



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

August 10 to September 4, 2015
Potsdam, Germany

Organised and sponsored by
Helmholtz Centre Potsdam
GFZ German Research Centre for Geosciences

co-sponsored by
Federal Foreign Office of Germany (Berlin)



List of institutions, lecturers and assistants contributing to the International Training Course on "Seismology, Hazard Assessment and Risk Mitigation", August 10 to September 4, 2015 in Potsdam, Germany

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Scientific Programme

**International Training Course on
Seismology, Seismic Data Analysis,
Hazard Assessment and Risk Mitigation**
Potsdam, Germany, 10 August to 4 September, 2015

1. Opening Day

Monday, Aug. 10

09.00 - 10.00

Prof. Dr. R. Hüttl, Dr. Ludwig Stroink
Opening of the Training Course 2015
Presentation of the Helmholtz-Centre Potsdam - GFZ
German Research Centre for Geosciences

Mr. Ole Grogro
Representative Federal Foreign Office

Prof. Torsten Dahm
Human-induced and triggered seismicity: it's role in hazard programs

10.00 - 10.30

Break for a welcome drink - Group Photo

10.30 - 11.00

Mahdi Motagh
Using InSAR for geo-hazard detection

11.00 - 11.30

Angelo Strollo
The GEOFON program and the SeisComp3 project

11.30 - 12.00

Domenico Di Giacomo
The International Seismological Centre (ISC): Mission and Products

12.00 - 12.30

Rüdiger Giese
Development of high-resolution seismic imaging and monitoring systems for the application in tunnels and boreholes

12.30 - 13.00

Andrey Babeyko
Deterministic and probabilistic tsunami hazard assessment: methodology and applications in selected regions

13.00 - 14.30

Lunch Break

A27

14.30 - 15.00

Claus Milkereit
The International Training Courses

15.00 - 15.30

Coffee break

15.30 - 17.00

T. DAHM
Aims and fundamentals of seismology

Evening

18.30 - 19.30

Dinner participants + lecturers

(Hotel)

19.30 - 21.00

C. Milkereit
Informal get-together of participants and lecturers

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

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Tuesday, Aug. 11

08.30 - 10.00

T. DAHM
2.1 Seismic sources and source parameters

10.30 - 12.00

T. DAHM
2.2 Theory of wave propagation: Basics of numerical methods

13.30 - 15.00

C. MILKEREIT, XIAOJUN LI
2.4 Seismic Sensors and Their Calibration

15.30 - 17.00

D. DI GIACOMO
2.5 Event Location and Magnitudes I

Wednesday, Aug. 12

08.30 - 10.00

T. DAHM
2.5 Seismic waves in the real Earth, required seismic records and derived Earth models

10.30 - 12.00

J. SAUL, D. DI GIACOMO
2.6 Event Location and Magnitudes II

13.30 - 15.00

S. CESCO
2.7 Moment Tensor Inversion Theory

15.30 - 17.00

S. HEIMANN
2.8 Earthquake Data Agencies and Formats

Thursday, Aug. 13

08.30 - 10.00

S. HEIMANN, S. CESCO
2.9 Data Access, Preparation and Visualization

10.30 - 12.00

S. HEIMANN, S. CESCO
2.10 Green's Functions

13.30 - 14.20

S. HEIMANN, S. CESCO
2.11 Synthetic Seismograms

14.30 - 15.20

S. CESCO, S. HEIMANN
2.12 Moment Tensor Inversion with RAPIDINV

Evening:

19.30 - 21.00

Cultural Presentation (1-7)

Friday, Aug. 14

- 08.30 - 10.00 S. CESCA, S. HEIMANN
2.13 Moment Tensor Inversion Exercise I
- 10.30 - 12.00 S. CESCA, S. HEIMANN
2.14 Moment Tensor Inversion Exercise II
- 13.30 - 15.00 A. STROLLO
2.15 Seismic station integration into SeisComp3
- 15.30 - 17.00 A. STROLLO
2.16 Seismic station integration into SeisComp3

Saturday, Aug. 15*Cultural Walk through Berlin***Sunday, Aug. 16***Cultural Walk through Potsdam***3. Engineering Seismology and Seismic Hazard Assessment**

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Monday, Aug. 17

- 08.30 - 10.00 S. PAROLAI
3.1 Ground shaking site effects.
Introduction: Effects of soft surface layers
- 10.30 - 12.00 S. PAROLAI
3.2 Effects of surface topography
- 13.30 - 15.00 S. PAROLAI, M. PILZ
3.3 Instrumental Microzonation: Surface waves based methods I
- 15.30 - 17.00 S. PAROLAI, M. PILZ
3.4 Instrumental Microzonation: Surface waves based methods II

