Quantitative data on planktonic foraminifers show cyclical variations in abundance of warm water oligotrophic forms (*Orbulina universa* and *Globigerinoides* sp.) and of cold watereutrophictaxa (mainly fitophagous Neogloboquadrinids). Moreover, an abundance peak of *Neogloboquadrina atlantica* (Mediterranean Messinian FCO 6.65 Ma) occurs in the middle-upper SAF and documents an influx of Atlantic cool waters, as well as eutrophic conditions, or seasonal upwelling, just before the basin isolation.
Calcareus nannofossils add other data about the paleoenvironment and appear less affected by environmental stress than foraminifers. Cyclic eutrophic conditions are also supported by peak of "small" *Reticulofenestra* and *Helicosphaera carteri* and by the progressive decrease of oligotrophic *Discoaster* spp. The sharp increase in surface salinity is testified in the uppermost SAF by the *Sphenolithus abies* peak abundance.

Voelker, Antje H.L. (A1 – Poster Presentation)

Mediterranean outflow water activity on the Western Iberian Margin: evidence from a benthic foraminifer trace element study

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In the eastern North Atlantic basin, the Mediterranean Outflow Water (MOW) is a prominent water mass between 500 and 1500 m, distinguished by its comparably higher temperature and salinity. Because of the high salinity and thus potential to increase a water mass' density the MOW is thought to enhance convection in the North Atlantic. Previous studies (e.g., Schoenfeld & Zahn, 2000) have shown that MOW settled deeper (2000m) in the water column during the last glacial maximum (LGM). Here we use proxy records for Calypso piston core MD03-2699 (39° 2.2'N; 10° 39.6' W; 1895 m.w.d.), today bathed by NEADW, to reconstruct oscillations in the MOW/ NEADW interface during Marine Isotope Stages (MIS) 15 to 9 (580–300 ka) including MIS 11c, one of the longest Pleistocene interglacials. Benthic foraminifer stable isotope and trace element records reveal deep-water properties and are combined with mean grain size data reflecting bottom current intensity. Planktonic $\delta^{18}O$ values indicate changes in the surface water hydrography and the presence of lithic grains ice-rafting events. One of the caveats in estimating bottom water temperatures (BWT) from the Mg/ Ca ratio was choosing the correct calibration equation. Until a regional calibration is available we are using Cacho et al.'s (2006) western Mediterranean Sea one being aware that our BWT might be overestimated.
All records reveal changes on orbital to millennial timescales. Grain size maxima during glacial MIS 14, 12 and 10 and periodic increases during the glacial inceptions coincided with warmer BWT indicating that MOW replaced NEADW. On the other hand, lower bottom current intensities and BWT revealing NEADW presence were observed during interglacial MIS 11c and 9e. The warm intervals of MIS 13, i.e. 13c and 13a, show BWT mostly warmer than today indicating either a strong admixing of MOW into the NEADW or even the lower edge of the MOW itself. Cd/ Ca and Ba/ Ca reveal changes in synchrony with the BWT whereby Ba/ Ca mimicks benthic $\delta^{13}C$. REE/ Ca ratios, such as Nd/ Ca, also increased during times when BWT indicate MOW presence but their timing differed (shorter) from the BWT signal raising the question if their signal is MOW related or derives from eroded glacial material. Overall our records reveal that deep-water dynamics on the mid-depth western Iberian margin were as variable during earlier glacial and stadial periods as they were during the last glacial cycle and experienced millennial-scale oscillations, mostly related to the MOW's response to changes in the Atlantic overturning circulation.

Voelker, Antje H.L. (C2 – Oral presentation)

Mid-Brunhes surface water changes in the mid-latitude North Atlantic revealed by G. Inflata trace element records

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Climate records from IODP Site U1313 (41°N, 33°W; 3412 m w.d.) from the mid-latitude North Atlantic were used to reconstruct surface and deep-water changes during the mid-Brunhes glacial/ interglacial cycles of Marine Isotope Stages (MIS) 10 to 16 (340 – 640 ka) including MIS 11c, one of the longest interglacials of the Pleistocene. The records reveal Heinrich-type ice-rafting events during the glacial MIS 16, 12 and 10 that led to a reduction in the Atlantic overturning circulation. Here we focus on the conditions in the surface waters, namely the winter mixed layer/ spring thermocline, using *G. inflata* stable isotope and trace element records. Today the site is influenced by the North Atlantic Drift, the northward extension of the Gulf Stream. Past surface water changes therefore reflect conditions in this current and its southward displacement due to incursions of iceberg-laden subpolar waters.
Thermocline temperatures were estimated from the Mg/ Ca ratio using the equation of Elderfield and Ganssen (2000). The overall temperature range varied between 1.4 and 12.8°C with the colder temperatures related to the Heinrich-type ice-rafting events. Interglacial and often also interstadial temperatures were similar, but – with the current equation – slightly colder than modern levels. MIS 11 experienced millennial-scale oscillations with maximum interstadial temperatures declining towards MIS 10. The interglacial section, i.e. MIS 11c, was associated with an early warming lasting from 426 to 396 ka, but temperatures started to cool already after 400 ka indicating that subpolar subsurface water might have started to penetrate further south after 400 ka. Interglacial MIS 13a temperatures were in the range or even warmer than those of MIS 11c revealing that at least in the thermocline waters this interglacial was not colder than its younger counterpart. Glacial MIS 12 experienced several temperature oscillations with thermocline temperatures being colder in the first half of the glacial. During late MIS 12 maximum temperatures even reached interglacial levels raising the question if warm core rings might have reached the site or if *G. inflata* values then reflected a different growth season.
Cd/ Ca values were highly variable and no clear relationship between thermocline temperature and nutrient levels can be seen. REE/ Ca ratios increased during glacial inceptions and glacials raising the possibility that these values reflect glacial erosion more than a water mass signal such as Antarctic Intermediate Water.

Voltsky, Ivan (D3 – poster presentation)

Elphidiidae of the western White Sea, European Arctic

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Elphidiids are diverse and abundant on the Arctic shelves, and thus they are key foraminiferal markers in Quaternary paleoecological reconstructions for these areas. However their value as markers is hindered by the species-level taxonomy insufficiently resolved and poorly understood ecological preferences.
The White Sea is a marginal basin with salinities of 24 to 31‰. The study area was off the Keret' River mouth in the western White Sea, and it embraced a range of habitats from the intertidal zone to c. 100mwd. We sampled soft bottom sediments and hard substrates (algae, shells), documented comprehensively the morphology of all elphidiid taxa, and estimated semi-quantitatively the abundance of live specimens (discernable by their pseudopodial activity and bright cytoplasm) during summer months.