole Dreyer* (M.Sc.), Applicability of GDGT based paleoenvironmental proxies to lacustrine environments.
2013	*Ann-Sophie Jonas* (M.Sc.), Variation of the Kuroshio Current over the last 8 million years.
	Jan-Peter Mayser (M.Sc.), GDGT distributions in Red Sea brine systems.
2013	*Julien Schirrmacher* (B.Sc.), Bulk geochemical characterization of the Eocene sedimentary sequence of the Mudurnu-Göynük-Basin (Turkey).
2012	*Katrin Hesseler* (Diplom), Chemotaxonomy of New Zealand's coastal flora.
2011	*Gitta von Röhn* (B.Sc.), Community structure of intertidal microbial mats (Westerhever, Germany).

Peer-Reviewed Publications

2016 Jonas, A.S., Schwark, L., **Bauersachs, T**. Late Quaternary sea surface temperature variation of the Kuroshio Current and its impact on the climate evolution of the Northwest Pacific Ocean based on the lipid paleothermometers TEX^{H}_{86}, $U^{K'}_{37}$ and LDI. Submitted to *Deep Sea Research Part I*

Zink, K.G., Vandergoes, M.J., **Bauersachs, T.**, Newnham, R., Schwark, L. A refined paleotemperature calibration for New Zealand limnic environments using differentiation of branched glycerol dialkyl glycerol tetraether (brGDGT) sources. *Journal of Quaternary Science*, in review

Mueller-Niggemann, C., Utami, S.R., Marxen, A., Mangelsdorf, K., **Bauersachs, T.**, Schwark, L. Distribution of tetraether lipids in agricultural soils – differentiation between paddy and upland management. *Biogeosciences*, 13: 1647-1667

Bauersachs, T., Schwark, L. Glycerol monoalkanediol diethers: a novel series of archaeal lipids detected in hydrothermal environments. *Rapid Communications in Mass Spectrometry*, 30: 54-60

2015 **Bauersachs, T.**, Rochelmeier, J., Schwark, L. Seasonal lake surface water temperature trends reflected by heterocyst glycolipid based molecular thermometers. *Biogeoscienes* 12: 3741-3751

Heyng, A.M., Mayr, C., Lücke, A., Moschen, R., Wissel, H., Striewski, B., **Bauersachs, T**. Middle and Late Holocene paleotemperatures reconstructed from oxygen isotopes and GDGTs of sediments from Lake Pupuke, New Zealand. *Quaternary International*, 374: 3-14

Bauersachs, T., Weidenbach, K., Schmitz, R.A., Schwark, L. Distribution of glycerol ether lipids in halophilic, methanogenic and hyperthermophilic archaea. *Organic Geochemistry*, 83-84: 101-108

Mudimu, O., Rybalka, N., **Bauersachs, T.**, Friedl, T., Schulz, R.. Influence of different CO_2 concentrations on microalgae growth rate, α-tocopherol content and fatty acid composition. *Geomicrobiology Journal*, 32: 291-303

2014 **Bauersachs, T.**, Schouten, S., Schwark, L. Characterization of the sedimentary organic matter preserved in the Messel oil shale by bulk geochemistry and stable isotopes. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 410: 390-400

Mudimu, O., Rybalka, N., **Bauersachs, T.**, Born, J., Friedl, T., Schulz, R. Biotechnological screening of microalgal and cyanobacterial strains for biogas production and antibacterial and antifungal effects. *Metabolites* 4: 373-393

Bauersachs, T., Stal, L., Grego, M., Schwark, L. Temperature dependency of the distribution of heterocyst glycolipids in N_2-fixing heterocystous cyanobacteria. *Organic Geochemistry* 69: 98-105

Bauersachs, T., Mudimu, O., Schulz, R., Schwark, L. Distribution of long chain heterocyst glycolipids in N_2-fixing cyanobacteria of the order Stigonematales. *Phytochemistry* 98:145-150.

2013 Schouten, S., Hopmans, E.C., Rosell-Melé, A., Pearson, A., **Bauersachs, T.**, et. al. An interlaboratory study of TEX_{86} and BIT analysis of sediments, extracts and standard mixtures. *Geochemistry, Geophysics, Geosystems* 14: 5263-5285

Bauersachs, T., Miller, S., Hopmans, E.C., van der Meer, M.J.T., Schouten, S., Sinninghe Damsté, J.S. Distribution of long chain heterocyst glycolipids in cultures of the thermophilic cyanobacterium *Mastigocladus laminosus* and a hot spring microbial mat. *Organic Geochemistry* 56: 19-24

2011 **Bauersachs, T.,** Compaoré, J., Severin, I., Hopmans, E.C., Stal, L.J., Schouten, S., Sinninghe Damsté, J.S. Diazotrophic microbial community of coastal microbial mats of the southern North Sea. *Geobiology* 9: 349-359

Kim, J.H., Talbot, H.M., Zarzycka, B., **Bauersachs, T.**, Wagner, T.. Occurrence and abundance of soil-specific bacterial membrane lipid markers in the Têt watershed (Southern France): soil-specific BHPs and branched GDGTs. *Geochemistry, Geophysics, Geosystems* 12: 1-15

2010 **Bauersachs, T.**, Speelman, E.N., Hopmans, E.C., Reichert, G.J., Schouten, S., Sinninghe Damsté, J.S. Fossilized glycolipids reveal past oceanic N_2 fixation by heterocystous cyanobacteria. *Proceedings of the National Academy of Science USA (PNAS)* 107: 19190-19194

Bauersachs, T., Schouten, S., Compaoré, J., Stal, L.J., Sinninghe Damsté, J.S. Occurrence of C_{35}-C_{45} polyprenols in filamentous and unicellular cyanobacteria. *Organic Geochemistry* 41: 867-870

2009 **Bauersachs, T.**, Compaoré, J., Hopmans, E.C., Stal, L.J., Schouten, S., Sinninghe Damsté, J.S. Distribution of heterocyst glycolipids in cyanobacteria. *Phytochemistry* 70: 2034-2039

Bauersachs, T., Hopmans, E.C., Compaoré, J., Stal, L.J., Schouten, S., Sinninghe Damsté, J.S. Rapid analysis of long-chain glycolipids in heterocystous cyanobacteria using high-performance liquid chromatography coupled to electrospray ionization tandem mass spectrometry. *Rapid Communications in Mass Spectrometry* 23: 1387-1394

Bauersachs, T., Schouten, S., Compaoré, J., Wollenzien, U., Stal, L.J., Sinninghe Damsté, J.S. Nitrogen isotopic fractionation associated with growth on dinitrogen gas and nitrate by cyanobacteria. *Limnology and Oceanography* 54: 1403-1411

Bauersachs, T., Schouten, S., Sinninghe Damsté, J.S., Kremer, B. A biomarker and $\delta^{15}N$ study of thermally altered Silurian cyanobacterial mats. *Organic Geochemistry* 40: 149-157

Publications in preparation

Papadomanolaki, N.M., , Dijkstra, N., van Helmond, N.A.G.M., Hagens, M., **Bauersachs, T.**, Sangiorgi, F., Kotthoff, U., Slomp, C.P. Controls on the onset and termination of hypoxia in the Baltic Sea during the Holocene Thermal Maximum and the Medieval Climate Anomaly. To be submitted to *Quaternary Sciences Reviews*

Weidenbach, K., **Bauersachs, T.**, Nickel, L., Neve, H., Alkhnbashi, O.S., Künzel, S., Krupczok, A., Schmitz, R.A. MSV, a novel lytic virus targeting *Methanosarcina* strains. To be submitted to *Journal of Virology*

Non-Peer-Reviewed Publications

2014 Andrén T., Jørgensen, B.J., Cotterill, C., Fehr, A., Green, S., Andrén, E., Ash, J., **Bauersachs, T.**, et al. Baltic Sea Paleoenvironment: paleoenvironmental evolution of the Baltic Sea Basin trough the last glacial cycle. *Integrated Ocean Drilling Program Preliminary Report*, Expedition 347, pp 1-102

2013 **Bauersachs, T.**, Mayser, J.P, Schwark, L. Organic-geochemical characterization of sediments from brine-filled Red Sea deeps. In: Schmidt, M., Al-Farawati, R., Al-Aidaroos, A., Kürten, B. (eds): RV Pelagia Fahrtbericht / Cruise Report 64PE350/64PE351 – Jeddah Transect. GEOMAR Report, N.Ser. 005, GEOMAR Helmholtz-Zentrum für Ozeanforschung, A-96 to A-103

Sommer, S., Linke, P., Walther, S., Al-Farawati, R., Al-Barakato, A., Orif, M., **Bauersachs, T.**, Schmidt, M. Water column sampling: gas and fluid geochemistry in Red Sea brine. In: Schmidt, M., Al-Farawati, R., Al-Aidaroos, A., Kürten, B. (eds): RV Pelagia Fahrtbericht / Cruise Report 64PE350/64PE351 – Jeddah Transect. GEOMAR Report, N.Ser. 005, GEOMAR Helmholtz-Zentrum für Ozeanforschung, A-24 to A-32

2011 Henry, P., Kanamatsu, T. Thu, M.K., Alves, T. **Bauersachs, T.**, et al. NanTroSEIZE Stage 2: subduction inputs 2 and heat flow. *Integrated Ocean Drilling Program Preliminary Report*, Expedition 333, pp 1-107

APPLICATION TO PARTICIPATE IN AN IODP EXPEDITION

ESSAC Office ECORD Science Support & Advisory Committee
GEOMAR | Helmholtz Centre for Ocean Research Kiel
Wischhofstrasse 1-3
24148 Kiel, Germany
Hanno Kinkel (ESSAC Science Coordinator):
Tel: +49 431 600 2418
Fax:+49 431 600 2922
Web Page: http://www.essac.ecord.org Email: **essac@geomar.de**

Please type information

Apply to Sail Application Form

Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

1. PERSONAL INFORMATION

Family name: Del Carlo

First name: Paola

Current Position: Researcher

Institution: Istituto Nazionale di Geofisica e Vulcanologia Sezione di Pisa

Address: via della Faggiola 32

City, Postcode, Country: Pisa, 56126, Italy

Tel. work: 0039 050 8311920
Tel. home:
Fax: 0039 050 8311942

Email: paola.delcarlo@ingv.it

Country of citizenship: Italy

Place of birth/date of birth: Viareggio (LU), Italy, 7 October 1964

Gender: Female

Education (highest degree, including year PhD was received / is expected): Ph.D. 2000

Are you currently a student? NO Expected Graduation Date:

2. EXPEDITION INFORMATION

Summary of proposed participation, including area of scientific interest, current research and participation plan (maximum 250 characters with space – more detail should be included in the Letter of Interest):

Tephrostratigraphy and tephrochronology, volcanology, petrology. Current research in Late Pleistocene-Holocene volcanic activity in northern Victoria Land recorded in Ross Sea (Antarctica) marine sediments. Volcanic rocks expert in core logging.

Prior involvement with DSDP/ODP/IODP and nature of involvement (expedition number, shipboard/shore-based participation, co-chief, etc):

Participation at the international ANDRILL (Antarctic Drilling) Project as volcanic rock expert joining the Southern McMurdo Sound Science Team during the XXIII Italian Antarctica Expedition in 2007 at McMurdo. Collaboration in the ICDP SCOPSCO Project (Lake Ohrid, Macedonia) for the study of tephra.

Post-cruise science support to achieve the proposed scientific objectives 1) future funding scheme and 2) support from host institution (e.g. staff, facilities)

1) Italian Antarctic Research Program (PNRA), INGV 2) INGV labs and facilities (SEM, EPMA, Sedimentology lab, etc.)

Three scientific and/or personal references

Kurt Panter, Bowling Green State University (USA)

John Smellie, University of Leicester (En)

Fabio Florindo, INGV (Italy)

3. SCIENTIFIC EXPERTISE

For Scientist Jobs Descriptions visit: http://iodp.tamu.edu/participants/scientist_jobs.html

Please indicate your area(s) of expertise (maximum 3)

Discipline	Mark with X	Speciality
microbiologist		
organic and inorganic geochemist/biogeochemist		
physical properties specialist		
sedimentologist		
structural geologist		
paleontologist		
paleomagnetist		
petrologist	x	Volcanic rocks
hydrogeologist		
Other: Volcanologist	x	Tephrochronology, tephrostratigraphy

4. ADDITIONAL DOCUMENTS

Please, provide the following documents:

- Letter of interest, including details about area of scientific interest, current research, expedition participation plan and post-cruise research
- CV and Publication list
- Letter of recommendation (for PhD students)
- See also: http://www.essac.ecord.org/flyer/Guidelines_for%20Applying_to_sail.pdf

Please, send your application form as *a MS Word document* and the additional documents in *PDF format* (preferably as one file) by email to Jan Behrmann and Hanno Kinkel at the ESSAC office: essac@geomar.de.

In addition to the ESSAC application, all applicants *must inform their national office* (if applicable) *and national delegate* and send a copy of the application documents. ECORD does not provide funds for participation; the national offices or national delegates can provide information regarding travel support, post-cruise funding opportunities, etc.

See http://www.essac.ecord.org/index.php?mod=about&page=ESSAC for a list of the national contact persons.

Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

Letter of interest

My main research interest is in the application of tephrochronology as a tool for refining the chronologies of palaeoenvironmental records and enabling their synchronisation over wide geographical areas. When distinctive and sufficiently widespread, volcanic ash layers (tephra) in fact represent valuable stratigraphic tools for geological correlation and dating of sedimentary archives. My research also focuses on use of tephra preserved in distal sedimentary archives as crucial records of eruptive history of the volcanoes. This is particularly important in volcanic settings where the preservation or exposure of tephra deposits associated with past eruptions is limited.

In polar regions, tephra layers have been widely used as a chronostratigraphic tool (Smellie 1999; Wilch et al. 1999; Dunbar et al. 2003; Narcisi et al. 2006; Dunbar and Kurbatov 2011; Di Roberto et al. 2012) to obtain independent age constraints for glaciological modelling (Narcisi et al. 2006; Curzio et al. 2008) and to synchronize palaeoclimatic proxies from widely spaced records (Davies et al. 2010; Narcisi et al. 2012).

Volcanics appear in drilled cores as: (i) single clasts (in diamictites) formed by rock fragments, single components (free crystals, glass shards) associated to continuous processes of erosion transport and sedimentation connected to the glaciers activity; ii) volcanoclastic beds, (layers in which volcanics are the major components of sediments) due to re-mobilisation and re-sedimentation of primary volcanic deposits; (iii) primary pyroclastic layers connected to the direct fallout or flow of products of explosive activity into the sedimentation basin; (iv) lava flows, sub-volcanic bodies and associated volcanoclastic deposits (breccias and hyaloclastites). Primary deposits (pyroclastic or effusive) can be emplaced in subaerial or subaqueous environments, in open marine conditions, under the ice or on the glacier surface. In the above framework, the study of the volcanic rocks is crucial in order to understand relationships between volcanic activity, paleo-climate and sedimentation and for linking the magmatism to the tectonics.

My recent research has considered the tephrostratigraphic and geochemical study on tephra beds identified in marine sediment sequences recovered in gravity cores from Ross Sea (Antarctica) and in particular along the coast of Victoria Land, in an area extending from the Dryglaski Glacier Tongue to Cape Hallet. Moreover, we have provided 40Ar-39Ar data on alkali feldspar crystals extracted from identified tephra beds, whose age has resulted Late Pleistocene and Holocene. Results of this study have been published in Del Carlo et al. (2015).

Thus, my interest in the IODP Expedition 374 is high because 1) the area that will be investigated with the proposed drillings may contains tephra layers previously identified that can allow stratigraphic correlations between cores; 2) tephra may provide dating useful for the age models of the cores; 3) their characterization may provide information on the paleoenvironment during the deposition; 4) the identification of new tephra layers will improve the dataset of the eruptions known in this area of Antarctica continent.

Expedition participation plan will include these activities and methods:

- visual examination of core, description and evaluation of down-core distribution of tephra and volcanic clasts;
- preliminary lithologic description, preliminary grainsize and component analyses;
- petrographic observations of thin section (granule to boulder size) or smear slide (silt to sand size) of volcanic material;
- sampling for further mineralogical and geochemical analyses;
- sampling for dating.

Post-cruise research plan:

- further visual examination and sampling of fine-volcanic tephra layers detectable only by XRF analyses of core and magnetic properties measurements (cryptotephra);
- textural and sedimentological investigation of main tephra layers (e.g. max size of pumices and lithic clasts, evaluation of reworking, etc.);
- detailed petrologic investigation including petrography, mineral and glass chemistry by SEM-EDS and EMPA analyses;
- detailed textural investigation and morphoscopy of fine grained clasts by SEM.

These activities will be performed at the INGV labs and facilities or in collaboration with other laboratories (e.g. IGG-CNR Pavia and Pisa; University of Perugia).

Curriculum vitae and publication list

Paola Del Carlo
Istituto Nazionale Geofisica e Vulcanologia - Sezione di Pisa
Address (work): via della Faggiola 32, 56126 Pisa Italy
ph. +39 050 8311943 fax +39 050 8311942
paola.delcarlo@ingv.it
Place and date of birth: Viareggio (LU), Italy, 7 October 1964
Nationality: Italian
Fluent English

Education: 1991- degree in Geological Sciences (Volcanology) at the University of Pisa.
2000 – Ph.D. in Petrology and Volcanology at University of Catania.
2014 - Habilitation Associate Professor (04/A1 Sector Geochemistry, mineralogy, petrology, volcanology, georesources and applications).

Appointments
December 2005-Present: Researcher at Istituto Nazionale di Geofisica e Vulcanologia (INGV) Sezione di Pisa.
Jan. 2001-Nov. 2005: post-Doctoral researcher in Volcanology at INGV Sezione di Catania, Italy.
1997-2000: Ph.D. Petrology and Volcanology at Geological Science Department of University of Catania and Istituto Internazionale di Vulcanologia, CNR.
1993-97: Fellowships in Volcanology at Istituto Internazionale di Vulcanologia CNR, Catania, Italy.

Duties
2015-16 Member of the Steering Committee ANTVOLC (Antarctic Volcanism) Group of the SCAR.
2009-2011 IODP substitute delegate of INGV in the Coordinating Committee for IODP-Italia activities.
2002-2006 Co-responsible scientist for Ash Monitoring of Etna and Stromboli volcanoes at INGV Sezione di Catania.
2002-2006 Responsible of the Laboratory of Sedimentology at INGV Sezione di Catania.

Antarctic Service Medal of the National Science Foundation for the 2007-2008 campaign at McMurdo base USA.

Research Activity
Physical volcanology, petrology and geochemistry of volcanic rocks. Tephrostratigraphy and tephrochronology; sedimentologic and morphoscophic study of tephra. Application of micro-analytical techniques (SEM-EDS; EPMA). Volcano monitoring activity (Etna and Stromboli) and fieldwork experience on active volcanoes. Study of Cenozoic and Neozoic Volcanism in Southern Victoria Land (Antarctica) and experience in coring activities offshore and inland (oceanographic cruises, portable coring).
Concerning Antarctic studies she participated at the XXIII Italian Antarctica Expedition in 2007 at McMurdo in ANDRILL project (Antarctic Drilling Project) as volcanic rocks expert (SMS Science Team). In the Italian Antarctic Research Program (PNRA) she has participated as PI or RU responsible in several research projects as volcanologist: 2014-16 RU Responsible Project: Origin and dispersal of volcanic ash in the Austral Hemisphere: a database for the volcanology, chronostratigraphy and paleoclimate of the Earth system. PI TefraRoss Project 2103-14: Multidisciplinary study of sediments glaciomarine deposits in the Ross Sea (Antarctica) over the past 50 Ka Information on fluctuations extent of the ice during the glacial-interglacial transition; 2103-14 RU 4 Responsible CLITEITAM Climate-tectonic interactions along the front of the Transantarctic Mountains and comparisons with the records in the arctic Greenland-Svalbard.
Concerning Arctic studies, in 2015-16 she is RU Responsible Tephra task in ARCA Project (ARctic: present Climatic change and pAst extreme events) for tephrochronology studies in marine cores (Svalbard Islands).
H-index 15 (Web of Science)

List of publications

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APPLICATION TO PARTICIPATE IN AN IODP EXPEDITION

ESSAC Office ECORD Science Support & Advisory Committee
GEOMAR | Helmholtz Centre for Ocean Research Kiel
Wischhofstrasse 1-3
24148 Kiel, Germany
Hanno Kinkel (ESSAC Science Coordinator):
Tel: +49 431 600 2418
Fax:+49 431 600 2922
Web Page: http://www.essac.ecord.org Email: **essac@geomar.de**

Please type information

Apply to Sail Application Form

Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

1. PERSONAL INFORMATION

Family name: Dr. Esper

First name: Oliver

Current Position: Research Scientist

Institution: Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research

Address: Am Handelshafen 12

City, Postcode, Country: 27570 Bremerhaven

Tel. work: 0471 4831 1077
Tel. home: 0471 94189382
Fax: 0471 4831 1923
Email: oliver.esper@awi.de

Country of citizenship: Germany

Place of birth/date of birth: Wiesbaden, Germany / 15.09.1968

Gender: male

Education (highest degree, including year PhD was received / is expected): PhD, 2001

Are you currently a student? NO Expected Graduation Date:

2. EXPEDITION INFORMATION

Summary of proposed participation, including area of scientific interest, current research and participation plan (maximum 250 characters with space – more detail should be included in the Letter of Interest):

Scientific interest: diatom-based paleoceanography; Cenozoic diatom biostratigraphy

Current research: Late Quaternary circum-Antarctic sea surface temperature and sea ice reconstructions; West Antarctic Ice Sheet development

Participation plan: I will fully participate and conduct post-cruise work at AWI

Prior involvement with DSDP/ODP/IODP and nature of involvement (expedition number, shipboard/shore-based participation, co-chief, etc):

Shore-based analysis of diatom assemblages from ODP-LEG177.

Proponent of IODP-Proposals 821 (SEPAP) and 873.

Post-cruise science support to achieve the proposed scientific objectives 1) future funding scheme and 2) support from host institution (e.g. staff, facilities)

I am employed at the Alfred Wegener Institute and have open access to:

1) the siliceous microfossil preparation laboratory (preparation of sediment material, and permanent slides for light microscopic analysis of siliceous microfossils),
2) apochromatic light microscope ZEISS Axioplan II with digital camera system,
3) scanning electron microscope (Philips) with EDAX elemental analyser,
4) biogenic opal measurements,
5) diatom reference data sets for quantitative diatom transfer functions (sea surface temperatures, sea ice extent),
6) digital scientific journals via institutional library link,
7) a fully equipped office with personal computer and server access,
8) colour laser printers and
9) technical support for the preparation of material and slides

Three scientific and/or personal references

Dr. Rainer Gersonde

Alfred Wegener Institute

Helmholtz Centre for Polar and Marine Research

PO Box 12 01 61

27515 Bremerhaven

0471 4831 1203

Rainer.Gersonde@awi.de

Prof. Dr. Ruediger Stein
Alfred Wegener Institute
Helmholtz Centre for Polar and Marine Research
PO Box 12 01 61
27515 Bremerhaven
0471 4831 1576
Ruediger.Stein@awi.de

PD Dr. Karsten Gohl
Alfred Wegener Institute
Helmholtz Centre for Polar and Marine Research
PO Box 12 01 61
27515 Bremerhaven
0471 4831 1361
Karsten.Gohl@awi.de

3. SCIENTIFIC EXPERTISE

For Scientist Jobs Descriptions visit: http://iodp.tamu.edu/participants/scientist_jobs.html

Please indicate your area(s) of expertise (maximum 3)

Discipline	Mark with X	Speciality
microbiologist		
organic and inorganic geochemist/biogeochemist		
physical properties specialist		
sedimentologist		
structural geologist		
paleontologist	X	**Micropaleontology:** Southern Ocean **diatom** ecology, stratigraphy and paleoceanography; Southern Hemisphere **dinoflagellate** ecology, stratigraphy and paleoceanography
paleomagnetist		
petrologist		
hydrogeologist		
Other		

4. ADDITIONAL DOCUMENTS

Please, provide the following documents:

- Letter of interest, including details about area of scientific interest, current research, expedition participation plan and post-cruise research
- CV and Publication list
- Letter of recommendation (for PhD students)
- See also: http://www.essac.ecord.org/flyer/Guidelines_for%20Applying_to_sail.pdf

Please, send your application form as *a MS Word document* and the additional documents in *PDF format* (preferably as one file) by email to Jan Behrmann and Hanno Kinkel at the ESSAC office: essac@geomar.de.

In addition to the ESSAC application, all applicants *must inform their national office* (if applicable) *and national delegate* and send a copy of the application documents. ECORD does not provide funds for participation; the national offices or national delegates can provide information regarding travel support, post-cruise funding opportunities, etc.

See http://www.essac.ecord.org/index.php?mod=about&page=ESSAC for a list of the national contact persons.

ESSAC Office ECORD Science Support & Advisory Committee
GEOMAR
Helmholtz Centre for Ocean Research Kiel
Wischofstr. 1-3
24148 Kiel

Dr. Oliver Esper
Alfred Wegener Institute
Helmholtz Centre for Polar and Marine Research
Am Handelshafen 12
27570 Bremerhaven
E-mail: Oliver.Esper@awi.de

Application for Expedition 374
Ross Sea West Antarctic Ice Sheet History

Letter of Interest

Bremerhaven, 08. 08. 2016

Dear Sir or Madam,

I would like to express my deep interest in the full participation of Expedition 374.

Since 2004 I am working as a paleoceanographer at the Alfred Wegener Institute for Polar and Marine Research and address paleoceanographic questions of the Southern Ocean by applying mainly micropaleontological proxies. Main focus of my previous work has been the development of diatoms and dinoflagellates as powerful tools for sea surface temperature and sea ice extent reconstructions. This work is based on several statistical methods such as transfer functions, multivariate analysis and spectral analysis. Besides transfer functions, I apply microfossils to reconstruct ocean ventilation and productivity regimes. Furthermore, I use diatoms and dinoflagellates as biostratigraphic tools.

Practically, I am trained to prepare and conduct scientific programs on expeditions to the high-latitudes. I led geological and biological sampling and analyses aboard research vessels and worked as shipboard biostratigrapher on several cruises to the Southern Ocean (RV Polarstern and RV Sonne). I am as well experienced in laboratory work and the development of analysis techniques for micropaleontology and paleoceanography.

Previously, I analysed diatom assemblages from ODP LEG 177 Sites 1091 and 1094 for a comparative study in the Atlantic sector of the Southern Ocean and the western Ross Sea drilling site of Cape Roberts Project (CRP-1) focused on Marine Isotope Stage 31 (Scherer et al., 2008). Besides that, my work is focused on the paleoenvironmental development of the Pacific Southern Ocean during the Pleistocene. I am proponent of IODP Proposal 821 (SEPAP) and Proposal 873 in the eastern Pacific sector and contribute my experience as diatomist and biostratigrapher. Currently I work on a Southrn Ocean synthesis of diatom-based temperature and sea ice reconstructions for a time slice study on Marine Isotope Stage 5e, including diatom records from ODP Sites 1093 and 1094 (Esper et al., 2014: AGU Abstract "Southern Ocean surface temperature and sea ice fields during the Last Interglacial").

In early 2017 (February and March) I will participate in a drilling expedition (with RV Polarstern and the MARUM MEBO drilling system) to the Amundsen Sea Embayment. Main scientific focus of the expedition is the development of the West Antarctic Ice Sheet and the geological history on the Amundsen Sea. I expect from the drilled records information on past warm phases and their expression in Antarctic coastal environments.

My intention to participate in Expedition 374 to the Ross Sea is to gain insight in the paleoceanographic development of the Ross Sea during the Quaternary with special emphasis on warmer-than-present (like MIS stage 5e, MIS 11 and MIS 31) and past glacial intervals (like the LGM). I will provide micropaleontological tools, such as Cenozoic diatom biostratigraphy and quantitative environmental reconstruction techniques for sea surface temperatures and sea ice extent based on diatoms (Esper and Gersonde, 2014 a, b). Results from the Ross Sea will later be combined with results from the Amundsen Sea Embayment and paleoenvironmental reconstructions of the open marine areas of the Pacific sector of the Southern Ocean (e.g. Benz, Esper et al., 2016) to reconstruct sea surface temperatures and sea ice extent during selected time slices in the Quaternary.

Dr. Oliver Esper Alfred Wegener Institute Tel: 0471 4831 1077
27570 Bremerhaven E-mail: Oliver.Esper@awi.de

Diatom analyses will be carried out in the micropaleontology laboratory at the Alfred Wegener Institute, section Marine Geology.

Research plan for the post-expedition and the 12-month moratorium period:

- Establishment of a diatom stratigraphy based on shipboard smearslides analysis
- Initial interpretation of diatom assemblages regarding the paleoenvironmental development of the Ross Sea based on a semi-quantitative analysis of diatom smearslides
- Post-cruise sampling of selected holes to study the Quaternary paleoenvironmental development of the Ross Sea region.
- Preparation and analysis of quantitative microscopic slides diatom content (about 300 samples)
- Statistical treatment of diatom census data
- Paleoenvironmental interpretation of selected time intervals
- Preparation on manuscripts (1: Detailed diatom stratigraphy of Expedition 374, 2: Paleoceanographic changes in the Ross Sea during the Quaternary)

Thank you for considering my application.

Yours sincerely,

Oliver Esper

Dr. Oliver Esper Alfred Wegener Institute Tel: 0471 4831 1077
27570 Bremerhaven E-mail: Oliver.Esper@awi.de

Curriculum vitae

Dr. Oliver Esper born 15. 09. 1968 in Wiesbaden, single

2004 – today Research Scientist at the Alfred Wegener Institute (Bremerhaven)

- Development and application of qualitative (opal distribution) and quantitative (diatom transfer function) proxies for past sea ice extent reconstructions in the Southern Ocean
- Development and application of circum-polar, diatom-based transfer functions to quantitatively reconstruct Quaternary sea surface temperatures in the Southern Ocean
- Successful application of the new paleo-proxies for temperature and sea ice within two PhD projects in the Southern Ocean (Wenshen Xiao, Verena Benz) and support of the development of temperature transfer functions for the North Pacific within the PhD-project of Jian Ren
- Paleoenvironmental and paleoceanographic studies of the Quaternary Southern Ocean and North Pacific in the frame of AWI-MARCOPOLI and PACES I & II within national and international projects (MARUM, Past4Future, PalMod)
- Responsible for biostratigraphy, surface sediment sampling and water column sampling on expeditions to the North Pacific (SO202-INOPEX) and South Pacific (MD152-MATACORE, ANT-XXVI/2-BIPOMAC, SO213-SOPATRA)

2001 – 2004 Post Doc at the University of Bremen

- Own DFG-research project (ES166/1): „Reconstruction of ocean fronts based on dinoflagellate cysts“
- Study on dinoflagellate cyst distribution in Southern Ocean surface sediments and development of a dinocyst-transfer function for Southern Ocean sea surface temperatures
- Research on the impact of climate cycles in the Quaternary Southern Ocean
- Expedition offshore NW-Africa (M58/1)
- Undergraduate teaching in Paleoceanography and Applied Micropaleontology, co-supervision of diploma theses/PhD students

1996 – 2001 PhD student at the University of Bremen

- PhD-thesis: „Reconstruction of Recent and Late Quaternary oceanographic conditions in the eastern South Atlantic Ocean based on calcareous- and organic-walled dinoflagellate cysts“
- Studies on South Atlantic dinoflagellate ecology and application of organic-walled and calcareous dinocysts for paleoenvironmental reconstructions
- Member of SFB 261 „The Late Quaternary South Atlantic“ and scholarship holder in the graduate college „Particle fluxes in marine geosystems“
- Expeditions to the South Atlantic (M41/2) and South Pacific (ANT-XVIII/5a)
- Network- and computer administrator of the working group

Dr. Oliver Esper Alfred Wegener Institute Tel: 0471 4831 1077
27570 Bremerhaven E-mail: Oliver.Esper@awi.de

1989 – 1996 Student of Geology and Paleontology at the University of Mainz

- Diploma-thesis: „Paläontologische Bearbeitung der Dinoflagellatengattung *Hystrichokolpoma* KLUMPP aus dem Oligozän des Mainzer Beckens. Taxonomie, Stratigraphie und Einflüsse von Milieuänderungen auf die Zystenmorphologie“
- Focus: Geology, Paleontology, Zoology, Chemistry and Sedimentology
- Mapping courses in Spain, Greece, Switzerland and Germany

1988 – 1989 Military service

1979 – 1988 Student at the Gerhard-Hauptmann-Gymnasium and the Oberstufengymnasiums West (Abitur) in Wiesbaden

Dr. Oliver Esper Alfred Wegener Institute 27570 Bremerhaven Tel: 0471 4831 1077 E-mail: Oliver.Esper@awi.de

Scientific profile

Academic and Practical Skills

- More than fifteen years of practical work in micropaleontology (ecology, taxonomy and stratigraphy), marine geology, paleoceanography and paleoclimatology
- Specialized in the analysis of large and complex data sets of different proxies, comprising micropaleontological data (diatoms, dinoflagellate cysts, pollen and spores) and geophysical/geochemical data (e.g. XRF measurements, $\delta^{18}O$-records, ^{14}C measurements)
- Expert in the development and application of statistical analyses, such as transfer function techniques and multivariate analyses (e.g. PCA, CCA)
- Experienced in the strategy and conduction of national and international research projects, such as **Past4Future**, **PalMod, PAGES-SIP (Sea Ice Proxies)** and **PAGES-QUIGS**
- Publication in peer-reviewed journals and presentation of research results at national and international conferences and workshops (see Publications, Conferences and Workshops)
- Experienced in Marine Biology and Oceanography (especially of the higher latitudes)
- Teaching of applied micropaleontology and paleoceanography at the University of Bremen (e.g. "**Sedimentkernpraktikum**" since 2002; "**Blockkurs Palökologie**, 2006-2012)
- Experienced in supervision of master students (Wise-Ihlo, 1998; Kuhlmann, 1999) and PhD students (Holzwarth, 2010; Xiao, 2011; Ren, 2015; Kühn, 2015; Benz, 2016) in the fields of micropaleontology and paleoceanography

- Experienced application of GIS- and statistical software in micropaleontology, marine geology and paleoceanography
- Extended knowledge on the application of statistical software for canonical analysis and spectral analysis of time series, as well as of transfer function software (e.g. Imbrie-and-Kipp-Method, Modern Analogue Technique, Weighted Average Partial Least Square Method)
- Highly experienced in the preparation and execution of geological/biological research expeditions to lower and higher latitudes; proponent of IODP proposal 821
- Experienced in leading and supervising geological und biological sampling on the research vessels **POLARSTERN**, **METEOR**, **SONNE**, and **MARION DUFRESNE**
- Knowledge in the planning and scheduling of projects, the assembly and guidance of project groups, and project-orientated work (project management)
- Experienced in laboratory methods (e.g. core descriptions, sediment core sampling, physical property measurements, XRF-scanning, preparation of microscopic slides)
- Expert user of light microscopes, polarised light microscopes and scanning electron microscopes, as well as of digital imagery equipment
- Acquisition, administration, and consulting in the fields of common computer systems and MICROSOFT working group networks

Expeditions

Scheduled early 2017

RV-POLARSTERN Expedition PS104 from the Amundsen Sea Embayment (Punta Arenas to Punta Arenas). Research activities: development of a stratigraphic framework for the MeBo-drilled sediment cores in Pine Island Bay.

