International Training Course on

Seismology, Seismic Data Analysis, Hazard Assessment and Risk Mitigation

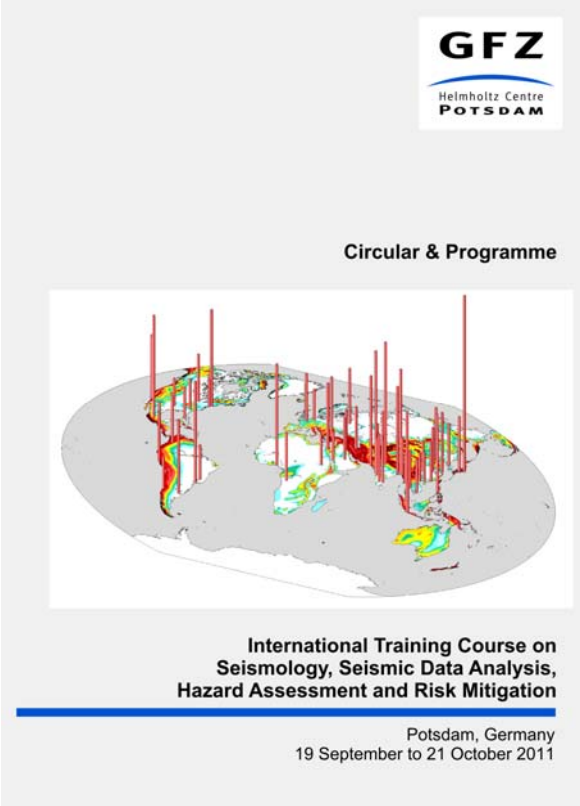
September 19 to October 21, 2011
Potsdam, Germany

organised and sponsored by

Helmholtz Centre Potsdam
GFZ German Research Centre for Geosciences

co-sponsored by

Federal Foreign Office (FFO) (Berlin)
GIZ (Berlin)



1. OBJECTIVES AND PROGRAMME OF THE TRAINING COURSE

The disastrous consequences of destructive earthquakes place a heavy burden on many societies and their economies, particularly in developing countries. In order to avoid or at least to mitigate the negative effects of such events a thorough scientific knowledge of their geological and geophysical causes, their structural, kinematics and dynamic characteristics and destructive effects as well as a developed capability to monitor and to analyse them is indispensable. The vulnerability of human societies and related human and economic losses due to earthquakes are steadily growing as a consequence of rapid population growth and urbanization. Accordingly, improved risk assessment and effective disaster mitigation measures are prerequisites to ensure sustainable development in earthquake-prone countries.

The GFZ German Research Centre for Geosciences is running an annual five weeks international training course in the field of seismology and seismic hazard assessment. This training course is part of related programs of the United Nations (OCHA and UNESCO) aimed at promoting training and know-how transfer, especially to nationals from developing countries. In 2011, the GFZ organizes and runs the course in Potsdam, Germany in the time period 19 September to 21 October for the benefit of participants from earthquake-prone developing countries under the main topics:

"SEISMOLOGY, SEISMIC DATA ANALYSIS, HAZARD ASSESSMENT AND RISK MITIGATION".

The training course is co-sponsored by the Federal Foreign Office (FFO) Germany (AA, Berlin), the United Nations Educational, Scientific and Cultural Organization (UNESCO, Paris), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ, Berlin) and the GFZ German Research Centre for Geosciences. It is also supported by the University of Bergen, the BGR Hannover, the Universities of Leipzig, Stuttgart, Karlsruhe, Jena and Munich as well as from institutions in France, Norway and Italy.
Until 2010, 886 participants from 114 countries, amongst them graduate students, university lecturers as well as senior staff and directors of reputed research institutes, have attended

the seismology training courses organized and supported by the GFZ Potsdam. Since the foundation of the GFZ in 1992 these courses are, as an essentially new feature, held alternately every second year in Potsdam and as regional courses in a hosting country of Africa, Asia or Latin America. In the latter case, the course topics are specifically tailored to the needs and potentials of the respective region and integrate many local lecturers into the international team of instructors.
More details on all training courses since 1992, including the circular, programme and application form for the course in 2011 can be found on the GFZ web-page under http://www.gfz-potsdam.de/portal/gfz/Struktur/Departments/Department+2/sec21/InternationalTrainingCourses

In line with the steadily growing demand by participants in former courses for mainly practice-oriented training and workshop discussions related to case studies, the current course programme comprises, besides introductory and state-of-the-art review lectures on the various subjects of earthquake seismology and risk assessment, extensive practical exercises, demonstrations, workshop discussions and scientific excursions. The excursions in 2011 focus on visits to geophysical and seismological observatories. Generally, the course programme aims at developing interdisciplinary problem understanding, acquaintance with the theoretical fundamentals and basic features of modern instrumentation, commonly used models and algorithms as well as developing practical skills in data evaluation and analysis.

