

# Sensitive High Resolution Ion MicroProbe (SHRIMP) applications of isotope geochemistry in Earth System Science

**September 4, 2017 – Monday to September 9, 2017 - Saturday**

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## Overview

The main motivation for this course is to equip students and professionals with new knowledge and tools, focusing on advanced methods of applying isotope geochemistry to geological and environmental problems in the context of the evolution and geodynamics of Earth, which will enable them to solve complex problems through an holistic and systemic perspective.

The course covers specific areas of cutting edge technology, in particular the emerging tool, SHRIMP, which can be used to constrain the timing of processes involved in the evolution and geodynamics of the Earth System. Till now twenty SHRIMP instruments have been installed around the world and SHRIMP results have been reported in about 5000 peer reviewed scientific papers. SHRIMP is an important tool for understanding early Earth history, having dated some of the oldest terrestrial material. Other significant milestones include the first U/Pb ages for lunar zircon and Martian apatite dating. More recent uses include the determination of Palaeozoic sea surface temperatures, the timing of snowball Earth events and the development of stable isotope techniques for environmental studies.

During the course emphasis will be focused on understanding the basics of Isotope Geochemistry along with applications of SHRIMP in Earth System Sciences. The participants will also be exposed to data acquisition, processing software and interpretation.

## Objectives

- Understand the basic concepts of Isotope Geochemistry.
- Understand the relevance and potential of Isotope Geochemistry in Earth System Sciences.
- Understand the applications, strengths and limitations of various isotopic techniques in solving problems in Earth System Science.
- Recognize the strengths and limitations of the various instruments available for isotopic analyses for Earth System Science.
- Understand the SHRIMP and its application in Earth System Science.
- Data acquisition, data reduction and interpretation of reduced data.
- Evaluate data quality and uncertainty. Understand the difference between scenario and parameter uncertainty. Understand the multi-functionality problem.
- Introduction to data processing and reporting software.

<b>Modules</b>	<p><b>A: Basics of Isotope Geochemistry</b>  <b>B: Sensitive High Resolution Ion MicroProbe (SHRIMP)</b>  <b>C: Data acquisition and Data reduction</b></p> <p>Number of participants for the course will be limited to fifty.</p>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>• Professionals, Earth Scientist, Environmentalist</li> <li>• Students (undergraduate/graduate) and faculty members from academic and research organization who are interested to know about Isotope Geochemistry and evolution and geodynamics of Earth are encouraged to attend this course.</li> </ul>
<b>Fees</b>	<p>The participation fees for taking the course is as follows:  <b>Participants from abroad : US \$500</b>  <b>Industry/ Research Organizations: Rs. 15000 (excluding boarding and lodging)</b>  <b>Faculty members from Academic Institution</b>  <b>INR 10,000 (excluding boarding and lodging)</b>  <b>Students from Academic Institution</b>  <b>INR 5000 (excluding boarding and lodging)</b>  The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis.</p>

## The Faculty



**Prof. Ian Williams** is serving at Reserch School of Earth Sciences, Australian National University, Austrlia His research interests include has a research interest in the micro-scale behaviour of mineral isotopic systems under diverse geological conditions. He also has keen interest on Palaeoclimate, Instrumentation and techniques for ion microprobe analysis of geological and biological materials.



**Prof. Sandeep Singh** is faculty at Department of Earth Sciences. His research interest is Himalayan Tectonics, Igneous Petrology, Geochronology and Isotope Geology of Rocks and Water, Tectonics, Igneous Petrology, Geochronology

## Course Co-ordinator

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