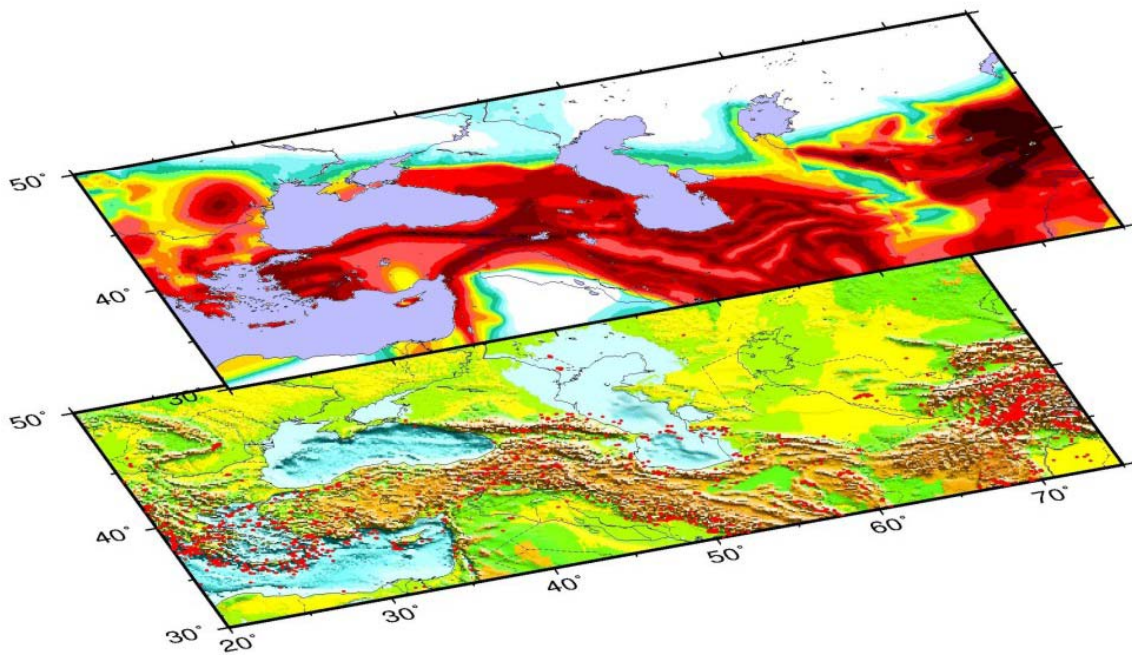


## Circular & Programme



## International Training Course on Seismology, Seismic Data Analysis, Hazard Assessment and Risk Mitigation

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Turkey  
20 September to 22 October 2010

International Training Course on  
**Seismology, Seismic Data Analysis,  
Seismic Hazard Assessment  
and Risk Mitigation**

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September 20 to October 22, 2010  
Turkey

Organised and sponsored by

**Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences  
Kandilli Observatory and Earthquake Research Institute, Istanbul  
Tübitak Marmara Research Center, Gebze  
Kocaeli University, Izmit  
Prime Ministry - Disaster and Emergency Management Office, Ankara  
Dokuz Eylül University, Izmir**

co-sponsored by

*German Foreign Office (Berlin)  
UNESCO (Paris)  
InWEnt (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 scientists and engineers from developing countries. In 2010, the GFZ organizes and runs the course as regional course in Turkey in the time period September 20 to October 22 for the benefit of participants from earthquake-prone countries of the regions Central Asia, Eastern Europe, Eastern Mediterranean, Middle and Near East under the main topics:

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

The training course is co-sponsored by the Foreign Office of the Federal Republic of Germany (Berlin), the United Nations Educational, Scientific and Cultural Organization (UNESCO, Paris), and Capacity Building International (InWEnt, Berlin). The team of lecturers from the GeoForschungsZentrum (GFZ), University of Stuttgart, University of Karlsruhe, University of Leipzig, Observatoire Grenoble, and the University of Bergen, is complemented by colleagues from research institutes and universities of Turkey, namely the Kandilli Observatory Istanbul, TÜBITAK MRC Gebze, Kocaeli University, AFET ISLERI Ankara, and the Dokuz Eylül University Izmir.

Until 2010, more than 830 participants from 104 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 German Research Centre for Geosciences. 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 about the training courses, including photo-documentation, as well as the circular, programme and application form for the course in 2010 can be found on the GFZ web-page under <http://www.gfz-potsdam.de/portal/gfz/Struktur/Departments/Department+2/sec21/>.

