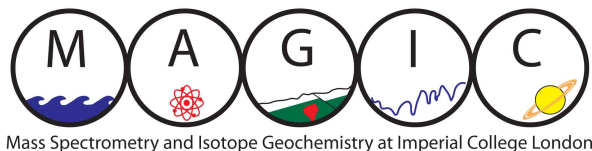


MIXING AND VOLATILE DEPLETION IN THE EARLY SOLAR SYSTEM

Prof Mark Rehkämper



This project addresses some of the most basic and debated questions of planetary science – How well was the material of the solar system mixed when the first planetary bodies formed? Why are the Earth, Moon, Mars and most asteroids so depleted in volatile constituents? How and when did the Earth acquire its budget of volatile elements, which ultimately supported the evolution of life?

In the last years, new developments in modeling and analytical techniques have significantly improved our knowledge of early solar system processes but overall the understanding still remains patchy. This project will utilize trace metal isotope analyses by MC-ICP-MS (multiple collector inductively coupled plasma mass spectrometry) to shed new light on these questions.

Depending on the exact interests of the student, the PhD research will focus on individual or coupled analyses of zinc, cadmium, molybdenum, platinum, lead and thallium isotope compositions for various meteorite types and meteorite constituents. In addition, or alternatively, the project can encompass or focus on the development of new techniques for isotopic analyses of additional elements, which are as yet poorly studied due to analytical challenges.

A significant component of any project is hands-on analytical research in the *MAGIC Laboratories* – see <http://www.imperial.ac.uk/earth-science/research/research-groups/magic/> for more info.



The MAGIC Labs provide facilities and instrumentation to support leading edge isotopic research for a team of about 30 scientists, comprising staff, post-docs and PhD students. The Labs encompass two clean room laboratories and three advanced mass spectrometers for high precision isotopic analyses.

The project is suitable for a student with a background in geology, geophysics, planetary science, chemistry, or equivalent experience. Further information about the research and myself can be obtained by sending an email to markrehk@imperial.ac.uk and here <http://www.imperial.ac.uk/people/markrehk>. Don't hesitate to get in touch if you're interested.