The detailed scientific programme of the course is annexed to this circular. After each major topic, time is reserved for workshop discussions based on short (15 min.) oral presentations by the participants. **Data brought along or case studies can also be taken** up for discussion, also for the Expert Day (Oct. 17, 2011).
The scientific-technical background and work duties of the course participants are usually rather different. None the less, there are generally two main groups of applicants:

- those mainly working in the field of seismic hazard and risk assessment, earthquake zonation and microzonation and/or earthquake engineering and disaster management;
- those responsible for the installation, maintenance, operation of and/or data analysis at seismic stations or network centres.

Throughout the course the completion of exercises by the participants as well as their contributions to workshop sessions and topical discussions are evaluated.

The successful participation in the course is acknowledged by a certificate at the end of the course.

2. APPLICATION AND ADMISSION

2.1 Conditions for application and admission

The course is arranged for the benefit of participants from earthquake-prone countries. To make the training effective, the number of participants is limited to about 26. Preference is given to young candidates engaged in seismology, seismic monitoring and zonation, earthquake data analysis, hazard, vulnerability and/or risk assessment. They should have active interest and obligations in these fields. Applicants with background and duties in earthquake engineering and disaster management who want to deepen their understanding of seismological phenomena, methods and data products are also considered, as are researchers or university lecturers in geosciences who may act as conveyers of the knowledge acquired in the course (training of trainers).

Applicants must have a scientific degree (B.Sc. or M.Sc.) or diploma in geosciences, physics or engineering from a recognized university. Preferably they should have several years of professional experience in subjects covered by the course. Applicants must also have **a thorough knowledge of English** which is **the only working language of the course**.
It is also **mandatory** for admission to the course that applicants are able and willing to present **a short paper (about 15 minutes) on their research or operational work and/or specify a problem or case study** they wish to discuss with their instructors and fellow

participants. In the latter case they should bring along relevant data, documents and/or computer programmes for demonstration and analysis.

Priority is given to applicants who are able to cover the cost for travel from domestic institutional or development-aid project funds for training. **Fellowships** to cover course fees (including full board) as well as **travel grants** are available to selected participants from developing countries in need of support.

Note: Fellowship and travel funds are limited and have to be economized in the interest of all applicants in need of support. Tickets bought in the home countries of the applicants at national airline offices are often substantially cheaper than tickets bought in Germany and deposited at the airports of departure. Therefore, applicants are urged to inquire about the cheapest two-way tourist economy fare connection between their national airport and Berlin/Germany and to **state the ticket price in the application form** (in US$ or EURO equivalent). This information is taken into account in the selection procedure.

In case the ticket option of an applicant is less costly than a ticket arrangement from Germany, he/she is asked to make his/her own travel arrangements locally and will then be refunded after arrival in Potsdam.

An application is considered only when:

- **the attached application form is duly filled-in and submitted in time;**
- **the applicants indicate in their application which group (A or B) they want to join during the specialisation week;**
- **the application form is accompanied by two letters of recommendation by supervisors or heads of nominating institutes/organisation. These letters should refer to the personality, academic qualification, obligations and performance as well as to future job requirements of the candidate;**
- **the applicants also explicitly confirm to appropriate command of the English, if possible by adding copies of respective language certificates;**
- **the application form is accompanied by a letter of motivation;**
- **the applicants give the title/topic of their presentation in the application form (with abstract);**
- **the applicants confirm, that an international travel and health insurance will be concluded.**

Those who intend to present and discuss additionally in a special workshop session data, methods used or case studies from their country should indicate this separately in the registration form and submit an abstract giving details about the subject, method applied, kind of data available as well as of the open questions they want to discuss about.

Without such specifications and accompanying documents an application will not be considered!

All participants are also kindly invited to present, at social evening get-togethers (cultural evening), slide, power point or video shows or any other suitable kind of material or personal performances (dances, songs, instruments) which can convey to their fellow participants some impressions about geography, culture, customs, music and daily life in their respective home countries. Such presentations should be limited to 15 min.