2010/11

RV-SONNE Expedition SO-213 from Valparaiso (Chile) to Valparaiso (Chile) (25.12. 2010 to 16.01 2011). Research activities: Biostratigraphy; water sampling for proxy calibrations

2009/10

RV-POLARSTERN Expedition ANT-XXVI/2 from Punta Arenas (Chile) to Wellington (New Zealand) (27.11. 2009 to 27.1. 2010). Research activities: biostratigraphy; surface sample collection for diatom reference data base; sediment coring; sediment core sampling

2009

RV-SONNE Expedition SO-202 from Tomakomai (Japan) to Busan (South Korea) (1.7. to 29.8. 2009). Research activities: Water sampling for proxy calibration and water mass identification; biostratigraphy; surface sample collection for diatom reference data base; sediment coring

2006

RV-MARION DUFRESNE Expedition MD152/MATACORE from Hobart (Tasmania to Auckland (New Zealand) (24.1. to 6.2. 2006). Research activities: Sea floor mapping; sediment coring; sediment core sampling

2003

RV-METEOR Expedition M58/1 from Dakar (Senegal) to Las Palmas (Gran Canaria) (14.4. to 12.5. 2003). Research activities: Surface sample collection for reference data improvement; plankton sampling for dinoflagellate analysis

2001

RV-POLARSTERN Expedition ANT XVIII/5a to the Bellingshausen- and Amundsen Seas, Pacific sector of the Southern Ocean (22.2. to 12.4. 2001). Research activities: Water sampling for proxy calibration and water mass identification; biostratigraphy; surface sample collection for diatom reference data base; sediment coring; sediment core sampling

1998

RV-METEOR Expedition M41/2 from Libreville (Gabon) to Vitoria (Brazil) (18.3. to 15.4. 1998). Research activities: Surface sample collection for reference data improvement; plankton sampling for dinoflagellate analysis

Dr. Oliver Esper Alfred Wegener Institute 27570 Bremerhaven Tel: 0471 4831 1077 E-mail: Oliver.Esper@awi.de

Publications

2016

Benz, V., **Esper, O.**, Gersonde, R., Lamy, F., Tiedemann, R. (2016): Last Glaxial Maximum sea surface temperatures and sea-ice extent in the Pacific sector of the Southern Ocean. Quaternary Science Reviews, 146, 216-237. Doi:10.1016/j.quascirev.2016.06.006.

Xiao, W., **Esper, O.** and Gersonde, R. (2016): Last Glacial-Holocene climate variability in the Southern Ocean Atlantic sector. Quaternary Science Reviews, 135, 115-137. Doi:10.1016/j.quascirev.2016.01.023.

Xiao, W., Frederichs, T., Gersonde, R., Kuhn, G., **Esper, O.** and Zhang, X. (2016): Constraining the dating of late Quaternary marine sediment records from the Scotia Sea (Southern Ocean). Quaternary Geochronology, 31, 97-118. Doi:10.1016/j.quageo.2015.11.003.

2015

Abelmann, A., Gersonde, R., Knorr, G., Zhang, X., Chapligin, B., Maier, E., **Esper, O.**, Friedrichsen, H., Lohmann, G., Meyer, H. and Tiedemann, R. (2015): The seasonal sea-ice zone in the glacial Southern Ocean as a carbon sink. Nature Communications, 6 (8136), 1-12. Doi:10.1038/ncomms9136.

Borchers, A., Dietze, E., Kuhn, G., **Esper, O.**, Voigt, I., Hartmann, K., Diekmann, B. (in press): Holocene ice dynamics and bottom-water formation associated with Cape Darnley polynya activity recorded in Burton Basin, East Antarctica. Marine Geophysical Research Doi:10.1007/s11001-015-9254-z.

Studer, A.S., Sigman, D.M., Martínez-García, A., Benz, V., Winckler, G., Kuhn, G., **Esper, O.**, Lamy, F., Jaccard, S.L., Wacker, L., Oleynik, S., Gersonde, R. and Haug, G.H. (2015): Antarctic Zone nutrient conditions during the last two glacial cycles. Paleoceanography, 30 (7), 845-862. Doi:10.1002/2014PA002745.

2014

Esper, O., Gersonde, R. (2014): New tools for the reconstruction of Pleistocene Antarctic sea ice, Palaeogeography, Palaeoclimatology, Palaeoecology, 399, 260-283. Doi:10.1016/j.palaeo.2014.01.019.

Esper, O., Gersonde, R. (2014): Quaternary surface water temperature estimations: New diatom transfer functions for the Southern Ocean. Palaeogeography, Palaeoclimatology, Palaeoecology, 414, 1-19. Doi:10.1016/j.palaeo.2014.08.008.

Kuehn, H., Lembke-Jene, L., Gersonde, R., **Esper, O.**, Lamy, F., Arz, H., Tiedemann, R. (2014): Laminated sediments in the Bering Sea reveal atmospheric teleconnections to Greenland climate on millennial to decadal timescales during the last deglaciation. Climate of the Past, 10 (6), 2215–2236. Doi:10.5194/cp-10-2215-2014.

Lamy, F., Gersonde, R., Winckler, G., **Esper, O.**, Jaeschke, A., Kuhn, G., Ullermann, J., Martínez-Garcia, A., Lambert, F., Kilian, R. (2014): Increased dust deposition in the Pacific Southern Ocean during glacial periods, Science, 343 (6169), 403-407. Doi:10.1126/science.1245424.

Ren, J., Gersonde, R., **Esper, O.**, Sancetta, C. (2014). Diatom distributions in northern North Pacific surface sediments and their relationship to modern environmental variables, Palaeogeography, Palaeoclimatology, Palaeoecology, 402, 81-103. Doi:10.1016/j.palaeo.2014.03.008.

2013

Maier, E., Chapligin, B., Abelmann, A., Gersonde, R., **Esper, O.**, Ren, J., Friedrichsen, H., Meyer, H., Tiedemann, R. (2013): Combined oxygen and silicon isotope analysis of diatom silica from a deglacial subarctic Pacific record , Journal of Quaternary Science, 28 (6), 571-581. Doi:10.1002/jqs.2649.

Publications

2011

Streng, M., **Esper, O.**, Wollenburg, J. (2011): Calcareous dinoflagellate cysts from the Pleistocene (Marine Isotope Stage 31) of the Ross Sea, Antarctica. Antarctic Science 23 (6), 597-604.

2010

Esper, O., Gersonde, R., Kadagies, N. (2010): Diatom distribution in southeastern Pacific surface sediments and their relationship to modern environmental variables. Paleogeography, Paleoclimatology, Paleoecology 287, 1-27. Doi:10.1016/j.palaeo.2009.12.006.

Hillenbrand, C.-D., Smith, J.A., Kuhn, G., **Esper, O.**, Gersonde, R., Larter, R.D., Maher, B., Moreton, S.G., Shimmield, T.M., Korte, M. (2010): Age assignment of a diatomaceous ooze deposited in the western Amundsen Sea Embayment after the Last Glacial Maximum. Journal of Quaternary Science 25 (3), 280-295. Doi: 10.1002/jqs.1308.

Holzwarth, U., **Esper, O.**, Zonneveld, K.A.F. (2010): Organic-walled dinoflagellate cysts as indicators of oceanographic conditions and terrigenous input in the NW African upwelling region, Review of Palaeobotany and Palynology, 159 (1), 35-55. Doi:10.1016/j.revpalbo.2009.10.005.

Holzwarth, U., Meggers, H., **Esper, O.**, Kuhlmann, H., Freudenthal, T., Hensen, C., Zonneveld, K.A.F. (2010): NW African climate variations during the last 47,000 years: Evidence from organic-walled dinoflagellate cysts, Palaeogeography, Palaeoclimatology, Palaeoecology, 291 (3), 443-455. Doi:10.1016/j.palaeo.2010.03.013.

2008

Jacot Des Combes, H., **Esper, O.**, De La Rocha, C., Abelmann, A., Gersonde, R., Shemesh, A. (2008): Diatom δ13C, δ15N, and C/N since the Last Glacial Maximum in the Southern Ocean: Potential Impact of Species Composition. Paleoceanography 23, PA4209, Doi: 10.1029/2008PA001589.

Scherer, R.P., Bohaty, S.M., Dunbar, R.B., **Esper, O.**, Flores, J.-A., Gersonde, R., Harwood, D.M., Roberts, A.P., Taviani, M. (2008): Precession-driven warming and Antarctic ice sheet retreat during early Pleistocene Marine Isotope Stage 31. Geophysical Research Letters 35, L03505, Doi:10.1029/2007GL032254.

2007

Esper, O., Zonneveld, K.A.F. (2007): The potential of organic-walled dinoflagellate cysts to reconstruct past sea-surface conditions in the Southern Ocean. Marine Micropaleontology 65, 185-212. Doi:10.1016/j.marmicro.2007.07.002.

Holzwarth, U., **Esper, O.**, Zonneveld, K. (2007): Distribution of organic-walled dinoflagellate cysts in shelf surface sediments of the Benguela upwelling system in relationship to environmental conditions. Marine Micropaleontology 64 (1-2), 91-119. Doi:10.1016/j.marmicro.2007.04.001.

2005

Zonneveld, K.A.F., Meier, K.J.S., **Esper, O.**, Siggelkow, D., Wendler, I., Willems, H. (2005): The (palaeo-) environmental significance of modern calcareous dinoflagellate cysts: a review. Paläontologische Zeitschrift 79/1, 61-77.

2004

Esper, O., Versteegh, G.J.M., Zonneveld, K.A.F., Willems, H. (2004): A palynological reconstruction of the Agulhas Retroflection (South Atlantic Ocean) during the Late Quaternary. Global and Planetary Change 41, 31-62. Doi:10.1016/j.gloplacha.2003.10.002.

Dr. Oliver Esper Alfred Wegener Institute 27570 Bremerhaven Tel: 0471 4831 1077 E-mail: Oliver.Esper@awi.de

Publications

2004

Vink, A., Baumann, K.-H., Boeckel, B., **Esper, O.**, Kinkel, H., Volbers, A., Willems, H., Zonneveld, K.A.F. (2004): Coccolithophorid and dinoflagellate synecology in the South and Equatorial Atlantic : Improving the paleoecological significance of phytoplanktonic microfossils. In: Wefer, G., Mulitza, S., Ratmeyer, V. (Eds), The Late Quaternary South Atlantic: Reconstruction of Particle Fluxes and Current Systems. Springer, Berlin, Heidelberg, pp. 101-120.

2002

Esper, O., Zonneveld, K.A.F. (2002): Distribution of organic-walled dinoflagellate cysts in surface sediments of the Southern Ocean (eastern Atlantic sector) between the Subtropical Front and the Weddell Gyre. Marine Micropaleontology 46, 177-208. Doi: 10.1016/S0377-8398(02)00041-5.

2000

Esper, O., Zonneveld, K. A. F., Höll, C., Karwath, B., Kuhlmann, H., Schneider, R.R., Vink, A., Weise-Ihlo, I. & Willems, H. (2000): Reconstruction of palaeoceanographic conditions in the South Atlantic Ocean at the last two Terminations based on calcareous dinoflagellate cysts. International Journal of Earth Sciences 88 (4), 680-693.

Conferences

2014

Esper, O., Gersonde, R. and Lohmann, G.: Southern Ocean surface temperature and sea ice fields during the Last Interglacial. AGU Fall Meeting, December 2014, San Francisco, USA. TALK

2013

Benz, V., **Esper, O.**, Gersonde, R., Lamy, F. and Tiedemann, R.: New insights into sea surface temperature and sea ice variability in the Pacific Southern Ocean since the last glacial. EGU General Assembly 2013, April 2013, Vienna, Austria. POSTER

Esper, O. and Gersonde, R.: Southern Ocean surface temperature and sea ice fields during the Last Interglacial. EGU General Assembly 2013, April 2013, Vienna, Austria. POSTER

2011

Ren, J., Gersonde, R. and **Esper, O.**: New diatom reference data to estimate glacial/interglacial sea surface temperature and sea ice variability in the North Pacific and the Bering Sea. American Geophysical Union fall meeting 2011, December 2011, San Franzisko, USA. POSTER

Ren, J., Gersonde, R., **Esper, O.** and Sancetta, C.: Diatom distribution in North Pacific surface sediments and application for paleoceanographic reconstruction. EGU General Assembly 2011, April 2011, Vienna, Austria. POSTER

Hockun, K., Borchers, A., **Esper, O.**, Frederichs, T. and Diekmann, B.: Late Cenozoic glacialmarine depositional environment in the Enderby Basin of the Southern Ocean. Sediment 2011: "Sediments: Archives of the Earth System", June 2011, Leipzig. POSTER

2010

Diekmann, B., Borchers, A., **Esper, O.**, Frederichs, T., Gersonde, R., Grobe, H., Hockun, K., Hubberten, H.W., Kretschmer, S., Kuhn, G., Mollenhauer, G. and Voigt, I. (2010). Glacialmarine records of Pliocene to Holocene ice and ocean dynamics along the East Antarctic coast. International Polar Year, Oslo Science Conference, June 2010, Oslo, Norway. TALK

Voigt, I., Borchers, A., **Esper, O.**, Frederichs, T., Gersonde, R., Kuhn, G., Kretschmer, S., Mollenhauer, G. and Diekmann, B.: Antarctic Bottom Water dynamics in the Indian sector of the Antarctic Ocean over the last 140000 years. International Congress, Deep-Water Circulation: Processes and Products, June 2010, Baiona, Spain. POSTER

2009

Borchers, A., Voigt, I., Frederichs, T., **Esper, O.**, Gersonde, R., Kuhn, G., Grobe, H. and Diekmann, B.: From Prydz Bay shelf to the deep sea - insights into 1.3 Ma history of bottom-water formation and ice-rafting inferred from sediment cores recovered in the Prydz Bay region. First SCAR ACE Symposium, September 2009, Granada, Spain. POSTER

2007

Esper, O., Abelmann, A., Gersonde, R., and Zonneveld, K.A.F.: Combined dinoflagellate and diatom evidence for changes in surface and bottom water palaeoenvironment of the Southern Ocean (Atlantic sector). European Geosciences Union General Assembly 2007, April 2007, Vienna, Austria. POSTER

Esper, O., Abelmann, A., Gersonde, R. and Zonneveld, K.A.F.: Combined diatom and dinoflagellate evidence for enhanced bioproductivity and less ventilated bottom water in the glacial Southern Ocean. Internationale Konferenz 2007 und 97. Jährliches Treffen der Geologischen Vereinigung e.V., October 2007, Bremen. POSTER

Conferences

2003

- Sixth International Conference on Modern and Fossil Dinoflagellates (DINO 7), September 2003, Nagasaki, Japan. TALK

2002

- 4. Interdisziplinäre Tagung für Dinoflagellaten-Biologie und -Paläontologie (Dino2002), September 2002, Helgoland. TALK

2001

- 3. Interdisziplinäre Tagung für Dinoflagellaten-Biologie und -Paläontologie (Dino2001), April 2001, Bremen. POSTER & Mitorganisation

- „7th International Conference on Paleoceanography (ICP VII)“, September 2001, Sapporo, Japan. POSTER

2000

- 2. Interdisziplinäre Tagung für Dinoflagellaten-Biologie und -Paläontologie (Dino2000), April 2000, Kiel. TALK

- „Eighth International Nannoplankton Association Meeting (INA 8)”, September 2000, Bremen. TALK & co-organisation

1999

- Erstes Treffen der deutschsprachigen Dinoflagellatenforscher, März 1999, Darmstadt. POSTER

- 14. Sedimentologentreffen (Sediment '99), May 1999, Bremen. POSTER

1998

- „Seventh International Nannoplankton Association Meeting (INA 7)”, February 1998, La Parguera, Puerto Rico. POSTER

- „Sixth International Conference on Modern and Fossil Dinoflagellates (DINO 6)“, June 1998, Trondheim, Norway. TALK

- "Sixth International Conference on Paleoceanography (ICP 6)”, August 1998, Lisbon, Portugal. POSTER

1997

- „Second European Palaeontological Congress (EPA 2)“, July 1997, Vienna, Austria. POSTER

Workshops since 2008

2015

Esper, O., Gersonde, R., Gierz, P. and Lohmann, G.: *The challenge of polar marine data synthesis: An example from the Last Interglacial Southern Ocean*. QUIGS "Warm Extremes" Workshop, November 2015, Cambridge, GB. INVITED TALK

2014

Esper, O. et al.: *Southern Ocean sea ice fields during Termination II and the Last Interglacial – Synthesis based on diatom records*. Third workshop of the PAGES Sea ice Proxy (SIP) working group, June 2014, Bremerhaven. TALK & co-organisation

Esper, O., Benz, V., Gersonde, R., and Xiao, W.: *Southern Ocean surface temperature and sea ice fields since the Last Interglacial*. MARUM Annual Retreat, June 2014, Farge. TALK

Esper, O., Benz, V., Gersonde, R., Lamy, F. and Tiedemann, R.: *Southern Ocean surface temperature and sea ice fields since the Last Interglacial*. MARUM OC Meeting, February 2014, Bremen. TALK

2013

Esper, O.: Fourth Past4Future General Assembly, April 2013, Vienna, Austria. PARTICIPATION

Esper, O. und Gersonde, R.: *Southern Ocean sea ice fields during Termination II and the Last Interglacial*. Second workshop of the PAGES Sea ice Proxy (SIP) working group, July 2013, Cambridge, GB. TALK

2012

Esper, O., Gersonde, R., Stein, R. et al.: *Status report on past and current activities of partner 17 (AWI)*. Third Past4Future General Assembly, March 2012, Kopenhagen, Dänemark. TALK

Esper, O., Gersonde, R., Heckendorff, S and Ren, J.: *Southern Ocean and North Pacific sea-ice reconstructions. First workshop of the PAGES Sea ice Proxy (SIP) working group*, March 2012, Montreal, Canada. TALK

2011

Esper, O., Gersonde, R., Stein, R., Xiao, W., Ren, J. and Kühn, H.: *Status report on past and current activities of partner 17 (AWI)*. Second Past4Future General Assembly, March 2011, Kopenhagen, Dänemark. TALK

Esper, O., Hayes, C. and Gersonde, R.: *Die Hydrographie der oberen Wassersäule von Nordpazifik und Beringmeer im Sommer 2009*. Statusseminar Meeresforschung mit FS SONNE, Februar 2011, BGR, Hannover. POSTER

2010

Esper, O., Gersonde, R., Stein, R. et al.*: Glacial-interglacial variability in polar oceans – Perspectives for Past4Future*. First Past4Future General Assembly (Kick-off Meeting), March 2010, Kopenhagen, Denmark. TALK

2008

Esper, O., Gersonde, R., Hillenbrand, C.D., and Smith, J.: *Unusual early Holocene diatom event of the Getz Ice Shelf (Amundsen Sea)*. BAS-AWI workshop on Amundsen Sea Embayment Geoscience, January 2008, British Antarctic Survey, Cambridge, GB. TALK

APPLICATION TO PARTICIPATE IN AN IODP EXPEDITION

ESSAC Office ECORD Science Support & Advisory Committee
GEOMAR | Helmholtz Centre for Ocean Research Kiel
Wischhofstrasse 1-3
24148 Kiel, Germany
Hanno Kinkel (ESSAC Science Coordinator):
Tel: +49 431 600 2418
Fax:+49 431 600 2922
Web Page: http://www.essac.ecord.org Email: **essac@geomar.de**

Please type information **Apply to Sail Application Form**

Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

1. PERSONAL INFORMATION

Family name: Gebhardt

First name: Andrea Catalina

Current Position: Senior Scientist

Institution: Alfred Wegener Institute Helmholtz Centre of Polar and Marine Research, Bremerhaven

Address: Van-Ronzelen-Str. 2

City, Postcode, Country: Bremerhaven, 27568, Germany

Tel. work: +49-471-4831 2040
Tel. home: +49-4182-809116
Fax: +49-471-4831 1977
Email: catalina.gebhardt@awi.de

Country of citizenship: Germany

Place of birth/date of birth: Chur (CH), 30 April 1975

Gender: female

Education (highest degree, including year PhD was received / is expected): PhD, 2004

Are you currently a student? YES/NO Expected Graduation Date:

2. EXPEDITION INFORMATION

Summary of proposed participation, including area of scientific interest, current research and participation plan (maximum 250 characters with space – more detail should be included in the Letter of Interest):

I would like to participate as an expert for physical properties (pp). I plan to use pp along with downhole and geochemical data for core correlation, for petrophysical characterization, and to reconstruct high-resolution fluctuations of the WAIS.

Prior involvement with DSDP/ODP/IODP and nature of involvement (expedition number, shipboard/shore-based participation, co-chief, etc):

IODP 364 Chicxulub, onshore scientific member

Post-cruise science support to achieve the proposed scientific objectives 1) future funding scheme and 2) support from host institution (e.g. staff, facilities)

Post-cruise science support of my own (permanent) position will be covered by the Alfred Wegener Institute Bremerhaven; a proposal for a PhD student shall be submitted to the German Science Foundation after drilling operations were successfully finished.

Three scientific and/or personal references

Prof. Dr. Wilfried Jokat, Alfred Wegener Institute Helmholtz Centre of Polar and Marine Research, Bremerhaven, Germany wilfried.jokat@awi.de

Dr. Jens Matthiessen, Alfred Wegener Institute Helmholtz Centre of Polar and Marine Research, Bremerhaven, Germany jens.matthiessen@awi.de

Prof. Dr. Martin Melles, University of Cologne, Germany, mmelles@uni-koeln.de

3. SCIENTIFIC EXPERTISE

For Scientist Jobs Descriptions visit: http://iodp.tamu.edu/participants/scientist_jobs.html

Please indicate your area(s) of expertise (maximum 3)

Discipline	Mark with X	Speciality
microbiologist		
organic and inorganic geochemist/biogeochemist	x	XRF Scanning (inorganic geochemistry only)
physical properties specialist	x	Multi-sensor core logger
sedimentologist		
structural geologist		
paleontologist		
paleomagnetist		
petrologist		
hydrogeologist		
Other		

4. ADDITIONAL DOCUMENTS

Please, provide the following documents:

- Letter of interest, including details about area of scientific interest, current research, expedition participation plan and post-cruise research
- CV and Publication list
- Letter of recommendation (for PhD students)
- See also: http://www.essac.ecord.org/flyer/Guidelines_for%20Applying_to_sail.pdf

Please, send your application form as *a MS Word document* and the additional documents in *PDF format* (preferably as one file) by email to Jan Behrmann and Hanno Kinkel at the ESSAC office: essac@geomar.de.

In addition to the ESSAC application, all applicants *must inform their national office* (if applicable) *and national delegate* and send a copy of the application documents. ECORD does not provide funds for participation; the national offices or national delegates can provide information regarding travel support, post-cruise funding opportunities, etc.

See http://www.essac.ecord.org/index.php?mod=about&page=ESSAC for a list of the national contact persons.

ALFRED-WEGENER-INSTITUT
HELMHOLTZ-ZENTRUM FÜR POLAR- UND MEERESFORSCHUNG

Alfred-Wegener-Institut, Postfach 12 01 61, 27515 Bremerhaven

ESSAC Office
ECORD Science Support & Advisory Committee
Geomar Helmholtz Centre for Ocean Research Kiel
Wischhofstraße 1-3
24148 Kiel, Germany

Application as physical properties scientist, IODP Expedition 374: Ross Sea West Antarctic Ice Sheet History

Dr. Catalina Gebhardt

Alfred-Wegener-Institut
Helmholtz-Zentrum für Polar- und Meeresforschung
Van-Ronzelen-Str. 2
27568 Bremerhaven
☏ 0471-4831 2040
@ catalina.gebhardt@awi.de

August 15, 2016

Dear Sir, dear Madam,

It is with enthusiasm that I read the call for IODP Expedition 374 to the Ross Sea – my main research interest is on glaciated margins, and on the waxing and waning of ice sheets in both hemispheres. I would hence like to take the opportunity to apply as a physical properties scientist.

During the past decade, my research mostly concentrated on the reconstruction of paleoclimate history of the northern hemisphere, namely on the evolution of the large northern ice sheets. I worked on the high-resolution paleoclimate record of 3.6 Ma old Lake El'gygytgyn (Siberia, Russia) that was drilled in 2009. Here, I combined physical properties, downhole logging and geochemical data to characterize the lithological succession, and to reconstruct the paleoclimate history of this area. A large part of my current research concentrates on glaciated margins such as the shelf north of Spitsbergen and east of Greenland, i.e. on the dynamics of the Scandinavian and Greenland Ice Sheets. Additionally, I recently started work inland (lakes) and offshore Canada in order to characterize the waxing and waning of the Laurentide Ice Sheet during the past glacial cycles. In winter 2017, I will participate in a Polarstern expedition to the Amundsen Sea where the seafloor drilling rig MeBo will be used to retrieve shallow cores from formerly glaciated sites. My overall scientific interest concerns the paleoclimate evolution since the Oligocene, with special emphasis on the Pliocene and younger, and hence on high-frequency fluctuations of ice sheets.

Participation in the Ross Sea expedition 374 would greatly expand my knowledge on the paleoclimate evolution of the Western Antarctic Ice Sheet (WAIS). My main interest is the younger part of the record, where high-frequency fluctuations similar to those seen in the northern hemisphere ice-sheets are to be expected. I plan to use physical properties measurements along with downhole logging data for correlation between the six different cores that will be acquired along a transect from proximal to distal sites. Physical properties, borehole data and geochemical proxies (XRF scanning data) shall then be used for a petrophysical characterization of the drill cores using a statistical approach. The petrophysical character of the sediments is likely driven by different environmental conditions, as was the case in the former ANDRILL cores. Identification of the specific facies types in each core can hence be used to reconstruct the change in environmental conditions at each drill site and to determine similarities and dissimilarities between the sites. This –

Alfred-Wegener-Institut
Helmholtz-Zentrum für Polar- und Meeresforschung
BREMERHAVEN

Am Handelshafen 12
27570 Bremerhaven
Telefon 0471 4831-0
Telefax 0471 4831-1149
www.awi.de

Stiftung des öffentlichen Rechts

Sitz der Stiftung:
Am Handelshafen 12
27570 Bremerhaven
Telefon 0471 4831-0
Telefax 0471 4831-1149
www.awi.de

Vorsitzender des Kuratoriums:
MinDir Dr. Karl Eugen Huthmacher
Direktorium:
Prof. Dr. Dr. h.c. Karin Lochte
(Direktorin)
Dr. Karsten Wurr
(Verwaltungsdirektor)
Dr. Uwe Nixdorf
(Stellvertretender Direktor)
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including older data from Cape Roberts and ANDRILL cores - allows establishing a model of paleoclimate evolution from the more proximal to the more distal parts of the Ross Sea. Additionally, these continuous, high-resolution datasets are perfect for the reconstruction of high-frequency paleoclimate change that likely dominated the younger part of the record. I plan to use statistical means to reconstruct Milankovich-type fluctuations of the WAIS. I am looking forward to many fruitful cooperation projects with other scientists, namely those working on seismic data (for correlation between the different sites) and those working on geochemical data and proxies for ice-sheet fluctuations (e.g. with Marcus Gutjahr, Geomar Kiel, Germany).

During the past decade, I was involved in several drilling projects.
In 2006, I joined the ANDRILL MIS expedition as a physical properties technician. After ANDRILL was successfully accomplished, I became an active member of the community that tried to establish a project at Coulman High. In 2008, I was involved in the PASADO drilling project by the International Continental Scientific Drilling Program (ICDP) in Patagonia, Argentina. Only 6 months later, I participated in the ICDP El'gygytgyn drilling project in Siberia, Russia. In both cases, I was fully responsible for the respective on-site laboratory (including physical properties measurements), and also conducted additional high-resolution physical properties measurements back home in our institute's laboratory. In case of El'gygytgyn, I was also involved in the acquisition of downhole logging measurements. After the expeditions, I worked on a combination of physical properties, downhole logging and geochemical data and used them for a lithological characterization of the sediments as well as for paleoclimate reconstructions.
During these three and several other shorter campaigns, I acquired the necessary skills to run the Geotek Multi-Sensor Core Logger and the line scan camera logger, and to subsequently process and interpret the data. Since 2009, I am radiation protection officer at our institute and hence have excellent knowledge on the handling of the radioactive source that is used for density measurements.
I am a member and physical properties specialist of the recent Chicxulub IODP expedition 364 where I plan to work on a combination of physical properties, downhole logging and geochemical data.

I would greatly appreciate if you were to take my application into consideration.

Yours faithfully,

C. Gebhardt

Dr. Catalina Gebhardt

Enclosures:
- Curriculum vitae
- Publication list

Curriculum vitae | Catalina Gebhardt

Alfred Wegener Institute,
Helmholtz Centre of Polar and Marine Research
Van-Ronzelen-Straße 2
27568 Bremerhaven
Germany
☎ +49-471 4831 2040
e-mail: catalina.gebhardt@awi.de

Name	Dr. Andrea Catalina Gebhardt
Date and Place of Birth	30 April 1975, Chur (Schweiz)
Nationalities	Swiss, German
Professional Background	Diploma in Natural Sciences (ETH Zurich, Switzerland)
Specialization	Earth Sciences, Sedimentology; Inorganic Geochemistry; Geophysics

Scientific career

since 01/2014	Senior Scientist at Alfred Wegener Institute Helmholtz Centre Bremerhaven, Geophysics Group
05/2004 to 12/2013	PostDoc at Alfred Wegener Institute Helmholtz Centre Bremerhaven at Geophysics Group; several projects (including 3x „Eigene Stelle DFG“)
12/2003 to 04/2004	PhD student at Alfred Wegener Institute Helmholtz Centre Bremerhaven, Geophysics Group
05/2001 to 11/2003	PhD student at University of Hamburg, Institute for Biogeosciences and Marine Sciences. Advisors: Dr. B. Gaye, Prof. Dr. K.-C. Emeis

Education

04/2004	PhD (Dr. rer. nat): „Modern Sedimentation Processes in the Kara Sea“, University of Hamburg. Advisors: Dr. B. Gaye, Prof. Dr. K.-C. Emeis
05/2001	Diploma in Natural Sciences, ETH Zurich, Switzerland. Specialization: Earth Sciences, Sedimentology. Advisors for Diploma thesis: Prof. Dr. H. Weissert (ETH Zurich, Switzerland), Prof. Dr. Gert de Lange (University of Utrecht, The Netherlands)
10/1996 to 04/2001	Studies of Earth Sciences, ETH Zurich, Switzerland
09/1999 to 06/2000	Exchange year („Erasmus“) to University of Utrecht (The Netherlands), member of the „Inorganic Geochemistry“ working group
Languages	German, English, French, Dutch (all fluent)

Experience in the field of physical properties

Expeditions

07/2015	Maria S. Merian expedition MSM44 *Head of Hydroacoustic group, and part of Geology group* *Including acquisition and processing of physical properties data*
08/2013 to 09/2013	Maria S. Merian expedition MSM31 *Head of Geology group* *including acquisition and processing of physical properties data*
02/2009 to 04/2009	El'gygytgyn deep drilling project, Siberia (ICDP) *Head of on-site laboratory* *Acquisition and processing of physical properties (~500 m core), preliminary on-site core correlation; Acquisition and processing of downhole logging measurements*
09/2008 to 11/2009	PASADO deep drilling project, Argentina (ICDP) *Head of on-site laboratory* *Acquisition and processing of physical properties (~500 m core), preliminary on-site core correlation*
07/2007 to 10/2007	R/V Polarstern, Cruise ARKXXII/2 *Acquisition and processing of physical properties and color scans*
10/2006 to 12/2006	ANDRILL MIS deep drilling campaign, Antarctica *Acquisition of physical properties (~1200 m core)*
08/2004 to 10/2004	R/V Polarstern, Cruise ARKXX/3 *Acquisition and processing of physical properties and color scans*

Home laboratory

05/2009 to 08/2009	PASADO logging campaign during extended sampling party *Acquisition and processing of physical properties (~500 m core in 1 cm steps), core splicing*
10/2009 to 01/2011	El'gygytgyn logging campaign during extended sampling party Acquisition and processing of physical properties and core images (~500 m core logged in high-resolution 2 mm steps)
2003 to 2016	several logging campaigns of short cores (lacustrine, marine)

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APPLICATION TO PARTICIPATE IN AN IODP EXPEDITION

ESSAC Office ECORD Science Support & Advisory Committee
GEOMAR | Helmholtz Centre for Ocean Research Kiel
Wischhofstrasse 1-3
24148 Kiel, Germany
Hanno Kinkel (ESSAC Science Coordinator):
Tel: +49 431 600 2418
Fax:+49 431 600 2922
Web Page: http://www.essac.ecord.org Email: **essac@geomar.de**

Please type information

Apply to Sail Application Form

Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

1. PERSONAL INFORMATION

Family name: Gutjahr

First name: Marcus

Current Position: Senior Scientist

Institution: GEOMAR Helmholtz Centre for Ocean Research Kiel

Address: Wischhofstraße 1-3

City, Postcode, Country: Kiel, 24148, Germany

Tel. work: +49 431 600 2232
Tel. home: +49 4348 2013 605
Fax: +49 431 600 2829
Email: mgutjahr@geomar.de

Country of citizenship: Germany

Place of birth/date of birth: Ostfildern-Ruit, Germany

Gender: Male

Education (highest degree, including year PhD was received / is expected): PhD 2007

Are you currently a student? NO

2. EXPEDITION INFORMATION

Summary of proposed participation, including area of scientific interest, current research and participation plan (maximum 250 characters with space – more detail should be included in the Letter of Interest):

Participation as inorganic geochemist (1st choice) or alternatively as sedimentologist. Inorganic isotope geochemist by training, interested in sedimentary authigenic Fe-Mn oxyhydroxide composition for reconstruction of WAIS dynamics in the Ross Sea.

Prior involvement with DSDP/ODP/IODP and nature of involvement (expedition number, shipboard/shore-based participation, co-chief, etc):

Published 16 papers to date using DSDP, ODP or IODP material and having three further ODP-related manuscripts under consideration. No shipboard participation in IODP drilling to date and very interested to participate in such an expedition.

Post-cruise science support to achieve the proposed scientific objectives 1) future funding scheme and 2) support from host institution (e.g. staff, facilities)

At minimum one PhD position is envisaged to carry out the proposed science. PhD student will be supervised by Dr. Marcus Gutjahr and Prof. Anton Eisenhauer at GEOMAR Kiel. Various funding sources are available and will be contacted when participation is granted: support via (i) either the DFG-IODP funding scheme, (ii) a Helmholtz Society internal PhD funding, (iii) third party sources such as the Chinese Scholarship Council (current four-year funding of another excellent PhD student in our group). Other funding avenues could alternatively be taken and we are confident the PhD can be realised to start in early 2018.

Four scientific and/or personal references

1) **Prof. Heiko Pälike**, University of Bremen, Leobener Straße, D-28359 Bremen, Germany

Tel. +49 2421 218 65980, Email: hpaelike@marum.de

2) **Prof. Martin Frank**, GEOMAR Helmholtz Centre for Ocean Research Kiel, Wischhofstrasse 1-3, 24148 Kiel, Germany

Tel: +49 431 600 2218, Email: mfrank@geomar.de

3) **Prof. Paul Wilson**, Ocean and Earth Science, National Oceanography Centre Southampton, University of Southampton, UK

Tel: +44 2380 596164, Email: paul.wilson@noc.soton.ac.uk

4) **Prof. Gavin Foster**, Ocean and Earth Science, National Oceanography Centre Southampton, University of Southampton, UK

Tel: +44 23 8059 3786, Email: Gavin.Foster@noc.soton.ac.uk

3. SCIENTIFIC EXPERTISE

For Scientist Jobs Descriptions visit: http://iodp.tamu.edu/participants/scientist_jobs.html

Please indicate your area(s) of expertise (maximum 3)

Discipline	Mark with X	Speciality
microbiologist		
organic and inorganic geochemist/biogeochemist	X	Inorganic elemental and isotope geochemistry (1st choice)
physical properties specialist		
sedimentologist	X	Core descriptions (2nd choice)
structural geologist		
paleontologist		
paleomagnetist		
petrologist		
hydrogeologist		
Other		

4. ADDITIONAL DOCUMENTS

Please, provide the following documents:

- Letter of interest, including details about area of scientific interest, current research, expedition participation plan and post-cruise research
- CV and Publication list
- Letter of recommendation (for PhD students)
- See also: http://www.essac.ecord.org/flyer/Guidelines_for%20Applying_to_sail.pdf

Please, send your application form as *a MS Word document* and the additional documents in *PDF format* (preferably as one file) by email to Jan Behrmann and Hanno Kinkel at the ESSAC office: essac@geomar.de.