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 2010 focus on visits to geophysical and seismological observatories as well on the tectonic expressions in Turkey. 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 part of 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.

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 28. 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 and/or attendance from domestic institutional or development-aid project funds for training. **Travel grants** are available to selected participants from developing countries in need of support.

**Note:** 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 Istanbul/Turkey 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 Turkey.

**An application is considered only when:**

- **the attached application form is dully filled-in and submitted in time;**
- **the application form is accompanied by two letters of recommendation**
- **Applicants give the title/topic of their presentation in the application form**
- **Applicants provide a “Letter of Motivation”, why they want to join the course**

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

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 thresh out.

All participants are also kindly invited to present, at social evening get-togethers, 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 participant’s **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 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, and representatives of the German Foreign Office as the main sponsor of the course. Chairman is Prof. Dr. J. Zschau, Head of Section 2.1 “Seismic 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 20, 2010**:

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

**Phone: (+49 331) 288 1201/1297  
Fax: (+49 331) 288 1204/1296  
E-mail:course-un@gfz-potsdam.de**

**Candidates will be informed of the decision of the Academic Board by July 15, 2010** and, if accepted, will receive further instructions by the GFZ in a letter of acceptance and a letter of invitation from the Kandilli Observatory Istanbul. 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, meals and tea-break refreshments within the facilities and arrangements provided by the organizers
- 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 (6 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**. Please note that every participant will receive manuals, lecture books and additional material during the course, which also have a certain weight (~8kg).

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 Turkey on the shortest possible way.

Participants may exchange their own freely convertible currency into Turkish Lira (TL) 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 (<http://en.wikipedia.org/wiki/Turkey>)

The regional training course 2010 is organised in cooperation with leading institutes and universities in Turkey. Turkey is a Eurasian country that stretches across the Anatolian peninsula in Western Asia and Thrace in the Balkan region of southeastern Europe. Turkey is bordered by eight countries: Bulgaria to the northwest; Greece to the west; Georgia to the northeast; Armenia, Azerbaijan and Iran to the east; and Iraq and Syria to the southeast. The Mediterranean Sea and Cyprus are to the south; the Aegean Sea to the west; and the Black Sea is to the north.

Separating Anatolia and Thrace are the Sea of Marmara and the Turkish Straits (the Bosphorus and the Dardanelles), which are commonly reckoned to delineate the boundary between Europe and Asia, thereby making Turkey a country of significant geostrategic importance.

#### 3.2 Excursions

Excursions will be realised during the weekends. As the course is planned in Istanbul, Gebze, Ankara, and Izmir the transfer times will be used to explain tectonic and geological feature of the North Anatolian Fault zone, but also other tectonic expressions of the region.

#### 3.3 Climate and recommended dressing (<http://www.enjoyturkey.com/info>)

Although Turkey is situated in a geographical location where climatic conditions are quite temperate, the diverse nature of the landscape, and the existence in particular of the mountains that run parallel to the coasts, result in significant differences in climatic conditions from one region to the other. While the coastal regions enjoy milder climates, the inland Anatolia plateau experiences hot summers and cold winters with limited rainfall. As the course will be realised in September-October, please prepare for different kind of weather: sunny and warm but also chilly and rainy. During the excursions we will visit seismological stations and some geological interesting points. Therefore, please take with you some good shoes. We will not do hiking during the course but we should prepare for walking some hundred meters under semi-rough conditions.

#### 3.4 Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences (<http://www.gfz-potsdam.de/>)

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:

- Geodesy and Remote Sensing;
- Physics of the Earth;
- Geodynamics and Geomaterials;
- Chemistry and Material Cycles;
- Earth Surface Processes.

This training course on “Seismology and Seismic Hazard Assessment” is part of the activities of the Department “Physics of the Earth”. Earthquake disaster related topics of the GFZ are:

- development of early warning systems concerning earthquakes;
- operation of a global digital broadband system for research (GEOFON)



- 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.

Disaster related topics of the Department are research on earthquakes and volcanic eruptions, multidisciplinary taskforce 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.

### **3.5 Kandilli Observatory and Earthquake Research Institute, Istanbul**

(<http://www.koeri.boun.edu.tr/eng/topeng.htm>)

Kandilli Observatory, is a unique organization in Turkey, was annexed to Boğaziçi University in 1983 and has acquired an institutional status, namely KANDILLI OBSERVATORY AND EARTHQUAKE RESEARCH INSTITUTE (KOERI).

