A short course on: Active Continental Tectonics

6 – 19 November 2016

OVERVIEW

Deformation in the Continents does not follow the simple rules of Plate Tectonics and occurs over wide distributed regions of continental interiors, away from the plate boundaries (e.g. for ~2000 km across Himalaya and Tibet). The description and study of such regions requires a specialised language of Continental Tectonics which bring together expertise from diverse sub-disciplines of Geosciences, including earthquake seismology, potential field methods, tectonic geomorphology, paleoseismology, GPS geodesy and rock mechanics. In India, such an integrated approach to study continental deformation is relatively new and emerging field. Additionally, one of the major mechanisms of accommodating the deformation within continental interiors occurs through earthquake faulting, which poses a serious hazard to populated continental regions, recently emphasized by devastating earthquakes in Jabalpur (1997), Uttarkashi (1999), Bhuj (2001), Andama-Sumatra (2004), Kashmir (2005), Sikkim (2011) and Nepal (2015).

The course will introduce participants to basic concepts in continental tectonics through a series of lectures accompanied by concept-building tutorials and practical exercises. At the end of the course, participants will develop an appreciation for earthquake hazard in the continents, with a focus on Asia.

This course will cover the following topics:

- Earthquake sources, faulting and scaling
- Normal faulting and continental extension
- Thrust and reverse faulting on continents
- Patterns of regional shortening
- Large scale kinematics of the Mediterranean and Middle East
- Active tectonics of Asia
- Variations in rheology and structure of the continental lithosphere
- Dynamics of continental deformation
- Earthquake hazard in Asia
- Tsunami hazards in Asia, the Pacific and Mediterranean

COURSE VENUE

Lecture Hall Complex
Indian Institute of Science Education and Research Kolkata
Mohanpur – 741 246, West Bengal, India

TARGET AUDIENCE

Undergraduate and postgraduate students of Earth Sciences, Geology, Geophysics and Physics from Academic Institutions and Universities. Young academics, researchers, teachers and persons from Industry with an interest in Continental Tectonics and Earthquake Hazard.

COURSE FEES

- Student participants from Academic Institutions & Universities: **Rs. 2,000/-** (refundable caution money)
- Academics, Researchers and Teachers: **Rs.5,000/-**
- Industry: **Rs.10,000/-**
- Participants from abroad: **$200/-**.

The above fee includes all instruction material, computer use for tutorials and assignments, laboratory equipment usage charges, free internet facility.

THE FACULTY

James Jackson (CBE, FRS) is Professor and Head of the Department of Earth Sciences, University of Cambridge, U.K. He did his undergraduate (in Geology, 1976) and PhD (in Geophysics, 1980) from the University of Cambridge. He was a Visiting Scientist at Massachusetts Institute of Technology, USA (1977 to 1981), Research Fellows in Queens' College, University of Cambridge and became Assistant Dean (1983). He served as an Assistant Lecturer, Lecturer (1988), Reader (1996) and Professor of Active Tectonics (2003) in the Department of Earth Sciences, University of Cambridge. He was appointed Head of Bullard Laboratories (2004) and Head of Earth Sciences (2008).

Professor Jackson is the recipient of many distinguished awards: Harkness Prize, University of Cambridge, (1976), President's Award, Geological Society of London (1985), Sedgwick Prize, University of Cambridge (1986 & 1990), Bigsby Medal, Geological Society of London (1997), Fellow of the Royal Society (FRS, 2002), Fellow of the American Geophysical Union (2003), Commander of the Order of the British Empire (CBE, 2015) and Wollaston Medal (2015).

Professor Jackson's work exploits techniques in earthquake source seismology, geomorphology, space geodesy and remote sensing to examine how the continents are deforming today on all scales: from the details of the fault rupture in single earthquakes, to how that faulting has created the local geomorphology and structure, to how regional fault patterns and motions can accommodate deformation of vast continental areas. Professor Jackson is

a part of the Dynamic Earth and Geohazards group (formerly the COMET project), part of the National Centre for Earth Observation, and the Centre for the Observation and Modelling of Earthquakes and Tectonics. He is also the lead PI on the Earthquakes Without Frontiers project, a joint NERC-ESRC consortium supporting a partnership of physical and social scientists working to help increase resilience to earthquakes in countries in Asia.

Supriyo Mitra is Professor of Earth Sciences at Indian Institute of Science Education and Research Kolkata and is currently the Dean of Research and Development. His research focuses in studying the crust and upper mantle structure of the Earth and its relation to tectonic deformation using techniques in earthquake seismology.

COURSE CO-ORDINATOR

Prof. Supriyo Mitra
Department of Earth Sciences
Indian Institute of Science Education and Research Kolkata
Mohanpur – 741 246, West Bengal, India
Phone: 033 6634 0000, Extn. 1236
E-mail: supriyomitra@iiserkol.ac.in
http://www.iiserkol.ac.in/people/faculty/des/supriyomitra

IMPORTANT INFORMATIONS

- For course registration please visit: http://www.gian.iitkgp.ac.in/GREGN/index
- Registration Deadline: 30 September 2016
- Fess to be paid by NEFT:
  - Name of the Beneficiary: IISER Kolkata Project A/c
  - Name of Bank and Branch: Indian Overseas Bank, Mohanpur
  - Beneficiary Account No.: 325001000000002
  - Bank MICR Code: 700020092
  - Bank IFS Code: IOBA0003250
- Accommodation based on nominal charges (per day) will be available to all participants. Participants need to bear their own accommodation and food expenses.
- After successful completion of the course, all participants will get participation certificates.
- No TA, DA will be provided to the participants.
- How to reach: http://www.iiserkol.ac.in/contactus/how-to-reach

ABOUT IISER KOLKATA

The Indian Institute of Science Education and Research (IISER) Kolkata was established in 2006 by the Ministry of Human Resource Development (MHRD), Government of India. This initiative was a part of the Government's effort to set up a number of new academic institutions of international standard that would train specialised manpower in basic sciences and allied technologies. Our central theme is to provide quality science education and to carry out research in basic and frontier areas of science involving both undergraduate and postgraduate students, in an intellectually vibrant atmosphere. Through borderless and flexible education programmes involving multi-disciplinary as well as inter-disciplinary curriculum, IISER Kolkata provides an unparalleled opportunity for young students to experience the excitements of research in basic sciences. In essence, IISERs are devoted to both teaching and research in an integrated manner – thus nurturing both curiosity and creativity. For more details: http://www.iiserkol.ac.in

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