In addition to the ESSAC application, all applicants *must inform their national office* (if applicable) *and national delegate* and send a copy of the application documents. ECORD does not provide funds for participation; the national offices or national delegates can provide information regarding travel support, post-cruise funding opportunities, etc.

See http://www.essac.ecord.org/index.php?mod=about&page=ESSAC for a list of the national contact persons.

GEOMAR
Helmholtz-Zentrum für Ozeanforschung Kiel

GEOMAR | Wischhofstraße 1-3 | 24148 Kiel | Germany

Dr. Marcus Gutjahr
FB2/ FE Marine Geosystems
mgutjahr@geomar.de

Tel +49 431 600-2232
Fax +49 431 600-2928

To:

ESSAC Office
ECORD Science Support & Advisory Committee
GEOMAR Helmholtz Centre for Ocean Research
Kiel, Germany

15. August 2016

Letter of interest for participation as inorganic geochemist or sedimentologist in IODP Expedition 374

Dear ECORD Science Support & Advisory Committee,

GEOMAR
Helmholtz-Zentrum für
Ozeanforschung Kiel

Wischhofstraße 1-3
24148 Kiel | Germany

Tel +49 431 600-0
Fax +49 431 600-2805
www.geomar.de

Deutsche Bank AG Kiel
BLZ 210 700 24
Kto. 144 8000

SWIFT/BIC DEUTDEDB210
IBAN DE 69210700240144800000

Steuernummer 1929404751
VAT DE281295378

In January 2018 the *JOIDES* Resolution will embark on an expedition aiming to drill six core sites in the Antarctic Ross Sea. I have read the call with enthusiasm since Antarctic Ice Sheet dynamics are forming a major component of my scientific interest. While not yet participating on board on an IODP expedition in the past, about half of my published scientific contributions are either entirely based on or at least used some DSDP-, ODP- or IODP-derived material. The projected cruise is not only scientifically highly relevant, aiming to assess WAIS dynamics back to the Miocene as a function of ambient climate, it also is a prime location to make use of an hitherto underemployed new isotope geochemical proxy to assess WAIS dynamics.

Already during my PhD carried out at ETH in Zürich, Switzerland, I have developed a gentle reductive leaching method that targets the authigenic radiogenic neodymium (Nd) and lead (Pb) isotope composition in marine sediments, thereby extracting the bottom water isotope compositions (see [1, 2]). While authigenic Nd is an excellent tracer for water mass circulation patterns [3], authigenic Pb isotope compositions react remarkably sensitive to continental ice sheet dynamics in glacial-interglacial transitions [4-7]. This adsorbed bottom water Nd and Pb isotope signal can then be compared to the sedimentary detrital Nd and Pb isotope signature.

During physicochemical weathering Nd is supplied to the oceans in a “congruent” manner, meaning its isotopic composition reflects the average of the continental source area. Pb on the other hand is weathered highly incongruently with the effect that during incipient and early chemical weathering the continental Pb isotopic runoff signal is significantly more radiogenic than the bulk source composition. This feature can mostly be ascribed to the release of Pb from uranogenic and thorogenic mineral phases that usually weather first compared with other major rock-forming mineral phases [8, 9] thereby preferentially releasing very radiogenic Pb. Runoff compositions become less “exotic” during prolonged chemical weathering in the hinterland, resulting in a Pb isotopic runoff composition more closely reflecting bulk rock compositions.

The key reason to use combined authigenic and detrital Nd and Pb isotope compositions is the powerful synergy of these two isotope systems: Nd isotopes will enable us to quantify changes in sourcing to the Ross Sea shelf and continental rise settings. Pb isotopes on the other hand provide information on (i) climate and (ii) ice sheet dynamics in the Ross Sea continental hinterland. Fully glacial conditions result in heavily fluctuating authigenic Pb isotope compositions at the core sites, more distal yet regional ice sheet presence will lead to relatively moderate radiogenic Pb isotope excursions, absence of continental ice sheets will only release a fairly muted Pb isotope signal isotopically indistinguishable from bulk rock compositions. The strongest amplitudes of Pb isotopic change are expected during periods of accelerated ice sheet retreat, when significant amounts of freshly exposed ground rock substrate is exposed to chemical weathering [5]. Elevated meltwater fluxes further exacerbate these radiogenic Pb isotope excursions that are expected to occur at every glacial-interglacial transition as long as ice was present in relative proximity to the Ross Sea. We also expect signals to be recorded during millennial-scale interstadial climatic excursions in the Ross Sea sector of the Southern Ocean. Given the proposed instability of the WAIS numerous short-term excursions will be expected. If all core sites can be readily correlated clear proximal-distal gradients in Pb isotopic compositions should be observable because of the short residence time of dissolved Pb in seawater.

Since October 2015 I am supervising a PhD student at GEOMAR Kiel using this method to resolve the present-day Pb isotopic input signal in the Weddell Sea based on 90 Weddell Sea core-top samples obtained from the AWI core repository in Bremerhaven from our cooperation partner Gerhard Kuhn. Furthermore we are also creating a millennial-scale combined Nd and Pb isotope record from ODP Site 1094 in the Southern Ocean over the past 150 ka (req. no. 038054IODP). The proposed work in the Ross Sea is the logical next step beyond this ongoing PhD project. Moreover, given knowledge gathered during past and

the current PhD projects, we already streamlined the purification protocol in a manner enabling us to produce high-resolution records of Nd and Pb isotopic compositions from Ross Sea sediments as far back as the Miocene at reasonable temporal resolution. The laboratory and mass spectrometric setup at GEOMAR is excellent making our project aims realistically achievable.

Various national and international funding sources are available (see attached list) and proposals will be submitted for adequate funding. The above described project will at least fund one PhD position, likely two. Whether funding for a second PhD project will be sought depends on the outcome of the first project. However, we are very optimistic that the proposed work will provide a wealth of new climatic insights into WAIS dynamics using a novel sensitive ice sheet tracer exceeding beyond the work load that can be tackled within a single PhD. Finally, our Nd and Pb isotope research would also further benefit from a cooperation with scientists at the AWI Bremerhaven (Catalina Gebhardt) who is applying as a physical properties scientist (petrophysical characterisation and XRF scanning data processing) for IODP Leg 374. I am also very interested in obtaining porewater samples for further evaluation of the depositional environment. My main specialty is inorganic geochemistry. However, I would also be delighted to take part as a sedimentologist on board the *JOIDES* Resolution should this position be filled by another geochemist.

Yours sincerely

References cited

[1] Gutjahr, M., et al. *Chem. Geol.* (2007) 242: p. 351-370.
[2] Blaser, P., et al. *Chem. Geol.* (2016) 439: p. 189-204.
[3] Böhm, E., et al. *Nature* (2015) 517: p. 73-76.
[4] Gutjahr, M., et al. *Earth and Planetary Science Letters* (2009) 286: p. 546-555.
[5] Kurzweil, F., et al. *Earth and Planetary Science Letters* (2010) 299: p. 458-465.
[6] Crocket, K.C., et al. *Quaternary Science Reviews* (2012) 38: p. 89-99.
[7] Crocket, K.C., et al. *Quaternary Science Reviews* (2013) 82: p. 133-144.
[8] Harlavan, Y., Y. et al. *Geochimica et Cosmochimica Acta* (1998) 62: p. 33-46.
[9] Erel, Y., Y. et al. *Geochimica et Cosmochimica Acta* (1994) 58: p. 5299-5306.

Dr. Marcus Gutjahr, born 31st August 1973, married, no children

Work address

GEOMAR *Helmholtz Centre for Ocean Research Kiel*

Wischhofstrasse 1-3, 24148 Kiel, Germany

Tel.: (+49) 431 600 2232, Mobile: (+49) 176 976 41585, Email: mgutjahr@geomar.de

Scientific interest

Analytical and applied isotope geochemistry, paleoclimatology, marine carbon cycle, paleoceanography, Cenozoic and Pleistocene glaciation history of the high latitudes

Academic curriculum

Since Jan. 2013	Senior scientist, permanent member of staff at GEOMAR *Helmholtz Centre for Ocean Research Kiel*, Germany
May 11 – Dec. 12	Postdoctoral Research Fellow, University of Southampton, UK, working in collaboration with Prof. Gavin Foster
Dec. 06 – April 11	Postdoctoral Research Fellow, University of Bristol, UK, working in collaboration with Prof. Derek Vance
Aug. 06 – Nov. 06	Postdoctoral employment in the Institute of Isotope Geochemistry and Mineral Resources at ETH Zürich, Switzerland, in the research group of Prof. Bernard Bourdon
Nov. 02 – July 06	Doctoral studies at the Institute for Isotope Geochemistry and Mineral Resources at the ETH in Zürich under supervision of Prof. Martin Frank in the research group of Prof. Alex Halliday (later Prof. Bernard Bourdon)
Feb. 00 – June 02	Graduate studies in Geology at the University of Canterbury, Christchurch, New Zealand. Accomplishment of the Master of Science in Geology with First Class Honours in June 2002
Oct. 96 – Feb. 00	Studies in Geology at the University of Tübingen, Germany Completed undergraduate intermediate degree in June 1999

Previous IODP involvement and other sailing experience

2016	Co-Proponent of Iceberg Alley IODP Proposal 902 (currently in external review)
2010	Granting of three full days of ship time for cold-water coral and seawater sampling on RV Polarstern leg ANT-XXVI/3

Other Grants and Awards

Since Oct. 15	Acquisition of PhD student via the Chinese Scholarship Council, supported via a full four-year scholarship
Since Sept. 15	Partner in EU-funded International Training Network "BASE-LiNE Earth", lead by PI Prof. Anton Eisenhauer, GEOMAR Helmholtz Centre for Ocean Research Kiel (see http://www.baseline-earth.eu), co-supervision of one PhD student

Since April 13	Associated partner in EU-funded International Training Network "MEDGATE", lead by PI Dr. Rachel Flecker, University of Bristol (see http://eu-medgate.net/), co-supervision of two PhD students
2010	*Royal Society Travel Grant* for the attendance of the AGU Fall Meeting in San Francisco in December 2010
2008	Two-year postdoctoral intra-European Marie Curie Fellowship
2006	One-year postdoctoral Fellowship for Prospective Researchers awarded by the Swiss National Science Foundation
2006	Participation (upon application and invitation) at DISCO XX, *20th Dissertation Symposium on Chemical Oceanography*, Honolulu, Hawaii, USA
2002	Sir Julius Van Haast Prize from the Department of Geological Sciences in Christchurch (New Zealand) issued for the quality of the Master's Thesis
2001/2002	Recipient of a University of Canterbury Master's Scholarship

Past and current PhD students

- Ruza Ivanovic (2009-2012), at University of Bristol, co-supervision with Dr. Rachel Flecker and Prof. Paul Valdes
- Marlies van der Schee (since 2013), MEDGATE, PhD candidate is based in Salamanca (Spain), carrying out ITN secondment at GEOMAR, co-supervision with Prof. Francisco Sierro
- Sevasti Modestou (since 2013), MEDGATE, PhD candidate is based in Glasgow (UK), carrying out ITN secondment at GEOMAR, co-supervision with Prof. Rob Ellam
- Sebastian Flöter (since Feb 14), GEOMAR, main supervisor in conjunction with Prof. Anton Eisenhauer
- Hana Jurikova (since Sept 15), BASELiNE EARTH PhD student, GEOMAR, main supervisor in conjunction with Dr. Volker Liebetrau and Prof. Anton Eisenhauer
- Huang Huang (since Oct 15), GEOMAR, main supervisor in conjunction with Prof. Anton Eisenhauer

Reviewing activity for

Australian Marine National Facility (CSIRO), Chemical Geology, Earth and Planetary Science Letters, Geochimica et Cosmochimica Acta, Geochemistry Geophysics Geosystems, Geology, Geophysical Research Letters, Gondwana Research, National Geographic Society, Nature, Nature *Geoscience*, Nature *Science Reports*, Quaternary Science Reviews, Paleoceanography, Science, Science of the Total Environment, Sedimentology, U.S. National Science Foundation

Manuscripts based upon or including DSDP, ODP or IODP material are shown in black font, while non-IODP publications are shown in green.

Total citations (Web of Science, all databases): 638
h-index: 13

Manuscripts under consideration

a. **Gutjahr, M.**, A. Ridgwell, P. F. Sexton, E. Anagnostou, P. N. Pearson, H. Pälike, R. D. Norris, E. Thomas, G. L. Foster (in revision). A large and mostly volcanic carbon source drove the Paleocene-Eocene Thermal Maximum. ***Nature***.

b. Stewart, J. A., **M. Gutjahr**, R. H. James, P. Anand, P. A. Wilson (accepted pending minor revisions). Influence of the Amazon River on the Nd isotope composition of deep water in the western equatorial Atlantic during the Oligocene-Miocene transition. ***Earth and Planetary Science Letters***.

c. Crocker, A.J., T.B. Chalk, I. Bailey, M.R. Spencer, **M. Gutjahr**, G.L. Foster, P.A. Wilson (accepted pending moderate revisions) Geochemical response of the mid-depth northeast Atlantic Ocean to freshwater input during Heinrich events. ***Quaternary Science Reviews***.

d. Modestou, S., D. Simon, **M. Gutjahr**, A. Marzocchi, T.J. Kouwenhoven, R.M. Ellam, R. Flecker (in review). Precessional variability of $^{87}Sr/^{86}Sr$ in the late Miocene Sorbas Basin: an interdisciplinary study of drivers of inter-basin exchange. ***Paleoceanography***.

Publications

32) Blaser, P., J. Lippold, **M. Gutjahr**, N. Frank, J.M. Link, M. Frank (2016) Extracting foraminiferal seawater Nd isotope signatures from bulk deep sea sediment by chemical leaching. ***Chemical Geology*** **439**, 189-204. *Article*

31) Lippold, J., **M. Gutjahr**, P. Blaser, E. Christner, M.L. de Carvalho Ferreira, S. Mulitza, M. Christl, F. Wombacher, E. Böhm, B. Antz, O. Cartapanis, H. Vogel, S.L. Jaccard (2016) Deep water provenance and dynamics of the (de)glacial Atlantic meridional overturning circulation. ***Earth and Planetary Science Letters*** **445**, 68-78. *Article*

30) Lang, D. C., I. Bailey, P. A. Wilson, T.B. Chalk, G. L. Foster, **M. Gutjahr** (2016) Incursions of southern-sourced water into the deep North Atlantic during late Pliocene glacial intensification. ***Nature Geoscience*** **9**, 375-379. *Article*

29) van der Schee, M., F.J. Sierro, F.J. Jiménez-Espejo, F.J. Hernández-Molina, R. Flecker, J.A. Flores, G. Acton, **M. Gutjahr**, P. Grunert, Á. García-Gallardo, N. Andersen (in press) Evidence of early bottom water current flow after the Messinian Salinity Crisis in the Gulf of Cadiz. ***Marine Geology***. *Article*

28) Flecker, R., W. Krijgsman, W. Capella, C. de Castro Martíns, E. Dmitrieva, J. P. Mayser, A. Marzocchi, S. Modestu, D. Ochoa, D. Simon, M. Tulbure, B. van den Berg, M. van der Schee, G. de Lange, R. Ellam, R. Govers, **M. Gutjahr**, F. Hilgen, T. Kouwenhoven, J. Lofi, P. Meijer, F. J. Sierro, N. Bachiri, N. Barhoun, A. C. Alami, B. Chacon, J. A. Flores, J. Gregory, J. Howard, D. Lunt, M. Ochoa, R. Pancost, S. Vincent, M. Z. Yousfi (2015). Evolution of the Late Miocene Mediterranean–Atlantic gateways and their impact on regional and global environmental change. ***Earth-Science Reviews*** **150**, 365-392. *Article*

27) Stewart, J. A., **M. Gutjahr** , F. Pearce, P. K. Swart, G. L. Foster (2015). Boron during meteoric diagenesis and its potential implications for Marinoan snowball Earth δ^{11}B-pH excursions. ***Geology*** **43 (7)**, 627-630. *Article*

26) Böhm, E., J. Lippold, **M. Gutjahr**, M. Frank, P. Blaser, B. Antz, J. Fohlmeister, N. Frank, M. B. Andersen, M. Deininger (2015) Strong and deep Atlantic meridional overturning circulation during the last glacial cycle. ***Nature*** **517**, 73-76. *Article*

25) Lang, D. C., I. Bailey, P. A. Wilson, G. L. Foster, C. T. Bolton, O. Friedrich, **M. Gutjahr** (2014). Response to "Comment on 'The transition on North America from the warm humid Pliocene to the glaciated Quaternary traced by eolian dust deposition at a benchmark North Atlantic Ocean drill site', by David Lang et al.". ***Quaternary Science Reviews*** **103**, 175-183. *Article*

24) Rickli, J.**, M. Gutjahr**, D. Vance, M. Fischer-Gödde, C.-D. Hillenbrand, G. Kuhn (2014). Neodymium and hafnium boundary contributions to seawater along the West Antarctic continental margin. ***Earth and Planetary Science Letters*** **394**, 99-110. *Article*

23) **Gutjahr, M.**, M. Frank, J. Lippold, A. N. Halliday (2014). Peak Last Glacial weathering intensity on the North American continent recorded by the authigenic Hf isotope composition of North Atlantic deep-sea sediments. ***Quaternary Science Reviews*** **99**, 97-111. *Article*

22) Lang, D. C., I. Bailey, P. A. Wilson, C. J. Beer, C. T. Bolton, O. Friedrich, C. Newsam, M. R. Spencer, **M. Gutjahr**, G. L. Foster, M. J. Cooper, J. A. Milton (2014). The transition on North America from the warm humid Pliocene to the glaciated Quaternary traced by eolian dust deposition at a benchmark North Atlantic Ocean drill site. ***Quaternary Science Reviews*** **93**, 125-141. *Article*

21) Ivanovic, R. F. , P. J. Valdes, R. Flecker, **M. Gutjahr** (2014). Modelling global-scale climate impacts of the late Miocene Messinian Salinity Crisis. ***Climate of the Past*** **10**, 607–622. *Article*

20) Ivanovic, R. F. , P. J. Valdes, L. Gregoire, R. Flecker, **M. Gutjahr** (2014). Sensitivity of modern climate to the presence, strength and salinity of Mediterranean-Atlantic

exchange in a global general circulation model. ***Climate Dynamics* 42**, 859–877. *Article*

19) **Gutjahr, M.**, D. Vance, D. L. Hoffmann, C.-D. Hillenbrand, G. L. Foster, J. W. B. Rae, G. Kuhn (2013). Structural limitations in deriving accurate U-series ages from calcitic cold-water corals contrast with robust coral radiocarbon and Mg/Ca systematics. ***Chemical Geology* 355**, 69–87. *Article*

18) Ivanovic, R. F., R. Flecker, **M. Gutjahr**, P. J. Valdes (2013). First Nd isotope record of Mediterranean–Atlantic water exchange through the Moroccan Rifian Corridor during the Messinian Salinity Crisis. ***Earth and Planetary Science Letters* 368**, 163–174. *Article*

17) Ivanovic, R. F. , P. J. Valdes, R. Flecker, L. J. Gregoire, **M. Gutjahr** (2013). The parameterisation of Mediterranean–Atlantic water exchange in the Hadley Centre model HadCM3, and its effect on modelled North Atlantic climate. ***Ocean Modelling* 62**, 11–16. *Article*

16) Chen, T.-Y., M. Frank, B. A. Haley, **M. Gutjahr**, R. F. Spielhagen (2012). Variations of North Atlantic inflow to the central Arctic Ocean over the last 14 million years inferred from hafnium and neodymium isotopes. ***Earth and Planetary Science Letters* 353–354**, 82–92. *Article*

15) **Gutjahr, M.**, J. Lippold (2011). Early arrival of Southern Source Water into the deep North Atlantic preceding Heinrich event 2. ***Paleoceanography* 26**, PA2101. *Article*

14) Meister, P., **M. Gutjahr,** M. Frank, S. M. Bernasconi, C. Vasconcelos, J. A. McKenzie (2011). Dolomite formation within the methanogenic zone induced by tectonically-driven fluids in the Peru accretionary prism. ***Geology* 39 (6)**, 563-566. *Article*

13) Crocket, K., D. Vance, **M. Gutjahr,** G. L. Foster, D. Richards (2011). Nordic deep water overflow driven by meltwater input during the entire last climate cycle. ***Geology* 39 (6)**, 515-518. *Article*

12) Kurzweil, F., **M. Gutjahr**, D. Vance, L.D. Keigwin. (2010). Authigenic Pb isotopes from the Laurentian Fan: changes in chemical weathering and patterns of North American freshwater runoff during the last deglaciation. ***Earth and Planetary Science Letters* 299**, 458–465. *Article*

11) **Gutjahr, M.**, B. A. A. Hoogakker, M. Frank, I. N. McCave (2010). Changes in North Atlantic Deep Water strength and bottom water masses during Marine Isotope Stage 3 (45 to 35 ka BP). ***Quaternary Science Reviews* 29**, 2451-2461. *Article*

10) **Gutjahr, M.**, M. Frank, A. N. Halliday, L. D. Keigwin (2009). Retreat of the Laurentide ice sheet tracked by the isotopic composition of Pb in western North Atlantic seawater during termination 1. ***Earth and Planetary Science Letters* 286**, 546-555. *Article*

9) Bradshaw, J. D., **M. Gutjahr**, S. D. Weaver, K. N. Bassett (2009). Cambrian intra-oceanic arc accretion to the austral Gondwana margin: constraints on the location of proto-New Zealand. ***Australian Journal of Earth Sciences*** **56**, (587–594). *Article*

8) Baumgartner, R., L. Fontbote, R. Spikings, M. Ovtcharova, U. Schaltegger, J. Schneider, L. Page, **M. Gutjahr** (2009). Bracketing the age of magmatic-hydrothermal activity at the Cerro de Pasco epithermal polymetallic deposit, central Peru: A U-Pb and $^{40}Ar/^{39}Ar$ study. ***Economic Geology*** **104**, 479-504. *Article*

7) **Gutjahr, M.**, M. Frank, C. H. Stirling, L. D. Keigwin, A. N. Halliday (2008). Tracing the Nd isotope evolution of North Atlantic Deep and Intermediate Waters in the western North Atlantic since the Last Glacial Maximum from Blake Ridge sediments. ***Earth and Planetary Science Letters*** **266,** 61-77. *Article*

6) Delacour, A., G. L. Früh-Green, M. Frank, **M. Gutjahr**, D. S. Kelley (2008). Sr- and Nd-isotope geochemistry of the Atlantis Massif (30°N, MAR): Implications for fluid fluxes and lithospheric heterogeneity. *Chemical Geology* **254**, 19-35. *Article*

5) **Gutjahr, M.**, M. Frank, C. H. Stirling, V. Klemm, T. van de Flierdt, A. N. Halliday (2007). Reliable extraction of a deepwater trace metal isotope signal from Fe-Mn oxyhydroxide coatings of marine sediments. ***Chemical Geology*** **242**, 351-370. *Article*

4) Meister, P., J. A. McKenzie, C. Vasconcelos, S. M. Bernasconi, M. Frank, **M. Gutjahr**, D. P. Schrag (2007). Dolomite formation in the dynamic deep biosphere: Results from the Peru margin. ***Sedimentology*** **54**, 1007-1032. *Article*

3) Chew, D. M., U. Schaltegger, J. Kosler, M. Whitehouse, **M. Gutjahr,** R. Spikings, A. Miskovic (2007). U-Pb geochronologic evidence for the evolution of the Gondwana margin of the north-central Andes. ***GSA Bulletin*** **119**, 697-711 *Article*

2) **Gutjahr, M.**, J. D. Bradshaw, S. Weaver, C. Münker, T. Ireland (2006). Provenance of Cambrian conglomerates from New Zealand: Implications for the tectonomagmatic evolution of the SE Gondwana margin. ***Journal of the Geological Society of London*** **163**, 997-1010. *Article*

1) Frank, M., H. Marbler, A. Koschinsky, T. van de Flierdt, V. Klemm, **M. Gutjahr**, A. N. Halliday, P. W. Kubik, P. Halbach (2006). Submarine hydrothermal venting related to volcanism in the Lesser Antilles: Evidence from ferromanganese precipitates. ***Geochemistry Geophysics Geosystems*** **7**, Q04010. *Article*

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ESSAC Office ECORD Science Support & Advisory Committee
GEOMAR | Helmholtz Centre for Ocean Research Kiel
Wischhofstrasse 1-3
24148 Kiel, Germany
Hanno Kinkel (ESSAC Science Coordinator):
Tel: +49 431 600 2418
Fax:+49 431 600 2922
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Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

1. PERSONAL INFORMATION

Family name: Laberg

First name: Jan Sverre

Current Position: Professor

Institution: University of Tromsø – the Arctic University of Norway

Address: Department of Geology, Dramsveien 201

City, Postcode, Country: Tromsø, NO-9037, Norway

Tel. work: +47 776 44456
Tel. home: +47 91662553
Fax: +47 45600
Email: jan.laberg@uit.no

Country of citizenship: Norwegian

Place of birth/date of birth: Harstad, Norway/2nd June 1963

Gender: Male

Education (highest degree, including year PhD was received / is expected): PhD 1994

Are you currently a student? ~~YES~~/NO Expected Graduation Date:

2. EXPEDITION INFORMATION

Summary of proposed participation, including area of scientific interest, current research and participation plan (maximum 250 characters with space – more detail should be included in the Letter of Interest):

- Study the sedimentology of the depositional environment
- Contribute to decoding the WAIS from its depositional record
- Compare the development of a southern and northern high-latitude ice sheet, both marine based (WAIS/Barents Sea Ice Sheet)

Prior involvement with DSDP/ODP/IODP and nature of involvement (expedition number, shipboard/shore-based participation, co-chief, etc):

IODP 333, shipboard participation, sedimentologist

Post-cruise science support to achieve the proposed scientific objectives 1) future funding scheme and 2) support from host institution (e.g. staff, facilities)

1) Funding for my post-cruise work will be provided through the ARCEx project funded by the Research Council of Norway and 8 industry partners

2) For post-cruise laboratory analysis the sedimentology laboratory at the Department of Geology, University of Tromsø will be available for me as I am part of the permanent staff of the department.

Three scientific and/or personal references:

1. Matthias Forwick, Head of Department, Department of Geology, University of Tromsø – the Arctic University of Norway, N-9037 Tromsø, Norway, email: Matthias.forwick@uit.no

2. David C. Mosher, Professor, University of New Hampshire, Center for Coastal and Ocean Mapping & Dept. Earth Sciences, Chase Ocean Engineering Lab, 24 Colovos Rd., Durham, NH, USA, 03824, email: dmosher@ccom.unh.edu

3. Angelo Camerlenghi, Director, Geophysics Research Section, OGS Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, Borgo Grotta Gigante 42/C, 34010 Sgonico, Trieste, Italy, email: acamerlenghi@inogs.it

4. **3. SCIENTIFIC EXPERTISE**

For Scientist Jobs Descriptions visit: http://iodp.tamu.edu/participants/scientist_jobs.html

Please indicate your area(s) of expertise (maximum 3)

Discipline	Mark with X	Speciality
microbiologist		
organic and inorganic geochemist/biogeochemist		
physical properties specialist	x	Here my expertise is within measurements and analysis of undrained shear strength, water content, sediment density
sedimentologist	x	Sedimentary processes at high-latitude continental margins including the sedimentology of debris flow deposits, turbidites, contourites, plumites, hemipelagites, glacimarine deposits, and till
structural geologist		
paleontologist		
paleomagnetist		
petrologist		
hydrogeologist		
Other		

4. ADDITIONAL DOCUMENTS

Please, provide the following documents:

- Letter of interest, including details about area of scientific interest, current research, expedition participation plan and post-cruise research
- CV and Publication list
- Letter of recommendation (for PhD students)
- See also: http://www.essac.ecord.org/flyer/Guidelines_for%20Applying_to_sail.pdf

Please, send your application form as *a MS Word document* and the additional documents in *PDF format* (preferably as one file) by email to Jan Behrmann and Hanno Kinkel at the ESSAC office: essac@geomar.de.

In addition to the ESSAC application, all applicants *must inform their national office* (if applicable) *and national delegate* and send a copy of the application documents. ECORD does not provide funds for participation; the national offices or national delegates can provide information regarding travel support, post-cruise funding opportunities, etc.

See http://www.essac.ecord.org/index.php?mod=about&page=ESSAC for a list of the national contact persons.

Letter of interest

1) Area of scientific interest

My area of scientific interest relates to the evolution of glaciated continental margins at northern high-latitudes where my focus have been on: 1) the sedimentary processes of the continental slope including; the role of glacigenic debris flows and turbidity currents in the sediment transfer into the deep-sea and their potential as paleoclimatic archives, contouritic and plumite deposits and their role as paleoclimatic archives and influence on the stability of the continental slope, and the morphology, sedimentary processes and triggering of submarine landslides. Furthermore, I have been working on the glacigenic sediments of the continental shelf and quantifying the source to sink sediment transfer at high-latitude margins on short (last glacial maximum) and long time-scales (the last ice age) and identifying the factors controlling this.

These studies have mainly been done using various types of acoustic data (swath bathymetry, side-scan sonar, 2D and 3D seismic data) integrated with core samples, mainly short cores (gravity, piston and calypso cores).

2) Current research

At present, my research focuses on:

- The glacial – deglacial succession deposited from one of the major paleo-ice streams draining the NW Fennoscandian Ice Sheet during the last glacial maximum, the rate of ice recession and the mechanisms involved,
- quantifying the sediment transfer to the continental margin – deep sea areas during the last ice age and its spatial and temporal variations
- the sedimentology and physical properties of high-latitude contourites and their role for the stability of the continental slope succession
- decoding the Pleistocene succession of the Scoresby Sund trough-mouth-fan based on ODP Site 987D/E and discuss implications for the evolution of the Scoresby Sund sector of the Greenland Ice Sheet

3) Expedition participation plan

During Expedition 374, I would like to participate as a sedimentologist describing the core samples recovered or to do the physical properties measurements (undrained shear strength, water content). I may also contribute to the core – seimics correlation and, the overall continental margin evolution and its implications for the evolution and behavior of the WAIS.

4) Post-cruise research

- Detailed studies of selected intervals based on visual core description, grain-size analysis and/or physical properties
- Contribute to the decoding of the WAIS
- From a detailed integration of the sedimentology and seismic stratigraphy, contribute to a better understanding of the seismic facies characterizing the deposits of glaciated continental margins
- Develop comparative studies of the evolution of southern and northern high-latitude, marine-based ice sheets

Prof. Dr. Jan Sverre Laberg

Tlf. +47 776 44456
Email: jan.laberg@uit.no

Curriculum Vitae

Academic degrees
Dr. Scient., University of Tromsø (UIT), 1994
Cand. Scient., University of Tromsø, 1990
Cand. Mag., University of Tromsø, 1987

Academic positions at the Dept. of Geology, University of Tromsø
Professor, 15.09.2014 – present
Associate Professor, 01.06.2012 – 15.09.2014
Research scientist, 01.05.2003 – 01.06.2012
Post. Doc., 01.02.2000 – 30.04.2003
Associate professor (temporary), 01.01.1999 – 30.01.2000
Post. Doc., 01.06.1996 – 31.12.1998
Associate professor (temporary), 01.01.1995 – 30.05.1996

Other present positions
Member of the board, Department of Geology, UIT

Past positions
Head of Department, Department of Geology, UIT (01.08 – 10.10 2014)
Member of the board, Faculty of Science and Technology, UIT (2008 – 2010)
Secretary of the Tromsø section of the Geological Society of Norway
Safety representative, Department of Geology, UIT
Leader of Heiagjengen, the social union at the Department of Geology, UIT

Research Experience
In my PhD project *Late Pleistocene evolution of the submarine fans off the western Barents Sea margin* the overall aim was to elucidate the sedimentary processes and to evaluate the potential of the Bear Island Trough Mouth Fan in documenting the long-term glacial history of the Barents Sea and surrounding land areas.

Afterwards, my research has focused on sedimentary processes and paleoenvironment of the formerly glaciated Norwegian – Barents Sea – Svalbard and NE Greenland continental margins mainly over the last ~2.7 Ma and includes studies of submarine landslides, contourites and glacigenic submarine fans as well as general studies of

passive margin evolution. I have also been involved in late Quaternary paleoenvironmental studies of fjords. At present my research involves studies of:
- development and sedimentary processes of submarine canyons offshore northern Norway
- age and origin of modern deep-sea sandy turbidites in the Lofoten Basin, Norwegian Sea
- geohazards: morphology, sedimentary processes and stability on the continental slope offshore northern Norway
- the evolution of the glaciated continental margin off Troms, Northern Norway over the last ~2.7Ma
- the glacial erosion of the Barents Sea shelf and – long-term glacial history and consequences for hydrocarbon exploration
- the Pleistocene evolution of the NE Greenland continental margin in order to document the long-term glacial history.

Professional Appointments

I have been guest lecturer at the University Centre on Svalbard (UNIS) and Sogn og Fjordane University College. At UNIS I have given lectures at Bachelor, Master and PhD level, at Sogn og Fjordane College at Bachelor level.

In the period 2008-2009 I was adviser to the Norwegian delegation regarding the submission of Norway in respect to the outer limits of Norway's continental shelf beyond 200 nautical miles to the UN Commission on the Limits of the Continental Shelf. This work, where I was one of the members responsible for presenting the documentation of Norway to the Commission was successfully ended in April 2009.

In the period 1998 – 2002 I was invited to present results from my studies of submarine landslides at the *Ormen Lange* workshops organized by Norsk Hydro related to the development of the Ormen Lange gas field offshore Norway.

Projects

Depositional models for sandy systems (DEMOCEN) (http://www.ig.uit.no/Democen/) together with Statoil, University of Bergen and Moscow State University – project leader

Sea floor stability of the continental slope offshore Lofoten, North Norway (LOSLOPE) (http://www.ig.uit.no/Loslope/) together with the Norwegian Geotechnical Institute, Oslo – project leader

Cenozoic development of the continental margin off Lofoten-Vesterålen and Troms, North Norway (LOVETRO) – project leader

IODP Expedition 333 – cruise participant (focusing on submarine landslide processes offshore Japan)

Deglaciation History of the North-Western Barents Sea from Sediments Generated by Paleo-Ice Streams (DEGLABAR) (Participating institutions: ICREA (Barcelona, Spain), University of Barcelona, GRC Marine Geosciences (Spain), Institut de Ciències del Mar - CSIC (Spain), Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS), Trieste (Italy), University of Tromsø (Norway), Institute of Marine Research, Bergen, Norway, University of Salamanca (Spain) (http://sites.google.com/site/ipynicestreams/deglabar) – project participant

IGCP-585: Earths continental margins: assessing the geohazard from submarine landslides (http://www.igcp585.org/home) – project participant

Research Centre for Arctic Petroleum Exploration (ARCEx) – Work Package leader (Education and outreach) and Task leader (Cenozoic uplift and erosion) (http://www.arcex.no/)

EUROFLEETS2 - PREsent and PAst flow REgime on contourite Drifts west of Spitsbergen - Partner

Funded Project Proposals

DEMOCEN funded by the Research Council of Norway and Statoil
LOSLOPE funded by the Research Council of Norway
LOVETRO funded by the Research Council of Norway and Front Exploration (now Dong Energy)
ARCEx funded by the Research Council of Norway and industry partners

Student Supervision

1995 – 01.06 2012: co-supervised 12 master students (could not be main supervisor because of non-permanent position).

01.06 2012 – present: 6 PhD-students (2 have finished in 2014, 1 in 2015) and 4 Master students, co-supervised 5 Master students and 2 PhD students.