“Istanbul Rasathanesi” in history of Turkish science, was established in 1868. In the beginning, it was not an astronomical observatory, but housed the central meteorology office. Observations were performed on the 74 m high Pera hill. From 1868 to today, the development of the Observatory and the researches conducted can be summarized into three important periods: 1868-1909-1911-1982, and from 1982 to the present: an Academic Institute.

After annexed to Boğaziçi University and given an institutional academic status, Kandilli Observatory and Earthquake Research Institute (KOERI) extended its activities into various observational fields with the main emphasis oriented towards earthquake research, education and relevant observational service activities. KOERI today has evolved into a multidisciplinary earthquake research organization providing graduate education in three departments namely Earthquake Engineering, Geophysics and Geodesy. KOERI is a unique organization in Turkey encompassing earthquake observation, research, and education and application services within a single, integrated body. Besides this, the Astronomy, Meteorology and Magnetism observatories have been updated with state of art technology.

KOERI provides seismological observation services with its continuously expanding network distributed throughout Turkey. Currently, the 140 station network is operational (two stations located in North Cyprus) with on-line, leased-line, radio-link and dial-up connections. The network provides continuous earthquake information to KOERI and this information is quickly forwarded to related authorities.

Observational studies also include permanent strong motion networks. About 300 digital strong motion accelerographs are operated by KOERI as dense urban network in and around Istanbul (Rapid response and early warning system, down hole systems and structural instrumentations). KOERI has taken and currently takes active roles in the EU FP6 and FP7 projects titled: PREVIEW, LessLOSS, NERIES, SAFER, TRIPOD, TRANSFER, SHARE and SERIES.

### **3.6 TÜBİTAK Marmara Research Center MRC**

(<http://www.mam.gov.tr/english/index.html>)

Earth and Marine Sciences Institute (EMSI) is part to the TUBITAK Marmara Research Center (MRC). It was first established in the year 1983 as Earth Sciences Division of Basic Sciences Research Institute. During the period from its foundation until 1996, it acquired experience and know-how in Earth Sciences and a strong infrastructure was built for

measurement and evaluation. From 1996 until today, when it was directly connected to TUBITAK MRC Directorate, it defined its mission and vision in parallel to reorganization of Marmara Research Institute and carried out its studies. In the year 1998, it acquired the status of being a research institute connected to TUBITAK MRC Directorate.

Having the vision of being a Centre of Excellence in research on active tectonics and underground resources areas countrywide and in our region and the mission of carrying out applied research in active tectonics and underground resources focusing on social benefit by multidisciplinary approaches based on modelling and measurement and dissemination of information acquired by these researches. It inclined on the earth sciences problems awaiting solutions in the light of the progress in earth sciences in the world.

Emphasizing on being a customer oriented institute, its studies were concentrated on three different areas, namely Earthquake Processes, Geophysical Processes and Geochemical Processes. Its name was simplified to become Earth and Marine Sciences Institute at the start of year 2005. Presently, EMSI researcher profile consists of totally 43 persons, namely 16 PhD, 7 MSc. 13 BSc.

### **3.7 Kocaeli University**

[\(http://www.kocaeli.edu.tr/int/\)](http://www.kocaeli.edu.tr/int/)

The Kocaeli University was founded in 1992. As of January 2010, Kocaeli University has 1984 academic staff including 174 professors, 147 associate professors, 446 assistant professors, 286 senior lecturers, 172 lecturers, 717 research assistants and 42 specialists, and 1028 administrative staff who work for 11 faculties, 6 schools, 1 state conservatory, 19 vocational training schools, 3 institutes, 12 Research Centres and 12 Research Units. As of January 2010, 57.487 students continue their education and training at our university. The department of geophysical engineering was founded in 1979 as a part of the academy of architecture-engineering of Kocaeli State. Education started in 1980 in our department. In 1982, the department joined the engineering faculty of the university of Yıldız. The total academic personnel working in our department is now 22 which includes 5 professors, 8 assistant professors, 8 research assistants, and 1 specialist.

To complete the education of the department of geophysical engineering as an undergraduate student takes at least 4 years. During this 4-years, students need to register and to succeed 168 credit/hours classes to graduate from the Kocaeli University. In the curriculum; geophysics classes, classes related to geophysics, mathematics, physics, geology, and computer programming are extensively taught.

Sophomore students (at the end of the second year) should enroll in a camp training course. It takes 3 weeks. During these 3 weeks, students should learn not only how to applied geophysical methods in a field but also how to manage and overcome some difficulties in a natural territory. Junior students (at the end of the third year) should work a summer intern (training) at some organizations such as government institutes, private companies etc. at least 20 days as a full time.

