

Early Career Researcher Support Programme

MARUM / GLOMAR Basic Knowledge Course

Foraminiferal Proxies for Paleoceanographic Reconstructions

Dr. Heather Johnstone, Dr. Lukas Jonkers

MARUM – Center for Marine Environmental Sciences, University of Bremen

19 – 21 July 2021 (+ voluntary microscope exercise in an office the week before)

Objectives

Planktonic foraminifera are arguably the most important proxy carriers in paleoceanography. Their skeletal remains as well as the chemical composition of their shells have provided a wealth of information about past oceans. However, use of planktonic foraminifera as environmental indicators is far from trivial, and reconstructions may reflect a combination of environmental information, ecological preferences of the foraminifera, archive specific biases and analytical noise.

This course will provide an introduction to planktonic foraminifera and the use of both assemblage based and chemical proxies. Lectures will provide a broad overview as well as hands-on information about the application and uncertainty of planktonic foraminiferal proxies.

Topics

- Introduction: evolution, ecology and biomineralisation of planktonic foraminifera.
- Assemblage based proxies: environmental controls on distribution, transfer function methods, caveats.
- Geochemical proxies: stable oxygen and carbon isotopes, minor elements with a focus on the Mg/Ca temperature proxy, inferring salinity (seawater $\delta^{18}\text{O}$) from temperature and isotopes using paleotemperature equations.
- Influence of ecology on proxy signals: effects of life cycle, depth and seasonal habitat imprints, proxy models.

Methods

The course will consist mainly of presentations with two practical components: i) a short microscopy session* and ii) simple numerical exercises with transfer functions and interpretation of sedimentary proxy signals.

***Under the given circumstances with the Covid measures, there will be a room in the GEO building that participants can go to one by one in the week previous to the course to do the microscopy exercise.**

Early Career Researcher Support Programme

Format and Schedule

Live online via Zoom (the link will be provided before the course)

Time: 09.00 – 12.30 (incl. short breaks)

Please note that in our online courses, we expect people to turn on their cameras. This is a matter of respect towards the lecturer/s and makes any kind of interaction much easier.

For the microscopy session, participants will need to go to MARUM one by one. Access to the building and room will be organised by us. Please indicate in the registration form whether you would like to do the microscopy exercise.

Registration

To register for this course, please visit the course web page:
<https://www.marum.de/en/education-career/2021-07-19.html>

Please note that your registration will be binding.

The registration deadline for this course is **12 July 2021**.

Any enquiries regarding the course should be addressed to early-career@marum.de.