Member of PhD Committees

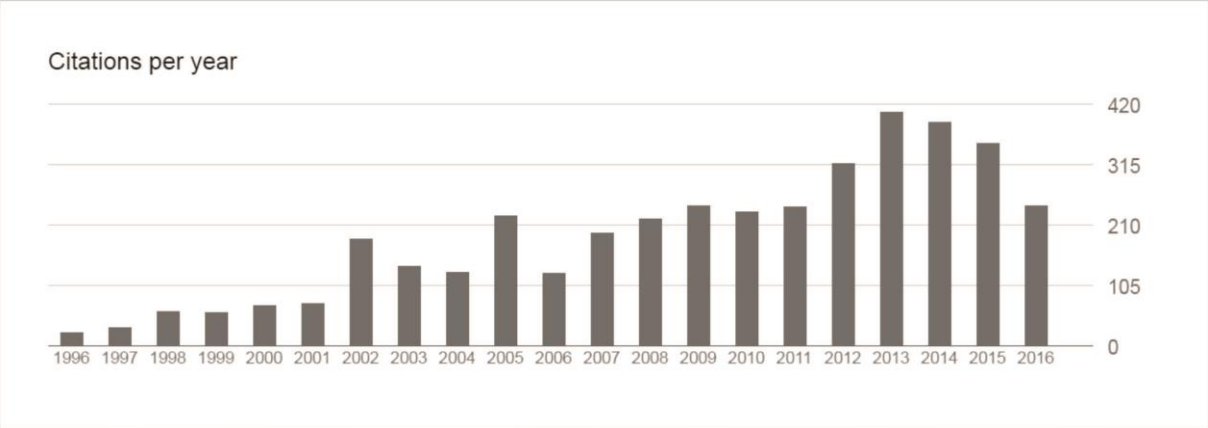
January 2010: External examiner for a Ph.D. student at the University of Edinburgh, UK
November 2007: 2. opponent for a Ph.D. student at the University of Bergen

Official Teaching Experience

Since 1995 I have taught Exogene Geology at the introductory level, Marine Geology, Sedimentology, Seismic Methods and Geohazards at Bachelor and Master levels at the University of Tromsø. I have also taught Arctic Sedimentation Environments at PhD level. At present I am responsible for *GEO-2005 Sedimentology*, *GEO-3144 Marine geology and geophysics cruise, and GEO-3145 Arctic marine geology and geophysics workshop* at the Department of Geology, University of Tromsø.

Citation analyses

The citation analyse was done using Google Scholar. The Web-based search as of July 2016 resulted in 133 publications, 4043 citations in total and an h-index of 36.



Peer Reviewed Publications (2010 – present)

(for pre-2010 publications, see:
http://www.cristin.no/as/WebObjects/cristin.woa/wa/personVis?type=PERSON&pnr=46407&la=no&instnr=186)

--- In press ---

Safronova, P.A., Laberg, J.S., Andreassen, K., Shlykova, V., Vorren, T.O., Chernikov, S. In press. Late Pliocene – early Pleistocene deep-sea basin sedimentation at high-latitudes: mega-scale submarine slides of the north-western Barents Sea margin prior to the shelf-edge glaciations. Basin Research.

--- 2016 ---

Forwick, M., Laberg, J.S., Husum, K., Gales, J.A. 2016. Submarine mass wasting on Hovgaard Ridge, Fram Strait, European Arctic. In: Submarine Mass Movements and their Consequences: 7th International Symposium, 253-263. Springer Publishing Company.

Laberg, J.S., Baeten, N., Vanneste, M., Forsberg, C.F., Forwick, M., Haflidason, H. 2016. Sediment Failure Affecting Muddy Contourites on the Continental Slope Offshore Northern Norway: Lessons Learned and Some Outstanding Issues. In: Submarine Mass Movements and their Consequences: 7th International Symposium, 281-289. Springer Publishing Company.

Mosher, D.C., Laberg, J.S., Murphy, A. 2016. The role of submarine landslides in the Law of the Sea. In: Submarine Mass Movements and their Consequences: 7th International Symposium, 15-26. Springer Publishing Company.

Rydningen, T.A., Laberg, J.S., Kolstad, V. 2016. Late Cenozoic evolution of high-gradient trough mouth fans and canyons on the glaciated continental margin offshore Troms, northern Norway – paleoclimatic implications and sediment yield. Geological Society of America Bulletin 128, 576 – 596.

--- 2015 ---

Amundsen, H.B., Laberg, J.S., Vorren, T.O., Haflidason, H., Forwick, M., Buhl-Mortensen, P. 2015. Late Weichselian – Holocene evolution of the high-latitude Andøya submarine canyon, North-Norwegian continental margin. Marine Geology 363, 1-14.

Forwick, M., Laberg, J.S., Hass, H.C., Osti, G. 2015. The Kongsfjorden Channel System offshore NW Svalbard: downslope sedimentary processes in a contour-current-dominated setting. Arctos 1, 17.

Rydningen, T.A., Laberg, J.S., Kolstad, V. 2015. Seabed morphology and sedimentary processes on high-gradient trough mouth fans offshore Troms, northern Norway. Geomorphology 246, 205-219.

Vorren, T.O., Rydningen, T.A., Baeten, N.J., Laberg, J.S. 2015. Chronology and extent of the Lofoten-Vesterålen sector of the Scandinavian Ice Sheet from 26 to 16 cal. Ka BP. Boreas 44, 445-458.

--- 2014 ---

Baeten, N.J., Laberg, J.S., Vanneste, M., Forsberg, C.F., Kvalstad, T.J., Forwick, M., Vorren, T.O., Haflidason, H. 2014. Origin of shallow submarine mass movements and their glide planes – sedimentological and geotechnical analyses from the continental slope off northern Norway. Journal of Geophysical Research: Earth Surface 119, doi:10.1002/2013JF003068.

Kawamura, K., Laberg, J.S., Kanamatsu, T. 2014. Potential tsunamigenic submarine landslides in active margins. Marine Geology 356, 44-49.

Laberg, J.S., Kawamura, K., Amundsen, H.B., Baeten, N.J., Forwick, M., Rydningen, T.A., Vorren, T.O. 2014. A submarine landslide complex affecting the Jan Mayen Ridge, Norwegian – Greenland Sea: slide-scar morphology and processes of sediment evacuation. Geo-Marine Letters 34, 51-58.

Rebesco, M., Laberg, J.S., Pedrosa, M.T., Camerlenghi, A., Lucchi, R.G., Zgur, F., Wardell, N. 2014. Onset and growth of Trough-Mouth Fans on the north-western Barents Sea margin – implications for the evolution of the Barents Sea/Svalbard Ice Sheet. Quaternary Science Reviews 92, 227-234.

Safronova, P.A., Henriksen, S., Andreassen, K., Laberg, J.S., Vorren, T.O. 2014. Evolution of shelf-margin clinoforms and deep-water fans during the middle Eocene in the Sørvestsnaget Basin, SW Barents Sea. AAPG Bulletin 98, 515-544.

--- 2013 ---

Baeten, N.J., Laberg, J.S., Forwick, M., Vorren, T.O., Vanneste, M., Forsberg, C.F., Kvalstad, T.J., Ivanov, M., 2013. Along slope heterogeneity of small-scale mass movement morphology and processes affecting contouritic deposits offshore Lofoten, northern Norway. Geomorphology 187, 122–134.

Gales, J., Forwick, M., Laberg, J., Vorren, T., Larter, R., Graham, A., Baeten, N., Amundsen, H., 2013. Arctic and Antarctic submarine gullies–a comparison of high latitude continental margins. Geomorphology 201, 449-461.

Kempf, P., Forwick, M., Laberg, J.S., Vorren, T.O. 2013. Late Weichselian and Holocene sedimentary palaeoenvironment and glacial activity in the high-arctic van Keulenfjorden, Spitsbergen. The Holocene 23, 1607 – 1618.

Laberg, J.S., Baeten, N.J., Lågstad, P., Forwick, M., Vorren, T.O. 2013. Formation of a large submarine crack during the final stage of retrogressive mass wasting on the continental slope offshore northern Norway. Marine Geology 346, 73-78.

Laberg, J.S., Forwick, M., Husum, K., Nielsen, T. 2013. A re-evaluation of the Pleistocene behavior of the Scoresby Sund sector of the Greenland Ice Sheet. Geology 41, 1231 – 1234.

Rebesco, M., Wåhlin, A., Laberg, J.S., Schauer, U., Beszczynska-Möller, A., Lucchi, R.G., Noormets, R., Accettella, D., Zarayskaya, Y., Diviacco, P. 2013. Quaternary contourite drifts of the Western Spitsbergen margin. Deep-Sea Research I 79, 156-168.

Rise, L., Bøe, R., Riis, F., Bellec, V.K., Laberg, J.S., Eidvin, T., Elvenes, S., Thorsnes, T., 2013. The Lofoten-Vesterålen continental margin, North Norway: Canyons and mass-movement activity. Marine and Petroleum Geology 45, 134-149.

Rydningen, T.A., Vorren, T.O., Laberg, J.S., Kolstad, V., 2013. The marine-based NW Fennoscandian ice sheet: glacial and deglacial dynamics as reconstructed from submarine landforms. Quaternary Science Reviews 68, 126-141.

Stoker, M., Leslie, A., Smith, K., Olavsdottir, J., Johnson, H., Laberg, J.S. 2013. Onset of North Atlantic Deep Water production coincident with inception of the Cenozoic global cooling trend Comment. Geology 41, E291.

--- 2012 ---

Laberg, J.S., Andreassen, K., Vorren, T.O. 2012. The late Cenozoic erosion of the high-latitude south-western Barents Sea shelf revisited. Geological Society of America Bulletin 124, 77-88. doi:10.1130/B30340.1.

Safronova, P.A., Andreassen, K., Laberg, J.S., Vorren, T.A. 2012. Development and post-depositional deformation of a Middle Eocene deep-water sandy depositional system in the Sørvestsnaget Basin, SW Barents Sea. Marine and Petroleum Geology 36, 83-99.

--- 2011 ---

Laberg, J.S., Johannessen, H.B., Forwick, M., Ivanov, M., Vorren, T.O. 2011. Extensive erosion of the deep seafloor – implications for the behaviour of flows resulting from continental slope instability. In: Yamada, Y. et al. (eds): Submarine mass movements and their consequences, 5th International Symposium. Springer Verlag, Germany, 159-166.

Laberg, J.S., Johansen, R., Bünz, S. 2011. A surging behaviour of a glacigenic debris flow. In: Yamada, Y. et al. (eds): Submarine mass movements and their consequences, 5th International Symposium. Springer Verlag, Germany, 441-450.

Expedition 333 Scientists, 2011. NanTroSEIZE Stage 2: subduction inputs 2 and heat flow. IODP Prel. Rept., 333. doi:10.2204/iodp.pr.333.2011

Rebesco, M., Liu, Y., Camerlenghi, A., Winsborrow, M., Laberg, J.S., Caburlotto, A., Diviacco, P., Accettella, D., Sauli, C., Wardell, N., Tomini, I. 2011. Deglaciation of the western margin of the Barents Sea Ice Sheet - a swath bathymetric and sub-bottom seismic study from the Kveithola Trough. Marine Geology 279, 141-147.

Strasser, M., Henry, P., Kanamatsu, T., Thu, M.K., Moore, G.F., and the IODP Expedition 333 Scientists (including Laberg, J.S.) 2011. Scientific Drilling of Mass-Transport Deposits in the Nankai Accretionary Wedge: First Results from IODP Expedition 333. In: Yamada, Y. et al. (eds): Submarine mass movements and their consequences, 5th International Symposium. Springer Verlag, Germany, 671-681.

Vanneste, M., L'Heureux, J.-S., Baeten, N., Brendryen, Vardy, M.E., Steiner, A., Forsberg, C.F., Kvalstad, T.J., Laberg, J.S., Chand, S., Longva, O., Rise, L., Haflidason, H., Hjelstuen, B.O., Forwick, M., Morgan, E., Lecomte, I., Kopf, A., Vorren, T.O., Reichel, T. 2011: Assessing Offshore Geohazards: a Multidisciplinary Research Initiative to Understand Shallow Landslides and their Dynamics in Coastal and Deep-water Environments, Norway. In: Yamada, Y. et al. (eds): Submarine mass movements and their consequences, 5th International Symposium. Springer Verlag, Germany, 29-41.

--- 2010 ---

Laberg, J.S., Andreassen, K., Knies, J., Vorren, T.O., Winsborrow, M. 2010. Late Pliocene – Pleistocene development of the Barents Sea Ice Sheet. Geology 38, 107-110.

Ivanov, M., Mazzini, A., Blinova, V., Kozlova, E., Laberg, J.S., Matveeva, T., Taviani, M., Kaskov, N. 2010. Seep mounds on the southern Vøring Plateau (offshore Norway). Marine and Petroleum Geology 27, 1235-1261.

Rørvik, K.-L., Laberg, J.S., Hald, M., Ravna, E.K., Vorren, T.O. 2010. Behaviour of the north-western part of the Fennoscandian Ice Sheet during Last Glacial Maximum – a response to external forcing. Quaternary Science Review 29, 2224-2237.

Winsborrow, M.C.M., Andreassen, K., Corner, G.D., Laberg, J.S. 2010. Deglaciation of a marine-based ice sheet: late Weichselian palaeo-ice dynamics and retreat in the southern Barents Sea reconstructed from onshore and offshore glacial geomorphology. Quaternary Science Review 29, 424-442.

Conferences, Workshops, Invited Talks (2010 - present)

(for pre-2010 presentations, see:

http://www.cristin.no/as/WebObjects/cristin.woa/wa/personVis?type=PERSON&pnr=46407&la=no&instnr=186)

--- 2016 ---

Laberg, J.S. 2016. Cenozoic erosion of the SW Barents Sea – where are we? Norwegian Petroleum Society International Arctic Geological Conference: Arctic Exploration - Understanding the Barents Sea potential, Tromsø 31 May - 2 June 2016.

Laberg, J.S., Rydningen, T.A., Safronova, P.A., Forwick, M. 2016. On the Evolution of Glaciated Continental Margins. 32nd Nordic Geological Winter Meeting, Helsinki, 13 – 15 January 2016.

Laberg, J.S., Rydningen, T.A., Safronova, P.A., Forwick, M. 2016. On the Evolution of Glaciated Continental Margins. EGU General Assembly, Geophysical Research Abstracts Vol. 18.

Osti, G., Mienert, J., Forwick, M., Laberg, J.S. 2016. Multiple slope failures shaped the lower continental slope offshore NW Svalbard in the Fram Strait. EGU General Assembly, Geophysical Research Abstracts Vol. 18.

--- 2015 ---

Laberg, J.S., Baeten, N., Vanneste, M., Forsberg, C.F., Forwick, M., Haflidason, H. 2016. Sediment Failure Affecting Muddy Contourites on the Continental Slope Offshore Northern Norway: Lessons Learned and Some Outstanding Issues. Submarine Mass Movements and their Consequences: 7th International Symposium, Wellington, New Zealand, 1 – 4th November 2015.

Laberg, J.S., Rydningen, T.A. 2015. On the quantification of late Cenozoic glacial erosion of the northern Norwegian – south-western Barents Sea continental margin (69 – 74°N). The 7th International Conference on Arctic Margins – ICAM, Trondheim, Norway, 2nd to 5th June 2015.

--- 2014 ---

Forwick, M., Laberg, J.S., Husum, K. 2014. Bathymetry and seismic stratigraphy in St. Jonsfjorden, Spitsbergen. Geophysical Research Abstracts Vol. 16, EGU2014-10553.

Forwick, M., Laberg, J.S., Husum, K., Olsen, I.L. 2014. Bathymetry and seismic stratigraphy of East Greenland fjords and sounds. Geophysical Research Abstracts Vol. 16, EGU2014-12329.

Laberg, J.S., Forwick, M., Husum, K. 2014. The NE Greenland Ice Sheet during the last glacial – a dynamic retreat from the shelf edge triggered by ice melting? Geophysical Research Abstracts Vol. 16, EGU2014-2075.

Rydningen, T.A., Laberg, J.S., Kolstad, V. 2014. Late Cenozoic evolution of high-gradient trough mouth fans and canyons on the glaciated north-Norwegian continental margin – palaeoclimatic implications and sediment yield. Geophysical Research Abstracts Vol. 16, EGU2014-7410.

Rydningen, T.A., Laberg, J.S., Kolstad, V. 2014. Late Cenozoic evolution of high-gradient trough mouth fans and canyons on the continental margin offshore Troms – palaeoclimatic implications and sediment yield. Arctic Conference Days, Tromsø, Norway, June 2nd-6th.

--- 2013 ---

Amundsen, H.B., Laberg, J.S., Vorren, T.O., Forwick, M., Haflidason, H. 2013. Late Quaternary evolution of the proximal Lofoten Basin Channel, Norwegian Sea – preliminary results. NGF Abstracts and Proceedings of the Geological Society of Norway, No. 1.

Baeten, N.J., Laberg, J.S., Forwick, M., Vorren, T.O., Vanneste, M., Forsberg, C.F., Kvalstad, T.J., Haflidason, H. 2013. On the origin of submarine mass movements on the continental slope offshore Lofoten, northern Norway – a multi-disiplinary approach. 6th Symposium on Submarine Mass Movements and their Consequences, Kiel, Germany, September 23rd-25th, 2013.

Forwick, M., Laberg, J.S., Vorren, T.O., Hass, H.C., Vanneste, M., Mienert, J. 2013. Large-scale mass wasting on the northwest Spitsbergen continental slope. Geophysical Research Abstracts Vol. 15, EGU2013-7971.

Gales, J., Forwick, M., Laberg, J.S., Larter, R., Mitchell, N. 2013. High-latitude continental slope geomorphology: a comparison of some Arctic and Antarctic submarine gullies. Geophysical Research Abstracts Vol. 15, EGU2013-637.

Kawamura, K., Laberg, J.S. 2013. Why is there a large submarine landslide in the Jan Mayen Ridge, north Norway? Geophysical Research Abstracts Vol. 15, EGU2013-554.

Kempf, P., Forwick, M., Laberg, J.S., Vorren, T.O. 2013. Late Weichselian – Holocene sedimentary palaenvironments and glacial activity in the high-Arctic van Keulenfjorden, Spitsbergen. Geophysical Research Abstracts Vol. 15, EGU2013-7305.

Laberg, J.S., Forwick, M., Husum, K. 2013. A re-evaluation of the Pleistocene deposits of ODP Site 987 – implications for the behavior of the Scoresby Sund sector of the Greenland Ice Sheet. Geophysical Research Abstracts Vol. 15, EGU2013-2739.

Laberg, J.S., Forwick, M., Husum, K. 2013. A re-evaluation of the Pleistocene deposits of ODP Site 987 – implications for the behavior of the Scoresby Sund sector of the Greenland Ice Sheet. 3P Arctic, Stavanger, Norway, October 15th – 18th 2013.

Laberg, J.S., Kawamura, K., Amundsen, H.B., Beaten, N., Forwick, M., Rydningen, T.A., Vorren, T.O. 2013. Submarine landslides affecting the Jan Mayen micro-continent, Norwegian – Greenland Sea. NGF Abstracts and Proceedings of the Geological Society of Norway, No. 1.

Laberg, J.S., Safronova, P.A., Andreassen, K., Vorren, T.O. 2013. Cenozoic sandy systems and sea floor stability along the western Barents margin and off Northern Norway. 7th Norwegian – Russian workshop, Arkhangelsk, Russia, June 18th – 19th 2013.

Rebesco, M., Laberg, J.S., Pedrosa Gonzalez, M.T., Camerlenghi, A., Lucchi, R.G. 2013. Early Pleistocene onset of Trough-Mouth Fan (TMF) growth on the NW Barents Sea margin: new results based on seismic reflection data. Geophysical Research Abstracts Vol. 15, EGU2013-7021.

Velle, J.H., Forwick, M., Hass, H.C., Laberg, J.S., Vorren, T.O., Nielsen, T., Solheim, A. 2013. Holocene sedimentary environments in Smeerenburgfjorden, Spitsbergen. Geophysical Research Abstracts Vol. 15, EGU2013-4694.

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Andreassen, K., Laberg, J.S., Winsborrow, M., Rüther, D. 2012. Arctic palaeo-ice streams, major agents of glacial erosion of the Barents Sea. Arctic Frontiers, Tromsø, Norway, January 22-27 2012.

Laberg, J.S., Baeten, N., Forsberg, C.F., Forwick, M., Vanneste, M., Vorren, T.O. 2012. Submarine landslide dynamics and frequency. The Deep-Sea & Sub-Seafloor Frontiers Conference, March 11- 14, 2012, Sitges, Spain.

Laberg, J.S., Forwick, M., Husum, K. 2012. A re-evaluation of the late Pliocene – Pleistocene behaviour of the Scoresby Sund sector of the Greenland Ice Sheet. EGU General Assembly, April 22 - 27, 2012, Vienna, Austria.

Rydningen, T.A., Vorren, T.O., Laberg, J.S., Kolstad, V. 2012. The marine based NW Fennoscandian Ice Sheet: glacial and deglacial dynamics as reconstructed from subglacial landforms. EGU General Assembly, April 22 - 27, 2012, Vienna, Austria.

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Andreassen, K., Laberg, J.S., Winsborrow, M., Rüther, D. 2011. Arctic palaeo-ice streams, major agents of glacial erosion of the Barents Sea. FORCE seminar on Petroleum Systems in the Eastern Barents Sea. Stavanger, Norway, October 11-12 2011.

Baeten, N.J., Laberg, J.S., Forwick, M., Vorren, T.O., Ivanov, M., Vanneste, M., Forsberg, C.F., Kvalstad, T.J. 2011. Small-scale mass wasting on the continental slope offshore Lofoten, northern Norway. EGU General Assembly 2011, April 3 - 8, 2011, Vienna, Austria.

Baeten, N.J, Laberg, J.S., Forwick, M., Vorren, T.O., Vanneste, M., Forsberg, C.F., Kvalstad, T.J., Haflidason, H. 2011. On the origin of weak layers on the continental slope offshore northern Norway: preliminary sedimentological and geotechnical results. 5th International Symposium on Submarine Mass Movements and Their Consequences, Kyoto, Japan, Oct. 24-26 2011.

Bünz, S., Johansen, R., Laberg, J.S., Mienert, J. 2011. 3D Seismic Analysis of Buried Slide Deposits in the SW Vøring Basin, Mid-Norwegian Margin. EGU General Assembly 2011, April 3 - 8, 2011, Vienna, Austria.

Forwick, M., Laberg, J.S., Vanneste, M., Vorren, T.O. 2011. Down- and along-slope erosional and depositional processes on the NW Svalbard continental slope. EGU General Assembly 2011, April 3 - 8, 2011, Vienna, Austria.

Henry, P., Kanamatsu, T., Strasser, M., and the IODP Expedition 333 Scientists Team (including Laberg, J.S.) 2011. Drilling Quaternary submarine landslides on the Nankai accretionary wedge: Results from IODP Expedition 333. EGU General Assembly 2011, April 3 - 8, 2011, Vienna, Austria.

Kanamatsu, T., Henry, P., Moe, K., and the IODP Expedition 333 Scientists Team (including Laberg, J.S.) 2011. Drilling inputs to the Nankai Subduction Zone: heat flow, diagenesis and basement alteration. EGU General Assembly 2011, April 3 - 8, 2011, Vienna, Austria.

Kanamatsu, T., Henry, P., Strasser, M., and the IODP Expedition 333 Scientists Team (including Laberg, J.S.) 2011. Summary of IODP Expedition 333: Drilling of subduction input sediments, and mass transport deposits. Japan Geosciencs Union International Meeting 2011, May 22 – 27, Mihama-ku, Chiba-city, Japan.

Kempf, P., Forwick, M., Vorren, T.O., Laberg, J.S. 2011. Sedimentary Processes and Palaeoenvironment in Van Keulenfjorden, Spitsbergen. Norwegian Geological Winter Meeting, January 11th -13th, 2011, Stavanger, Norway.

Laberg, J.S. 2011. Submarine glacigenic debris flows – a review. EGU General Assembly 2011, April 3 - 8, 2011, Vienna, Austria.

Laberg, J.S. 2011. Submarine landslides offshore Norway – a summary of observations and implications for initial deformation and flow dynamics. FORCE seminar on Geohazards, Stavanger, Norway, December 6th 2011.

Laberg, J.S., Andreassen, K., Vorren, T.O. 2011. The late Cenozoic erosion of the high-latitude south-western Barents Sea shelf revisited. 3P Arctic Conference, August 30th – September 2nd, Halifax, Nova Scotia, Canada.

Laberg, J.S., Johannessen, H.B., Forwick, M., Ivanov, M., Vorren, T.O. 2011. Extensive erosion of the deep seafloor – implications for the behavior of flows resulting from continental slope instability. 5th International Symposium on Submarine Mass Movements and Their Consequences, Kyoto, Japan, Oct. 24-26 2011.

Laberg, J.S., Johansen, R., Bünz, S. 2011. A surging behavior of a glacigenic debris flow. 5th International Symposium on Submarine Mass Movements and Their Consequences, Kyoto, Japan, Oct. 24-26 2011.

Laberg, J.S., Strasser, M., Alves, T., Gao, S., Nagahashi, Y., Satoguchi, Y., Ekinci, K., Henry, P., Kanamatsu, T., Moe, K.T. and IODP Expedition 333 Scientific Party, 2011. Mass-transport deposits and their inferred flow behavior from IODP Expedition 333 offshore Japan. 5th International Symposium on Submarine Mass Movements and Their Consequences, Kyoto, Japan, Oct. 24-26 2011.

Safronova, P., Andreassen, K., Laberg, J.S., Vorren, T.O. 2011. Seismic characterization of Middle Eocene depositional systems, south-western Barents Sea margin. 73rd EAGE Conference & Exhibition incorporating SPE EUROPEC 2011. May 23 – 26, Vienna, Austria.

Strasser, M., Henry, P., Kanamatsu, T., and the IODP Expedition 333 Scientists Team (including Laberg, J.S.) 2011. A new record of submarine landslide history in the Nankai accretionary wedge: Results from IODP Expedition 333. Japan Geosciencs Union International Meeting 2011, May 22 – 27, Mihama-ku, Chiba-city, Japan.

Strasser, M., Moore, G., Kimura, G., Sakaguchi, A., Underwood, M., and the IODP Expedition 333 Scientists Team (including Laberg, J.S.) 2011. Alternating periods of high and low activity along the megasplay fault in the Nankai Trough. Japan Geosciencs Union International Meeting 2011, May 22 – 27, Mihama-ku, Chiba-city, Japan.

Strasser, M., Henry, P., Kanamatsu, T., Thu, M.K., Moore, G.F., and the IODP Expedition 333 Scientists (including Laberg, J.S.) in press. Scientific Drilling of Mass-Transport Deposits in the Nankai Accretionary Wedge: First Results from IODP Expedition 333. 5th International Symposium on Submarine Mass Movements and Their Consequences, Kyoto, Japan, Oct. 24-26 2011.

Vanneste, M., L'Heureux, J.-S., Baeten, N., Brendryen, Vardy, M.E., Steiner, A., Forsberg, C.F., Kvalstad, T.J., Laberg, J.S., Chand, S., Longva, O., Rise, L., Haflidason, H., Hjelstuen, B.O., Forwick, M., Morgan, E., Lecomte, I., Kopf, A., Vorren, T.O., Reichel, T. In press: Assessing Offshore Geohazards: a Multidisciplinary Research Initiative to Understand Shallow Landslides and their Dynamics in Coastal and Deep-water Environments, Norway. 5th International Symposium on Submarine Mass Movements and Their Consequences, Kyoto, Japan, Oct. 24-26 2011.

Vorren, T.O., Elverland, E., Laberg, J.S., Vorren, K.-D. 2011. LGM and early deglaciation in Northern Norway. 41st annual Arctic Workshop, March 2-4, 2011, Montreal, Canada.

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Laberg, J.S., Andreassen, K., Vorren, T.O. 2010. On the glacial erosion of the south-western Barents Sea shelf. 29th Nordic Geological Winter Meeting. January 11-13, 2010, Oslo, Norway.

Laberg, J.S., Forwick, M., Johannessen, H.B., Ivanov, M., Kenyon, N.H., Vorren, T.O. 2010. Selective erosion by gravity flows in the deep-sea Lofoten Basin, Norwegian Sea. 29th Nordic Geological Winter Meeting. January 11-13, 2010, Oslo, Norway.

Laberg, J.S., Andreassen, K., Vorren, T.O. 2010. On the glacial erosion of the south-western Barents Sea shelf. EGU General Assembly 2010, May 2-7, 2010, Vienna, Austria.

Laberg, J.S., Forwick, M., Johannessen, H.B., Ivanov, M., Kenyon, N.H., Vorren, T.O. 2010. Selective erosion by gravity flows in the deep-sea Lofoten Basin, Norwegian Sea. EGU General Assembly 2010, May 2-7, 2010, Vienna, Austria.

Laberg, J.S., Forwick, M., Johannessen, H.B., Ivanov, M., Kenyon, N.H., Vorren, T.O. 2010. Selective erosion by gravity flows in the deep-sea Lofoten Basin, Norwegian Sea. Arctic Days 2010, May 31st – June 4th, 2010, Tromsø, Norway.

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Laberg, J.S., Forwick, M., Johannessen, H.B., Ivanov, M., Kenyon, N.H., Vorren, T.O. 2009. Morphological elements of the Lofoten Basin Channel – implications for the properties of the latest turbidity currents. International conference and TTR-17th post-cruise meeting, 2.- 5. February 2009, Granada, Spain.

Laberg, J.S., Forwick, M., Ivanov, M., Kenyon, N.H., Vorren, T.O. 2009. Small-scale mass wasting on the continental slope offshore Norway. International conference and TTR-17th post-cruise meeting, 2.- 5. February 2009, Granada, Spain.

Laberg, J.S., Forwick, M., Johannessen, H.B., Ivanov, M., Kenyon, N.H., Vorren, T.O. 2009. Morphological elements of the Lofoten Basin Channel – implications for the properties of the latest turbidity currents. Geophysical Research Abstracts, vol. 11, EGU2009-0, 2009.

Laberg, J.S., Eilertsen, R.S., Salomonsen, G.R., Vorren, T.O. 2009. Submarine push moraine formation during the early Fennoscandian Ice Sheet deglaciation. Geophysical Research Abstracts, vol. 11, EGU2009-0, 2009.

Laberg, J.S. 2009. Cenozoic sandy systems of the western Barents Sea. The 4th Norway-Russia Arctic Offshore Workshop, June 17-18, 2009, Oslo, Norway.

Laberg, J.S., Forwick, M., Ivanov, M., Kenyon, N.H., Vorren, T.O. 2009. Small-scale mass wasting on the continental slope offshore Norway. The 4th International Symposium on Submarine Mass Movements and their Consequences, November 8-11, 2009, Austin, Texas, USA.

Outreach (2010 - present)

(for pre-2010 outreach, see:
http://www.cristin.no/as/WebObjects/cristin.woa/wa/personVis?type=PERSON&pnr=46407&la=no&instnr=186)

Presentation of my research at *Forskningsdagene* in 2009, 2011 and 2012.

Vorren, T.O., Laberg, J.S. 2010. Norges grenser i dyphavet. Newspaper Nordlys 16/8-2010.
Vorren, T.O., Laberg, J.S. 2010. Gamle olje- og gasslekasjer i Barentshavet. Newspaper Nordlys 28/8-2010.
Vorren, T.O., Laberg, J.S. 2010. Undersjøiske kjempeskred og flodbølger. Newspaper Nordlys 25/9-2010.
Vorren, T.O., Laberg, J.S. 2010. Undersjøiske daler og oljereservoar. Newspaper Nordlys 2/10-2010.

Forwick, M., Vorren, T.O., Baeten, N., Hansen, T., Kempf, P., Velle, J.H. & Laberg, J.S., 2013. Svalbards unike fjorder. Published on www.geoforskning.no on May 27th 2013.
Forwick, M., Vorren, T.O., Baeten, N., Hansen, T., Kempf, P., Velle, J.H. & Laberg, J.S., 2013. Da isbreene ble mindre. Published on www.geoforskning.no on June 6th 2013.
Forwick, M., Vorren, T.O., Baeten, N., Hansen, T., Kempf, P., Velle, J.H. & Laberg, J.S., 2013. Isbreenes vekst og tilbaketrekning. Published on www.geoforskning.no on June 14th 2013.
Forwick, M., Vorren, T.O., Baeten, N., Hansen, T., Kempf, P., Velle, J.H. & Laberg, J.S., 2013. Ustabil fjordbunn på Svalbard. Published on www.geoforskning.no on June 21st 2013.
Forwick, M., Vorren, T.O., Baeten, N., Hansen, T., Kempf, P., Velle, J.H. & Laberg, J.S., 2013. Fjordbunnen lekker. Published on www.geoforskning.no on June 28th 2013.

Conference/session and workshop organisation

Convener for Session CL1.3: *Polar continental margins and fjords - glacial and climatic evolution in the Cenozoic* at EGU, Vienna, April 2012 and May 2014
Co-convener for Session CL4.8: *Glaciated continental margins - sedimentary processes architecture, evolution and implications for paleoclimatic reconstructions* at EGU, Vienna, 2010, 2011, 2013, 2015, 2016
Member of the organizing committee for *Arctic Conference Days,* Tromsø, Norway, 2014, organized by the Geological Society of Norway
Member of the program committee for *Ice shelves and ocean interactions*, Arctic Frontiers, Tromsø, Norway, 2010
Member of the conference committee for *Deep Ocean 2010* Tromsø, Norway, 2010, organized by the Geological Society of Norway
Member of the scientific committee for the international congress: *Deep water circulation: processes and products*, Baiona Pontevedra, Spain, 2010
Co-convener for two sessions at IGC33, Oslo, 2008 (OSP-04: *Contourites*, and EUR-13: *Neogene of NW Europe: Paleoclimate, tectonics and sedimentation*)

Paper reviewing

I review scientific manuscripts (>50) for the following journals on a regular basis:
Boreas, Geo-Marine Letters, Geological Society of London (Special Publications), Geology, Geological Society of America (Bulletin), Global and Planetary Change, Marine Geology, Marine and Petroleum Geology, Marine Geophysical Researches, Near Surface Geophysics, Norwegian Journal of Geology, Oceanologica Acta, Quaternary Science Review, and Sedimentology.

Participation in Scientific Cruises

In December-January 2010-2011 I participated on IODP Expedition 333 offshore Japan in order to unravel the submarine landslide history and its controlling mechanisms.
I have participated and been chief scientist on marine geological cruises (>20) using the University of Tromsø research vessels *Jan Mayen/Helmer Hanssen* and *Johan Ruud* to the Norwegian-Greenland Sea and the Barents Sea in the period 1988-2013 doing coring, high-resolution seismics and multi-beam bathymetry.
In addition I have participated on cruises to the Norwegian Sea using RRS *James Clark Ross* (1994), RRS *Charles Darwin* (1997), RV *Marion Dufresne* (1999), RV *Professor Logachev* (2003 and 2008 as co-chief scientist), RV *H.U. Sverdrup II* (2008 and 2010) and RV *G.O. Sars* (2010 and 2014 as chief scientist).

Technical Expertise

Hydroacoustics

For studies of sea-floor morphology and sediment composition I am using multi-beam (KongsbergSimrad EM300) and side-scan sonar data (TOBI and MAK-I). Muliti-beam data are processes using the Neptun software of KongsbergSimrad and gridded and displayed using the GMT software and ArcMap. The side-scan sonar data is displayed and interpreted using ArcMap.

Sediment Sampling and Analyses

In my research I am using box corer, gravity corer and piston corer for sediment sampling. Core analyses emphasises lithostratigraphy, physical properties and chronostratigraphy using standard laboratory techniques, MSCL-core logger for physical properties and Sedigraph/Particle Size Analyser for grain-size analyses. During IODP Expedition 333 I also used CT-scanner for studies of sedimentary structures.

Seismic data acquisition and Analyses

I mainly use singe-channel 2D-seismic data collected using air guns, Boomer or Sparker. The data is displayed and interpreted following some processing using Kingdom software.

Together with colleagues at our department I am also using 3D seismic data for studies of paleo-slides and other aspects of glaciated continental margins.