In addition to these, junior and senior students should prepare a project and present it to academic staff and students. As for senior students, they should study a graduation project and present their results to academic staff and students in a public seminar room. In the department of geophysical engineering based Graduate School of Natural Applied Sciences, graduate education (MSc and PhD) has been offered since 1993.

In the Earth and Space Sciences Research Center (YUBAM), the academic personnel successfully continue their research in an effective manner about earthquake, seismology, microzonation, disaster mitigation, disaster risk reduction, disaster preperadness education, disaster management systems, early warning systems, archeogeophysics, environmental geophysics, remote sensing, soil inspection, amplification of soils, shear wave splitting analysis, seismic tomograpgy, etc.

### **3.8 Prime Ministry - Disaster and Emergency Management Office, Ankara**

(<http://www.deprem.gov.tr>)

Disaster and Emergency Management Presidency is a department of Prime Ministry specialized on disaster management studies in Turkey. It was founded in 2009 by the law Number 5902. Until 2009, studies related with disaster management had been performed by three different directorates under different ministries.

The Earthquake Department under the Presidency operates National weak motion and Strong motion observation Networks. There are 161 weak motion and 271 strong motion instruments installed all around the country. The Earthquake Department is also responsible from earthquake preparedness activities, earthquake risk management and earthquake safety policy making activities, and increasing public awareness on earthquakes in Turkey.

The Earthquake Department is also a part to many joint R&D projects with universities, research institutes. It has also close relations with international seismological centers and is member of several national and international committees. Earthquake Department is also acting as the secretariat of National Earthquake Advisory Board which was established in 2009 by the law N. 5902.

### **3.9 Dokuz Eylül University, Izmir**

(<http://www.deu.edu.tr/DEUWeb/English/>)

Dokuz Eylül University was founded on 20 July 1982. Seventeen previously founded institutions of Ege University and other various higher education institutes were affiliated to the University. The number of its academic units reached 41 until 1992. Presently DEU owns 10 faculties, 5 schools, 5 vocational schools, 5 graduate schools and 5 institutes.

The Faculty of Engineering of Dokuz Eylül University is the largest teaching and research midpoint in the Aegean Region of Turkey. It has been created in 1969 as a part of the Ege University, was committed later to Dokuz Eylül University founded in 1982.

It now consists of 11 departments including Geophysics, Geology and Civil Engineering. Education members, researchers and academicians of the Engineering Faculty are also leading top position in academic research centers to form a sustainable urbanization. The combination of research into natural sciences and socio-economic research within a single faculty is unique in the Aegean Region. Mutual cross-fertilization between different institutions gives rise to new ideas and ensures ongoing research on city or regional scale.

Geophysicists of the faculty have a long track record in fundamental knowledge of the urban and regional developments, and make a significant contribution to provide best solutions for the problems facing society. Geologists and Geotechnicians also aim to link academic research providing knowledge to industrial and social institutions.

List of institutions, lecturers and assistants  
contributing to the International Training Course on

**"Seismology, Seismic Hazard Assessment and Risk Mitigation"**

**September 20 to October 22, 2010 in Turkey**

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**GeoForschungsZentrum Potsdam (GFZ), Germany**

Prof. Dr. P. Bormann	Dr. M. Sørensen
Dr. C. Milkereit	Prof. Dr. R. Wahlström
Dr. S. Parolai	Prof. Dr. J. Zschau, Prof. Dr. R. Kind
Dr. D. Bindi	Dr. T. Walter
Dr. M. Picozzi	Dr. R. Wang
Dr. H. Woith	Dr. A. Strollo

**Kandilli Observatory and Earthquake Research Institute (KOERI), Turkey**

Prof. M. Erdik	Prof. M. Aktar
Prof. N. Aydinoglu	Assoc. Prof. N. M. Özel
Dr. M. B. Demircioglu	Dr. K. Sesetyan

