Contribution ID: **65** Type: **Plenary talk (only invited speakers)**

Dust from „recent“Supernovae, just around the corner

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Stars with a mass larger than about ten times that of our Sun usually end in Supernova-explosions. Most of the material synthesized in earlier burning stages or during the explosion is expelled and travelling through space. If such an explosion happens close to the solar system also radionuclides will be deposited on Earth and other Solar system bodies. At the MLL tandem accelerator in Garching we are using the most sensitive technique for the detection of long-lived radionuclides, accelerator mass spectrometry, to determine minute quantities of the long-lived radioisotope 60Fe (T1/2 = 2.6 Myr). Already in 1999 we found an indication of an increased 60Fe content in a deep-ocean crust. Five years later we reported a clear enhancement for a time period around 2 Myr ago in another slow-growing (3mm/Myr) crust. To obtain this 60Fe signal with good time resolution we searched also in 1000 times faster growing sediments. Last year we could publish our finding in two sediment cores that the 60Fe signal started about 2.7 Myr ago and lasted for about 1 Myr. Here we had made use of the fact that so-called magnetotactic bacteria live in sediments who build little magnets in their body from iron-oxide dissolved in the ocean water. By selectively leaching such magnetite from fossilized bacteria, the signal is not washed out by large grain iron-oxide dust, brought into the ocean by erosion. A few months earlier last year a competing group in Canberra, Australia, has also reported the 60Fe peak in different sediments with about the same timing. In order to obtain a reliable estimate for the total fluence of 60Fe that had reached the solar system, we searched also in Lunar samples provided by NASA, since on the moon there is no redistribution through atmosphere and ocean currents. Also here we find 60Fe in samples down to about 20 cm depth. That is about the depth down to which the lunar surface is reworked by micrometeorites on a time scale of about 3 Myr.
In the meantime astrophysicists have even an idea in which group of young stars, about 300 light years from the sun, a number of Supernova explosions must have happened between 3 and 2 Myr ago which are thought to be the cause for the increase in 60Fe concentrations. It is interesting to note that the geologists start a new epoch, the Pleistocene, exactly 2.588 Myr ago, in which the ice ages started and, in the development of the hominins, the genus homo appeared. However, we do not claim a causal connection.

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