APPLICATION TO PARTICIPATE IN AN IODP EXPEDITION

ESSAC Office ECORD Science Support & Advisory Committee
GEOMAR | Helmholtz Centre for Ocean Research Kiel
Wischhofstrasse 1-3
24148 Kiel, Germany
Hanno Kinkel (ESSAC Science Coordinator):
Tel: +49 431 600 2418
Fax:+49 431 600 2922
Web Page: http://www.essac.ecord.org Email: **essac@geomar.de**

Please type information

Apply to Sail Application Form

Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

1. PERSONAL INFORMATION

Family name: Müller

First name: Juliane

Current Position: Leader of Helmholtz Young Investigator Group (PALICE)

Institution: Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research

Address: Am Alten Hafen 26

City, Postcode, Country: Bremerhaven, 27568, Germany

Tel. work: +49 471 4831 1238
Tel. home: +49 179 8429 379
Fax: +49 471 4831 1149
Email: juliane.mueller@awi.de

Country of citizenship: Germany

Place of birth/date of birth: Berlin, 22.11.1981

Gender: female

Education (highest degree, including year PhD was received / is expected): PhD (2011)

Are you currently a student? YES/NO Expected Graduation Date:

2. EXPEDITION INFORMATION

Summary of proposed participation, including area of scientific interest, current research and participation plan (maximum 250 characters with space – more detail should be included in the Letter of Interest):

Neogene biomarker-based sea ice, SST and primary productivity reconstructions in ice-sheet proximal environments; application and development of HBIs as sea ice and SST proxies; pursue multi-proxy approach for IODP 374 post-cruise research

Prior involvement with DSDP/ODP/IODP and nature of involvement (expedition number, shipboard/shore-based participation, co-chief, etc):

Shipboard sedimentologist during IODP Expedition 341 (Gulf of Alaska); organic geochemical biomarker work on U1417 and U1419 sediments focusing on Plio-/Pleistocene time intervals: SST and sea ice reconstructions using alkenones and highly branched isoprenoids (HBIs), estimates of terrestrial organic matter input and marine primary productivity using *n*-alkanes and sterol biomarkers; 2 publications in advanced state of preparation (to be submitted to Nature and Paleoceanography until 01/12/2016 and spring 2017, respectively)

Post-cruise science support to achieve the proposed scientific objectives 1) future funding scheme and 2) support from host institution (e.g. staff, facilities)

Helmholtz Association Grant for a Young Investigator Research Group (funding period: 04/2016 - 04/2021; 250.000 €/year; funding covers own and 2 PhD positions, 1 technician, 1 PostDoc); additional funding is planned to be obtained e.g. through the German Research Foundation (DFG) and ECORD. All organic geochemical analyses proposed to achieve the scientific goals outlined above (and in the Letter of Interest) can be carried out at the Alfred Wegener Institute. Analytical facilities and staff support (one technician, student assistants) will be provided.

Three scientific and/or personal references

Prof. Alan Mix (Oregon State University, USA; Email: mix@coas.oregonstate.edu)

Prof. Eric Wolff (University of Cambridge, UK; Email: ew428@cam.ac.uk)

Dr. Gerhard Kuhn (Alfred Wegener Institute, Germany; Email: Gerhard.Kuhn@awi.de)

3. SCIENTIFIC EXPERTISE

For Scientist Jobs Descriptions visit: http://iodp.tamu.edu/participants/scientist_jobs.html

Please indicate your area(s) of expertise (maximum 3)

Discipline	Mark with X	Speciality
microbiologist		
organic and inorganic geochemist/biogeochemist	X	biomarker lipids
physical properties specialist		
sedimentologist	X	core description & interpretation
structural geologist		
paleontologist		
paleomagnetist		
petrologist		
hydrogeologist		
Other		

4. ADDITIONAL DOCUMENTS

Please, provide the following documents:

- Letter of interest, including details about area of scientific interest, current research, expedition participation plan and post-cruise research
- CV and Publication list
- Letter of recommendation (for PhD students)
- See also: http://www.essac.ecord.org/flyer/Guidelines_for_Applying_to_sail.pdf

Please, send your application form as *a MS Word document* and the additional documents in *PDF format* (preferably as one file) by email to Jan Behrmann and Hanno Kinkel at the ESSAC office: essac@geomar.de.

In addition to the ESSAC application, all applicants *must inform their national office* (if applicable) *and national delegate* and send a copy of the application documents. ECORD does not provide funds for participation; the national offices or national delegates can provide information regarding travel support, post-cruise funding opportunities, etc.

See http://www.essac.ecord.org/index.php?mod=about&page=ESSAC for a list of the national contact persons.

Juliane Müller

Letter of Interest

Polar sea ice is not only highly responsive to but also amplifying climate change. The currently observed increase in sea ice extent in the Ross Sea is in stark contrast to its rapid decline in other parts of the Southern Ocean and partly attributed to shifts in oceanic and/or atmospheric circulation patterns. At the same time, changes in sea ice coverage exert a strong control on (1) the formation of dense Antarctic Bottom Water and (2) the heat and gas exchange between the ocean and the atmosphere with considerable effects on ocean temperature, CO_2 fluxes and precipitation over land. Knowledge of how these feedback mechanisms impacted the evolution of the West Antarctic Ice Sheet (WAIS) in the geological past is, however, sparse. A relatively novel approach for reconstructing paleo sea ice distributions makes use of the sedimentary occurrence of specific organic biomarkers (highly branched isoprenoids; HBIs) produced by sea ice diatoms. This method has been successfully applied within few studies in different parts of the Southern Ocean that demonstrate its applicability to gain valuable information on paleo sea ice conditions.
As a geoscientist with a strong background in organic geochemistry, I am studying marine sediment cores and therein preserved biomarker lipids, which hold crucial paleoenvironmental information - in particular, where/when the application of diatoms or foraminifera is limited due to silica or carbonate dissolution effects, respectively. My overall research focus is on the reconstruction of sea ice, sea surface temperature (SST) and primary productivity in the polar ocean under changing (glacial-interglacial) climate conditions. Specifically, I am concerned with the evaluation and application of HBIs as sea ice, and potentially SST, proxies. While my research hitherto focused on the Arctic Ocean and adjacent subpolar seas (Fram Strait; Gulf of Alaska - IODP Expedition 341), I am now extending my activities into the Southern Ocean. During a recent R/V Polarstern cruise (PS97: Drake Passage/Antarctic Peninsula), we recovered high-resolution sediment cores from the Bransfield Strait that are currently investigated following a biomarker-, sedimentology- and micropaleontology-based multi-proxy approach. Only the joint consideration of different paleoceanographic proxies permits a thorough and unambiguous assessment of the complex land-ocean-atmosphere interactions in ice-proximal environments and how they relate to climate change. I would be absolutely delighted to pursue such a multidisciplinary approach in close cooperation with other IODP 374 scientists. The scientific objectives outlined in the IODP 374 Expedition proposal address essential aspects of my own on-going and future research activities in the Southern Ocean and I thus wish to express my strong interest in participating in this cruise. Based on my expertise in marine (ice-sheet proximal) climate reconstructions and my experience as IODP shipboard sedimentologist, I am certainly able to contribute to the success of this expedition.

My particular interests in post-expedition research studies focus on, but are not confined to, the following:

- Identification of intervals of sea ice coverage and (semi)quantitative estimates of the intensity and/or duration of the sea ice cover using HBI biomarkers (this also includes the characterization of polynya conditions),
- Generation of continuous and/or time-slice ocean temperature records using different biomarker approaches (U^{K}_{37}, TEX_{86}, HBIs),
- Comparison of HBI-based sea ice and SST reconstructions with diatom records (and other proxies) for a cross-evaluation of different approaches,
- Reconstruction of primary productivity conditions by means of phytoplankton biomarkers and assessment of potential terrestrial matter input (via aeolian, sea ice, iceberg, meltwater transport) using terrigenous biomarkers,
- Comparison of Plio-Pleistocene paleoceanographic records from the Ross Sea with records from the Gulf of Alaska for an identification of (dis)similarities in the evolution of the WAIS and Western Cordilleran Ice Sheet (e.g. during the MPT).

Information on the spatial and temporal variability in sea ice cover at the proposed drill sites along the outer shelf and continental rise of the Ross Sea are crucial for an evaluation of polar amplification feedbacks. These data may provide the base for an examination of the affect of sea ice on Antarctic Bottom Water formation, CO_2 ventilation, wind-driven upwelling of Circumpolar Deep Water, and primary productivity conditions during major Neogene climate transitions. SST data contribute to the assessment of the oceanic forcing on WAIS dynamics (i.e. ice-sheet advance vs. retreat phases). Further, information on primary productivity changes adds to the understanding of the role that the biological carbon pump played in ice-proximal and ice-distal regimes.
These organic geochemical studies clearly address the main expedition's objectives relating to forcing and feedback mechanisms in the ocean-atmosphere-WAIS system (Objectives 2-4) and will complement sedimentological and micropaleontological records.

Funding to conduct the outlined studies is provided through a Helmholtz Association Research Grant to establish a Young Investigator Research Group at the Alfred Wegener Institute (AWI) in Bremerhaven (funding period 04/2016 - 04/2021). The grant covers costs for personnel (2 PhD students, 1 PostDoc, 1 technician, student assistants), laboratory consumables and travel expenses. The project involves close cooperation with colleagues from the AWI, the University of Bremen, and the MARUM. Further funding is planned to be obtained e.g. through the German Research Foundation (DFG) and the European Consortium for Ocean Drilling (ECORD).
Instrumental facilities for the extraction, purification, identification and quantification of target biomarker lipids (e.g. via GC, GC-MS, HPLC-MS) as well as routine analyses of organic geochemical bulk parameters (TOC, CNS, $CaCO_3$) are available at the AWI home laboratories.

Curriculum Vitae

Personal Data

Name:	Juliane Müller
Date/Place of Birth:	November 22, 1981 in Berlin, Germany
Office Address:	Alfred Wegener Institute, Am Alten Hafen 26, 27568 Bremerhaven
E-Mail:	juliane.mueller@awi.de
Telephone:	+49-471-4831-1238 (office); +49-179-8429-379 (mobile)

Education & Research

since 04/2016 — Leader of the Helmholtz Young Investigator Group PALICE
Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research and University of Bremen, Germany
(Project on Palaeo Sea Ice and Climate Dynamics)

09/2013 - 04/2016 — PostDoctoral Researcher (PI of DFG/IODP Project; MU3670/1-2)
Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research
(Project on Pleistocene Environmental and Climate Variability in the Gulf of Alaska)

05/2013 - 08/2013 — IODP-Expedition Scientist
Federal Institute for Geosciences and Natural Resources (BGR), Hannover

10/2011 - 05/2013 — PostDoctoral Researcher
Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research
(Project on Rapid Deglacial Sea Ice Changes in the subpolar North Atlantic)

12/2007 - 10/2011 — Ph.D. Geosciences
University of Bremen (Geosciences); Alfred Wegener Institute
Ph.D. Thesis: "Last Glacial to Holocene variability in the sea ice distribution in Fram Strait/Arctic Gateway: A biomarker approach" (summa cum laude)

09/2001 - 09/2007 — Diploma in Applied Geosciences (Exploration Geology)
Technical University Berlin; GFZ-Potsdam (Organic Geochemistry)
Diploma Thesis: "Heavy oil reservoirs of the Liaohe Basin, NE China" (with distinction)

Expeditions & International Research Stays

02/2016 - 04/2016 — ANT-XXXI/3 Expedition (R/V *Polarstern*)
PS97: Southern Ocean (Drake Passage and Antarctic Peninsula)

01/2014 - 07/2014 — University of Durham (UK)
Department of Geography; Organic Geochemistry (E. McClymont)

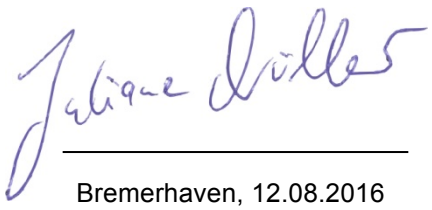
05/2013 - 07/2013 — IODP Expedition 341 (R/V *JOIDES Resolution*)
Gulf of Alaska, NE Pacific

08/2008 - 10/2008 — ARK-XXIII/3 Expedition (R/V *Polarstern*)
PS72: Arctic Ocean (Canada Basin/Chukchi Plateau/East Siberian Shelf)

06/2008 - 07/2008 — University of Plymouth (UK)
Earth & Environmental Sciences; Organic Geochemistry (S.T. Belt, G. Massé)

Grants, Scholarships & Awards

04/2016	Helmholtz Grant 'Young Investigator Research Group' (Helmholtz Association)
06/2014	ECORD Research Grant (European Consortium for Ocean Research Drilling)
03/2014	IASC-ICARP III Research Fellowship (International Arctic Science Committee)
09/2013	DFG/IODP Research Grant (MU3670/1-2; German IODP Priority Programme)
05/2013	Expedition Stipend (IODP Germany; BGR Hannover)
11/2012	German Thesis Award (Körber-Foundation)
11/2011	CASE Fellowship (Changing Arctic & Subarctic Environment Training Network)
12/2010	AWI Science Award (AWI-Förderverein)
12/2010	Young Scientist's Travel Award (European Geosciences Union)



Bremerhaven, 12.08.2016

Publications

Müller, J. (2016). New evidence for abrupt sea-ice fluctuations in the subpolar North Atlantic at the end of the Last Glacial in relation with thermohaline and atmospheric circulation. *Polarforschung, Alfred Wegener Institute for Polar and Marine Research & German Society of Polar Research*, 85 (2), pp. 157-160, doi:10.2312/polfor.2016.012

Werner, K., Müller, J., Husum, K., Spielhagen, R., Kandiano, E., Polyak, L. (2016). Holocene sea subsurface and surface water masses in the Fram Strait - Comparisons of temperature and sea-ice reconstructions. *Quaternary Science Reviews*, in press. doi:10.1016/j.quascirev.2015.09.007

Gulick, S., Jaeger, J., Mix, A., Asahi, H., Bahlburg, H., Belanger, C., Berbel, G., Childress, L., Cowan, E., Drab, L., Forwick, M., Fukumura, A., Ge, S., Gupta, S., Kioka, A., Konno, S., LeVay, L., März, C., Matsuzaki, K., McClymont, E., Moy, C., Müller, J., Nakamura, A., Ojima, T., Ribeiro, F., Ridgway, K., Romero, O., Slagle, A., Stoner, J., St-Onge, G., Suto, I., Walczak, M., Worthington, L., Bailey, I., Enkelmann, E., Reece, R., Swartz, J. (2015). Mid-Pleistocene climate transition drives net mass loss from rapidly uplifting St. Elias Mountains, Alaska. *Proceedings of the National Academy of Sciences*, 112 (49), pp. 15042-15047. doi:10.1073/pnas.1512549112.

Xiao, X., Fahl, K., Müller, J., Stein, R. (2015). Sea-ice distribution in the modern Arctic Ocean: Biomarker records from trans-Arctic Ocean surface sediments. *Geochimica et Cosmochimica Acta*, 155, pp. 16-29.

Spielhagen, R.F., Müller, J., Wagner, A., Werner, K., Lohmann, G., Prange, M., Stein, R. (2015). Holocene Environmental Variability in the Arctic Gateway. In M. Schulz and A. Paul. *Integrated Analysis of Interglacial Climate Dynamics (INTERDYNAMIC)*. SpringerBriefs in Earth System Sciences, pp. 37-42.

Müller, J., Stein, R. (2014). High-resolution record of late glacial and deglacial sea ice changes in Fram Strait corroborates ice-ocean interactions during abrupt climate shifts. *Earth and Planetary Science Letters*, 403, pp. 446-455.

Werner, K., Frank, M., Teschner, C., Müller, J., Spielhagen, R.F. (2014). Neoglacial change in deep water exchange and increase of sea-ice transport through eastern Fram Strait: evidence from radiogenic isotopes. *Quaternary Science Reviews*, 92, pp. 190-207.

Belt, S.T., Müller, J. (2013). The Arctic sea ice biomarker IP_{25}: A review of current understanding, recommendations for future research and applications in palaeo sea ice reconstructions. *Quaternary Science Reviews*, 79, pp. 9-25.

Müller, J., Werner, K., Stein, R., Fahl, K., Moros, M., Jansen, E. (2012). Holocene cooling culminates in sea ice oscillations in Fram Strait. *Quaternary Science Reviews*, 47, pp. 1-14.

Stein, R., Fahl, K., Müller, J. (2012). Proxy Reconstruction of Cenozoic Arctic Ocean Sea-Ice History - from IRD to IP_{25}. *Polarforschung, 82 (1), pp. 37-71.*

Müller, J. (2012). Wie fossile Moleküle helfen können, Klimamodelle zu verbessern. *Polarforschung*, *Alfred Wegener Institute for Polar and Marine Research & German Society of Polar Research,* 82 (1), pp. 87-91.

Müller, J., Wagner, A., Fahl, K., Stein, R., Prange, M., Lohmann, G. (2011). Towards quantitative sea ice reconstructions in the northern North Atlantic: A combined biomarker and numerical modelling approach. *Earth and Planetary Science Letters*, 306 (3), pp. 137-148.

Müller, J., Massé, G., Stein, R., Belt, S.T. (2009). Variability of sea-ice conditions in the Fram Strait over the past 30,000 years. *Nature Geoscience*, 2, pp. 772-776.

Conference Contributions (Talks)

Müller, J. (2015; ***invited talk***). The sea ice proxy IP_{25} and examples of its application within palaeo sea ice research. XIX INQUA Congress, Nagoya, Japan.

Moy, C., Addison, J., Finney, B., Bahlburg, H., Childress, L., Cowan, E., Forwick, M., Müller, J., Ribeiro, F., Ridgway, K. (2014). Late Pleistocene biogenic sedimentation in the Gulf of Alaska: A biogeochemical perspective from IODP Expedition 341. AGU Fall Meeting, San Francisco, USA.

Müller, J., Stein, R. (2014; ***invited talk***). Arctic sea ice variability during the last deglaciation: a biomarker approach. AGU Fall Meeting, San Francisco, USA.

Müller, J., Stein, R. (2014). Abrupt sea ice fluctuations in the subpolar North Atlantic at the end of the last glacial and their potential impact on ocean circulation changes**.** REKLIM Conference October 2014, Berlin, Germany.

Müller, J., Stein, R. (2014). From full glacial to current interglacial conditions: a high-resolution record of sea ice variability in Fram Strait. PAST Gateways 2nd Conference, Trieste, Italy.

Müller, J., Stein, R. (2014). Sea ice variability during the last glacial and deglacial: coincidence with or cause of abrupt climate change? 3rd PAGES SIP Workshop, AWI Bremerhaven, Germany.

Stein, R., Fahl, K., Hörner, T., Kolling, H., Müller, J., Xiao, X. (2014). Pliocene to late Quaternary Arctic sea-ice history: Past, present and future IP_{25} research at the AWI. 3rd PAGES SIP Workshop, AWI Bremerhaven, Germany.

Müller, J., Wagner, A., Stärz, M., Stein, R. (2013). Late glacial and interglacial sea ice variability in the Arctic Ocean: new insights from proxy and numerical modelling data. EGU General Assembly, Vienna, Austria.

Müller, J. (2012; ***keynote lecture***). Lessons from the past to improve the understanding and modelling of Arctic sea ice changes. ART-APECS Science Workshop, IOPAN, Sopot, Poland.

Müller, J., Werner, K., Stein, R. (2012; ***invited talk***). Holocene sea ice in the main Arctic gateway. EGU General Assembly, Vienna, Austria.

Müller, J., Stein, R. (2012). The benefit of coupling IP_{25} and marine phytoplankton biomarkers for sea ice reconstructions. 1st PAGES SIP workshop, GEOTOP, Montréal, Canada.

Müller, J., Werner, K., Stein, R., Moros, M. (2011). Holocene cooling and Neoglacial sea ice fluctuations in the subpolar North Atlantic. AGU Fall Meeting, San Francisco, USA.

Müller, J., Stein, R., Werner, K., Spielhagen, R. (2011). Neoglacial cooling culminates in rapid sea ice oscillations in eastern Fram Strait. EGU General Assembly, Vienna, Austria.

APPLICATION TO PARTICIPATE IN AN IODP EXPEDITION

ESSAC Office ECORD Science Support & Advisory Committee
GEOMAR | Helmholtz Centre for Ocean Research Kiel
Wischhofstrasse 1-3
24148 Kiel, Germany
Hanno Kinkel (ESSAC Science Coordinator):
Tel: +49 431 600 2418
Fax:+49 431 600 2922
Web Page: http://www.essac.ecord.org Email: **essac@geomar.de**

Apply to Sail Application Form

Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

1. PERSONAL INFORMATION

Family name: ROMERO

First name: Oscar Enrique

Current Position: Senior Researcher

Institution: MARUM, Universität Bremen, Bremen, Germany

Address: Leobener Str.

City, Postcode, Country: Bremen, 28359, Germany

Tel. work: +49 421 218 65645
Tel. home: +49 421 50097116
Fax:
Email: oromero@uni-bremen.de

Country of citizenship: Germany

Place of birth/date of birth: Argentina / Nov 20th 1965

Gender: M

Education (highest degree, including year PhD was received / is expected): PhD

Are you currently a student? NO Expected Graduation Date:

2. EXPEDITION INFORMATION

Summary of proposed participation, including area of scientific interest, current research and participation plan (maximum 250 characters with space – more detail should be included in the Letter of Interest):

My main area of scientific interest is changes in diversity and abundance of diatoms on the Neogene marine ecosystem. I am working on materials collected during IODP Exp 321 (off Alaska) and 341 (Bay of Bengal). My expertise will contribute to the onboard identification of downcore diatoms.

Prior involvement with DSDP/ODP/IODP and nature of involvement (expedition number, shipboard/shore-based participation, co-chief, etc):

1) IODP Exp 303, Northern Atlantic Climate I, St. Johns, Canada - Azores Islands, Portugal Sept 25 – Nov 17 2004. Shipboard participant. Co-chiefs: J. Channel & Toki Sato.
2) IODP Exp 321, Pacific Age Equatorial Transect, Honolulu, Hawaii – San Diego, California, US. May 06 – Jun 23 2009. Shipboard participant. Co-chiefs: M. Lyle & I. Raffi.
3) IODP Exp 341, Southern Alaska Margin, Victoria (Canada) – Valdez (Alaska). May 29 – Jul 29 2013. Shipboard participant. Co-chiefs: J. Jaeger & S. Gulick.
4) IODP Exp 353, Indian Monsoon Rainfall, Singapur – Singapur. Nov 30 2014– Jan 29 2015. Shipboard participant. Co-chiefs: S. Clemens & W. Kuhnt.

Post-cruise science support to achieve the proposed scientific objectives 1) future funding scheme and 2) support from host institution (e.g. staff, facilities)

1) Priority Programme 527 "International Ocean Discovery Program" will provide funding for post Exp research. A proposal will be submitted for research on Neogene sediments. A major priority will be integrating my own research with research from different fields (bio/geochemistry, sedimentology, magnetostratigraphy), and propose a multi-parameter study.
2) Marum's lab facilities includes several mass spectrometers, opal device measurements, light and electron microscopes, Avaatech core scanners, grain size lab, etc.

Three scientific and/or personal references

1) Prof. Dr. Leanne Armand: Deputy Director of the MQ Marine Research Centre, Department of Biological Sciences, Faculty of Science and Engineering, Macquarie University, Australia. E: leanne.armand@mq.edu.au
2) Dr. Steven Clemens: Earth, Environmental and Planetary Sciences, Brown University, Providence RI., USA. E: steven_clemens@brown.edu
3) Dr. Carlota Escutia: Instituto Andaluz de Ciencias de la Tierra, CSIC - Univ. de Granada, Granada, Spain. E: cescutia@ugr.es

3. SCIENTIFIC EXPERTISE

For Scientist Jobs Descriptions visit: http://iodp.tamu.edu/participants/scientist_jobs.html

Please indicate your area(s) of expertise (maximum 3)

Discipline	Mark with X	Speciality
microbiologist		
organic and inorganic geochemist/biogeochemist		
physical properties specialist		
sedimentologist		
structural geologist		
paleontologist	X	Diatoms
paleomagnetist		
petrologist		
hydrogeologist		
Other		

4. ADDITIONAL DOCUMENTS

Please, provide the following documents:

- Letter of interest, including details about area of scientific interest, current research, expedition participation plan and post-cruise research
- CV and Publication list
- Letter of recommendation (for PhD students)
- See also: http://www.essac.ecord.org/flyer/Guidelines_for%20Applying_to_sail.pdf

Please, send your application form as *a MS Word document* and the additional documents in *PDF format* (preferably as one file) by email to Jan Behrmann and Hanno Kinkel at the ESSAC office: essac@geomar.de.

In addition to the ESSAC application, all applicants *must inform their national office* (if applicable) *and national delegate* and send a copy of the application documents. ECORD does not provide funds for participation; the national offices or national delegates can provide information regarding travel support, post-cruise funding opportunities, etc.

See http://www.essac.ecord.org/index.php?mod=about&page=ESSAC for a list of the national contact persons.

Universität Bremen

marum
Center for Marine Environmental Sciences
DFG Research Center · Cluster of Excellence
University of Bremen www.marum.de

Dr. Oscar E. Romero
Senior Scientist
MARUM
www.marum.de
Leobener Str.
28359 Bremen – Germany

Tel. +49 421 218 – 65 645
E-Mail oromero@marum.de

Bremen, 10th August 2016

ESSAC Office

ECORD Science Support & Advisory Committee

Dear Members of the ECORD Science Support & Advisory Committee,

Herewith I apply to sail on the "*Ross Sea West Antarctic Ice Sheet History*" (IODP Exp374) as a ship-based paleontologist. Sailing on Exp374 will allow me to compare the diatom biostratigraphy, the high resolution diatom and biogenic silica, and XRF records I have generated/am generating for the Subarctic Atlantic (X303, U1302/03 and U1304), the eastern equatorial Pacific (X321, U1337), the Alaskan Margin (X341, U1417 and U1419), and the western Bay of Bengal (X353, U1445) with those from the Ross Sea. This comparison will lead to the reconstruction of interbasin Plio-Pleistocene teleconnections in the dynamics of the nutrients, and changes in (diatom) paleoproductivity related with biogeochemical, tectonic and climatic events of the Plio-Pleistocene.

After sailing as "Biostratigrapher (diatom specialist)" on four IODP Exps (303, 321, 341 and 353) in four different ocean basins, I am familiar with the onboard work on the JR, the analyses to be performed on core-catcher samples, the quick delivery of data, and their onboard interpretation. As my on-board and home-lab bio-stratigraphic work requires a sound knowledge of diatom taxonomy, my experience with diatoms is not only limited to low- and mid-latitudes areas of the oceans, but it also extends to southern polar waters (see Publication list: Armand et al., 2005; Crosta et al., 2005: Romero et al., 2005, 2015; Romero and Schmieder, 2006; Denis et al., 2006; Escutia et al., 2009). During X374, my diatom expertise will contribute to the onboard species identification of downcore preserved diatoms, hence helping –with colleagues from the Micropal and Paleomag labs, and the stratigraphic correlators– in establishing the onboard biostratigraphic frame of down-core sediments, and will give insights into the preliminary interpretation of the evolution of the WAIS in the Ross Sea.

My publication record evidences my long-time commitment to IODP. Successful post Exp collaborations with several co-participants of previous Exps is evidenced by publications in high-impact journals (*e.g.*, Hodell et al., 2008; Romero et al., 2011; Nicholl et al., 2012; Cermeno et al., 2015; Gulick et al., 2015; Holbourn et al., 2015 - for full references see my Publication list).

The study of the fossil marine diatoms community supplies information on the effect of (*i*) ice sheet cover, (*ii*) sea level, (*iii*) sea surface temperature and salinity, and (*iv*) nutrient availability. By generating high-resolution diatom counts (total concentration and the species-specific composition of the preserved assemblage), biogenic silica, and isotopic ($d^{30}Si$ and $d^{18}O$) measurements on diatoms, and XRF counts, my post-Exp research will mainly contribute to objectives 1 to 4 of

Proposal 751. MARUM lab facilities (among others, three XRF-core scanners, light and electron microscopes, biogenic silica and isotope labs) will help to achieve the objectives of Exp374 and of my post-Exp research. Funding will be provided by the DFG-Priority Program 527.

I am mainly interested in the interplay between siliceous production and deposition, and climatic, tectonic, and oceanographic major events (Si switches, development of ice sheets, effect of sea ice sheets on productivity) for the Plio-Pleistocene time interval. By looking at the variations of diatom communities in the Ross Sea, three main objectives will be pursued: (*i*) providing diatom-based information on the WAIS evolution, (*ii*) reconstructing the biological evolution and turnover rates of diatoms in the Ross Sea during Plio-Pleistocene times of climatic, tectonic, and oceanographic stress; and (*iii*) improving and intercalibrating biostratigraphic datums provided by diatoms at high and low latitudes. Two hypotheses to be tested are (*i*) whether the temporal differences in diatom and biogenic silica concentration among high and low latitude ocean basins were connected to the appearance/disappearance of different *opal carriers* (diatom species), and (*ii*) how the variability of the valve size (of key species) affected its degree of valve dissolution and the Si balance among ocean basins.

I hope my application deserves your positive review. Looking forward of hearing from you,

Dr. Oscar Romero

Enclosures: (1) Apply to Sail Application Form, and (2) CV and Publication list

CURRICULUM VITAE

Surname: ROMERO
First and middle names: Oscar Enrique
Place of birth: Córdoba, Argentina Nationalities: German/Argentinean (dual)
Date of birth: November 25th 1965
Current Position: Senior Researcher, MARUM, University of Bremen, Pavillon R 0010, Leobener Str., 28359 Bremen, Germany.
T: (+49) 421 218 65645 - E: oromero@uni-bremen.de / oromero@marum.de

WWW presence:
https://scholar.google.de/citations?user=EgnxlQIAAAAJ
https://www.researchgate.net/profile/Oscar_Romero10
https://marum.academia.edu/oscarromero

1.1.- University Qualifications

1983 - 1989 Bachelor in Biology, Faculty of Exact and Natural Sciences, National University of La Pampa, Santa Rosa, Argentina.

1992 - 1995 Master of Sciences, Department of Botany, Faculty of Natural and Oceanographic Sciences, University of Concepción, Concepción, Chile. January 1995. Dissertation Title: "Morphology, Taxonomy and Distribution of *Cocconeis* Ehrenberg (Bacillariophyceae) in Chile".

1995 - 1998 PhD, University of Bremen, Germany, August 1998. Dissertation title: "Marine planktonic diatoms from the tropical and equatorial Atlantic: temporal flux patterns and the surface sediments".

1.2.- Academic employment

1989 – 1992	Teaching Assistant, Department of Natural Sciences, National University of La Pampa, Santa Rosa, Argentina
1992 – 1994	Teaching Assistant, Department of Botany, University of Concepción, Chile.
Jun 1995 – Aug 1998	PhD Student, Department of Geosciences, University Bremen, Bremen, Germany
Aug 1998 – Dec 2002	Post-doc position, Department of Geosciences, University Bremen, Bremen, Germany.
Jan 2001 – Mar 2007	Researcher, Department of Geosciences, University Bremen, Bremen, Germany.
Mar 2007 – Dec 2013	Instituto Andaluz de Ciencias de la Tierra, Facultad de Ciencias, Universidad de Granada, Granada, Spain.
Jan 2014 – present	Senior Researcher, MARUM - Center for Marine Environmental Sciences, University of Bremen, Bremen, Germany.

1.3.- Scientific stays (last five years)

Mar 2010	EPOC, Université BordeauxI, Bordeaux, France.
Apr 2010	Natural History Museum, London, UK.
Aug 2010	CRIOBE – Université de Perpignan, Perpignan, France.
Oct/Nov 2010	CEREGE, Aix-en-Provence, France.
Feb 2011	Department of Ecology, Universidad de Vigo, Vigo, Spain.

May 2011	MARUM, University Bremen, Bremen, Germany.
July 2011	CEREGE, Aix-en-Provence, France.
Sept 2011	EPOC, Université BordeauxI, Bordeaux, France.
Dec 2011	Freie Universität Berlin, Berlin, Germany.
Juli 2012	MARUM, University Bremen, Bremen, Germany.
Sep 2012	EPOC, Université Bordeaux I, Bordeaux, France.
Feb 2013	MARUM, University Bremen, Bremen, Germany.
May 2014	Université Perpignan, Perpignan, France.
June 2014	CEREGE, Aix-en-Provence. France.
Aug 2014	Freie Universität Berlin. Berlin, Germany.
Sept 2014	Lund University. Lund, Sweden.
Nov 2014	Freie Universität Berlin. Berlin, Germany.
July 2015	University of Copenhagen, Copenhagen, Denmark.
April 2016	Kochi Core Center, Kochi, Japan.

1.4. Sea-going Experience

SONNE - 102, Valparaíso-Valparaíso (Chile), SE Pacific Ocean. June 2-28 1995.

METEOR 38-1, Las Palmas (Canary Islands) – Recife (Brazil), Equatorial Atlantic. January 25 - March 1 1997.

METEOR 46-4, Mar del Plata (Argentina) – Salvador (Brazil), Southern Atlantic. February 10 - March 13 2000.

SONNE 156, Valparaíso-Talcahuano (Chile), SE Pacific Ocean. March 29 – May 14 2001.

METEOR 53/1c, Las Palmas (Canary Islands)-Mindelo (Cape Verde Islands), off NW Africa. April 20 – May 3 2002.

METEOR 57/2, Walvis Bay – Walbis Bay, off Namibia. Feb 10 – March 12 2003.

TTR 14, RV Prof. Logachev, Cadiz – Alicante, Spain. Aug 10 – 19 2004

IODP Exp 303, Northern Atlantic Climate I, St. Johns, Canada - Azores Islands, Portugal Sept 25 – Nov 17 2004.

SONNE184, Cilacap-Cilacap, Indonesia. 1 – 22 August 2005

IODP Exp 321, Pacific Age Equatorial Transect, Honolulu, Hawaii – San Diego, California, US. May 06 – Jun 23 2009.

IODP Exp 341, Southern Alaska Margin, Victoria (Canada) – Valdez (Alaska). May 29 – Jul 29 2013.

IODP Exp 353, Indian Monsoon Rainfall, Singapore – Singapore. Nov 30 2014– Jan 29 2015.

1.5.- Meetings, Conferences (last five years)

Aug 2010	Gordon Research Conference - Organic Geochemistry, New Hampshire, USA
Dec 2010	AGU, San Francisco, USA
April 2011	EGU2011, Vienna, Austria
Sept 2011	RCMNS/RCANS Meeting, Salamanca, Spain
April 2012	EGU2012, Vienna, Austria
Aug 2012	22nd International Diatom Symposium, Ghent, Belgium
Sept 2013	13th International Conference on Paleoceanography, Sitges, Spain
April 2015	EGU 2015, Vienna, Austria
April 2016	EGU 2016, Vienna, Austria

1.6.- Affiliations

1995-present American Geophysical Union

1997-present European Geophysical Union

1996-present International Society for Diatom Research (ISDR) / Since July 2014 Council Member of the ISDR (http://www.isdr.org/about#council)

1.7.- Languages

Spanish, German, and English = fluent

French = basic level.