**Istanbul Technical University (ITU), Turkey**

Prof. C. Şengör

**The Scientific and Technological Research Council of Turkey (TÜBİTAK), Turkey**

Prof. S. Inan	Ass. Prof. S. Ergintav
Dr. Z. Cakir	

**Prime Ministry, Disaster and Emergency Management Office, Turkey**

Dr. M. Nurlu

**Kocaeli University, Turkey**

Prof. S. Baris  
Prof. O. Cakin

**Middle East Technical University (METU), Turkey**

Prof. Dr. S. Akkar

**Dokuz Eylül University, Turkey**

Dr. O. Polat

**University of Leipzig, Geophysical Observatory Collm, Germany**

Dr. S. Wendt

**University of Stuttgart, Institute of Geophysics, Germany**

Prof. Dr. E. Wielandt

**University of Karlsruhe, Black Forest Observatory, Germany**

Dr. T. Forbriger

**Observatoire Grenoble, Laboratoire de Geophysique Interne et Tectonophysique and  
Laboratoire Central des Ponts-et Chaussees, Paris, France**

Dr. P.-Y. Bard

**University of Bergen, Norway**

Dr. L. Ottemöller

# International Training Course on Seismology, Seismic Data Analysis, Seismic Hazard Assessment and Risk Mitigation

Turkey, 20 September to 22 October 2010

## 1. Opening Day

**Monday, Sept. 20**

*Istanbul*

09:00 – 9:15

*Prof. Dr. Mustafa Erdik (Director)*

*Kandilli Observatory and Earthquake Research Institute*

*Dr. Brita Wagener*

*Consul general of Germany in Istanbul*

09:15 – 10:00

*Prof. Celal Şengör*

*Active tectonics and seismicity of the Central Alpides*

10:00 – 10:45

*Prof. Dr. J. Zschau or Prof. Dr. R. Kind*

*Earthquake Science and its Contribution to Society*

*Group photo and Coffee/Tea break*

11:15 – 11:45

*Prof. M. Aktar*

*Seismic Activity in and around Turkey*

11:45 – 12:15

*NN (City of Istanbul, AKOM)*

*Dikkat Istanbul, Deprem Kapıda*

*Lunch Break*

13:30 – 14:15

*Prof. P. Bormann*

*Earthquake Disaster, Scourge of Nature or Man Made Disaster?*

14:15 – 15:00

*Prof. M. Nuray Aydınoğlu*

*Civil Engineering for seismic safety in Turkey*

*Coffee/Tea Break*

15:30 – 16:00

*Dr. N. M. Özel*

*Seismological and Tsunami Observations at KOERI*

16:00 – 17:00

*Walk through the area of the Kandilli Observatory and Earthquake Research Institute,  
Visit to National Earthquake Monitoring Center and Seismology Museum*

17:00

*Reception at KOERI*

*(Prof. Dr. Mustafa Erdik, Dr. Brita Wagener)*

**Evening:**

19:30 – 21:00

**Hotel**

*Dr. C. Milkereit*

*Informal get-together of participants and lecturers*

## 2. Fundamentals of Seismology, Seismometry, Instrumentation, Seismogram Analysis, Earthquake Source Parameter

### **Tuesday, Sept. 21**

- 08:30 – 10:00 P. BORMANN  
2.1 Aims and fundamentals of seismology  
Part I: Seismic sources and source parameters
- 10:30 – 12:00 P. BORMANN  
2.2 Aims and fundamentals of seismology  
Part II: Seismic Waves, Earth's models and seismic recordings
- 13:30 – 14:20 E. WIELANDT  
2.3 Design of Seismic Sensors I
- 14:30 – 15:20 E. WIELANDT  
2.4 Design of Seismic Sensors II
- 15:30 – 17:00 E. WIELANDT  
2.5 Fundamentals of Signal Processing I

### **Wednesday, Sept. 22**

- 08:30 – 10:00 P. BORMANN  
2.6 Earthquake magnitudes and energy estimates
- 10:30 – 12:00 P. BORMANN  
2.7 **Manual exercise** on magnitude determination
- 13:30 – 15:00 E. WIELANDT  
2.8 Fundamentals of Signal Processing II, Filter demonstration
- 15:30 – 17:00 E. WIELANDT  
2.9 Installation and Shielding

### **Thursday, Sept. 23**

- 08:30 – 10:00 P. BORMANN  
2.10 Phase interpretation and methods of event location by using local network data
- 10:30 – 12:00 P. BORMANN  
2.11 Teleseismic phase interpretation and 3-component event location; animation of seismic ray propagation
- 13:30 – 15:00 E. WIELANDT, T. FORBRIGER  
2.12 Poles and Zeros, SEED Headers
- 15:30 – 17:00 E. WIELANDT, T. FORBRIGER  
2.13 Sensor Calibration

**Evening:** P. BORMANN  
19:30 – 21:00 Theory of wave propagation and attenuation

**Friday, Sept. 24**

08:30 – 10:00 P. BORMANN  
2.14 Demonstration of Fault Plane Solutions

10:30 – 12:00 P. BORMANN  
2.15 Introduction to Source Parameters derived from seismic spectra