In the selection of participants **preference is given to those applicants,** who (as confirmed in the application forms and accompanying letters):

- are most in need of training in the subjects covered by the course;
- are concerned with the operation of and data analysis at seismic stations or network centres;
- are working with seismic hazard assessment or microzonation;
- are involved in vulnerability and risk assessment, engineering seismology, and/or disaster management and mitigation projects;

- can serve as multipliers in spreading the knowledge and skills acquired;
- can make an active contribution to the workshop sessions and discussions;
- had applied already earlier for the course, been found eligible/qualified but could not be accepted due to the limited number of fellowships available for each course;
- can pay their travel.

The application forms and accompanying candidates´ files will be carefully screened by the Academic Board and Selection Committee of the course. Members of the board are prominent geoscientists of the GFZ German Research Centre for Geosciences and representatives of the Federal Foreign Office (FFO) as the main sponsor of the course. Chairman is Prof. Dr. J. Zschau, head of section 2.1 “Earthquake Risk and Early Warning” at the GFZ.

2.2 Application formalities

Applications should include the following information:

(1) Filled-in application form;
(2) List of scientific publications;
(3) Two letters of recommendation or reference which give details on the applicants personality, duties and performance in seismic station operation, data analysis or other specified applied or research projects;
(4) Confirmation of appropriate command of English;
(5) Title and one page abstract of the proposed topic or case study to be presented or discussed in a special workshop session;
(6) Title and kind of intended cultural presentation;
(7) Letter of motivation.

One copy of the application documents should be posted or faxed or sent by email as scanned documents to reach the address below not later than **June 15, 2011**:

Helmholtz Centre Potsdam
GFZ German Research Centre
for Geosciences
Dr. C. Milkereit
Telegrafenberg
D-14473 Potsdam
GERMANY

Phone: (+49 331) 288 -1289 or -1201
Fax: (+49 331) 288 -1296 or -1204
E-mail: course-un@gfz-potsdam.de

Candidates will be informed of the decision of the Academic Board by June 28, 2011 and, if accepted, will receive further instructions by the GFZ in a letter of acceptance.
Any additional questions may be directed to the address above.

2.3 Services provided to selected participants

Fellowships granted to participants entitle them to the following services:

- Accommodation in single rooms, meals and tea-break refreshments within the facilities and arrangements provided by the organizers; (Only during the excursion we may ask the participants to stay for one or two nights in double rooms);
- Tuition, printed course material, scientific and cultural excursions;
- Collection of scientific textbooks and software which participants can take home;
- A small amount of pocket money (8 EURO per day) to cover incidental expenses;
- Local transport in connection with the official programme, field excursions and pick-up arrangements for meeting participants arriving at and departing from the airport.

Travel grants to cover the cost of international air travel might be available for only some of the selected participants. Therefore, every applicant is urged to look into available possibilities to cover travel expenses on his/her own with the support of his/her nominating

or sponsoring institution and to make, an explicit statement to this effect in the application form.

2.4 Costs borne by participants or nominating agencies

Participants or their nominating governments/agencies are required to bear the following:

- Cost of personal travel, accident, live and medical insurance;
- All expenses in the home country for travelling abroad, including passports, visa, medical examinations, inoculations, domestic travel, etc.;
- Salary and related allowance during the period of participation in the training course;
- Any expenses other than the travel grants for selected participants and the living and accommodation expenses at the seminar place (see 2.3) including subsistence and incidental expenses during travel, any expenses incurred during stop-over en route and any additional costs for travel by other route than the one originally provided with the ticket;
- Any costs for excess luggage.

Neither the GFZ nor any other co-organiser or co-sponsor of the course will assume responsibility for the following expenditures or services:

- Costs incurred by participants with respect to travel insurance, medical bills and hospitals fees in connection with their attendance at the training course;
- Loss of or damage to property while attending the training course;
- Compensation in the event of death or disability of participants in connection their attendance at the training course;
- Any claim towards expenses incurred by participants other than those mentioned in section 2.4. above (e.g. for accommodation in hotels, food and drink orders or private trips of the participants own choice, shopping, excess luggage, etc.);
- Re-routing tickets or making visa arrangements other than those required for entering or leaving Germany on the shortest possible way.

Participants may exchange their own freely convertible currency into Euro to cover themselves the cost for any additional personal needs beyond what is provided under 2.3

With their signature under the application form all applicants and their nominating institutions accept these conditions irrevocably.

3. GENERAL INFORMATION

3.1 Location of the course

The GFZ German Research Centre for Geosciences is situated in a wooded area on the top of a hill (Telegrafenberg) called Science Park "Albert Einstein". Potsdam, the capital of the State of Brandenburg, is surrounded by many lakes and beautiful parks. It lies on the river Havel and has about 150,000 inhabitants. Potsdam is particularly famous for its beautiful 18th and 19th century palaces and gardens of the Prussian kings, notably Sanssouci, which have been included in the world list of UNESCO of the cultural heritage of mankind.