1.8.- Funding story (as PI or co PI) (Last five years)

Project Title	PI(s)	Amount	Agency	Grant period
		€		
IODP Expedition 321: Post-expedition research activity grant	OERomero (PI)	55.000	Science and Innovation Ministry, Spain – CGL2009-31136-F/BTE	2010 - 2011
Reconstructing the Neogene Siliceous Paleoproductivity of the Eastern Equatorial Pacific	OERomero (PI)	135.000	Science and Innovation Ministry, Spain – CGL2010-29863-F/BTE	2011 - 2013
Diatom d^{18}O evidence for the variability of the stratification and halocline conditions in the Subarctic Atlantic during the last glacial cycle	GEASwann (co PI) & OERomero (co PI)	55.000	Natural Environment Research Council, UK – IP/1072/1108	2010-2011
Late Pleistocene variations of the diatom productivity in the high-latitude Atlantic: convergence shifts, nutrient availability, and rapid climate variability	OERomero (PI)	220.000	German Science Foundation (RO 3039/4-1)	2014-2016
Using Si isotopes to understand the role of the silicate availability changes in the eastern Southern Atlantic	OERomero (PI, cooperation with K. Hendry)	5.000	MARUM Incentive Fund	2015

Publication list

93. Fischer, G., J. Karstensen, O.E. Romero *et al*. 2016. Bathypelagic particle flux signatures from a suboxic eddy in the oligotrophic tropical North Atlantic: production, sedimentation and preservation. *Biogeosciences* 13: 3203–3223. doi:3210.5194/bg-3213-3203-2016.
92. Romero, O.E., G. Fischer, J. Karstensen, and P. Cermeño. 2016. Eddies as trigger for diatom productivity in the open-ocean Northeast Atlantic. *Prog. Oceanogr.* (in press).
91. Fischer, G., O.E. Romero, U. Merkel *et al.* 2016. Deep ocean mass fluxes in the coastal upwelling off Mauritania from 1988 to 2012: variability on seasonal to decadal timescales. *Biogeosciences* (13: 3071–3090, doi:3010.5194/bg-3013-3071-2016.
90. Romero, O.E. 2016. Study of the type material of two *Platessa* Lange- Bertalot species (formerly *Cocconeis brevicostata* Hust. and *Cocconeis cataractarum* Hust. (Bacillariophyta). *Diatom Res.* 31(1): 63-75.
89. McKay, C. L., H. L. Filipsson, O.E. Romero *et al*. 2016. The interplay between the surface and bottom water environment within the Benguela Upwelling System over the last 70 ka. *Paleoceanography* 31: 266–285.
88. Cermeño, P., P.G. Falkowski, O.E. Romero et al. 2015. Continental erosion and the Cenozoic rise of marine diatoms. *PNAS* 112(14): 4239-4244.
87. Gulick, S. P. S., J.M. Jaeger, A.C. Mix, H. Asahi, H. Bahlburg, C.L. Belanger, G.B. B. Berbel, L. Childress, E. Cowan, L. Drab, M. Forwick, A. Fukumura, S. Ge, S. Gupta, A. Kioka, S. Konno, L.J. LeVay, C. März, K.M. Matsuzaki, E.L. McClymont, C. Moy, J. Müller, A. Nakamura, T. Ojima, F.R. Ribeiro, K.D. Ridgway, O.E. Romero *et al*. 2015. Mid-Pleistocene climate transition drives net mass loss from rapidly uplifting St. Elias Mountains, Alaska. *PNAS* 112(49): 15042-15047.
86. McKay, C. L., J. Groeneveld, H.L. Filipsson, D. Gallego-Torres, M.J. Whitehouse, T. Toyofuku, and O.E. Romero. 2015. A comparison of benthic foraminiferal Mn/Ca and sedimentary Mn/Al as proxies of relative bottom-water oxygenation in the low-latitude NE Atlantic upwelling system. *Biogeosciences* 12: 5415–5428.
85. Romero, O.E. X. Crosta, J.-H. Kim, L. Pichevin and J. Crespin. 2015. Rapid longitudinal migrations of the filament front off Namibia (SE Atlantic) during the past 70 kyr. *Global Planet. Change* 125: 1-12.
84. Romero, O.E., J.-H. Kim, M.A. Bárcena, I. Hall, R. Zahn and R. Schneider. 2015. High-latitude forcing of diatom productivity in the southern Agulhas Plateau during the past 350 kyr. *Paleoceanography* 30: 118-132.
83. Cartapanis, O., K. Tachikawa, O.E. Romero and E. Bard. 2014. Persistent millennial-scale link between Greenland climate and northern Pacific Oxygen Minimum Zone under interglacial conditions. *Clim. Past* 10: 405-418.
82. McKay, C. L., H.L. Filipsson, O.E. Romero *et al*. 2014. Pelagic-benthic coupling within an upwelling system of the subtropical northeast Atlantic over the last 35 ka BP. *Quaternary Sc. Rev.* 106: 299-315.
81. Holbourn, A., W. Kuhnt, M. Lyle, L. Schneider, O.E. Romero and N. Andersen. 2014. Middle Miocene climate cooling linked to intensification of eastern equatorial Pacific upwelling. *Geology* 42: 19-22.
80. Romero, O.E., and C. Riaux-Gobin. 2014. Two closely-related species of *Cocconeis* (Bacillariophyta): comparative study and typification. *Plant Ecol. Evol.* 147(3): 426–438.
79. Gallego-Torres, D., O.E. Romero, F. Martínez-Ruiz, J.-H. Kim, B. Donner, and M. Ortega-Huertas. 2014. Rapid bottom-water circulation changes during the last glacial cycle in the coastal low-

latitude NE Atlantic. *Quaternary Res.* 81: 330-338.

78. Riaux-Gobin, C., P. Compere, O.E. Romero, and D.M. Williams. 2014. *Cocconeis pinnata* W. Gregory ex Greville (Bacillariophyta): Lectotypification and an emended description after examination of type material and South Pacific specimens. *Phytotaxa* 147(3): 426–438.
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APPLICATION TO PARTICIPATE IN AN IODP EXPEDITION

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Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

1. PERSONAL INFORMATION

Family name: Salvi

First name: Gianguido

Current Position: Scientific Coordinator

Institution: Department of Mathematics and Geosciences, University of Trieste

Address: Via Weiss, 2 Trieste (Italy)

City, Postcode, Country: 34128

Tel. work: ++390405582034
Tel. home:
Fax: ++39-040-5586121
Email: gsalvi@units.it

Country of citizenship: Italy

Place of birth/date of birth: Trieste 10/07/1964

Gender: Male

Education (highest degree, including year PhD was received / is expected):

PhD - National Board No. 798 – Ecology (Environmental Sciences) achieved on November 18, 1996 at the University of Parma

Are you currently a student? NO Expected Graduation Date:

2. EXPEDITION INFORMATION

Summary of proposed participation, including area of scientific interest, current research and participation plan (maximum 250 characters with space – more detail should be included in the Letter of Interest):

Analyses of the ostracods associations for paleoenvironmental interpretations; possible application of Krithe's Mg/Ca paleothermometry on the Southern ocean; development of a Southern hemisphere Mg/Ca-based calibration

Prior involvement with DSDP/ODP/IODP and nature of involvement (expedition number, shipboard/shore-based participation, co-chief, etc):

None

Post-cruise science support to achieve the proposed scientific objectives 1) future funding scheme and 2) support from host institution (e.g. staff, facilities)

national funds still undefined; geochemical analyses, SEM and TEM facilities, educational and dissemination activities support

Three scientific and/or personal references

Marco Taviani - National Research Council, Bologna

Clara Manno – British Antarctic Survey Cambridge

Elsa Gliozzi – Department of Geosciences University of Roma 3

3. SCIENTIFIC EXPERTISE

For Scientist Jobs Descriptions visit: http://iodp.tamu.edu/participants/scientist_jobs.html

Please indicate your area(s) of expertise (maximum 3)

Discipline	Mark with X	Speciality
microbiologist		
organic and inorganic geochemist/biogeochemist		
physical properties specialist		
sedimentologist		
structural geologist		
paleontologist	X	Systematics of Neogenic and Quaternary ostracods, Paleoclimatic and paleoenvironmental reconstructions of Neogenic and quaternary marine series
paleomagnetist		

petrologist		
hydrogeologist		
Other		

16. Salvi G., Colizza E. 2015 - Ostracoda record from Quaternary biogenic carbonate sediments off Cape Adare (North West Ross Sea, Antarctica). Abstract XII Internationa Symposium on Antarctic Earth Sciences ISAES.

Letter of interest

The research on ostracods from the Southern Ocean has mainly concerned recent ostracods (e.g. Yasuhara et al., 2007). Instead, investigations on ostracods from past records from the Antarctic seas are rare because of the poor preservation of the fossil ostracod's valves (Brambati et al., 1999; Dingle, 2000). New results (Salvi et al., unpublished) obtained from micropaleontological analyses realized on sediments cores collected in the north western sector of the Ross Sea demonstrated that Ostracods act as reliable tools for paleoenvironmental and paleoecological interpretations, climate reconstructions and for improving our understanding of the carbonate deposition in polar environments. Recent papers on the geochemistry ($\delta^{18}O$, $\delta^{13}C$, Mg/Ca, Sr/Ca) of ostracods' valves from the Arctic Ocean have also shown the potential of these organisms as paleoclimate indicators (Cronin et al., 2012).

I intend to focus on: a) the quali/quantitative study of the ostracods associations together with compositional data (texture, organic Carbon, CaCO3 contents…) to reconstruct the ice shelf front oscillation phases and the connected paleo-environmental / climatic changes; b) the possible application of Krithe's Mg/Ca paleothermometry on the Southern ocean to reconstruct the paleotemperature; c) the possible development of a Southern hemisphere Mg/Ca-based calibration (Dwyer et al., 2002).

Analyses can be realized troughout facilities of which are provided the laboratories of the Mathematics and Geosciences Department. In particular will be possible to analyze ostracods specimen, also for morphological purposes, with Leica Stereo-Microscope and Electron Microscopy (SEM).

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UNIVERSITÀ
DEGLI STUDI DI TRIESTE

dipartimento di matematica e geoscienze

Curriculum vitae
Dr Gianguido Salvi, micropaleontologist

University degree (equivalent to a Master degree), in Geological Sciences awarded on 20.07.1992 at the University of Trieste;
PhD Marine Sciences - National Board No. 798 - Ecology achieved on November 18, 1996 at the University of Parma;
Since 2000 Scientific Coordinator of the University of Trieste (Department of Mathematics and Geosciences);
Since 2000 Scientific Coordinator of the Trieste Section of the National Antarctic Museum;
From 2003 until his inauguration in June 2004, I coordinated the scientific and technical activities for the realization of the exhibition of the National Museum of Antarctica – Trieste section.

Good knowledge of written and spoken English

Technical skill
Quali/quantitative analyses of ostracods from sediment core samples and zooplankton net samples.
Quali/quantitative analyses of foraminifera from sediment cores samples.
Experience of preparation of sediment cores (visual description, cutting, sieving).
Experience with stereomicroscope.
Experience with SEM (scanning electron microscope).
Biometric and biomass investigation of benthonic and planktonic ostracods and foraminifera.

Experience record
Teaching
Teaching for the Course of Paleontology II in the academic year 2002-2003, 2003-2004, 2011-2012, 2012-2013, 2013-2014, 2014-2015, 2015-2016;

Teaching for the Course of Environmental Impact Assessment for the Master of Science in Environmental Sciences in the academic year 2002-2003;

Teaching for the Course of Environmental Impact Assessment for the Master of Science in Environmental Sciences in the academic year 2003-2004;

Teaching for the Course of Paleontology II in the academic year 2003-2004;

Teaching for the Course of Environmental Impact Assessment for the Master of Science in Environmental Sciences in the academic year 2004-2005;

Teachers in the summer universities of Bovec with the Workshop on "Climate change and ocean circulation, sea level changes and impacts on ancient civilizations with particular reference to the coastal basin of the Adriatic Sea" August 2006 at the University of Klagenfurt;

Lecturer for the course of Ecology (academic years 2007-2010), with a seminar about Antarctic ecosystem ecology;

Professor at the Institute of Economic and Social Research (IRES), years 2011-2012, with a course "How to disclosure of Sciences - The Science Museums" in the course funded by Regione FVG "Promotion and Provision of Cultural Services";

Since 2000, coordinates the activities of teaching, schools of all levels of Friuli Venezia Giulia, promoted by the National Museum of Antarctica Trieste Section;

Supervisor of thesis for the degree of Geological and Natural Sciences.

Other cultural/professional qualifications
1994 – Course on Marine Diatoms fossil diagnostic features. Meaning palaeoecological and biostratigraphic. Organizer: University of Genoa;

1995 - Participation in the X oceanographic cruise Italian expedition in Antarctica - "Cruise '95 Strait of Magellan, in the framework of the research activities of the National Research Program in Antarctica;

1997 – Participation in the Oceanographic cruise in Mediterranean area;

2001/2002 - Participation in the XVII oceanographic cruise Italian expedition to Antarctica in the framework of the research activities of the National Research Program in Antarctica;

2005 - Participation in the Strait of Magellan Oceanographic Cruise as part of the research project "Evolution of late Quaternary climate in areas Magellan-Fuegian (South-South America)" in the framework of the research activities of the National Research Program in Antarctica;

2009 - Visiting scientist at City of Arts and Sciences of Valencia, Spain;

2012 - Visiting scientist at University of Tromso – UIT - Norway;

2016 - Visiting scientist at British Antarctic Survey, Cambridge, UK.

Coordination/Participation in Research Projects
Participation in the Project – late Quaternary Paleoclimatic Evolution in sediments of the Southern Ocean. Funded by the National Research Program in Antarctica;

Participation in the Project Record sedimentary climatic fluctuations late Quaternary and Holocene sediments of the coastal areas of Victoria Land and the Central Trough/Joides Basin (Western Ross Sea). Funded by the National Research Program in Antarctica;

Coordinator of the project funded by Regione FVG "Trieste and the first International Polar Year. Story of the birth of the scientific stations in polar regions. " 1882-1883 shipment of Trieste Carl Weyprecht (LR n ° 3/98) 2007;

Project Coordinator for the International Polar Year: POLARHISE Polar Areas Historical Survey and Exhibition - From Weyprecht to modern research activities of Italy in Polar Areas (2007-2008);

Project Coordinator for the realization of educational tours for schools of all levels of Friuli Venezia Giulia funded by the FVG Region (Regional Decree n.3481/CULT) for the year 2007;

Coordinator of the project funded by Regione FVG "Trieste and the first International Polar Year. Story of the birth of the scientific stations in polar regions. " 1882-1883 shipment of Trieste Carl Weyprecht (LR n ° 3/98) 2008;

Project Coordinator for the realization of educational tours for schools of all levels of Friuli Venezia Giulia funded by the FVG Region (Regional Decree n.3481/CULT) for the year 2008;

Coordinator of the project funded by the Province of Trieste "From the Adriatic to the ice" proposed collaboration art.10 (2008-2009);

Participation in the project "Record sedimentary climatic fluctuations late Quaternary and Holocene sediments of the coastal areas of Victoria Land and the Central Trough / Joides Basin (Western Ross Sea)." Funded by the National Research Program in Antarctica in 2008;

Participation in the project "Holoclip" Holocene climate variability at high-southern latitudes: an integrated perspective approved and funded by the European Science Foundation 2010-2012;

Coordination in the research unit 5 of the GEOchemical Signatures in the Antarctic MARine carbonate sysTem: present, past and future implications (GEOSMART) research project. Funded by the National Research Program in Antarctica in 2013-2015;

Publication List

1. Brambati A., Fanzutti G.P., Finocchiaro F., Melis R., Pugliese N., Salvi G. & Faranda C. 1999 - Some paleoecological remarks on the Ross Sea Shelf, Antarctica. In: Ross Sea Ecology, ItaliAntartide Expeditions (1987-1995), Springer Verlag, Berlin. 51-61;

2. Salvi C., Salvi G., Brambati A. 2000 - Palaeoenvironmental characteristics in core Anta 96-5bis (Glomar Challenger Basin, Ross Sea, Antarctica). Terra Antartica Reports, 4, 179-184;

3. Amore F.O., Caffau M., Colizza E., Salvi G., Tsakiridou E. 2000 – Holocene calcareous nannofossils and planktonic foraminifera assemblages in the Western Magellan Strait (Chile). Journal of Nannoplankton Research, 22 (2), 79-81;

4. Melis R., Pugliese N., Salvi G., Boschetti S., Pizzolato F. 2000 - Micropalaeontological results of three Cores located in the Western Magellan Strait (MB91/47-MB91/40-MB91/54R). Terra Antartica Reports, 4, 75-80;

5. Colizza E., Salvi G. 2000 - Sedimentological Analyses of three Cores Collected in the Pacific Sector of the Strait of Magellan (Chile). Terra Antartica Reports, 4, 69-74;

6. Brambati A., Melis R., Salvi G., Quaia T., 2002 - Late Quaternary climatic changes in the Ross Sea area (Antarctica). In: Gamble J.A, Skinner D.N.B., Henrys S. & Lynch R. (Eds.): "Antarctica at the close of a Millennium"; Proc. Vol. 8th ISAES, Royal Soc. of New Zealand, Bullettin 35, 359-364;

7. Amore F. O., Caffau M., Colizza E., Salvi G., Tsakiridou E., 2003 - Holocene calcareous nannofossils and planktonic foraminifera assemblages in the Western Magellan Strait (Chile). In Courier Forschungsinstitut Senckenberg, Frankfurt, 244, 61-81;

8. Bussi M., Colizza E., Corradi N., Finocchiaro F., Fontolan G., Ivaldi R., Lancucci C., Nicotra G., Pittà A., Salvi G. 2003 - Late quaternary palaeoclimatic evolution of marine sediments in the Southern Ocean Project: preliminary results of the 2001-2002 PNRA cruise in the Ross Sea. Terra Antartica Reports, 9, 89-94;

9. C. Salvi, G. Salvi, B. Stenni and A. Brambati. 2004 - Paleoenvironmental aspects in the Ross Sea during the last 15 ky BP: a comparison between sediment and ice cores. Annals of Glaciology, 39, 445-450;

10. Pistolato M., Quaia T., Marinoni L., Menegazzo Vitturi L., Salvi G., Setti M., Brambati A. 2005 - Grain Size, Mineralogy and Geochemistry in Late Quaternary Sediments from the Western Ross Sea outer Slope as Proxies for Climate Changes. In Contributions to Global Earth Sciences. Springer-Verlag, Berlin Heidelberg New York, 421-430;

11. Melis R., Salvi G. 2009 - Late Quaternary foraminiferal assemblages from western Ross Sea (Antarctica) in relation to the main glacial and marine lithofacies. Marine Micropaleontology 70 (2009) 39–53;

12. Tolotti R., Salvi C., Salvi G. and Bonci M. C. 2013 - Late Quaternary climate variability recorded by diatom micropaleontological and geochemical data from the Western Ross Sea, Antarctica. Antarctic Science 25(06), 804-820;

13. Salvi G., Pugliese N., Faranda C. & Montenegro M.E. 2013 – Reconstruction of the late Quaternary climatic variations based on ostracod assemblages from the North Western Basin (Ross Sea, Antarctica). Naturalista sicil., S. IV, XXXVII (1), 341-343;

14. Salvi G., Colizza E., Fernetti M., Novaro L., Pugliese N. 2015 - Recent Ostracode fauna from the Western Magellan Strait. Abstract XV convegno Nazionale della Società paleontologica;

15. Salvi G., Taviani M. 2015 - Ostracode fauna from the Cape Barne area (Antarctica). Abstract XV convegno Nazionale della Società paleontologica;

APPLICATION TO PARTICIPATE IN AN IODP EXPEDITION

ESSAC Office ECORD Science Support & Advisory Committee
GEOMAR | Helmholtz Centre for Ocean Research Kiel
Wischhofstrasse 1-3
24148 Kiel, Germany
Hanno Kinkel (ESSAC Science Coordinator):
Tel: +49 431 600 2418
Fax:+49 431 600 2922
Web Page: http://www.essac.ecord.org Email: **essac@geomar.de**

Please type information

Apply to Sail Application Form

Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

1. PERSONAL INFORMATION

Family name: Sangiorgi

First name: Francesca

Current Position: Assistant Professor

Institution: Marine Palynology and Paleoceanography, Dept. Earth Sciences, Faculty Geosciences, University of Utrecht

Address: Heidelberglaan 2

City, Postcode, Country: Utrecht, 3584CS, The Netherlands

Tel. work: +31(0)302532419
Tel. home: +31(0)302300161
Fax: +31(0)302535096
Email: f.sangiorgi@uu.nl

Country of citizenship: Italy

Place of birth/date of birth: Ravenna (Italy), 25-11-1970

Gender: F

Education (highest degree, including year PhD was received / is expected): PhD in Environmental Sciences (2001)

Are you currently a student? NO

2. EXPEDITION INFORMATION

Summary of proposed participation, including area of scientific interest, current research and participation plan (maximum 250 characters with space – more detail should be included in the Letter of Interest):

Palynological data to reconstruct surface water properties (productivity, freshwater influence, temperature, sea-ice occurrence) and assess sealevel and oceanographical changes through the Neogene (during major climate shift). Antarctic biostratigraphy.

Prior involvement with DSDP/ODP/IODP and nature of involvement (expedition number, shipboard/shore-based participation, co-chief, etc):

IODP 302 (Arctic Expedition, ACEX): involvement, shore-based participation
IODP 318 (Wilkes Land): involvement, shore-based participation
ANDRILL: invited science member, shore-based participation
IODP 323 (Bering Sea): shore-based participation

Post-cruise science support to achieve the proposed scientific objectives 1) future funding scheme and 2) support from host institution (e.g. staff, facilities)

1) I have a permanent position. The Netherlands has a yearly call for specific research on polar areas within the "Polar programme" financed by NWO (Netherlands Organisation for Scientific Research). This is highly competitive selection, but up to 200 keuros can be asked for a 4-years PhD or 3 years postdoc. Next to this possibility, funding (200 keuros) can be asked within the so-called "open programme". 2) I would have full support of other staff members and all the required facilities are available at our department. The host institution/my group generally provides travel money for such expeditions and post-cruise meetings.

Three scientific and/or personal references

Prof. Dr. Henk Brinkhuis (Utrecht University/NIOZ, the Netherlands)

Prof. Carlota Escutia (University of Granada, Spain)

Dr. Fabio Florindo (INGV, Italy)

3. SCIENTIFIC EXPERTISE

For Scientist Jobs Descriptions visit: http://iodp.tamu.edu/participants/scientist_jobs.html

Please indicate your area(s) of expertise (maximum 3)

Discipline	Mark with X	Speciality
microbiologist		
organic and inorganic geochemist/biogeochemist		
physical properties specialist		
sedimentologist		
structural geologist		
paleontologist	**X**	Marine palynology: dinoflagellate cysts (major expertise)
paleomagnetist		
petrologist		
hydrogeologist		
Other		

4. ADDITIONAL DOCUMENTS

Please, provide the following documents:

- Letter of interest, including details about area of scientific interest, current research, expedition participation plan and post-cruise research
- CV and Publication list
- Letter of recommendation (for PhD students)
- See also: http://www.essac.ecord.org/flyer/Guidelines_for_Applying_to_sail.pdf

Please, send your application form as *a MS Word document* and the additional documents in *PDF format* (preferably as one file) by email to Jan Behrmann and Hanno Kinkel at the ESSAC office: essac@geomar.de.

In addition to the ESSAC application, all applicants *must inform their national office* (if applicable) *and national delegate* and send a copy of the application documents. ECORD does not provide funds for participation; the national offices or national delegates can provide information regarding travel support, post-cruise funding opportunities, etc.

See http://www.essac.ecord.org/index.php?mod=about&page=ESSAC for a list of the national contact persons.

Sangiorgi – Letter of interest

To the co-chiefs and the Staff Scientist of the Ross Sea IODP 374 Expedition

With this letter, I would like to express my interest in participating in the IODP Expedition 374 to the Ross Sea West Antarctic Ice Sheet History as marine **palynologist** (dinoflagellate cysts).

The aims of the expedition perfectly match my interests in and my knowledge of the Neogene climate and cryosphere evolution of Antarctica during past periods of warmer-than-present climate and during rapid climate transitions. Moreover, the expertise I can provide is useful to achieve some of the major aims of the expedition such as environmental and oceanographic reconstructions as well as for biostratigraphy.

Specifically, during the last 5-6 years, I have taken part in several Antarctic projects, all of which focused on reconstructing Antarctic climate and cryosphere variability during the Neogene. In particular, these projects aim at understanding how warm was Antarctica/Southern Ocean during warmer-than-present intervals of the Neogene and how stable was the ice sheet given changes in ocean temperature and oceanographic features. Such projects are here briefly summarized:

1) Oligocene, mid Miocene and warm Pliocene marine and terrestrial environmental reconstruction at Wilkes Land basin (IODP 318), PI of a PhD project funded by NWO (Netherlands Organisation for scientific research)
2) Early and mid Miocene and Pliocene climate and ocean temperatures in the Ross Sea (ANDRILL),
3) Marine Isotope Stage 5e climate offshore Drygalski basin, Ross Sea (Italian national projects, PNRA)
4) Holocene climate and productivity changes in the Ross Sea (Italian national PNRA project) and Adelie land (IODP 318)

What became clear while working on these projects through analyses of marine sediments is that ocean temperatures and oceanographic features seem to have been markedly different during e.g. the warm Miocene Climatic Optimum and the Pliocene compared to today (Sangiorgi et al., submitted to *Nature Communications*; Levy et al., 2016, *PNAS*; Cook et al., 2013, *Nature Geosciences*; McKay et al., 2012, *PNAS*). This implies that other factors next to greenhouse gasses may have played an important role in reducing the ice sheet extension during warm intervals or in affecting its stability even during periods of reconstructed low CO_2 concentrations. One of such factors is ocean temperature, which seems to have been much warmer than thought (Sangiorgi et al., submitted) during certain intervals of the Neogene. I am also fascinated by the fact that some regions (such as the Wilkes Land basin in east Antarctica) seem to have been extremely sensitive to ocean warmth in the past from the Oligocene to the Pliocene. Therefore we need more proximal continuous records from other potentially sensitive regions.

Moreover, the basin configuration, topography and basin subsidence history/bathymetry are extremely important not only for determining the amount of ice that can be accommodated on the continent, by also to define the role of ocean influence on the stability of the ice shelves and the potential consequent ice sheet melting upon intrusion of warm waters. Such information is as important as yet scarce and represents one of the aims of this expedition. The latitudinal and depth transects proposed for this expedition are therefore extremely interesting.
Personally, I am mostly interested in the continental rise/slope sites, deeper sites where a more continuous long record can be expected, where records from the mid Miocene climatic Optimum and younger (warm) intervals can be retrieved. I would be interested in studying the Miocene after the Mid Miocene Climate Optimum and during and after Transition to compare with the Wilkes Land site, where ocean temperatures seem to be periodically returning to warmer values. Moreover, distal sites may give indications on the sensitivity of dinoflagellate cysts during glacial interglacial cycles. We basically know nothing about this aspect of palynology.
On the other hand, the continental shelf sites may be more appropriate and suitable for high-resolution palynological study. The integration of information from marine and terrestrial climate from palynology may be more successful in these more proximal sites.

My major expertise is indeed in marine **palynology** (dinoflagellate cysts). However, I have gained experience in organic geochemistry paleothermometry, which I have so far performed in collaboration with the Royal Netherlands Institute for Sea Research. I am used to integrate information from different geochemical, biological and sedimentological proxies.
Palynology is an extremely important discipline not only for the environmental and climatic indications that dinocysts can provide on surface waters, but also because pollen and spores are found in the same palynological slides giving the possibility of getting both marine and terrestrial derived environmental and climatic information at once. Dinoflagellates are well suited for reconstructing *sea surface productivity, sea surface temperature, and sea surface salinity, the presence of sea-ice, water stratification, and sea level changes*. The dinocysts signal will be certainly useful for the scope of this expedition, if organic palynomorphs are preserved (Neogene Southern Ocean records are not always very abundant in palynomorphs). However, the presence of reworked palynomorphs (Cenozoic or Mesozoic) can also provide indication on ice advance and retreat; moreover, reworking also provides useful information on the age and type of reworked strata, e.g., whether they are from land or marine origin. Next to dinocysts, the presence of freshwater or brackish water palynomorphs (algal remains) can provide information on the occurrence of freshwaters (meltwaters) and water mass properties in general (stratification).
The highest dinocysts diversity in recent and sub-recent sediments is achieved in neritic to upper bathyal environments. While some species are cosmopolitan, others are very tolerant to restricted coastal conditions, others are only found in open oceanic waters. The changes in the assemblages (e.g., oceanic vs shallower water dinocysts) are therefore useful to trace sea level change. The links between environmental/climatic variables and the occurrence of certain dinocyst assemblages are pretty well understood and a world-wide atlas has been compiled (Zonneveld et al., 2013, *Review of Palaeobotany and*

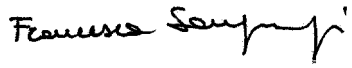
Palynology). Useful information from the Southern Ocean is available in Prebble et al. (*Marine Micropaleontology*, 2013). The valuable information obtained from these publications can be applied in the past for extant species. Many of the Neogene dinocyst species so far encountered in the Southern Ocean records are still present in the recent and Quaternary sediments, making reconstructions based on dinocysts sound. Fossil species will certainly be recovered, but literature available has thoroughly reconstructed the environmental preferences also for those species.

Moreover, our work on the Wilkes Land site (Bijl et al., in prep) allows a huge improvement in the use of dinoflagellate for Southern Ocean as biostratigraphic tools for the Oligocene and Miocene. If magnetostratigraphy of sediments from Expedition 374 is good, our biostratigraphic information can be further fine-tuned.

As for the post-cruise plan: *my experience with working with high southern latitude samples makes me expect that several samples could be barren of palynomorphs, while some intervals may contain relatively few palynomorphs*. Careful processing and time-consuming analysis of many samples will probably be needed, which means there is ample room for collaboration with other palynologists (both marine and terrestrial palynologists) to achieve the best results. Typically, samples processed for marine palynology are also good for terrestrial palynology (pollen and spores), which implies that processing efforts can be concentrated in one or two labs for

Finally, I would like to declare that I have taken part to several cruises in the Mediterranean Sea, although I never sailed on IODP cruises, and participated to coring expeditions and several IODP-related projects (see Curriculum Vitae).

Sincerely yours,



Francesca Sangiorgi

FRANCESCA SANGIORGI - CURRICULUM VITAE

Birthdate and birthplace: November 25, 1970 - Ravenna, Italy
Address: WORK: Marine Palynology & Paleoceanography – Laboratory of Palaeobotany and Palynology, Dept. Earth Sciences, Fac. Geoscience, Utrecht University, Heidelberglaan 2, 3584 CS Utrecht, the Netherlands. Phone +31 (0)30 2532419 Fax +31 (0)30 2535096; Mobile +31 (0)6 38213991. E-mail: F.Sangiorgi@uu.nl

Current position: Assistant Professor (Senior Lecturer, UD1), Marine Palynology & Paleoceanography, Dept. Earth Sciences, University of Utrecht, the Netherlands
Academic Qualifications: 1996: M.Sc. equivalent in Marine Environmental Sciences (*cum laude*), University of Bologna. 2001: Ph.D. in Environmental Sciences, University of Bologna, Italy.
Languages: Italian (native), English (fluent), Dutch (very good)
Personalia: married with 2 children

Employment

June 2015 -:	Assistant Professor (Senior Lecturer, UD1) Marine Palynology & Paleoceanography, Earth Sciences, Geology, Utrecht University, The Netherlands
2012- 2015:	Assistant professor (Lecturer) Marine Palynology & Paleoceanography, Earth Sciences, Geology, Utrecht University, The Netherlands (0.8 fte; from 1 Septemebr 2014, 1fte)
2010 – 2011:	Assistant professor Biomarine Sciences, Utrecht University, The Netherlands (0.6 fte, sept 2010 – December 2011).
2009 – 2010:	associate researcher at Utrecht University, Laboratory of Palaeobotany and Palynology (unemployment + maternity leaves)
2005 – 2009:	Post-doc (3 years) at Biology, Utrecht University, the Netherlands, Palaeoecology, Laboratory of Palaeobotany and Palynology, in collaboration with the NIOZ (Royal Dutch Institute for Sea research). The project, entitled "From Greenhouse to Icehouse: reading the Arctic climatic record
2005	Post-doc fellow at Biology, Utrecht University, the Netherlands, Palaeoecology, Laboratory of Palaeobotany and Palynology.
2000- 2004	Research Assistant, University of Bologna
1997 – 2000	Doctoral research fellow, University of Bologna (PhD defence on 4th April, 2001).

1997 - 1999 Enrolment on short-term contracts for Environmental Impact Assessment Studies and oceanographic surveys in the Mediterranean Sea

1996- 1997 National Research Council (C.N.R) grant on the project "Sediment - water interaction in marine environment".

Involvement in projects (on-going):

1) Recent evolution and (palaeo-)ecology of coastal areas and deltas: natural trends and anthropogenic impact

Trends in productivity and eutrophication and recent (last 200 years) environmental changes in coastal and delta areas due to anthropogenic impact (Dutch coastal delta areas, Long Island Sound, North Adriatic Sea, Florida estuaries, Baltic sea); Future Delta project (Focus Area University Utrecht) "Can paleoenvironmental reconstructions help setting targets for nutrient management and legislation in deltas under anthropogenic pressure?" (PI)

2) Cenozoic climate evolution in polar areas: Reconstructing the evolution and dynamics of the Antarctic cryosphere from Ocean Drilling; a dinoflagellate perspective (PI); Cenozoic climate evolution at Wilkes Land, East Antarctica from sediments retrieved during IODP 318; Holocene Antarctic climate and environmental change in the Ross Sea, funding several Progetto Nazionale di Ricerca in Antartide (PNRA); ACEX: (Arctic Coring Expedition, IODP 302): Cenozoic climate evolution of the Central Arctic Ocean; ANDRILL: Invited Science Member (www.andrill.org).

Others (selection): ICDP (International Continental Scientific Drilling Program) – The North Sea Basin as recorder for key Cenozoic transitions: co-PI; Nature Conservation Management and Restoration, co-PI; Paratethys Retreat And Causes: Timing and Implications for Climate and Environment (PRACTICE): funding Focus and Massa call; Paleocenography and paleoenvironmental changes during late Quaternary sapropel deposition in the Mediterranean Sea; DINOFLAGELLATE CYSTS ATLAS: linking dinocysts occurrence in surface sediments worldwide with physical-chemical parameters of the water column where they form.

Research Interests and major expertise:

- Marine palynology (organic-walled dinoflagellate cysts) for environmental and paleoenvironmental reconstructions: ecology, paleoecology and their Harmful Algal Blooms
- Neogene paleoclimate and paleoceanography
- Human impact and eutrophication in coastal areas

Fellowships, project funding and awards:

2001: Young researchers (Progetto Giovani Ricercatori), University of Bologna (6k€ euros)

2002: Progetto Marco Polo: Marco Polo Project, granted by the University of Bologna, a visiting grant

2006: KNAW (Dutch Academy of Science) 2k€ grant

2008: Awarded (but not taken up) a Ramon Y Cajal *tenure track* University position in Spain after qualifying 1st in the national ranking for Earth Sciences.

2010: "Multidisciplinary study of glaciomarine sediments from the Ross Sea (Antarctica) in the last 50,000 years", Progetto Nazionale di Ricerca in Antartide (PNRA), PI dott. Massimo Pompilio, Istituto Nazionale di Geofisica e Vulcanologia, Pisa, Italy). Funds (5 k€ euros)

2010: NWO-NNPP project "Reconstructing the evolution and dynamics of the Antarctic cryosphere from Ocean Drilling; a dinoflagellate perspective", PI, funded with 240,000 Euros

2011: CNR (Consiglio Nazionale delle Ricerche, Italy), eligible (after qualifying 2nd in the national ranking) for a permanent position as researcher at the National Research Council (Italy)

2013: Earned Habilitations for Associate and Full professorship of Earth Sciences in the national Italian selection procedure

2014 -: Nature Conservation Management and Restauration (NWO funding 800 k€), co-PI

2014-: Influenza della variabilità del ghiaccio antarctico sulle tele-connessioni climatiche delle basse latitudini dell'emisfero Sud durante la transizione del Plio-Pleistocene (3.5 Ma – 2.5 Ma). Unita' di Ricerca 2 (Florindo, Sangiorgi, McKay, Winter)

2015: - Future delta: "Can paleoenvironmental reconstructions help setting targets for nutrient management and legislation in deltas under anthropogenic pressure?" Funding 15k€ PI

2016: Eurofleets project PANTHER (Pantelleria High Eergy eruptions from marine studies), co-PI

Teaching

1999: Teacher of Ecology for the professional course "*Tecnico per l'utilizzo dei sistemi geografici territoriali in ambito ambientale*" (G.I.S. technician for environmental applications) by ECAP Emilia-Romagna (Italy);

1999 Co-supervisor of MSc. thesis at Bologna University (Environmental Sciences, Ravenna)

2000- 02: assistant course "Reconstruction of past Global Change: a Palaeobotanical and Palynological Approach" held at Utrecht University for 3rd year Biology students;

2003: teacher for the "Marine Paleoecology" course held at Utrecht University for 3rd year Geo-Biology students;

2004: teacher of paleoclimatology within the Marine Geology course held for 4th year students of the Environmental Sciences Course, University of Bologna.