13:30 – 15:00 E. WIELANDT, T. FORBRIGER  
2.16 Demo on Sensor Calibration

15:30 – 17:00 E. WIELANDT, T. FORBRIGER  
2.17 Measuring Noise, Low Noise Modell

**Evening:** **Hotel**  
19:30 – 21:00 *Cultural Presentation (1-6)*

**Saturday, Sept. 25** *Visiting Istanbul*

**Sunday, Sept. 26** *Travel by bus to Gebze*

**GPS, InSAR and Slip Inversion**

**Monday, Sept. 27** *Gebze*

08:30 – 10:00 S. ERGINTAV  
2.18 GPS

10:30 – 12:00 S. ERGINTAV  
2.19 Exercise on GPS

13:30 – 15:00 T. WALTER  
2.20 InSAR I

15:30 – 17:00 Z. CAKIR, T. WALTER  
2.21 InSAR II

**Tuesday, Sept. 28**

08:30 – 10:00 T. WALTER  
2.22 InSAR III

10:30 – 12:00 R. WANG  
2.23 Slip Inversion from GPS and InSAR

- 13:30 – 15:00 R. WANG  
2.24 **Computer Exercise** on Slip inversion
- 15:30 – 17:00 Scientific presentations Participants (1-6)  
*Evening: Travel by bus to Kocaeli*

### **3. Automated Seismogram Analysis, SeisComp3**

#### **Wednesday, Sept. 29**

*Kocaeli*

- 08:30 – 10:00 Gempa  
3.1 SeisComp3 Playback Example /Demonstration
- 10:30 – 12:00 Gempa  
3.2 SeisComp3 Real Time Data
- 13:30 – 15:00 Gempa  
3.3 SeisComp3 Installation
- 15:30 – 17:00 Gempa  
3.4 SeisComp3 Seismogram Analysis

#### **Thursday, Sept. 30**

- 08:30 – 10:00 S. BARIS  
3.5 Installing and running a local seismic network: Aims,  
a) common problems and lessons learnt.  
b) O. CAKIN  
Community-based Disaster Awareness Education
- 10:30 – 12:00 Gempa  
3.6 SeisComp3 Seismogram Analysis
- 13:30 – 15:00 Gempa  
3.7 SeisComp3 Seismogram Analysis
- 15:30 – 17:00 Gempa  
3.8 SeisComp3 Seismogram Analysis

#### **Friday, Oct. 1**

- 08:30 – 10:00 Gempa  
3.9 SeisComp3 Seismogram Analysis
- 10:30 – 12:00 Gempa  
3.10 SeisComp3 Seismogram Analysis





**Wednesday, Oct. 6**

- 08:30 – 10:00 L. OTTEMÖLLER, C. MILKEREIT, S. WENDT  
4.9 **Exercise** on determination of fault-plane solutions
- 10:30 – 12:00 L. OTTEMÖLLER, C. MILKEREIT, S. WENDT  
4.10 **Exercise** on spectral source parameter determination
- 13:30 – 15:00 L. OTTEMÖLLER, C. MILKEREIT, S. WENDT  
4.11 **Exercises** on seismogram analysis based on digital data
- 15:30 – 17:00 L. OTTEMÖLLER, C. MILKEREIT, S. WENDT  
4.12 **Exercises** on seismogram analysis based on digital data

**Evening:**

19:00 – 21:00

**Hotel***Cultural Presentation (13-18)***Thursday, Oct. 7**

- 08:30 – 10:00 S. AKKAR, D. BINDI  
4.13 Attenuation Relations, Strong Motion Instruments and Installation
- 10:30 – 12:00 NN  
4.14 Strong Motion Data Base
- 13:30 – 15:00 S. AKKAR, D. BINDI  
4.15 Strong Motion Data Analysis I
- 15:30 – 17:00 NN, D. BINDI  
4.16 Strong Motion Data Analysis II

**Friday, Oct. 8**

- 08:30 – 10:00 D. BINDI, S. AKKAR  
4.17 Strong Motion Data Analysis III
- 10:30 – 12:00 S. AKKAR, D. BINDI  
4.18 Strong Motion Data Analysis IV
- 13:30 – 14:45 Scientific Presentations (7-11)
- 15:00 – 16:00 Scientific Presentations (12-15)

