

# Geological Exploration by Ground Penetrating Radar

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## Overview

Exploration of natural resources buried under the earth surface is a well-known engineering activity. However, with the space exploration of planetary bodies, GPR technology promises to unravel the subsurface contents of extraterrestrial bodies. But to use it successfully, one needs to master the arts and sciences of microwave propagation, ultrawideband technique, radar principles and radar signal processing. The course aims to take a step forward to unravel the mysteries of this fascinating technology.

This course is organized in two modules that should be taken together. The topics in Module A will expose the participants to the entire gamut of GPR technology like Electromagnetic Properties of ground materials, GPR Antennas design, GPR Channel Modeling and simulation, GPR Systems design and GPR Signal Processing. In Module B, the Geophysical Exploration methodology with GPR is emphasized. The topics in the module include Planetary Geological Exploration, Subsurface Mine Detection, Regulatory and EMC constraints of GPR, Remote Sensing with SAR and exploration with the help of SAR imagery.

Course participants will learn these topics through lectures and hands-on experiments. Also case studies and assignments will be shared to stimulate research motivation of participants.

<b>Modules</b>	<b>A: GPR Technology : May 12 - May 17</b> <b>B: Geophysical Exploration by GPR : May 19 - May 23</b> <b>Number of participants for the course will be limited to fifty.</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>▪ you are an electronics engineer or research scientist interested in designing ground penetrating radar and processing of microwave images for exploration.</li> <li>▪ you are geologist or geophysicist or non-destructive test engineer interested to learn application of GPR in your profession.</li> <li>▪ you are a student or faculty from academic institution interested in learning how to do research on GPR system or subsystem or want to work with GPR imagery for geological interpretation.</li> </ul>
<b>Fees</b>	The participation fees for taking the course is as follows: <b>Participants from abroad : US \$500</b> <b>Industry/ Research Organizations: ` 30000</b> <b>Academic Institutions: ` 10000</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.

## The Faculty



**Prof. Sébastien Lambot** is in the faculty of Université catholique de Louvain (UCL) Belgium. His research interests include Hydrogeophysics, Electromagnetic modeling including antenna modeling, coupled hydrogeophysical inversion, soil hydrodynamics, digital soil mapping and remote sensing.



**Tapan Misra** is the Deputy Director of Space Application Centre, Ahmedabad. His research interest is development of SAR based sensors for various space missions of ISRO and development of algorithms for high resolution processing of microwave SAR imagery.



**Dr. Amitabha Bhattacharya** is an Associate Professor of Indian Institute of Technology, Kharagpur. His research interest is Microwave Imaging, High Power Microwaves and Microwave Stealth Technology.

## Course Co-ordinator

**Prof. Amitabha Bhattacharya**

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<http://www.gian.iitkgp.ac.in/GREGN>