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The European Consortium for Ocean Research Drilling (ECORD) is sponsoring an initiative for a lecture series to be given by leading scientists involved with the International Ocean Discovery Program (IODP).

Applications to host a *Distinguished Lecturer* will be accepted from any college, university or non-profit organisation in all European countries, Israel and Canada.

Bridget Wade

Dept. Earth Sciences,
University College London, UK

CLIMATE AND OCEAN CHANGE

Biotic response to Cenozoic climate perturbations: new insights from ocean drilling

Mark Lever

Department of Environmental Systems Science
ETH Zurich, Switzerland

BIOSPHERE FRONTIERS

Controls on microbial population size and community structure in subseafloor environment

Marianne Conin

University of Lorraine,
Nancy , France

EARTH IN MOTION

Thrilling advances in the understanding the up-dip limit of subduction zones and the associated risks of tsunami and earthquakes through scientific drillings

Gretchen Früh-Green

Institute of Geochemistry and Petrology
ETH Zurich, Switzerland

EARTH CONNECTIONS

Serpentinization and Life:
Insights through ocean drilling.

Apply by email to:

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The ECORD Distinguished Lecturer Programme

The ***ECORD Distinguished Lecturer Programme*** (DLP) is designed to bring the exciting scientific discoveries of IODP to the geosciences community in ECORD and non-ECORD countries. **Distinguished Lecturers** will give lecturers in each of the four main thematic areas of IODP Science Plan 2013-2023. http://www.iodp.org/Science-Plan-for-2013-2023/

How to apply to host a Lecture?

Apply via electronic mail to essac@geomar.de

The application should include: 1) a list with more than one choice of speaker (1st, 2nd, optionally 3rd choice) — this provides more flexibility in scheduling and increases your institution's chance of hosting a lecture; and 2) the name, address, telephone number and email address of a contact person in your institution for communications with the ESSAC Office and the lecturer. Distinguished Lecturer will then liaise directly with you to decide a suitable date and help determine the best pairing of speaker and institution. ECORD funding will cover the speaker's travel expenses; host institutions are asked in turn to provide local transportation, housing, and meals for the speaker. Only one lecture per institution will be funded. The schedule of the lecturers will be principally based on the applications received by 1 November 2016, although later applications can also be considered.

For further information or questions please contact:
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Biotic response to Cenozoic climate perturbations: new insights from ocean drilling

Bridget Wade, University College London: b.wade@ucl.ac.uk

Determining past oceanographic change often involves organic or inorganic geochemical proxies, however, there is a wealth of information available from examining alterations in the assemblages of marine biota. Microscopic fossils (foraminifera, nannofossil, diatoms, radiolarians) are abundant in deep sea sediments and can provide a record of paleoceanographic change. Marine cores from the International Ocean Discovery Program and its predecessors allows examination of how different groups responded through time, and in particular their reaction at climatic perturbations. Changes in the marine biota may involve the extinction of species or groups of species that can tell us about alterations in their habitat. It can also comprise the enhanced abundance of a particular species, or a group, for a short interval of time (acme events). The dwarfing of organisms is increasingly becoming recognised as a response to environmental stress, however, I will show several intervals in the Cenozoic where a species became much larger for a short interval of time. Different plankton groups respond in different ways. For example, a major turnover in both calcareous (planktonic foraminifera) and siliceous (radiolarians) zooplankton occurred at the middle/late Eocene boundary about 38 Ma. New analysis of the nannofossil assemblages indicates a relatively muted response, and demonstrates the contrasting sensitivity to environmental change in these plankton groups. This talk focuses on Cenozoic ocean drilling records where the marine microfossils respond in sometimes mysterious ways, with particular focus on the Eocene, Oligocene and Miocene.

Controls on microbial population size and community structure in subseafloor environments

Mark Alexander Lever, ETH Zürich: mark.lever@usys.ethz.ch

I will discuss how the interplay of environmental variables, such as temperature and redox conditions, as well as availability of organic and inorganic energy substrates determine the population size and community structure of microorganisms in deeply buried sediments and crustal environments. I will show how rates of biomolecule-damaging reactions, e.g. amino acid racemization, DNA depurination, and the energetic cost of biomolecule repair are direct consequences of the temperature and redox environment and that therefore temperature and redox conditions exert a key influence on microbial population size in subsurface environments. In addition, I will discuss the role the chemical composition of microbial energy substrates has in determining the community structure of microorganisms. I will present the hypothesis that the macromolecular composition of biogenic organic compounds is a key determinant of microbial community structure in the majority of subseafloor sediments, whereas in subseafloor crustal environments and deep sediments in proximity to seismically and geothermally active zones the composition of geogenic inorganic and small organic molecules is the main driver of microbial community structure. I will conclude with an outlook on important scientific goals and drilling targets of future subsurface microbiological research, and demonstrate how scientific observations and hypotheses resulting from ocean drilling expeditions are challenging fundamental microbiological concepts and transforming our understanding of life on Earth and beyond.

Serpentinization and life: Insights through ocean drilling

Gretchen Früh-Green, ETH Zurich: frueh-green@erdw.ethz.ch

Ultramafic and lower crustal rocks are exposed on the seafloor in many tectonic settings and have been the target of a number of expeditions throughout the history of ocean drilling. Progressive interaction of seawater with mantle-dominated lithosphere during serpentinization is a fundamental process that controls rheology and geophysical properties of the oceanic lithosphere and has major consequences for heat flux, geochemical cycles and microbial activity in a wide variety of environments. At slow spreading ridge environments, serpentinization occurs along detachment faults (major, large-scale offset normal faults), as mantle rocks are uplifted to the seafloor and are incorporated in dome-shaped massifs known as oceanic core complexes. The processes controlling fluid flow and a deep biosphere are intimately linked, however, the spatial scale of lithological variability, the implications for geochemical cycles and the consequences for subsurface ecosystems supported by these systems remain poorly constrained.

This presentation will provide an overview of mid-ocean ridge processes and will highlight recent results of drilling the Atlantis Massif on the western flank of the Mid- Atlantic Ridge at 30°N. The Atlantis Massif is one of the best-studied oceanic core complexes and hosts the unique Lost City hydrothermal field on its southern wall.
Serpentinization reactions in the underlying mantle rocks produce high pH fluids that form large carbonate-brucite structures upon venting on the seafloor. The fluids have negligible dissolved carbonate and metals, but have high concentrations of hydrogen, methane and formate that support novel microbial communities dominated by methane- cycling archaea in the hydrothermal carbonate deposits. Understanding the links between serpentinization processes and microbial activity in the shallow subsurface of the Atlantis Massif was the focus of IODP Expedition 357, which used seabed rock drilling technology for the first time in the history of the ocean drilling programs to recover ultramafic and mafic rock sequences along a detachment fault zone. The expedition also successfully applied new technologies that provide insight into active serpentinizing systems. A sensor package and water sampling system on the seabed drills monitored real-time variations in dissolved oxygen and methane, pH, oxidation-reduction potential, temperature and conductivity during drilling and allowed sampling of bottom water after drilling. A borehole plug system for sealing the boreholes was installed at two sites to allow access for future sampling; and chemical tracers for contamination testing were delivered into the drilling fluids with the seabed drills. Thus, results of drilling the Atlantis Massif will provide important insights for future studies of serpentinization processes and microbial activity at slow-spreading ridges.

Thrilling advances in the understanding the up-dip limit of subduction zones and the associated risks of tsunami and earthquakes through scientific drillings

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Abstract coming soon – this lecture can be hosted from summer 2017 onwards!