Tuesday, Aug. 18

- 08.30 - 10.00 S. PAROLAI
3.5 Estimation of site effects: Instrumental, numerical, empirical
- 10.30 - 12.00 S. PAROLAI
3.6 Use of microtremor recordings for estimating site effects
- 13.30 - 15.00 S. PAROLAI, M. PILZ
3.7 Surface wave data acquisition III
- 15.30 - 17.00 S. PAROLAI, M. PILZ
3.8 Surface wave data acquisition IV

Wednesday, Aug. 19

- 08.30 - 10.00 S. PAROLAI, M. PILZ, T. BOXBERGER
3.9 Array Techniques I
- 10.30 - 12.00 S. PAROLAI, M. PILZ, T. BOXBERGER
3.10 Array Techniques II
- 13.30 - 15.00 S. PAROLAI, M. PILZ, T. BOXBERGER
3.11 Array Techniques III
- 15.30 - 17.00 S. PAROLAI, M. PILZ, T. BOXBERGER
3.12 Array Techniques IV

Thursday, Aug. 20

- 08.30 - 10.00 D. BINDI
3.13 Introduction to Strong Motion Seismology
- 10.30 - 12.00 D. BINDI
3.14 Strong Motion data processing
- 13.30 - 15.00 D. BINDI, M. PILZ
3.15 **Exercise** on Strong Motion data processing
- 15.30 - 17.00 D. BINDI
3.16 Introduction to Ground Motion Prediction Equation (GMPE)

Evening:19.30 - 21.00 *Cultural Presentation (8-14)***Friday, Aug. 21**

- 08.30 - 10.00 D. BINDI
3.17 Ground Motion Prediction Equation
- 10.30 - 12.00 D. BINDI
3.18 **Exercise** on Ground Motion Prediction Equation

13.30

Excursion
Welzow, Freiberg**Saturday, Aug. 22**Excursion
Freiberg, KTB**Sunday, Aug. 23**Excursion
Göttingen, Potsdam

Monday, Aug. 24

- 08.30 - 10.00 F. COTTON
3.19 Earthquake seismology primer for PSHA, earthquakes
- 10.30 - 12.00 F. COTTON
3.20 Earthquake seismology primer for PSHA, earthquake-effects
- 13.30 - 15.00 F. COTTON
3.21 Earthquake seismology primer for PSHA, waves
- 15.30 - 17.00 F. COTTON
3.22 The basic principles of probability theory (PSHA)

Tuesday, Aug. 25

- 08.30 - 10.00 F. COTTON
3.23 The basic principles of probabilistic seismic hazard analysis (PSHA)
- 10.30 - 12.00 F. COTTON
3.24 The basic principles of probabilistic seismic hazard analysis (PSHA)
- 13.30 - 15.00 F. COTTON
3.25 Seismicity models for PSHA
- 15.30 - 17.00 F. COTTON
3.26 Ground-motion models

Wednesday, Aug. 26

- 08.30 - 10.00 F. COTTON
3.27 The hazard curve from different perspectives
Epistemic and aleatory uncertainties
- 10.30 - 12.00 F. COTTON, S. KOTHA
3.28 GEM and OpenQuake
- 13.30 - 15.00 F. COTTON
3.29 Testing PSHA models
- 15.30 - 17.00 F. COTTON
3.30 Discussion: How data and recent earthquakes challenge our view of seismic hazard

4. Seismic Risk**Thursday, Aug. 27**

- 08.30 - 10.00 M. PITTORE
4.1 Introduction to Risk Assessment
- 10.30 - 12.00 M. PITTORE, M. HAAS
4.2 Risk: Exposure Modeling
- 13.30 - 15.00 M. PITTORE, M. HAAS
4.3 Risk: Exposure Modeling
- 15.30 - 17.00 M. PITTORE, M. HAAS
4.4 Ingredients to OpenQuake

Evening:

19.30 - 21.00 *Cultural Presentation (15-21)*

Friday, Aug. 28

- 08.30 - 10.00 M. PITTORE, M. HAAS
4.5 Estimating Exposure
- 10.30 - 12.00 M. PITTORE, M. HAAS
4.6 Estimating Vulnerability
- 13.30 - 15.00 M. PITTORE, M. HAAS
4.7 Estimating Risk
- 15.30 - 17.00 M. PITTORE, M. HAAS
4.8 Managing Risk: Open Challenges

Saturday, Aug. 29

Leisure Time

Sunday, Aug. 30

Leisure Time

VR2-3

5. Satellite Methods**Monday, Aug. 31**

- 08.30 - 10.00 J. SALZER, N. RICHTER, T. WALTER
5.1 Satellite remote sensing of earthquakes and other geohazards
- 10.30 - 12.00 J. SALZER, N. RICHTER, T. WALTER
5.2 Change detection

