



Induced Polarization of Rocks: From Petrophysics to Tomography and Their Applications to Reservoirs and Geothermal Systems

(March 5-9, 2018)

Venue: Indian Institute of Technology Roorkee, Roorkee-247667, Uttarakhand, India

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Overview

Induced polarization describes geophysical method used to image the subsurface of the Earth. Induced polarization refers to a method looking at the reversible storage of electrical charges at low frequencies (below 10 kHz). Initially, this method was used for the detection of ore bodies (from pyrite to galena and copper) and to characterize oil and gas reservoirs (oil and gas traps are usually overlaid by a halo rich in pyrite that can remotely detected using induced polarization) and for downhole measurements to characterize oil and gas saturations. More recently the method has been used very successfully for a broad number of applications in environmental geosciences such as aquifer characterization, alteration mapping, coal sea fires (a crucial problem in India), and contaminant plumes. A unified constitutive models for induced polarization phenomena has recently been available. In addition, new techniques of geophysical imaging, data fusion and joint inversion with other geophysical data have started to emerge showing more than ever the powerful applications of induced polarization to a variety of applications with societal issues (water resources, oil, gas and ores resources assessment, permeability mapping and so on). It is now essential that industries across India develop a good understanding of this method, its physical roots, and how it can be applied in the field.

Objective:

The primary objectives of the course are as follows:

- i) Exposing participants to the fundamentals of induced polarization practices in the laboratory and in the field, presenting the way equipments are working, new strategies in getting clean data,
- ii) explaining recently developed models providing the roots in physics and electrochemistry for the method,
- iii) explaining new strategies to improve geophysical imaging of the subsurface with the method of induced polarization
- iv) Providing exposure to practical problems in geosciences and their solutions, through case studies and live projects in water resources, ore exploration, coal seam fire and in hydrogeophysics, geoengineering, and oil, gas, and ore resources discovery.

Course Information	Duration: March 5 - March 9, 2018
Modules	<p>Module 1: Electrochemistry and petrophysics Module 2: The case of dispersed ores (semi-conductors, metals and semi-metals) Module 3: Laboratory investigations: cores and sandbox experiments Module 4: Introduction to tomographic techniques Module 5: Applications to ores, oil reservoirs, and geothermal systems</p> <p>Number of participants for the course will be limited to fifty.</p>
You Should Attend If...	<ul style="list-style-type: none"> ▪ You are an executives, engineers and researchers from oil and gas companies, research lab and universities to learn the nuances of theory and practical implication of the polarization of grains and porous media ▪ You are a student at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institution and if you plan to engage yourself with research aspects of polarization and relaxation processes involved in field measurement of resistivity and conductivity in earth materials.
Fees	<p>The participation fees for attending the course is as follows:</p> <ul style="list-style-type: none"> • Participants from abroad: US \$500 • Industry/ Research Organizations: Rs. 12000.00 • Academic Institutions (Faculty): Rs. 7000.00 • Academic Institutions (Students): Rs. 3000.00 <p>➤ Students have to show the proof of their full time student enrollment in academic institute.</p> <p>The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, free internet facility.</p> <p>Fee does not include accommodation and food. On request basis, participants may be provided with accommodation on payment basis.</p> <p>Note: Accommodation: 1. The registration fee should be sent in advance through bank draft drawn in favor of "Dean SRIC, IIT Roorkee" and payable at Roorkee latest by Feb. 28, 2018. 2. The Complete form along with payment may please be sent to: Dr. Ravi Sharma, Department of Sciences, IIT Roorkee, Roorkee-247667, Uttarakhand e-mail: ravisharmafes@iitr.ac.in, ravisharmafes@gmail.com</p>

The Faculty



Prof. André Revil is Directeur de Recherche at UMR ISTERRE (CNRS), Université de Savoie Mont-Blanc. He studied for his doctorate at the Ecole de Physique du Globe de Strasbourg. He held an associate professor position at the Colorado school of Mines and a chargé de recherche position at CNRS. He investigates various numerical methods for the simulation of electrokinetic flow with applications for hydro geo physics and porous media flow. He has published more than 276 research papers in reputed international journals. He received the Fellowship for outstanding young scientists (ACI-Jeune Chercheur) and the Bronze Medal of CNRS; he is a Fellow of the American Geophysical Union. He published two books in the field of electrical properties of porous media. Webpage: <http://www.andre-revil.com> Contact email id: andre.revil@univ-smb.fr



Dr. Ravi Sharma received the first Masters' (M.Tech.) in Applied Geophysics from the University of Roorkee in the year 1999. He received his second Masters' and PhD in Petroleum Engineering from Colorado School of Mines, Golden , USA in the year 2015. Dr. Sharma has a rich industry experience right from his days with ONGC from 2001 to 2007 and with other multinational oil and gas companies such as BP, MOC and COP from 2008 to 2015. He mostly worked in multidisciplinary teams performing validation and integration of geoscience data for predicting of rock and fluid properties using seismic/acoustic amplitudes acquired through experiments in laboratories and in fields. He has extensive research experience with experimentation and modelling for storage, flow and elastic property prediction in the reservoirs using Petrophysical and Rock Physics techniques and tools. His other interests include Flow Through Porous Media, Simulation, Hydraulic Fracturing, Unconventional Resources, Digital Rock Physics. He received many merit awards for his professional services and research activities. He serves on the review and editorial board of reputed geoscience journals. He currently serves as Assistant Professor at the Department of Earth Sciences in IIT Roorkee. Contact email ID: ravisharmafes@iitr.ac.in

Course Co-ordinator

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

Indian Institute of Technology Roorkee

Registration Form

**Induced Polarization of Rocks: From Petrophysics to Tomography
and Their Applications to Reservoirs and Geothermal Systems**

(MHRD Scheme on Global Initiative on Academic Network (GIAN))

March 5 - 9, 2018

- Name
- Designation
- Affiliation
- Address for Correspondence
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- Email:
- Phone No:
- Accommodation required: **Yes / No**
- Type: Hotel/Hostel/Guest House (accommodation shared basis may be available @Rs. 500/
per day)
- Cheque/DD No.
- Dated for Rs.

Date

Signature of the participant

Note:

1. The registration fee should be sent in advance through bank draft drawn in favor of "Dean SRIC, IIT Roorkee" and payable at Roorkee latest by February 28, 2018.

2. The Complete form along with payment may please be sent to:

Dr. Ravi Sharma, Department of Earth Sciences, IIT Roorkee, Roorkee-247667, Uttarakhand, India, Ph.No.: (+91)- (0)1332-284867, e-mail: ravisharmafes@gmail.com, ravisharmafes@iitr.ac.in