*16 o'clock Departure by bus to Afyon***Saturday, Oct. 9***Visiting Cay, Heybeli  
Visiting Bolvadin Seismological Station***Sunday, Oct. 10***Travel to Izmir, Visiting Geothermal Field Kizildere*

## **5. Direct and induced effects of strong earthquake ground motions, Microzonation, Array measurements**

### **Monday, Oct. 11**

*Izmir*

- 08:30 – 10:00 P.-Y. BARD  
5.1 Ground shaking site effects. Introduction: Effects of surface topography
- 10:30 – 12:00 P.-Y. BARD  
5.2 Effects of soft surface layers
- 13:30 – 15:00 S. PAROLAI, D. BINDI, M. PICOZZI  
5.3 Instrumental Microzonation I
- 15:30 – 17:00 S. PAROLAI, D. BINDI, M. PICOZZI  
5.4 Instrumental Microzonation II

### **Tuesday, Oct. 12**

- 08:30 – 10:00 P.-Y. BARD  
5.5 Estimation of site effects: Instrumental, numerical, empirical
- 10:30 – 12:00 P.-Y. BARD  
5.6 Use of microtremor recordings for estimating site effects
- 13:30 – 15:00 S. PAROLAI, D. BINDI, M. PICOZZI  
5.7 Instrumental Microzonation III
- 15:30 – 17:00 S. PAROLAI, D. BINDI, M. PICOZZI  
5.8 Instrumental Microzonation IV

### **Wednesday, Oct. 13**

- 08:30 – 10:00 P.-Y. BARD  
5.9 Liquefaction: Basic physical phenomena and procedures for assessing the liquifaction potential
- 10:30 – 12:00 P.-Y. BARD  
5.10 Liquefaction: Basic physical phenomena and procedures for assessing the liquifaction potential
- 13:30 – 15:00 S. PAROLAI, D. BINDI, M. PICOZZI  
5.11 Instrumental Microzonation III
- 15:30 – 17:00 S. PAROLAI, D. BINDI, M. PICOZZI  
5.12 Instrumental Microzonation IV

### **Thursday, Oct. 14**

- 08:30 – 10:00 P.-Y. BARD  
5.13 Slope instabilities: Basic physics and estimation techniques

- 10:30 – 12:00 O. POLAT  
5.14 Site Effects for IzmirNet Strong-Motion Stations
- 13:30 – 15:00 S. PAROLAI, D. BINDI, M. PICOZZI  
5.15 Instrumental Microzonation III
- 15:30 – 17:00 S. PAROLAI, D. BINDI, M. PICOZZI  
5.16 Instrumental Microzonation IV

**Friday, Oct. 15 Expert ½ Day**

**8:30 – 12:00**

During the morning, participants will form working groups where they work on special aspects: (Participants can choose according to their interest)

- Array Methods in Microzonation (M. Picozzi)
- Strong Motion Data Analysis (D. Bindi)
- Special Exercise Hazard Assessment (M. Sørensen)
- Microzonation (P.Y. Bard)
- H/V measurements and interpretation (S. Parolai, O. Polat)

13:30 – 15:00 Scientific presentations (16-22)

15:30 – 17:00 Scientific presentations (23-28)

***Evening:***

19:00 – 21:00 *Cultural Presentation (19-23)*

**Saturday, Oct. 16** *Travel to Istanbul*

**Sunday, Oct. 17** *Leisure time*

**6. Earthquake Hazard Assessment and Risk Estimation**

**Monday, Oct. 18**

*Istanbul*

- 08:30 – 10:00 R. WAHLSTRÖM  
6.1 Macroseismic and Strong Motion Parameter
- 10:30 – 12:00 R. WAHLSTRÖM  
6.2 Macroseismic and Strong Motion Parameters, cont.;  
European Macroseismic Scale
- 13:30 – 15:00 M. SØRENSEN  
6.3 Ground motion parameters and attenuation, **Exercise**
- 15:30 – 17:00 M. SØRENSEN  
6.4 Ground motion parameters and attenuation, **Exercise**

**Tuesday, Oct. 19**

- 08:30 – 10:00 R. WAHLSTRÖM  
6.5 Fundamentals of statistics and probability theory
- 10:30 – 12:00 R. WAHLSTRÖM  
6.6 Earthquake statistics and probability of occurrence
- 13:30 – 15:00 M. SØRENSEN  
6.7 Parameters of the Gutenberg-Richter relationship,  
**Exercise**
- 15:30 – 17:00 R. WAHLSTRÖM  
6.8 Methodology of seismic hazard assessment; “Global  
Seismic Hazard Assessment Program”

