

Earth Science/ Geoscience/ Environment
Planning Group Members: Takeshi Kakegawa and Claudio Richter

Early Life

Speaker:

Andreas Kappler, Eberhard-Karls-University Tuebingen

Title: Micobial Life on Early Earth

A few hundred million years after the accretion of the Earth, temperatures dropped to ambient values, oceans and land masses formed, and environmental conditions for the formation and evolution of life developed. The identity of the first organisms that existed on Earth, most probably microorganisms or bacteria, is unknown. However, several billion year old rocks in combination with modern analytical tools can help to read these ancient archives and decipher what happened in the past. The probably most dramatic change in Earth history happened when oxygen-producing organisms (cyanobacteria or so-called blue-green algae) evolved and O₂ was present in the atmosphere. Oxygen is the fundamental compound required by our metabolism and by that of all other higher organisms. In my talk I would like to address what kind of microbes probably lived before the evolution of oxygen-producing cyanobacteria, provide evidence for this major shift in Earth history, and speculate about why this happened at all.

References:

Andrew Knoll (2004) *Life on a Young Planet: The First Three Billion Years of Evolution on Earth*. (Princeton University Press).

Kasting, J. F. and S. Ono, Paleoclimates: the first two billion years, *Phil. Trans. Royal Soc. Lond. B.* **361**, 917-929.

J. F. Kasting and J. L. Siefert, Life and the evolution of Earth's atmosphere (Perspective), *Science* **296**, 1066-1068.