The Abdus Salam
International Centre for Theoretical Physics

United Nations
Educational, Scientific and
Cultural Organization

IAEA
International Atomic Energy Agency

Workshop on Geophysical Data Analysis & Assimilation

29 October - 3 November 2012
(Miramare – Trieste, Italy)

The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, will organize in cooperation with the Karlsruhe Institute of Technology (Karlsruhe, Germany), University of Trieste (Italy), and the Russian Academy of Sciences (Moscow, Russia) the ***"Workshop on Geophysical Data Analysis & Assimilation"***, from ***29 October - 3 November 2012.*** The Workshop is endorsed by the International Union of Geodesy and Geophysics.

Geophysicists are facing global problems related to studies of the dynamics of the Earth and its environment (e.g., lithosphere dynamics, natural hazards, climate dynamics). Huge sets of observed data are available presently for utilization, but their use is limited by current knowledge and skills that are required to analyse the data and solve these problems. New opportunities exist for the data analysis and data assimilation into a variety of seismological and geodynamical models. The goal of this workshop is to discuss the state of the art in analysis and assimilation of seismological, geodetic and geodynamic data and the challenges that presently exist. The workshop will highlight the progress and perspectives in data analysis and assimilation studies in seismology and geodynamics.

Results of analysis and interpretation of seismological observations, such as tomographic images, seismic anisotropy measurements, characteristics of seismic events, provide constrains and input data for development of geodynamical Earth models. Three-dimensional maps of present-day seismic velocities combined with physical models to translate these seismic velocity anomalies into density and temperature anomalies and with models of mantle viscosity structure can allow for efficient assimilations of mantle flow and temperatures to the geological past. The basic element of the data analysis and assimilation is methodology (theoretical and computational). The workshop will provide training in advanced methodologies of R&D in fundamental studies of the Earth's structure, evolution and dynamics. The theoretical grounds include (i) the theory of seismic wave propagation in realistic Earth models, (ii) the theory of mantle dynamics and plate motion, and (iii) computational techniques and methods for inversion of seismic wave fields, and seismological and geodynamical data assimilation. Lectures focus both on the research methodologies as well as on recent results of data interpretation and data assimilation.

Students will be able to have a close acquaintance with the newest developments in all these directions, not only by listening to the intensive lecture courses, but also by active participation in computer demonstrations and exercises. The lectures and computer exercises at the workshop will cover the following basic topics:

- Seismic wave generation and propagation: theory, modeling and data analysis.
- Seismic-structural studies.
- Dynamics of the Earth's crust and mantle: theory, modeling and data assimilation.

Students are encouraged to prepare presentations of their recent results related to the workshop programme.

PARTICIPATION

Scientists and students from all countries, which are members of the United Nations, UNESCO or IAEA, may attend the Workshop subject to approval by the Workshop Directors. As the Workshop will be conducted in English, participants should have an adequate working knowledge of that language. Although the ICTP main purpose is to help researchers from developing countries, through a programme of training activities within a framework of international cooperation, a limited number of students and post-doctoral scientists from developed countries are also welcome to attend. A degree in Physics, Mathematics, Geophysics (theoretical or computational), Computer Science and/or similar disciplines is required.

As a rule, travel and subsistence expenses of the participants should be borne by the home institution. Every effort should be made by candidates to secure support for their fare (or at least half-fare). However, limited funds are available for some participants, who are nationals of, and working in, a developing country, and who are not more than 45 years old. Such support is available only for those who attend the entire activity. There is no workshop registration fee.

HOW TO APPLY FOR PARTICIPATION

The application form can be accessed at the activity website **http://agenda.ictp.it/smr.php?2373**

Once in the website, comprehensive instructions will guide you step-by-step, on how to fill out and submit the application form. Closing date for receipt of the applications is: **30 May 2012.**

ACTIVITY SECRETARIAT: Telephone: +39-040-2240-355 Telefax: +39-040-2240-585

E-mail: smr2373@ictp.it ICTP Home Page: http://www.ictp.it/

October 2011

DIRECTORS

B.G. Bukchin
(International Institute of Earthquake Prediction Theory & Mathematical Geophysics, Russian Academy of Sciences, MITPAN, Moscow, Russia)

A.T. Ismail-Zadeh
(Geophysical Institute, Karlsurhe Institute of Technology, Karlsruhe, Germany)

G.F. Panza
(Dept. of Earth Sciences, University of Trieste/ ICTP, Trieste, Italy)

LOCAL ORGANIZER

J. Niemela
(ICTP, Trieste, Italy)

DEADLINE
For requesting participation:

30 May 2012