

Ocean crust processes: magma, faults, fluxes, and life

31 August - 11 September 2015, Bremen, Germany

On the afternoon of Sunday 30 August, thirty-three young PhD students from eleven different countries in Europe and America arrived in Bremen. We came together to learn about the numerous processes occurring in the ocean crust and about the ways they can be investigated in the ECORD Summer School 2015, which took place at the MARUM - Center for Marine Environmental Sciences and the IODP Bremen Core Repository at the University of Bremen in Germany. The school combined lectures with practical and laboratory exercises on state-of-the-art IODP-style shipboard methodologies. By the "virtual ship experience" at MARUM, we gained insights into how the samples and measurements we encounter in publications or use for our own research are actually acquired. Moreover, we had the opportunity of presenting our own research projects to exchange our most recent findings and ideas regarding oceanic crust processes.

The lectures addressed "ocean crust processes", the general topic of the summer school, from various disciplines. Topics ranged from the upper mantle to the seafloor, from geochemistry and petrology to seismic and paleomagnetism, and from the formation to the alteration of the ocean crust. We learned that "heat is key" when it comes to estimating hydrothermal fluid fluxes, that oceanic core complexes are not necessarily magma-starved, that deep hydrothermal circulation can result in "hydrous" magmatism, that the appropriate model for crustal accretion at fast-spreading ridges is probably somewhere between the classical "gabbro glacier" and "sheeted sills" end members, that paleomagnetism is not only for sedimentologists, and much, much more. Additionally, we got to know about IODP itself; its world of



photo Voelker Diekamp/MARUM

acronyms, its organisational structure, application processes, current plans and future projects that gave us a much clearer idea of how we may get involved in future IODP expeditions.

We visited the reefer and labs of the Bremen Core Repository, and several of the fascinating "favorite toys" of the MARUM group, such as the seabed drill rigs MeBo, MeBo2, ROV's and AUVs. We experienced many aspects of a core workflow during an IODP expedition: the fun of recognising interesting structures and shiny minerals in a core (*above*) or a thin section, the way in which the most complex cores can be structured, described and classified, and the measurement of physical properties. Course room exercises allowed us to follow the process further from data acquisition through processing to interpretation.

We leave Bremen not only with plenty of new knowledge and inspiration for future projects, but also with fresh ideas

regarding our current research that we presented. Coffee breaks, lunch times and the outdoor group programmes gave us the opportunity to discuss the challenges of our current projects with a number of new colleagues and potential collaborators.

A recurrent thought during the course, which seemed to be shared by all lecturers, is that there is much to be explored, sampled, measured, and understood by the "next generation" of marine geoscientists. Finally, the two weeks of summer school have certainly done their part to prepare us to face the scientific challenges of our future.

ECORD Scholarship Awardees 2015 :

Kristina Grete Dunkel, University of Oslo, Norway; Jakub Ciazela, Adam Mickiewicz University, Poland; Joseph Offei Thompson, Ifremer, France; Sofia Escario Perez, Geosciences Montpellier, France and Minasadat Seyedali, University of Victoria, Canada