2005: teacher of paleoclimatology within the Marine Geology course held for 4th year students of the Environmental Sciences Course, University of Bologna.

2005/06: Teacher for Marine Ecology and Marine Sciences courses at Utrecht University

2006, 2012: Teacher at the Jurassic – Cretaceous – Tertiary Dinoflagellate Cyst Course on Morphology, Stratigraphy & (Paleo)ecology. Urbino, Italy.

2006-: Teacher for the courses Marine Sciences I (1st year Biology), Marine Sciences II (2nd), and Marine Sciences III (3rd year) Utrecht University.

2007-: Teacher at the International Urbino Summer School in Paleoclimatology, Urbino, Italy

2013-: Earned BKO (20-8-2013), official qualification for university teaching programme.

2016-: Teaching Master course Univ. Utrecht, Earth Sciences, "Environmental paleobiology and proxies"

Coordination

2008 – 2014: course Marine Sciences 2 (Ocean of the Future, bachelor, 2nd year Biology) now Marine Sciences III

2013-: seminar series for Honours Students at the Faculty of Geosciences, 100 elected students from the Faculty. Coordination means provision of set up of the seminars (30 per years), develop and propose ideas for the seminar themes, invite speakers, led discussion, etc.

2014 – Setting-up a new course of Marine Science "Coastal ecology and evolution" (2nd year, bachelor students biology and geology, Utrecht University) and coordination

2017-: coordinator Master Earth Sciences course "Environmental paleobiology and proxies"

Supervision since 2005

2 post-doc projects (Dr. Peter Bijl, Dr. Emmy Lammertsma);

1 Junior researcher (Keechy Akkerman)

11 PhD theses (9 as official co-promotor);

On-going PhD thesis

- Tjerk Veenstra: Early and Middle Miocene climate (global ocean)
- Mariska Datema: Last two Glacial-interglacial cycles (Iberian Margin)
- Julian Hartman: Intervals of warmer than present climate during the Neogene: an Antarctic perspective
- Carolien van der Weijst: Pliocene warm period (global ocean)

~40 Master projects; ~50 BSc projects

BKO (Basis Kwalificatie Onderwijs, teaching qualification certificate) for Dr. Peter Bijl (2016)

Other Activities

2003: member of the organising committee of the 6th MEDCOAST03 international conference held in Ravenna (Italy), 7-11 October and

2003: organiser of a workshop within the conference MEDCOAST03 (Ravenna, Italy) on "Climatic change and foreseeable impacts on delta areas: a new challenge in the coastal management"

2004: 'On-board' teacher of marine sciences and oceanography for master students, course performed on board of the research vessel Universitatis (Conisma, Italy), June 2004.

2004-: Participation to several oceanographic cruises in the Mediterranean Sea and two fieldworks in the Everglades, Florida, USA,

2005: Editor (Gabbianelli & **Sangiorgi**) of the 4th volume of the 6th MEDCOAST international conference "Climatic change and foreseeable impacts on delta areas: a new challenge in the coastal management", Ravenna, Italy, 110 pp.

2006-2008: organizer of the IPPU (Institute for Paleoenvironment and Paleoclimate Utrecht) seminar series.

2008: proposer of a session at the XII Palynological Conference in Bonn, Germany.

2009: co-organizer of a workshop on sea-ice proxies held in Granada within the ACE (Arctic Climate Evolution) symposium in September. Organizer: Steve Pekar

2011-2015: associate scientist at CNR (Consiglio Nazionale delle Ricerche), ISMAR (Institute of Marine Research), Bologna, Italy

2012: convener of a session at AGU Fall Meeting (S. Francisco, December) entitled Antarctica and the Southern Ocean during past warm periods of the Icehouse

2012-: member of the opponent committee for the PhD thesis defence of Sander Houben (University of Utrecht, NL), Christian van Baak (University of Utrecht, NL), Mirja Hoins (University of Utrecht, NL)

2012, 2013: organizing committee of the Christmas party for the Faculty of Geosciences (380 persons)

2012-: funding member of ACROPORANET (Consortium of Dutch Research Institutes dealing with Tropical Marine Biology, http://projects.nioz.nl/acroporanet).

2014: organizer of the symposium "Ocean of the present, Ocean of the future" (University of Utrecht, NL)

2015: Member of the steering organising committee of the 12th International Conference on Paleoceanography, which will be held in Utrecht, 28 August – 2 September 2016

2016: Member of the evaluating committee for the Master and Bachelor courses and tracks at Department of Biology (5 year evaluation of the quality of teaching, in Dutch "visitatie commissie biologie")

2016-: Member of the steering committee “Caribbean Coastal Development” conference

2016-: Mentor for women at the faculty of Science (Utrecht University)

Service to international peer-reviewed journals and proposals

Editor for post-Palaeozoic palynology of Journal of Micropaleontology

Reviewer for international journals (e.g., Nature Communications, Climate Research, Paleoceanography, Marine Micropaleontology, Marine Ecology Progress Series, Canadian Journal of Earth Sciences, Review of Palaeobotany and Palynology, Global and Planetary Change, Limnology & Oceanography, Palynology)

Reviewer for national and international projects

Reviewer/Commission member for career progress of international scientists (PhD to professor level)

Publications (peer reviewed)

In preparation or submitted

- ✓ **Sangiorgi F**., et al., Miocene ocean and land climate at the Wilkes Land margin (Antarctica), submitted to Nature Communications
- ✓ **Grothe A., Sangiorgi et al.,** Migration of the dinoflagellate *Galeacysta etrusca* and its implications for the Messinian Salinity Crisis, submitted to Newsletters on Stratigraphy
- ✓ **Datema M. Sangiorgi F. et al.,** Glacial-Interglacial climate variability in the Western Iberian Margin based on dinoflagellate cysts, submitted to Marine Micropaleontology
- ✓ **Bijl et al**., Oligocene climate variability at Wilkes Land, Antarctica, to be submitted to Climate of the Past
- ✓ **Chiarini F., et al.,** Multi-year sediment fluxes analysis in the Ross Sea polynya: sea ice and biogenic forcing, ready for submission to Polar Research
- ✓ **Hartman J., et al.** Oligocene temperature reconstruction in sediment from IODP site U1356, south of the polar front. To be submitted to Climate of the Past
- ✓ **Strother S. et al.,** Identification of reworking in Eocene to Miocene pollen records from offshore Antarctica: a new approach using red fluorescence, to be submitted to Biogeosciences
- ✓ **Papadomanolaki N.M.,** et al., Controls on the onset and termination of hypoxia in the Baltic Sea during the Holocene Thermal Maximum and the Medieval Climate Anomaly, in prep.

1) Fensome R., Bijl P.K., Grothe A., Head M., **Sangiorgi F**., Williams G., 2016, Proposals to conserve the names *Selenopemphix* against *Margosphaera*, and *S. nephroides* against *M. velata* (Dinophyceae), *Taxon*, 65(3), 636-637
2) Levy R., Harwood D., Florindo F., **Sangiorgi F.,** et al., 2016, Antarctic Ice Sheet sensitivity to atmospheric CO_2 variations during the early to mid-Miocene, *Proceeding National Academy of Science,* 113(13), 3453-3458
3) van Helmond, Niels A.G.M., Hennekam, Rick, Donders, Timme H., Bunnik, Frans P.M., de Lange, Gert J., Brinkhuis, Henk & **Sangiorgi, Francesca** (2015). Marine productivity leads organic matter preservation in sapropel S1: palynological evidence from a core east of the Nile River outflow. *Quaternary Science Reviews*, 108, pp. 130-138.
4) Kim, J.-H., Schouten, S., Rodrigo-Gámiz, M., Rampen, S., Marino, G., Huguet, C., Helmke, P., Buscail, R., Hopmans, E. C., Pross, J., **Sangiorgi, F.**, Middelburg, J.B.M. & Sinninghe Damsté, J.S. (2015). Influence of deep-water derived isoprenoid tetraether lipids on the $TEXH_{86}$ paleothermometer in the Mediterranean Sea. *Geochimica et Cosmochimica Acta*, 150, pp. 125-141.
5) Andreas Koutsodendris, Achim Brauer, Ierotheos Zacharias, Victoria Putyrskaya, Eckehard Klemt, **Francesca Sangiorgi**, Jörg Pross, 2015, Ecosystem response to human- and climate-

induced environmental stress on an anoxic coastal lagoon (Etoliko, Greece) since 1930 AD. *Journal of Paleolimnology*, DOI 10.1007/s10933-014-9823-1

6) Vasiliev Iuliana, Gert-Jan Reichart; Arjen Grothe; Jaap S Sinninghe Damsté; Wout Krijgsman; **Francesca Sangiorgi**; Johan Weijers; Linda van Roij, 2015, Recurrent phases of drought in the upper Miocene of the Black Sea region, *Palaeogeography, Palaeoclimatology, Palaeoecology*,
7) Grothe, A., **Sangiorgi, F**., Mulders, Y.R., Reichart, G.-J., Brinkhuis, H., Stoica, M. & Krijgsman, W. (2014). Black sea desiccation during the Messinian Salinity Crisis: Fact or fiction?. *Geology*, 42(7), 563-586.
8) Jansson, I.-M., Mertens, K.N., Head, M.J., de Vernal, A., Londeix, L., Marret, F., Matthiessen, J. & **Sangiorgi, F**. (2014). Statistically assessing the correlation between salinity and morphology in cysts produced by the dinoflagellate Protoceratium reticulatum from surface sediments of the North Atlantic Ocean, Mediterranean-Marmara-Black Sea region, and Baltic-Kattegat-Skagerrak estuarine system. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 399, 202-213.
9) Cook Carys P., Tina van de Flierdt, Trevor Williams, Sidney R Hemming, Masao Iwai, Munemasa Kobayashi, Francisco J Jimenez-Espejo, Carlota Escutia, Jhon Jairo González, Boo-Keun Khim, Robert M McKay, Sandra Passchier, Steven M Bohaty, Christina R Riesselman, Lisa Tauxe, Saiko Sugisaki, Alberto Lopez Galindo, Molly O Patterson, **Francesca Sangiorgi**, Elizabeth L Pierce, Henk Brinkhuis, and the Expedition 318 scientists (2013), Dynamic behavior of the East Antarctic ice sheet during the Pliocene warmth, *Nature Geosciences*, 6(9), 765-769
10) Houben AJP, Peter K Bijl, Jörg Pross, Steven M Bohaty, Sandra Passchier, Catherine E Stickley, Ursula Röhl, Saiko Sugisaki, Lisa Tauxe, Tina van de Flierdt, Matthew Olney, **Francesca Sangiorgi**, Appy Sluijs, Carlota Escutia, Henk Brinkhuis (2013), Reorganization of Southern Ocean Plankton Ecosystems at the onset of Antarctic Glaciation. *Science* 340: pp. 341-344.
11) Zonneveld K.A.F., et many others including **Sangiorgi F**. (2013), Atlas of modern dinoflagellates cyst distribution based on 2405 data points, *Review of Palaeobotany and Palynology*, 191, 1-198
12) McKay, R., Naish, T., Carter, L., Riesselman, C., Sjunneskog, C., Winter, D., Dunbar, R., **Sangiorgi, F**., Warren, C., Pagani, M., Schouten, S., Willmott, V., Levy, R., DeConto, R., Powell, R., 2012, Antarctic and Southern Ocean influences on Late Pliocene global cooling, PNAS, *Proceedings of the National Academy of Science,* 109(17), 6423-6428.
13) Stickley C.E.S, Nalân Koç, Richard B. Pearce, Alan E.S. Kemp, Richard W. Jordan, **Francesca Sangiorgi** and Kristen St. John, 2012, Variability in the length of the sea ice season in the middle Eocene Arctic, *Geology*, 40(8), 727-730

14) L. Tauxe, Stickley, C.E., S. Sugisaki, Bijl, P.K., Bohaty, S., Brinkhuis, H., Escutia, C,, Flores, J.A., Iwai, M., F. Jimenez-Espejo, McKay, R., Passchier, S., Pross, J., Riesselman, C., Rohl, U., **Sangiorgi, F**., Welsh, K., Williams, T., and the Expedition 318 Shipboard Scientists, 2012, Integrated biomagnetostratigraphy of the Wilkes Land Margin for reconstruction of 53 Ma of Antarctic Margin paleoceanography: New results from IODP Expedition 318, submitted to *Paleoceanography*, 27(2), PA2214

15) Barke J., Abels H., **Sangiorgi F**., Greenwood D.R., Sweet A.R., Donders T., Lotter A.F., and Brinkhuis H., 2011, Orbital forcing, *Azolla* blooms and middle Eocene Arctic hydrology; clues from palynology, *Geology*, 39, 427-430

16) Els van Soelen, Emmy Lammertsma, Holger Cremer, Timme Donders, **Francesca Sangiorgi**, Gregg Brooks, Rebekka Larson, Jaap S. Sinninghe-Damsté, Frederike Wagner-Cremer, Gert-Jan Reichart, 2010. Late Holocene sea-level rise in Tampa Bay: Integrated reconstruction using biomarkers, pollen, organic-walled dinoflagellate cysts, and diatoms, *Estuarine, Coastal and Shelf Science*, 86, 216-224

17) Kim J-H, van der Meer J., Schouten S., Helmke P., Willmott V., **Sangiorgi F**., Koç N., Hopmans H.C., and Sinninghe Damsté J.S., New indices derived from the distribution of archaeal isoprenoid tetraether lipids: Implications for past sea surface temperature reconstructions, *Geochimica and Cosmochimica Acta,* 74(16), 4639-4654.

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19) Florindo F., Harwood D.M., Levy R.H., Acton G., Fielding C., Panter K., Paulsen T., Talarico F., Taviani M., **Sangiorgi F**., Willmont V., Lenczewski M. & the SMS Science Team, 2009. Explanatory Notes for the ANDRILL Southern McMurdo Sound Project, Antarctica. In: Harwood, D.M., Florindo, F., Talarico, F., and Levy, R.H., (editors), Studies from the ANDRILL, Southern McMurdo Sound Project, Antarctica. *Terra Antartica,* 15(1)-21-39

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24) Appy Sluijs, Stefan Schouten, Timme H. Donders, Petra Schoon, Ursula Röhl, Gert-Jan Reichart, **Francesca Sangiorgi**, Jung-Hyun Kim, Jaap S. Sinninghe Damsté, Henk Brinkhuis, A tropical Arctic during Eocene Thermal Maximum 2, *Nature Geosciences,* 11, 2, 777-780

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Paleoenvironmental Setting of the Central Arctic Ocean. *Paleoceanography,* 23, PA1S20, doi:10.1029/2007PA001559

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33) Cremer H., **Sangiorgi F**., Wagner F., McGee V., Lotter A.F., Visscher, H., 2007. Marine Littoral Diatoms (Bacillariophyceae) and Dinoflagellates cysts (Dinophyceae) from Rookery Bay, Florida, U.S.A. *Caribbean Journal of Science, 43, 1, 23-58*
34) Donnini F., Dinelli E., **Sangiorgi F**., Fabbri E., 2007. A biological and geochemical integrated approach to assess the environmental quality of a coastal lagoon (Ravenna, Italy). *Environment International, 33, 919-928*
35) Jakobsson M., Backman J., Rudels B., Nycander J., Frank M., Mayer L., Jokat W., **Sangiorgi F**., O'Regan M., Brinkhuis H., King J., Moran K., 2007. The Early Miocene onset of a Ventilated Circulation regime in the Arctic Ocean, *Nature, 447, 986-990*
36) Marino, G., Rohling E.J., Rijpstra W.I.C., **Sangiorgi F**., Schouten S., Sinninghe Damsté J.S., 2007. Exceptional sensitivity of the Eastern Mediterranean deep circulation to perturbations in the freshwater budget. *Geology, 35, 8, 675-678*
37) **Sangiorgi F**., Dinelli E., Maffioli P., Principato S., Capotondi L., Giunta S., Morigi C., Emeis K.C., Negri A., Corselli C., 2006. Geochemical and micropaleontological characterisation of a Mediterranean sapropel S5: a case study from core BAN89GC09 (south of Crete). *Palaeogeography, Palaeoclimatology, Palaeoecology,* 235, 192-207.
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39) Capotondi L., Morigi C., Principato M.S., **Sangiorgi F**., Maffioli P., Giunta S., Negri A., Corselli C., 2006. Planktonic and benthonic foraminifer changes during sapropel S5 deposition in the Eastern Mediterranean Sea. *Palaeogeography, Palaeoclimatology, Palaeoecology,* 235, 48-65
40) Giunta S., Maffioli P., Negri A., **Sangiorgi F**., Capotondi L., Morigi C., Principato M.S., Corselli C., 2006. The Isotopic stage 5e in the eastern Mediterranean Sea: Phytoplankton signal and its implications. *Palaeogeography, Palaeoclimatology, Palaeoecology,* 235, 28-47

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42) **Sangiorgi F**., Dinelli E., Gabbianelli G., Previati L., Donnini F., Fraternali M., Caselli F., Fabbri E., 2005. Integration of biological and geochemical analysis to assess the environmental quality of a coastal lagoon, the Pialassa Baiona (Ravenna, Italy). In: Lasserre P., Viaroli P., Campostrini P., *Lagoons and coastal wetlands in the Global Change context: Impacts and management Issues*, UNESCO proceedings series, 210-216.
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Other publications (not peer reviewed and/or outreach)

- Capotondi, L., Vigliotti L., Bergami C. and **Sangiorgi F**., 2011, The Dark Side of the Mediterranean Geological Record: the sapropel layers and a case study from the Ionian Sea. Volume Mare, Consiglio Nazionale delle Ricerche (CNR), Italy

- **F. Sangiorgi,** A. Sluijs, J. Barke and H. Brinkhuis, 2009, Reading the first early Cenozoic central Arctic sediment record: a palynological view**,** *PAGES (Past Global Changes) newsletters,* 17(2), 78-80
- **Sangiorgi F**., Brumsack H-J., Willard D.A., Schouten S., Stickley C.E., O'Regan M., Reichart G-J., Sinninghe Damste' J.S., Brinkhuis H., 2008. A 26 million years gap in the central Arctic Cenozoic record: Why and How? NSG (Netherlands Research School of Sedimentary Geology), Annual Report 2006, 41-46.
- Gabbianelli G., **Sangiorgi F**., 2005**.** Historical development and foreseeable evolution of the Po Delta Park coastal areas (Italy) as a response to the predicted climatic change and sea level rise. In: Gabbianelli G. & **Sangiorgi F**. (eds), Volume 4 of the 6th International Conference on the Mediterranean Coastal Environment, MEDCOAST03, Ravenna, Italy, 43-54.
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- **Sangiorgi F.**, L. Boni, K.P. Boessenkool, H. Brinkhuis, 2001 - Organic-walled dinoflagellate cysts from the north-western Adriatic Sea: preliminary results. *Biologia Marina Mediterranea*, vol. 8 (1), 562-565.
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- **Sangiorgi F.**, Dinelli E., Gabbianelli G., 2001. Coupling dinoflagellate cysts and geochemistry in the north Adriatic sediments: Clues to pollution and eutrophication. *Rapp. Comm. Int. Mer Médit*. 36: 416.
- **Sangiorgi F.**, Setti R., Gabbianelli G., Trombini C., 1998 - Geochemical characterization of Hg-contaminated Sediments of the "Pialassa Baiona" (Ravenna lagoon, Italy). *Rapp. Comm. Int. Mer Médit*. vol. 35(1): 96-97.

Conference abstracts: ~130 in international conferences, several have been presented as oral presentation and some as invited speaker (latest at EGU, Vienna, 2016, TMS Firenze, September 2016; Bonaire, October 2016)

Associations: Associations: American Association of Stratigraphic Palynologists (AASP), American Geophysical Union (AGU), Quaternary Dinoflagellates (DINOQUA, www.dinoqua.org), AIQUA (Associazione Italiana per gli studi del Quaternario)
WSPA (World Organization for the Protection of Animals), and UNICEF

Utrecht, 8 August 2016

APPLICATION TO PARTICIPATE IN AN IODP EXPEDITION

ESSAC Office ECORD Science Support & Advisory Committee
GEOMAR | Helmholtz Centre for Ocean Research Kiel
Wischhofstrasse 1-3
24148 Kiel, Germany
Hanno Kinkel (ESSAC Science Coordinator):
Tel: +49 431 600 2418
Fax:+49 431 600 2922
Web Page: http://www.essac.ecord.org Email: **essac@geomar.de**

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Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

1. PERSONAL INFORMATION

Family name: Taviani

First name: Marco

Current Position: Research Director

Institution: Institute of Marine Sciences, Italian National Research Council (ISMAR-CNR)

Address: via Gobetti 101

City, Postcode, Country: Bologna, 40129, Italy

Tel. work: +39-051 6398874
Tel. home: +39-347 2105420
Fax: +39-051 6398940
Email: marco.taviani@bo.ismar.cnr.it

Country of citizenship: Italy

Place of birth/date of birth: Rome (Italy) 1 August 1952

Gender: Male

Education (highest degree, including year PhD was received / is expected): PhD in Paleontology, 1987

Are you currently a student? NO

2. EXPEDITION INFORMATION

Summary of proposed participation, including area of scientific interest, current research and participation plan (maximum 250 characters with space – more detail should be included in the Letter of Interest):

Documented expertise on marine carbonates from temperate to polar settings. On-board recognition of carbonates in cores, evaluation of compositional and sedimentological aspects, and paleoenvironmental reconstructions, providing best choice material for dating/geochemical purposes

Prior involvement with DSDP/ODP/IODP and nature of involvement (expedition number, shipboard/shore-based participation, co-chief, etc):

No previous experience with DSDP/ODP/IODP (nomination for Red Sea leg in the '80s cancelled for geopolitical issues). Substantial experience in Antarctic drilling as on-ice palaeontologist for the three Cape Roberts Project and the two ANDRILL drilling seasons.

Post-cruise science support to achieve the proposed scientific objectives 1) future funding scheme and 2) support from host institution (e.g. staff, facilities)

1) Upon approval to IODP participation, future funding will be eventually provided through applications to the Italian Antarctic Project (PNRA). 2) With a permanent and untenured staff of > 200 people, ISMAR-CNR is the largest marine scientific institution of Italy (www.ismar.cnr.it/), organized in seven territorial sections which provide suitable sedimentological and chemical lab facilities for supporting the proposed study. Furthermore, the carbonate group is interfaced with top labs in the world for sophisticated geochemical analyses and up-to-date dating of marine carbonates

Three scientific and/or personal references

Dr. John B. Anderson

Earth Science Wiess School of Natural Sciences

Rice University, Houston, TX, USA

"John Anderson" johna@rice.edu

(alternatively: Dr. Ross D. Powell

Board of Trustees Professor and Distinguished Research Professor

Department of Geology and Environmental Geosciences, Northern Illinois University DeKalb, IL, USA, "Ross Powell" <rpowell@niu.edu>)

Dr. Timothy Naish

Director Antarctic Research Center

Kelburn Campus, Victoria University of Wellington, New Zealand

timothy.naish@vuw.ac.nz

Dr. Fabio Florindo

Research Director, National Institute of Geophysics and Volcanology (INGV)

Rome, Italy

"Fabio Florindo" <fabio.florindo@ingv.it

3. SCIENTIFIC EXPERTISE

For Scientist Jobs Descriptions visit: http://iodp.tamu.edu/participants/scientist_jobs.html

Please indicate your area(s) of expertise (maximum 3)

Discipline	Mark with X	Speciality
microbiologist		
organic and inorganic geochemist/biogeochemist		
physical properties specialist		
sedimentologist		
structural geologist		
paleontologist	X	Marine carbonates, paleoecology
paleomagnetist		
petrologist		
hydrogeologist		
Other		

4. ADDITIONAL DOCUMENTS

Please, provide the following documents:

- Letter of interest, including details about area of scientific interest, current research, expedition participation plan and post-cruise research
- CV and Publication list
- Letter of recommendation (for PhD students)
- See also: http://www.essac.ecord.org/flyer/Guidelines_for_Applying_to_sail.pdf

Please, send your application form as *a MS Word document* and the additional documents in *PDF format* (preferably as one file) by email to Jan Behrmann and Hanno Kinkel at the ESSAC office: essac@geomar.de.

In addition to the ESSAC application, all applicants *must inform their national office* (if applicable) *and national delegate* and send a copy of the application documents. ECORD does not provide funds for participation; the national offices or national delegates can provide information regarding travel support, post-cruise funding opportunities, etc.

See http://www.essac.ecord.org/index.php?mod=about&page=ESSAC for a list of the national contact persons.

Marco Taviani

Affiliation:

Institute of Marine Science - National Research Council

ISMAR-CNR, Via Gobetti 101, 40129 Bologna, Italy

Phone. +39 051 6398874 Fax +39 051 6398940

e-mail: marco.taviani@bo.ismar.cnr.it

http://www.ismar.cnr.it/personale/taviani-marco/tt_cv_breve_view?idRicercatore=taviani-marco

https://www.whoi.edu/profile.do?id=mtaviani

https://scholar.google.com/citations?user=qfolpccAAAAJ&hl=en

https://www.researchgate.net/profile/Marco_Taviani/info

Present Position
Research Director at ISMAR- Italian National Research Council (Istituto di Scienze Marine-CNR) Bologna, from 2001 to present

Education
Laurea cum laude in Geology, 1976, University of Bologna

PhD in Paleontology, 1987, Roma

CNR fellow (1978-80), Laboratory of Marine Geology, Bologna

CNR fellow (1982) Lamont-Doherty Geological Observatory, Columbia University, N.Y.

CNR fellow (1985), Louisiana State University, Baton Rouge, LA

NATO postdoc fellow (1989), University of Houston, TX

Visiting Associate Professor LSU (1985-86)

Tenured

CNR Researcher Researcher (1982-1999)
CNR First researcher (1999-2001)

Other

Participant at many research stages in USA and European universities

Lecturer at USA and European universities

Scientific SCUBA diving (FIPS, PADI, CMAS international certificates)

UNEP list of coral experts; CITES Scientific Commission (Italy) for two consecutive calls.

Is or has been member of International Associations of Sedimentologists, New York Academy of Sciences, Houston Natural History Museum, American Paleontological Society.

Guest Visitor at Woods Hole Institute of Oceanography (Biology Deptm), Woods Hole, USA 2005 to present).

Antarctic Service Medal (NSF)

Teaching and academic experience:

1985-1986: Visiting Associate Professor: Louisiana State University, Baton Rouge (USA); course in Advance Paleoecology (graduate students); Seminar on Paleoceanography (graduate)

1987: Lecturer in various Institutions of the People's Republic of China (e.g., Beijing University, Qingdao Academy of Sciences, Nanjing Institute of Paleontology, South-western Petroleum Institute etc.)

1996: Granted Professor, University of Palermo

2009-2010: Granted Professor, University of Bologna (Ravenna)

2010: External examiner, Georg-August-Universität Göttingen · Faculty of Geosciences and Geography, Germany, Göttingen, Evaluation Habilitation Thesis

2013: Non-Visiting External Examiner, University of Malta (Biology)

plus various other actions as PhD Student reviewer, Project reviewer, Award endorsement, etc. for German, Dutch, US, New Zealand and other international institutions, and participation in open house and on-board teaching activities in US Antarctic international contexts.

Main Interests

His main interests are: Marine carbonates; Paleoclimatology and paleoceanography (Antarctica, Mediterranean, Red Sea, Western Indian Ocean); Cainozic-Recent marine paleoecology; extreme environments (polar, *cold seeps*); bio-sedimentology (biogenic carbonate factories, deep water coral ecosystems); scientific SCUBA diving; outreach.

Activity

General:

His recent research is focused upon marine ecosystems (especially deep water corals), Cainozic-Recent marine paleontology and paleoecology (Antarctica, Mediterranean, Red Sea, Western Indian Ocean); extreme environments (polar, *cold seeps*); bio-sedimentology (biogenic carbonate factories); paleoclimatology and paleoceanography based upon sediment cores (Mediterranean, Antarctica, Red Sea), drillholes (Antarctica, Mediterranean), corals (Mediterranean, Atlantic Ocean, Antarctica) and other natural archives, including multiple geochemical approaches. He is very involved in popularizing science through articles, conferences, documentaries, TV and radio interviews, scientific films.

Cruises:

Has partecipated in over 50 oceanographic missions in the Mediterranean, Antarctica, Atlantic Ocean, Indian Ocean and Red Sea) often as chief-scientist, on major (over 40) and minor vessels, including submersible dives. Has participated upon invitation to a number of oceanographic expeditions aboard German, French, USA research vessels (e.g., Sonne, Meteor, Poseidon, Merian, NB Palmer, Falkor Le Suroit, Jean Charcot) in the Mediterranean, Antarctica, Northern Atlantic, West Africa, Indian Ocean, and Gulf of Mexico. Ha carried out dives on manned submersibles on deep-water cold seeps in the Gulf of Mexico (Johnson Sea-Link) and on deep-water coral banks off Norway (Jago).

Regarding Antarctica, has participated in four oceanographic missions, three in the Ross Sea (RV Polar Queen 1987-88; RV NB Palmer 2004, 2005), and one around the Antarctic Peninsula (RV NB Palmer 2007).

Scientific Drilling in Antarctica: He participated on all international drilling seasons in Antarctica within the Cape Roberts (CRP1-3) and Andrill (AND1,2) programmes as on-ice macropaleontologist, also with the role of Paleontology Team Leader (AND2).

He carried out on-land and nearshore field work in Europe, USA, South America (Tierra del Fuego), New Zealand, China's Karakorum, North Africa, Arab Peninsula, South Korea, Caribbeans, Indo-Pacific islands.

Project coordinator:

1991-93: RED SED (*The Red Sea and Gulf of Aden Sedimentological Project*, 1991-93, partners: France, Germany, Italy, UK) *(National Coordinator)*;

1994-97: TESTREEF (*Temporal and SpaTial variability of western Indian Ocean REEFs: climatic and environmental record,* 1994-97, partners: France, Germany, Italy, Netherlands, UK) *(National Coordinator)*;

Euromargins Moundforce: Forcing of Carbonate Mounds and Deep Water Coral Reefs along the NW European Continental Margin della European Science Foundation (National Coordinator);

CNR Strategic National Project Mar Rosso (co-responsible)

Antarctica/PNRA – (Programma Nazionale Ricerche Antartide) (5 projects)

Co-organizer of two field courses on bio-geology of coral reefs, Egypt.

Operating Unit (or Work Package) leader:

Partecipation with responsability (corals) in tasks of 'Hermes' (2004-2009) ed 'Hermione' EU programmes.

Responsible or task coordinator in various Italian Antarctic Projects (PNRA) including CARBONANT and PolarDove;

Responsible or task coordinator in various Italian ministry (MURST) projects such as SINAPSI, FIRB "Aplabes" (2003-05), Ritmare, and PNRA projects; participation in 4 COFIN national projects (Bologna and Parma universities), WP leader in PRIN Project.

M. Taviani

Publications

MT published > 350 scientific papers, as articles on ISI journals, other journals, book chapters and various science-popular articles on Italian and International magazines. for complete reference list see : https://scholar.google.com/citations?hl=en&user=qfolpccAAAAJ&pagesize=80&view_op=list_works

H index = 39 (Google Scholar)

Selected papers (last 5 years)

2016

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2015

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AM Addamo, I Martínez-Baraldés, A Vertino, R García-Jiménez, M **Taviani**, A Machordom 2015. Morphological polymorphism of *Desmophyllum dianthus* (Anthozoa: Hexacorallia) over a wide ecological and biogeographic range: stability in deep habitats? Zoologischer Anzeiger-A Journal of Comparative Zoology, doi.org/10.1016/j.jcz.2015.10.004

Foglini F, M Prampolini, A Micallef, L Angeletti, V Vittoria, A Deidun, M Soldati, M Taviani 2015. Late Quaternary coastal landscape morphology and evolution of the Maltese Islands (Mediterranean Sea) reconstructed from high-resolution seafloor data. Geological Society London Special Publications 411, 1-20, doi:10.1144/SP411.12

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Taviani M, F Franchi, L Angeletti, A Correggiari, M Lopez Correa, V Maselli, C Mazzoli, J Peckmann 2015. Biodetrital carbonates on the Adriatic continental shelf imprinted by oxidation of seeping hydrocarbons. Marine and Petroleum Geology, 66(3), 511-531

Blumenberg M, EO Walliser, M **Taviani**, R Seifert, J Reitner 2015. Authigenic carbonate formation and its impact on the biomarker inventory at hydrocarbon seeps–a case study from the Holocene Black Sea and the Plio-Pleistocene Northern Apennines (Italy). Marine and Petroleum Geology 66(3), 532-541

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L Krissek, G Kuhn, L Lacy, R Lehmann, D Magens, K Mankoff, C Milan, S Nielsen, M Olney, K Panther, S Passchier, T Patterson, T Paulsen, S Pekar, D Persico, S Petrushak, S Pierdominici, K Pound, J Reed, L Reichelt, C Riesselman, S Sandroni, D Schmitt, GS di Clemente, M Speece, E Strada, P Szymek, F Talarico, **M Taviani**, E Tuzzi, R Williams, T Wonik 2010. Cryogenic origin for brine in the subsurface of southern McMurdo Sound, Antarctica. Geology 38(7), 587-590

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M. Taviani

Letter of interest

The applicant has a long and documented experience in the field of marine carbonate bio-sedimentology and paleoecology (see CV and Reference list). A substantial part of his scientific activity has been and is still devoted to the study of carbonate factories governed by extreme polar conditions (Southern Ocean and Antarctica) and to macrofossil-based paleoenvironmental reconstruction of Cainozoic to present Antarctica. Having served for the whole five drilling seasons of Cape Roberts and ANDRILL programs as on-ice macropaleontologist, coupled with similar experience as core analyzer on-board US research vessels, the applicant has developed first-hand skills in the recognition of marine carbonates in drill-cores, their taxonomic recognition, and the related taphonomic and other sedimentological implications.

The relevance of macropaleontological content in Antarctic cores and drill-cores has long been neglected until their abundance and relevance has been clearly demonstrated by the Cape Roberts and ANDRILL programs. It has been thus shown that calcareous (and other) macrofossils and derived particles are much commoner than previously supposed with > ten times more macrofossil horizons identified through the availability of a specialist directly on-ice with respect of later post-cruise analyses.

In fact, macrofossils are common occurrence in the Cainozoic to Pleistocene marine record of Antarctic cores and of much value to identify at best past environments, since strongly responding to climatic and other forcing factors. They are also unique archives of precious paleoceanographic information encoded into calcareous skeletal parts and further provide material for a variety of dating techniques, useful at establishing precise chronological constraints. There are pitfalls, however, since many carbonates are of difficult identification, *in primis* because of taphonomic and diagenetic processes (fragmentation, dissolution etc.); furthermore, carbonate particles are obviously susceptible of *post-mortem* transport and other events in the sedimentary cycle, what could easily compromise their function as paleoenvironmental descriptors and/or as suitable geochemical material for dating.

The applicant has a considerable experience on modern and past ecosystems worldwide, including temperate-cool, subpolar and polar extreme environments, to deal with taxonomic identification of any fossil material even under imperfect preservation state. It has also a solid knowledge of sedimentological processes as well as of carbonate petrography and geochemistry to assist at best with the identification of the most suitable material for dating or other geochemistry-based paleoceanographic issues. This has been already the case with carbonates obtained by Cape Roberts and ANDRILL programs or by sediment cores around Antarctica which have been considered for dating or for stable isotope assessments (see Reference list).