The opening day of the course takes place at the GFZ, also the lectures are held at the GFZ German Research Centre for Geosciences. Only the evening lectures as well as the special programs will take place in the hotel, where the participants are accommodated. During one week of the course, one group of the participants (Group B) will receive specialized training at the Federal Institute for Geosciences and Natural Resources (BGR) in Hannover in the northern part of Germany.
Hannover is the capital of the federal state of Lower Saxony (Niedersachsen), Germany. With a population of more than 520,000 the city is a major center of northern Germany, known for hosting annual commercial expositions such as the Hannover Fair and the

CeBIT. The Hannover fairground, due to numerous extensions especially for the Expo 2000, is the largest in the world. Hannover also has regional importance because of its universities and medical school.

3.2 Excursions

During the weekends there will be three full-day excursions in Potsdam, Berlin and surroundings. There will also be a 3 days scientific excursion by bus, visiting Freiberg, the KTB Drill Site, the Observatory Wettzell, the Wiechert museum Göttingen and the BGR Hannover. For details see the annexed programme.

3.3 Climate and recommended dressing

September and October are fairly dry in Germany; some rain is to be expected every third day, on the average. In September, the maximum temperature typically is ranging between 14°C and 20°C during day-time and 5°C to 10°C during night time; in October the average maximum temperature reaches 8°C to 15°C and during the nights light frost may occur. It is recommended that the participants bring along a sweater and a rain coat or an umbrella as well as proper shoes for the field excursions and occasional hiking. No formal dressing is required during the course.

3.4 The Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences

The GFZ is the national research centre for geosciences of Germany and belongs to the Hermann von Helmholtz Association of German Research Centres. It has been jointly established by the Federal Ministry of Education and Research and by the Ministry of Science, Research and Culture of the State of Brandenburg on January 1, 1992.

Research is carried out in five departments and further centers:
- Geodesy and Remote Sensing;
- Physics of the Earth;
- Geodynamics and Geomaterials;
- Chemistry and Material Cycles;
- Earth Surface Processes.
- Engineering Centers (Tsunami Early Warning, Geothermal Energy)

Besides this, the GFZ:
- provides effective management for major joint geoscientific research projects;
- executes research drilling projects, runs observatories and provides extensive modern facilities, equipment and logistics for both large-scale field projects as well as laboratory measurements;
- performs research with satellites;
- provides, in close cooperation with universities and within the framework of international collaboration, training, expertise and equipment to other countries in need;
- is responsible for the German contribution to the Tsunami Early Warning System in the Indian Ocean region.

Earthquake disaster related topics of the GFZ are:
- development of early warning systems concerning earthquakes;
- microzonation studies;
- multidisciplinary task-force missions to be dispatched into areas which are struck by devastating geological events with the aim to collect first-hand data about damage,
- vulnerability, aftershocks or other post-event activity, local underground effects, seismotectonic conditions, etc.;
- Megacity research;

- assessment of seismic hazard, vulnerability and risk (CEDIM);
- Tsunami research and installation of an Tsunami Early Warning in the Indian Ocean.

Other research projects deal with deep seismic and electromagnetic soundings and with seismology and seismic tomography. The seismology project is mainly concerned with the installation and operation of a global digital broadband system for research (GEOFON), with operational quick determinations of source parameters from strong regional and global earthquakes and with the investigation of deep seismic structures, material properties such as anisotropy and the nature of discontinuities in the Earth's mantel and core.

The training course on "Seismology and Seismic Hazard Assessment" is part of the activities of the Department "Physics of the Earth". Disaster related topics of the Department are research on earthquakes and volcanic eruptions, multidisciplinary task force missions to be dispatched into areas which are struck by devastating, geological events with the aim to collect first-hand data about damages, vulnerability, aftershocks or other post events activity, local underground effects, seismotectonic conditions.

The GFZ is situated on the Telegrafenberg (Telegraph Hill) in Potsdam, where world famous scientific institutes for astrophysics, geodesy, geomagnetism and meteorology were founded already between 1876 and 1892. Seismology has a long tradition in Potsdam too. On 17 April 1889, E. von Rebeur-Paschwitz, with a tilt-meter installed at the Telegrafenberg, obtained the world's first record of a teleseismic event, an earthquake near Japan. In 1902 the Potsdam seismic station began to operate and in 1906 the famous San Francisco earthquake was recorded there with a Wiechert seismograph. In 1969, the Geodetic and the Geomagnetic Institutes in Potsdam were united with the Geodynamic Institute in Jena and the Tectonic Institute in Berlin to form the Central Institute for Physics of the Earth (ZIPE) of the Academy of Sciences of the German Democratic Republic.