**Wednesday, Oct. 20**

- 08:30 – 10:00 M. SØRENSEN  
6.9 The Gutenberg-Richter relationship and catalogue  
completeness, **Exercise**
- 10:30 – 12:00 M. SØRENSEN  
6.10 The Gutenberg-Richter relationship and catalogue  
completeness, **Exercise**
- 13:30 – 15:00 M. SØRENSEN  
6.11 The Gutenberg-Richter relationship and dependent  
events, **Exercise**
- 15:30 – 17:00 M. SØRENSEN  
6.12 The validity of the Poisson distribution, **Exercise**

**Evening:**

19:00 – 21:00 **Hotel**  
*Cultural Presentation (24-28)*

**Thursday, Oct. 21**

- 08:30 – 10:00 M. SØRENSEN  
6.13 Seismic hazard assessment – a simplified approach,  
**Exercise**
- 10:30 – 12:00 M. B. DEMIRCIOĞLU  
6.14 Assessment of Seismic Hazard in Marmara Region and  
in Turkey
- 13:30 – 15:00 K. SESETYAN  
6.15 Introduction to ELER Routine  
ShakeMap Methodology and Applications
- 15:30 – 17:00 C. ZULFIKAR  
6.16 Risk Assessment:- Inventories of elements at risk,  
Vulnerability of elements at risk

**Evening:** NN  
19:30 – 21:00 Visit AKOM Center

**Friday, Oct. 22**

08:30 – 10:00

NN

6.17 Regional and Urban scale risk assessment and applications with ELER

10:30 – 12:00

NN

6.18 Regional and Urban scale risk assessment and applications with ELER - II

13:30 – 15:00

NN

6.19 Earthquake Early Warning and Rapid Response Systems. Applications in Istanbul

15:30 – 17:00

NN

Visit to Earthquake Engineering Laboratories  
Cocktail Prolonge at KOERI

**Evening:**

19:30 -

Closing of the Training Course 2010

**Saturday, Oct. 23**

*Departure of Participants*

**Sunday, Oct. 24**

*Departure of Participants*

# GFZ German Research Centre for Geosciences

## International Training Course on „SEISMOLOGY, SEISMIC DATA ANALYSIS, HAZARD ASSESSMENT AND RISK MITIGATION“

September 20 to October 22, 2010, Turkey  
(Arrival on September 18/19 – Departure on October 23/24, 2010)

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### APPLICATION

(deadline for submission is June 20, 2010)

1. Surname: .....
- First (given) name: .....
- Academic degree: .....
- Sex: ..... picture
- Date of birth: .....
- Marital status: .....
- Nationality at present: .....

2. Profession: .....
- Affiliation/Institution: .....
- Business address: .....
- .....
- .....
- .....
- Telephone: ..... Fax: .....
- E-mail:.....

3. Field of scientific .....  
activity/duties of work: .....
- .....
- .....

- 4.1 Are you able to make a scientific contribution to one of the various topical workshops?\*

yes                      no

If yes, please give the title and add the abstract.

.....

- 4.2 Are you interested to use in the exercises on seismogram analysis your own digital recordings or can you present in the workshops other kind of original data or software relevant to your problems?

yes                      no                      If yes, please specify:

.....

5. Are you able to give an evening cultural presentation?\*                      yes                      no  
If yes, please indicate kind of presentation:  
.....
6. Are you working at or operating a seismic station or seismic network centre in your country? Please specify (WWSSN, GSN, GEOFON, GEOSCOPE, MEDNET, others?)  
.....
7. Command of English:
- |                  |      |          |      |
|------------------|------|----------|------|
| a) understanding | full | moderate | poor |
| b) speaking      | full | moderate | poor |
8. Please provide a letter of motivation (1/2 – 1 page)!
9. Can you/your institution pay for your travel? \* yes                      uncertain                      no
10. Cost of the cheapest two-way ticket from your country to Istanbul/Turkey in EUR/US\$:
11. **Statement:**  
With my signature below I confirm that I have carefully read the section 2 of the circular and that I accept the conditions as laid down therein and that I will, when accepted, conclude a travel and health/medical insurance for the duration of the course.

Date: ..... Signature: .....

\* for details please consult the Circular & Programme

The application can be sent by mail or fax or in a scanned form by e-mail and should have reached the secretariat not later than June 20, 2010.

- Please attach:
- Two letters of recommendation
  - List of scientific publications
  - Abstract of your intended workshop presentation/demonstration
  - English language certificate
  - Letter of motivation

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