Therefore, the applicant's design during the IODP mission would be to check at cm scale with magnifying lens all recovered cores for any visible carbonate, sampling those which may serve to provide paleoenvironmental reconstructions and/or useful for geochemical analyses and dating. A first hand identification of selected samples will be carried out on-board after cleaning, also under and optical microscope.

The post-cruise research would focus on refining the taxonomy of the carbonate material to better the paleoenvironmental reconstruction, as well as to go in-depth to examine the fossils' composition in the lab (diffractometric and other techniques). This research will be conducted at ISMAR-CNR, Bologna and connected labs, following the availability of samples. It is expected to produce results within six months after reception and to reasonably contribute to scientific papers within one year from the cruise's end.

APPLICATION TO PARTICIPATE IN AN IODP EXPEDITION

ESSAC Office ECORD Science Support & Advisory Committee
GEOMAR | Helmholtz Centre for Ocean Research Kiel
Wischhofstrasse 1-3
24148 Kiel, Germany
Hanno Kinkel (ESSAC Science Coordinator):
Tel: +49 431 600 2418
Fax:+49 431 600 2922
Web Page: http://www.essac.ecord.org Email: **essac@geomar.de**

Please type information

Apply to Sail Application Form

Expedition Number 374: Ross Sea West Antarctic Ice Sheet History

1. PERSONAL INFORMATION

Family name: van de Flierdt

First name: Tina

Current Position: Reader in Isotope Geochemistry

Institution: Imperial College London

Address: Department of Earth Science and Engineering, South Kensington Campus, Exhibition Road

City, Postcode, Country: London, SW7 2AZ, UK

Tel. work: +44 20 759 41290
Tel. home: +44 20 738 59681
Fax: +44 20 759 47444
Email: tina.vandeflierdt@imperial.ac.uk

Country of citizenship: Germany

Place of birth/date of birth: Kevelaer / 21.11.1973

Gender: Female

Education (highest degree, including year PhD was received / is expected):

2003 – PhD in Natural Sciences, ETH Zurich

Are you currently a student? NO Expected Graduation Date:

2. EXPEDITION INFORMATION

Summary of proposed participation, including area of scientific interest, current research and participation plan (maximum 250 characters with space – more detail should be included in the Letter of Interest):

(i) reconstruct the Neogene stability of the WAIS by using (isotope) geochemical provenance analysis of detrital sediments, (ii) decipher the Neogene history of Ross Sea Bottom Water by analysing the Nd isotopic composition of authigenic phases

Prior involvement with DSDP/ODP/IODP and nature of involvement (expedition number, shipboard/shore-based participation, co-chief, etc):

As a palaeoceanographer and palaeoclimatologist I have worked on DSDP/ODP/IODP samples for the past 13 years. I sailed as Inorganic Geochemist on IODP Expedition 318 to Wilkes Land (January-March 2010). The paper produced by my PhD student Carys Cook has been one of the highlights from this expedition so far (published in summer 2013 and cited 61 times according to Google Scholar). I was a named co-author on 10 papers from this expedition so far, including papers in *Nature*, *Science* and *Nature Geoscience*, with four more papers submitted/under submission. I was an invited keynote speaker at the UK IODP conference in 2014 and have given numerous invited/plenary talks about my group's work on Antarctic ice sheets and past ocean circulation patterns using radiogenic isotopes. I incorporated a life podcast with IODP Expedition 361 in my 2016 classroom teaching.

Post-cruise science support to achieve the proposed scientific objectives 1) future funding scheme and 2) support from host institution (e.g. staff, facilities)

I am a permanent member of staff at Imperial College and a co-leader and co-founder of the MAGIC (Mass Spectrometry and Isotope Geochemistry at Imperial College London) isotope facility. The facility is supported by two experienced technicians and hosts a diverse group of about 30 scientists and scientific guests engaged in high-profile isotopic research (see: www.imperial.ac.uk/engineering/departments/earth-science/research/research-groups/magic/). The laboratories offer all analytical facilities required for the proposed work. This includes (i) well-equipped general-purpose laboratories; (ii) metal-free clean rooms of more than 150 m^2 with Class 10 laminar flow workbenches for demanding, low blank sample preparation work; (iii) mass spectrometry laboratories with currently two instruments for high precision isotopic analyses of a wide range of elements – a Nu Plasma HR MC-ICP-MS, and a Thermo-Fisher Triton TIMS. An additional MC-ICP-MS instrument (a Nu Plasma II) was recently purchased and is due to be installed in October 2016, which will be particularly suited for past seawater analysis.

Running costs for the laboratories and machines are shared by the Department of Earth Science and Engineering, Imperial College London, and research grants from four different PIs with an active research portfolio in isotope geochemistry. In addition to my normal grant writing portfolio (NERC, Royal Society, Leverhulme Trust, Jebsen Foundation, Grantham Institute for Climate Change, European Commission), which has maintained my own research group of ~4 PhD students and 1-2 postdocs over the past eight years, I will apply for UK IODP funds if available at the time of sailing.

Three scientific and/or personal references

Carlota Escutia, Henk Brinkhuis, Sidney Hemming

3. SCIENTIFIC EXPERTISE

For Scientist Jobs Descriptions visit: http://iodp.tamu.edu/participants/scientist_jobs.html

Please indicate your area(s) of expertise (maximum 3)

Discipline	Mark with X	Speciality
microbiologist		
organic and inorganic geochemist/biogeochemist	x	Radiogenic isotope geochemistry (Sr, Nd, Hf, Pb); major and trace element geochemistry
physical properties specialist	x	Not really my expertise, but probably a job description I could satisfy
sedimentologist		
structural geologist		
paleontologist		
paleomagnetist		
petrologist		
hydrogeologist		
Other		

4. ADDITIONAL DOCUMENTS

Please, provide the following documents:

- Letter of interest, including details about area of scientific interest, current research, expedition participation plan and post-cruise research
- CV and Publication list
- Letter of recommendation (for PhD students)
- See also: http://www.essac.ecord.org/flyer/Guidelines_for_Applying_to_sail.pdf

Please, send your application form as *a MS Word document* and the additional documents in *PDF format* (preferably as one file) by email to Jan Behrmann and Hanno Kinkel at the ESSAC office: essac@geomar.de.

In addition to the ESSAC application, all applicants *must inform their national office* (if applicable) *and national delegate* and send a copy of the application documents. ECORD does not provide funds for participation; the national offices or national delegates can provide information regarding travel support, post-cruise funding opportunities, etc.

See http://www.essac.ecord.org/index.php?mod=about&page=ESSAC for a list of the national contact persons.

Imperial College London

Mass Spectrometry and Isotope Geochemistry at Imperial College London

Room 4.45, Royal School of Mines
Department of Earth Science and Engineering
South Kensington Campus
London SW7 2AZ
Tel: +44 (0)207 59 41290

tina.vandeflierdt@imperial.ac.uk
http://www3.imperial.ac.uk/people/tina.vandeflierdt

Dr Tina van de Flierdt
Reader in Isotope Geochemistry

13/08/2016

Application IODP Expedition 374 – Ross Sea West Antarctic Ice Sheet History

Dear madam/sir,

The focus of my research over the past sixteen years has been the development and application of geochemical and isotopic tracers in oceanography, paleoceanography and paleoclimate, in particular using radiogenic isotope systems (Ar, Sr, Pb, Nd, Hf). Current projects my group is working on include addressing the relationships between continental crust composition, continental weathering, and ocean chemistry, reconstructing past ocean circulation patterns (on millennial- to million-year time-scales), and understanding the response of the Antarctic ice sheet to past climates (on millennial- to million-year time-scales).

To address frontier questions in Earth Science I utilise a wide spectrum of methodologies from multiple collector inductively coupled plasma mass spectrometry (MC-ICP-MS) over thermal ionization mass spectrometry (TIMS) to noble gas mass spectrometry. I am co-leader of the MAGIC isotope facility (http://www3.imperial.ac.uk/earthscienceandengineering/research/magic) and have extensive experience in inorganic geochemistry.

Two of my current research areas are of particular relevance to IODP Expedition 374 and will be expanded on below:

(1) Provenance of marine sediments – from the build-up of a West Antarctic ice sheets to dynamic fluctuations of its marine-based portions on orbital timescales

For the past 10+ years I have been working on developing and establishing ways to reconstruct the extent of Antarctic ice sheets and to unravel the geology hidden underneath the ice (e.g. van de Flierdt et al., 2007; Roy et al., 2007; van de Flierdt et al., 2008; Williams et al., 2010; Pierce et al., 2011). The approach utilises the relationship between geochemical fingerprints (i.e. radiogenic isotope composition) of past detrital sediments (single grains and bulk fractions) and continental source rocks to decipher where the eroding ice margin (or riverine system) was located in the past. Methods applied to date include Sr, Nd, Hf, and Pb isotopes in bulk and size-specific detrital sediments, and single grain U-Pb zircon dating as well as 40Ar/39Ar biotite and hornblende dating. I sailed on IODP Expedition 318 to the Wilkes Land margin, where such techniques, have been applied with great success to learn about the provenance of eroded sediments and ice sheet dynamics (e.g. Pross et al., 2012; Houben et al., 2013; Cook et al., 2013; Cook et al., under submission). Over the past three years I also started more detailed studies on applying similar techniques to the shores of West Antarctica, which shows great promise (Simoes Pereira et al., 2016, Goldschmidt abstract).

IODP Expedition 374 to the Ross Sea will benefit from experience with and insights into both of these ice sheets, as the (initial) detrital material deposited may contain an erosional signal from both ice sheets (objective 1), which can however be teased apart using the right geochemical toolbox. I would be excited to work on unravelling the provenance of sediment from the initial ice advance in the Ross Sea (shelf sites and objective 1) as well as reconstructing a low resolution record of the Neogene history of the WAIS, and a high resolution record of Plio-Pleistocene ice dynamics (combination of shelf and rise sites). Interpretation of the new records will be greatly aided by comparison with previous and ongoing work in my group from East and West Antarctica (i.e. Wilkes Land: Cook et al., 2013; Cook et al., under submission; Pierce et al., under submission; Bertram, ongoing PhD project; West Antarctica and Amundsen Sea: Simoes Pereira, ongoing PhD project).

(2) The role of Antarctic Bottom Water in global ocean circulation – first records of the history of Ross Sea Bottom Water

A second interest of mine is to understand the role of bottom waters formed around the Antarctic shores and their contributions to and interplay with the global thermohaline circulation (e.g. van de Flierdt et al., 2004a,b; van de Flierdt et al., 2006; Lambelet et al., 2015, Goldschmidt abstract; Huck et al., under submission). Ross Sea bottom water is the local variety of Antarctic Bottom Water (AABW) most influential in the abyssal Pacific Ocean. Its composition is distinct from Weddell Sea bottom water and local East Antarctic varieties of bottom water such as Adélie Coast bottom water. This is not only true for T-S properties but also for its radiogenic isotope composition (e.g. Rickli et al., 2014; Lambelet et al., 2015, Goldschmidt abstract) and makes it hence traceable back in time. The proxy and archives utilised for such work is the Nd isotopic composition of fossil fish teeth and debris and FeMn coatings (e.g. van de Flierdt and Frank, 2011). The detailed history of Ross Sea bottom water production and export is however undetermined. This statement is true for Neogene timescales, where Southern Component water will have modulated and compensated for reorganisation of the global thermohaline circulation following the closure of tectonic gateways such as Indonesia (van de Flierdt et al., 2004) and Panama. It is however also true at higher resolution during the Late Pleistocene, where glacial-interglacial patterns reveal an intriguing interplay of deep and intermediate waters from the Atlantic and Pacific (e.g. Deaney et al., submitted; Struve et al., in preparation), distinct from the concept of one large overturning circulation cell in the modern ocean. Southern Ocean stratification, northward shift of the westerlies, and (increased) export of intermediate to deep waters from the North Pacific are some of the observed glacial changes. IODP Expedition 374 has the potential to provide a near continuous records of AABW production in the Ross Sea. The two rise sites will be particularly important in this respect and will hopefully yield a Neogene record of SCW export as well as a Late Pleistocene record of changes in production (or even location) of AABW in the Ross Sea (objective 3).

In summary, I would be excited to bring my expertise in radiogenic isotope geochemistry to Expedition 374 and contribute towards objectives 1, 3, and 4 of the proposed work. Reconstructing and understanding ocean circulation and ice sheets have been central topics to my entire scientific career, and are two goals that can be realised from the same sample material by isolating different fractions of the sediments (detrial fraction = provenance record; authigenic fraction = fish teeth/FeMn oxides = seawater record).

Please contact me if I can provide any further information.

Yours sincerely,
Tina van de Flierdt

Dr. Tina van de Flierdt

Imperial College London, Department of Earth Science and Engineering,
South Kensington Campus, London, SW7 2AZ
Phone: +44 207 59 41290, Email: tina.vandeflierdt@imperial.ac.uk

Nationality: German, *Date of Birth*: November 21, 1973

PROFESSIONAL EXPERIENCE

2014 –	Reader, Imperial College London
2010 – 2014	Senior Lecturer, Imperial College London
2008 –	Adjunct Research Scientist, Lamont-Doherty Earth Observatory of Columbia University, New York
2007 – 2010	Lecturer, Imperial College London
2006 – 2008	Storke Doherty Lecturer, Lamont-Doherty Earth Observatory and Department of Earth and Environmental Sciences, Columbia University, New York
2005 – 2008	Doherty Associate Research Scientist, Lamont-Doherty Earth Observatory of Columbia University, New York
2003 – 2005	Postdoctoral Research Fellow, Lamont-Doherty Earth Observatory of Columbia University, New York

EDUCATION

2000 – 2003	PhD in Natural Sciences, Institute of Isotope Geology and Mineral Resources, ETH Zürich, Switzerland
1993 – 2000	Diplom in Geology and Paleontology (MSc equivalent), Institute for Geology and Paleontology, University of Bonn, Germany

RESEARCH

I work on the development and application of novel geochemical tools to address fundamental questions in Earth Sciences with a focus on ocean chemistry and climate change, now and in the past. Some of my key research questions evolve around assessing and understanding the impact of anthropogenic pollution and climate change on ocean chemistry and ocean circulation. Of particular societal relevance is my work on the stability of polar ice sheets under warmer than present temperatures.

FUNDING

Lead PI and co-I on **23 funded research grants totalling ~ £3,100,000** (2004-2016).

Funding bodies: NERC (10), NSF (7), European Commission (1), Leverhulme Trust (1), Royal Society (1), Kristian Gerhard Jebsen foundation (1), L-DEO Climate Center (3).

PDRA AND RESEARCH FELLOW MENTORING

PDRAs – present (2) and past (3)

- Myriam Lambelet, 2014-
- D. Wilson 2013-
- T. Stichel 2013-2014, now: PDRA at University of Southampton/NOC
- M. Paul, 2010-2012, now: visiting researcher at Imperial College London
- K. Crocket, 2009-2012, now: lecturer at SAMS

Mentoring of research fellows – present (1) and past (3)

- Susan Little, 2015- , Leverhulme Early Career Research Fellow
- Matthias Willbold, 2013-2014, NERC Independent Research Fellow, now: Senior Research Fellow (proleptic Senior Lecturer) at University of Manchester
- J. Prytulak, 2011-2013, NERC Research Fellow, now: lecturer at Imperial College
- T. Dunkley Jones, 2010-2011, Royal Society Dorothy Hodgkin Fellow, now: lecturer at the University of Birmingham

ANALYTICAL EXPERIENCE

Co-leader of the MAGIC facilities at Imperial College London with more than 15 years of experience in clean room isotope geochemistry and mass spectrometry (MC-ICP-MS, TIMS, AMS, ICP-AES, ICP-MS, gas mass spectrometry).

SEAGOING EXPERIENCE

February - March 2017	five week cruise on the German vessel Polarstern to the Amundsen Sea to collect sediment cores to unravel past ice sheet stability (Punta Arenas to Punta Arenas; chief scientist: K. Gohl, AWI, Bremerhaven)
May - June 2011	five week cruise on the Nathaniel B. Palmer in the Drake Passage to collect deep-sea corals (Punta Arenas to Punta Arenas; PIs: L.F. Robinson, WHOI, R. Waller, U Hawaii)
January-March 2010	two month IODP Leg 318, Wilkes Land; sailing as Inorganic Geochemist (Wellington to Hobart; chief scientists: C. Escutia, University of Granada, and H. Brinkhuis, Utrecht University)
June-July 2008	two week cruise on the R/V Knorr to collect seawater and particles for international intercalibration of Nd and Hf isotopes and REE concentrateions in seawater; GEOTRACES program (Bermuda to Norfolk, VA; PIs: G. Cutter, K. Bruland, R. Sherrell)
April - May 2008	seven week cruise on the Nathaniel B. Palmer in the Drake Passage to collect deep-sea corals (Punta Arenas to Punta Arenas; PIs: L.F. Robinson, WHOI, R. Waller, U Hawaii)

PUBLICATIONS

Lead author and co-author on **63 peer-reviewed publications in 14 years (h-Index of 24; citations: 1601** – Google Scholar, August 2016).

See last pages for full publication list.

TEACHING

TEACHING EXPERIENCE

- ***Fellow of the Higher Education Academy*** *(2016).*
- ***Excellent student evaluations*** for classes taught at Imperial College (since 2008) and Columbia University (2004-2006).
- ***Certificate of Advanced Study in Learning and Teaching*** (2 year course), Imperial College London (2010).
- ***Nominated for the student academic choice awards in best teaching and best tutoring.***

Since 2012	ESE 3.35/4.30 Environmental/Earth Science projects (2^{nd}/3^{rd} year module), 18.75 ECTS, lecturer, Imperial College London
Since 2010	ESE 4.22 Climate (1^{st}/2^{nd}/3^{rd} year module), 3.75 ECTS, coordinator and lecturer, Imperial College London
Since 2009	ESE 5.28 MSci project, (4^{th} year module), 30.00 ECTS, supervisor and marker, Imperial College London
Since 2008	ESE 2.15 & 3.12 Projects and Tutorials (1^{st} and 2^{nd} year modules), 3.75 ECTS each, personal tutor, Imperial College London
Since 2008	ESE 5.09 Palaeoceanography (3^{rd}/4^{th} year module), 7.50 ECTS, coordinator and lecturer, Imperial College London
2015	Climate Change Controversies (3^{rd} year module), Imperial College London
2013	Fresher's fieldtrip (1^{st} year module), Imperial College London
2012	Topical Tutorials (2^{nd} year module), Imperial College London
Autumn 2006	EESC V2100 'Climate Systems', Columbia University
Spring 2006	Graduate seminar EESC G9802 'Toward an improved understanding of paleoceanographic proxies: combining models with data', L-DEO
2004	Guest lecture about Ocean Circulation in the undergraduate course 'Introduction to Earth Science II', Columbia University

PHD SUPERVISION

Nominated for the President's Awards for Excellence in Research Supervision.

PhDs – ongoing (5):

- Naomi Pratt, 2015-2019, DTP Scholarship (supervisor)
- Alexander Griffiths, 2015-2019, DTP Scholarship (co-supervisor)
- Rachel Bertram, 2014-2018, Kristian Gerhard Jebsen Scholarships (supervisor)
- Patric Simoes Pereira, 2014-2018, Kristian Gerhard Jebsen Scholarships (supervisor)
- K. Murphy, 2012-2016; NERC standard grant (co-supervisor)

PhDs – graduated (8):

- T. Struve, 2011-2015: (supervisor, now PDRA at ICBM Oldenburg)
- L. Bridgestock, 2011-2015 (supervisor, now PDRA at University of Oxford)
- K. Prentice, 2011-2015 (co-supervisor, now working in industry)
- R. Khondoker, 2011-2014 (co-supervisor)
- C. Huck, 2011-2014 (supervisor; now PDRA at NOCS)

- M. Lambelet, 2010-2014 (supervisor; now PDRA at Imperial College)
- C. Cook, 2009-2013 (supervisor; now PDRA at University of Florida, Gainesville)
- Z. Xue, 2007-2012 (co-supervisor)

ESTEEM AND PROFESSIONAL ACTIVITIES

HONORS AND AWARDS

2016	Fellow of the Higher Education Academy
2011	Antarctic Service Medal
2006 - 2010	Storke Doherty Lectureship, Department of Earth and Environmental Sciences and Lamont-Doherty Earth Observatory, Columbia University
2003 - 2005	Lamont-Doherty Postdoctoral Research Fellowship
2003 - 2005	Gary Comer Abrupt Climate Change Fellowship
2001	"IMAGES Student Poster Prize for outstanding research work and excellent standard of presentation" at the 7th International Conference on Paleoceanography, Sapporo, Japan
2000	"Heinrich-Hörlein-Foundation" prize for an outstanding Diploma thesis, Bonn, Germany
1999	Poster award, 3rd Meeting of Young Geochemists, Göttingen, Germany

INVITED TALKS

Keynote, Plenary and Invited Conference talks:

- Congresso Brasileiro de Oceanografia, November 2016, Salvador-Bahia, Brasil (keynote)
- Royal Society meeting, 'Biological and climatic impacts of ocean trace element chemistry', December 2015, London (invited/plenary)
- RIP (Research in progress) conference, 2015, Southampton (invited/plenary)
- UK IODP science conference, 2014, London (invited/plenary)
- Goldschmidt conference, California, 2014 (invited talk – declined)
- '100 years and Beyond' – centenary oil technology meeting at Imperial College London, 2013 (invited/plenary)
- 11th conference on Paleoceanography, Sitges, Spain, 2013 (invited/plenary)
- INQUA workshop on contourites, Hull, UK, 2013 (keynote/plenary)
- Fall AGU, San Francisco, USA, 2012 (invited)
- Goldschmidt conference, Montreal, Canada, 2012 (keynote)
- Ocean Day, Imperial College London, 2012 (invited/plenary)
- Frontiers of Science meeting in 'Marine Sciences', Royal Society & Australian Academy of Sciences, Perth, Australia, 2010 (invited/plenary)
- Fall AGU meeting, 2006 (invited)
- Dissertation Symposium on Chemical Oceanography, Hawaii, 2003

Invited seminars at >25 international universities over the past 13 years.

EDITORIAL EXPERIENCE

- Associate Editor for ***Geochimica et Cosmochimica Acta***
- Editor for **'*Geochemical News*'** – distributed weekly to 20,000 readers
- Lead editor on 'geochemistry and microbiology' chapters in ***Initial Reports and Proceedings of the Integrated Ocean Drilling Program***, Expedition 318, Wilkes Land glacial history (2010 and 2011)
- Invited guest editor for a ***special volume*** on 'Case studies on Nd isotopes in paleoceanography'; ***Quaternary Science Reviews*** (2010)

MEMBERSHIP OF RESEARCH COUNCIL COMMITTEES

- Member of the ***Royal Society***'s International Exchange Committee (2014-2016)
- Member of the ***NERC*** peer review panel (2011-2014): served on seven panels for various NERC activities (e.g. standard grants, fellowships, directed programs)

MANAGEMENT COMMITTEES OF LARGE SCIENTIFIC PROGRAMS

- Alternate member for ***UK ANDRILL*** representation (2014-)
- Member of international standards and intercalibration committee for the ***GEOTRACES*** program (2014-)
- Member of the ***UK GEOTRACES*** steering committee (2012-)
- Member of intercalibration work group of ES0801 COST Action on 'The Ocean Chemistry of Bioactive Trace Elements and Paleoclimate Proxies' (2009-2012)
- Co-coordinating the ***international intercalibration*** for Nd isotopes and rare earth elements in seawater samples (GEOTRACES intercalibration phase; 2007-2011)
- Serving on the first ***US GEOTRACES*** Steering Committee (2006-2010)

REVIEWING SERVICES

Reviewer for a large number of ***scientific journals***, including Nature, Science, Nature Geoscience, Earth & Planetary Science Letters, Geochimica et Cosmochimica Acta, Geology, Paleoceanography, Chemical Geology, Deep-Sea Research, G-cubed, Journal of Geophysical Research, Geophysical Research Letters

Reviewer for a diverse range of ***funding bodies*** including Australian Antarctic Division, DFG, ETH, Geo Mission, IODP, Marsden Foundation, NERC, NSERC, NSF, Royal Society

CONFERENCE, WORKSHOP AND SEMINAR ORGANISATION

- serving on the International Planning Committee for the International Conference on Paleoceanography in 2016 in Utrecht, NL
- session organiser: Goldschmidt 2016, 2015, 2012, 2009, 2006; EGU 2016, 2011; INQUA 2015; Fall AGU 2008, Spring AGU 2005
- organiser for a GEOTRACES workshop on 'Stable isotopes of biologically important trace metals', Imperial College, 2012 (50 international participants)
- serving on the International Planning Committee for the Goldschmidt conference 2006 in Melbourne, Australia

PROFESSIONAL ORGANIZATIONS

American Geophysical Union, Geochemical Society, German Mineralogical Association, Challenger Society for Marine Sciences

INTERNAL CONTRIBUTIONS AND OUTREACH

- Member of the ***college-wide NERC demand management review group*** (2016-)
- Chairing the ***departmental NERC committee*** (2016-)
- Co-developed ***White Paper for Sabbatical Leave*** for department (2015)
- Member of the ***Departmental Strategy Group*** (2015-)
- Departmental ***Athena Swan*** committee member (2013-)
- Co-organising monthly ***E&P lunchtime meetings*** (since 2013)
- Co-organizing Earth Science and Engineering ***departmental seminar*** 2011-2015
- ***Managing laboratories*** for shared cross-departmental use and ***organizing several moves and laboratory space redistributions*** (~30 users) (since 2008)
- Contributing to the ***career advancement of younger colleagues*** through talks and panel discussions organized by the postdoctoral development center and the faculty
- recent outreach activities: ESE and Imperial Open Days, Imperial Fringe, Imperial Festival, Royal Society Summer Exhibition; media contact for specific topics through the Grantham Institute (e.g. **COP21**); one hour podcast with Nature editor Michael White (**forecast.org**); panelist for screening of climate change movie; representing ESE and Imperial College at several occasions (i.e. informal visit Al Gore)

Evening and educational lectures:

Evening lecture series, Cardiff, 2016; Birbeck student series, 2016; Pint of Science, London, 2014; Amateur Geological Society, London, 2013; Postdoctoral Development Centre, Imperial College, 2013; Harrow and Hillingdon Geological Society, 2011; London International Youth Science Forum, 2010; Geological Society, Shell University lecture series, Birmingham, 2009

PUBLICATION LIST

Lead author and co-author on 63 peer-reviewed publications since 2002 (Google Scholar, August 2016: h-Index of 24, cited: 1601 times).

(*) students supervised by myself
(**) postdocs mentored by myself
(‡) students supervised by collaborators

Under submission

(71) Pierce, E.L.‡, **van de Flierdt, T.**, Williams, T., Hemming, S.R., Cook, C.P., Passchier, S. (under submission), Evidence for a dynamic East Antarctic ice sheet during the mid-Miocene climate transition. *Earth Planet. Sci. Lett.*

(70) Cook, C.P.*, Hemming, S.R., **van de Flierdt, T.**, Pierce, E.L., Williams, T., Galindo, A.L., Jiménez-Espejo, F.J., Escutia, C. (under submission), Glacial erosion of Antarctica in the Pliocene: a comparative study of multiple marine sediment provenance tracers. *Chemical Geology*.

(69) Huck, C.E.*, **van de Flierdt, T.**, Bohaty, S.M., Hammond, S.J. (under submission), Antarctic climate, ocean circulation patterns, and deep-water formation in the Southern Ocean during the Eocene. *Paleoceanography*.

(68) Struve, T.*, **van de Flierdt, T.**, Burke, A., Robinson, L.F., Hammond, S., Crocket, K.C., Bradtmiller, L.I., Auro, M.E., Falcon, K.M. (under submission), Neodymium isotopes and concentrations in aragonitic scleractinian deep-sea coral skeletons – modern calibration and evaluation of palaeo-applications. *Chemical Geology*.

(67) Khondoker, R.*, Weiss, D., **van de Flierdt, T.**, Rehkämper, M., Strekopytov, S., Williams-Humphries, E., Najorka, J., Shoufei, D., Ferrat, M., Bory, A., Bout-Roumazeilles, V., Smichowski, P., Cid-Agüero, Gioia, S., Babinski, M., Losno, R., Monna, F. (under submission), Elemental and isotopic (Pb and Nd) characterisation of potential aerosol sources to the South Atlantic Ocean from South America and Southern Africa. *Chemie der Erde.*

Submitted / under revision

(66) Wilson, D.J.**, **van de Flierdt, T.**, Adkins, J.F. (submitted), Lead isotopes in deep-sea coral skeletons: ground-truthing and a first deglacial Southern Ocean record. *Geochimica et Cosmochimica Acta*.

(65) Deaney, E.L.‡, Barker, S., **van de Flierdt, T.** (submitted), Timing of ocean circulation recovery modulates amplitude of deglacial CO_2. *Nature Communications.*

(64) Sangiorgi, F., Bijl, P.K., Passchier, S., Salzmann, U., Schouten, S., Pross, J., Bohaty, S.M., McKay, R., **van de Flierdt, T.**, Levy, R., Williams, T., Escutia, C., Brinkhuis, H. (under revision), Ocean warmth and loss of marine-terminating East Antarctic ice sheets during the mid-Miocene Climate Optimum. *Nature Communications.*

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(62) Bridgestock, L.[*], **van de Flierdt, T.**, Rehkämper, M., Paul, M., Middag, R., Milne, A., Lohan, M.C., Baker, A., Chance, R., Khondoker, R., Strekopytov, S., Humphrey-Williams, E., Achterberg, E., Rijkenberg, M., de Baar, H. (accepted), Return of naturally sourced Pb to Atlantic surface waters. *Nature Communications.*

(61) Huck, C.E.[*], **van de Flierdt, T.**, Jiménez-Espejo, F.J., Bohaty, S.M., Röhl, U., Hammond, S.J. (2016), Robustness of fossil fish teeth for seawater neodymium isotope reconstructions under variable redox conditions in an ancient shallow marine setting. *Geochem. Geophys. Geosyst.*, 17, doi:10.1002/2015GC006218.

(60) Lambelet, M.[*], **van de Flierdt, T.**, Crocket, K., Rehkämper, M., Kreissig, K., Coles, B., Rijkenberg, M.J.A., Gerringa, L.J.A., De Baar, H.J.W., Steinfeldt, R. (2016), Neodymium isotopic composition and concentration in the western North Atlantic Ocean: Results from the GEOTRACES GA02 section. *Geochim. Cosmochim. Acta.*, 177, 1-29.

(59) Murphy, K.[*], Rehkämper, M., Kreissig, K., Coles, B., **van de Flierdt, T.** (2016), Improvements in Cd stable isotope analyses achieved through use of liquid-liquid extraction to remove organic residues from Cd separates obtained by extraction chromatography. *J. Anal. At. Spectrom.*, 31, 319-327.

(58) Struve, T.[*], **van de Flierdt, T.**, Robinson, L.F., Bradmiller, L.I., Hines, S.K., Adkins, J.F., Lambelet, M., Crocket, K.C., Kreissig, K., Coles, B., Auro, M.E. (2016), Neodymium isotope analyses after combined extraction of actinide and lanthanide elements from seawater and deep-sea coral aragonite. *Geochem. Geophys. Geosyst.*, 17, doi:10.1002/2015GC006130.

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(57) Jiménez-Espejo, F.J., Pardos-Gené, M., Martínez-Ruiz, F., García-Alix, A., **van de Flierdt, T.**, Toyofuku, T., Bahr, A., Kreissig, K. (2015), Geochemical evidence for intermediate water circulation in the westernmost Mediterranean over the last 20 ky cal BP and its impact on the Mediterranean outflow. *Global Planetary Change*, 135, 38-46.

(56) Paul, M.[**], **van de Flierdt, T.**, Rehkamper, M., Khondoker, R.[*], Weiss, D., Lohan, M.C., Homoky, W.B. (2015), Tracing the Agulhas leakage with lead isotopes. *Geophys. Res. Lett.*, 42, 8515-8521, doi:10.1002/2015GL065625.

(55) Paul, M.[**], Bridgestock, L.[*], Rehkamper, M., **van de Flierdt, T.**, Weiss, D. (2015), High-precision measurements of seawater Pb isotope compositions by double spike thermal ionization mass spectrometry. *Analytica Chimica Acta*, 863, 59-69.

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(50) Pierce, E.L.[‡], Hemming, S.R., Williams, T., **van de Flierdt, T.**, Thomson, S.N., Reiners, P.W., Gehrels, G.E., Brachfeld, S.A., Goldstein, S.L. (2014), A comparison of detrital U-Pb zircon 40Ar/39Ar biotite ages in marine sediments off East Antarctica: implications for the geology of subglacial terrains and provenance studies. *Earth Science Reviews*, 138, 156-178.

(49) Patterson, M.O. [‡], McKay, R.M., Naish, T., Escutia, C., Jimenez-Espejo, F.J., Raymo, M.E., Meyers, S.R., Tauxe, L., Brinkhuis, H., and **IODP Expedition 318 Scientists** (2014), Orbital forcing of the East Antarctic ice sheet during the Pliocene and Early Pleistocene. *Nature Geoscience*, 7, doi:10.10.8/NGEO02273.

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(44) Crocket, K.[**], Lambelet, M.[*], **van de Flierdt, T.**, Rehkämper, M., Robinson, L. (2014), Measurement of fossil deep-sea coral Nd isotopic compositions and concentrations by TIMS as NdO+, with evaluation of cleaning protocols. *Chem. Geol.*, 374-375, 128-140.

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(41) Orejola, N.[‡], Passchier, S., and **Expedition 318 Scientists** (2013), Sedimentology of lower Pliocene to Upper Pleistocene diamictons from IODP Site U1358, Wilkes Land margin, and implications for East Antarctic Ice Sheet dynamics, *Antarctic Sci.*, doi:10.1017/S0954102013000527.

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(39) Cook, C.P.[*], **van de Flierdt, T.**, Williams, T., Hemming, S.R., Iwai, M., Kobayashi, M., Jimenez-Espejo, F.J., Escutia, C., Gonzales, J.J., Khim, B.-K., McKay, R.M., Passchier, S., Tauxe, L., Sugisaki, S., Lopez Galindo, A., Patterson, M.O., Bohaty, S.M., Riesselman, C.R., Sangiorgi, F., Pierce, E.L., Brinkhuis, H., and IODP Expedition 318 Scientists (2013), Dynamic Behaviour of the East Antarctic Ice Sheet during Pliocene Warmth. *Nature Geoscience*, 6, 765-769.

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(36) Griffith, J.D. [‡], Barker, S., Hendry, K.R., Thornalley, D.J.R., **van de Flierdt, T.**, Anderson, R.F., Hall, I.R. (2013), Evidence for increased silica leakage to the tropical Atlantic during glacial development. *Paleoceanography*, 28, 307-318, doi:10.1002/palo.20030.

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(33) Houben, A.J.P. [‡], Bijl, P.K., Pross, J., Bohaty, S.M., Stickley, C.E., Passchier, S., Röhl, U., Suasaki, S., Tauxe, L., **van de Flierdt, T.**, Olney, M., Sangiorgi, F., Sluijs, A., Escutia, C., Brinkhuis, H., and Expedition 318 Scientists (2013), Reorganization of

Southern Ocean Plankton Ecosystem at the Onset of Antarctic Glaciation. *Science*, 340, 341-344.

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(31) Lambelet, M.[*], Rehkämper, M., **van de Flierdt, T.**, Xue, Z., Kreissig, K., Coles, B., Porcelli, D., Andersson, P. (2013), Isotopic analysis of Cd in the mixing zone of Siberian rivers with the Arctic Ocean – New constraints on marine Cd cycling and the isotope composition of riverine Cd. *Earth Planet Sci. Lett*., 361, 64-73.

2012

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