This institute initiated in 1979 the international UNESCO-sponsored training course on "Seismology and Seismic Hazard Assessment". After the unification of Germany, ZIPE was dissolved in December 1991. Part of its former facilities are now incorporated in the GFZ under a new scientific concept with a wider scope of national and international research activities and international co-operation. Since 1997, most of the GFZ has moved to a new modern building complex on the Telegrafenberg. More information is available from the GFZ home-page http://www.gfz-potsdam.de/ .

3.5 The Federal Institute for Geosciences and Natural Resources (BGR)

The BGR is the central geoscientific institution of the Federal Government of Germany and a subsidiary agency of the Federal Ministry for Economics. It advises and informs the Federal Ministries on matters related to natural resources and applied geosciences and on geoscientific aspects of environmental and resources protection. The BGR deals with research and development in the field of applied geosciences and carries out, on the request of the Federal Government, related activities within Germany and abroad, in developing countries in particular. The BGR also represents the Federal Republic of Germany in international, especially intergovernmental, geoscientific bodies and organizations, e.g. those related to the Comprehensive Nuclear Test Ban Treaty Organization (CTBTO).

The BGR is also responsible for the monitoring and cataloguing of the earthquake activity in Germany and the surrounding near-border areas. In this connection it maintains the German Regional Seismic Network (GRSN) of digital broadband stations and operates the Central Seismological Observatory Gräfenberg (SZGRF) in Erlangen, which also functions as the centralized seismological data archive and analysis centre in Germany. More information is available from the BGR home-page http://www.bgr.bund.de/

List of institutions, lecturers and assistants contributing to the International Training Course on "Seismology, Hazard Assessment and Risk Mitigation", September 19 to October 21, 2011 in Potsdam, Germany

---

GFZ German Research Centre for Geosciences, Germany

Prof. Dr. P. Bormann	pb65@gmx.net
Dr. D. Bindi	bindi@gfz-potsdam.de
Dr. W. Hanka	winfried.hanka@gfz-potsdam.de
Dr. S. Hainzl	sebastian.hainzl@gfz-potsdam.de
Prof. Dr. F. Tilmann	frederik.tilmann@gfz-potsdam.de
Dr. J. Lauterjung	joern.lauterjung@gfz-potsdam.de
Dr. C. Milkereit	claus.milkereit@gfz-potsdam.de
Dr. M. Picozzi	picoz@gfz-potsdam.de
Dr. S. Parolai	parolai@gfz-potsdam.de
Dr. M. Pilz	marco.pilz@gfz-potsdam.de
Dr. Massimilano Pittore	massimiliano.pittore@gfz-potsdam.de
Dr. A. Strollo	angelo.strollo@gfz-potsdam.de
Dr. J. Saul	joachim.saul@gfz-potsdam.de
Dr. T. Walter	twalter@gfz-potsdam.de
Dr. R. Wang	wang@gfz-potsdam.de
M. Wieland	marc.wieland@gfz-potsdam.de
Prof. Dr. J. Zschau	zschau@gfz-potsdam.de
Dr. R. Arvidsson	ronalda@gfz-potsdam.de
Dr. S. Tyagunov	sergey.tyagunov@gfz-potsdam.de

University of Leipzig, Geophysical Observatory Collm, Germany

Dr. S. Wendt	obssw@hpwork30.collm.uni-leipzig.de

University of Stuttgart, Institute of Geophysics, Germany

Prof. Dr. E. Wielandt	e.wielandt@t-online.de

Black Forest Observatory (BFO) Schiltach, Germany

Dr. T. Forbriger	Thomas.Forbriger@kit.edu

Federal Institute for Geosciences and Natural Resources, (BGR), Hannover, Germany

Dr. K. Stammler	klaus@szgrf.bgr.de
Dr. T. Plenefisch	plenefisch@sdac.hannover.bgr.de

University of Bergen, Norway

Dr. L. Ottemöller	lot081@geo.uib.no
Dr. M. Sørensen	Mathilde.Sorensen@geo.uib.no

Université Joseph Fourier-Grenoble, France

Dr. P.-Y. Bard	bard@obs.ujf-grenoble.fr

NORSAR, Norway

Dr. D. Lang	lang@norsar.no