

Scientific Programme

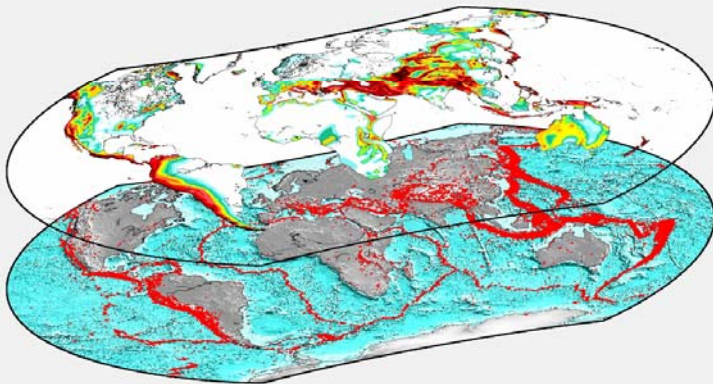
International Training Course on

Seismology, Seismic Data Analysis, Hazard Assessment and Risk Mitigation

Potsdam, Germany, 12 August to 6 September, 2013



Circular & Programme



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

Potsdam, Germany
12 August to 6 September 2013

1. Opening Day

Monday, Aug. 12

H VR1 / VR 2

09.00 - 10.00

Prof. Dr. R. Hüttl

Opening of the Training Course 2013

Presentation of the GeoForschungsZentrum Potsdam

NN

Representative Federal Foreign Office

Prof. Dr. T. 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

Dr. S. Parolai

Global Change Observatory in Central Asia

11.00 - 11.30

Dr. J. Lauterjung

GITEWS – The Tsunami Early Warning Project

11.30 - 12.00

Dr. W. Hanka

The GEOFON Project

12.00 - 12.30

Dr. C. Milkereit

Aim and Layout of the International Training Course

12.30 - 13.30

Lunch Break

13.30 - 15.00

Prof. Dr. T. Dahm

Aims and fundamentals of seismology
Seismic sources and source parameters

15.00 - 15.30

Coffee Break

15.30 - 16.00

Dr. B. Weber

Introduction to Seiscomp3

16.00 - 16.30

Dr. B. Weber, T. Boxberger, Dr. C. Milkereit

SeisComp3 Installation

Evening

(Hotel)

19.30 - 21.00

Dr. C. Milkereit

Informal get-together of participants and lecturers

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

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|---------------------------|--|-----|
| | | A27 |
| Tuesday, Aug. 13 | | |
| 08.30 – 10.00 | T. DAHM 2.1 Theory of wave propagation: Basics of numerical methods | |
| 10.30 – 12.00 | P. BORMANN 2.2 Seismic waves in the real Earth, required seismic records and derived Earth models | |
| 13.30 – 15.00 | B. WEBER, T. BOXBERGER. C. MILKEREIT 2.3 Exercise with SeisComp3 | |
| 15.30 – 17.00 | B. WEBER, T. BOXBERGER. C. MILKEREIT 2.4 Exercise with SeisComp3 | |
| Wednesday, Aug. 14 | | |
| 08.30 – 10.00 | P. BORMANN 2.5 Local phase interpretation and event location | A27 |
| 10.30 – 12.00 | C. MILKEREIT 2.6 Design of Seismic Sensors | |
| 13.30 – 15.00 | B. WEBER, T. BOXBERGER. C. MILKEREIT 2.7 Exercise with SeisComp3 | |
| 15.30 – 17.00 | B. WEBER, T. BOXBERGER. C. MILKEREIT 2.8 Exercise with SeisComp3 | |
| Thursday, Aug. 15 | | |
| 08.30 – 10.00 | C. MILKEREIT 2.9 Installation and Shielding | A27 |
| 10.30 – 12.00 | P. BORMANN 2.10 Earthquake magnitude and energy estimation | |
| 13.30 – 15.00 | B. WEBER, T. BOXBERGER. C. MILKEREIT 2.11 Exercise with SeisComp3 | |
| 15.30 – 17.00 | B. WEBER, T. BOXBERGER. C. MILKEREIT 2.12 Exercise with SeisComp3 | |
| Friday, Aug. 16 | | |
| 08.30 – 10.00 | C. MILKEREIT 2.13 Demo on Sensor Calibration | A27 |

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| 10.30 – 12.00 | P. BORMANN 2.14 Introduction to source parameters derived from seismic spectra |
| 13.30 – 15.00 | C. MILKEREIT 2.15 Demonstration of fault plane solution |
| 15.30 – 17.00 | B. WEBER, T. BOXBERGER. C. MILKEREIT 2.16 Exercise with SeisComp3 (Fault Plane Solution) |
| <u>Evening:</u> | |
| 19.30 – 21.00 | <i>Cultural Presentation (1-6)</i> |

Saturday, Aug. 17 *Cultural Walk through Potsdam*

Sunday, Aug. 18 *Cultural Walk through Berlin*

3. Introduction into Microzonation and Risk Assessment

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| Monday, Aug. 19 | | A27 |
| 08.30 – 10.00 | S. PAROLAI 3.1 Ground shaking site effects. | |
| 10.30 – 12.00 | S. PAROLAI, D. BINDI, M. PILZ 3.2 Introduction into Microzonation | |
| 13.30 – 15.00 | S. PAROLAI, D. BINDI, M. PILZ 3.3 Exercise: Surface wave data inversion - I | |
| 15.30 – 17.00 | S. PAROLAI, D. BINDI, M. PILZ 3.4 Exercise: Surface wave data inversion - II | |
| Tuesday, Aug. 20 | | A27 |
| 08.30 – 10.00 | S. PAROLAI, D. BINDI, M. PILZ 3.5 Exercise: Surface wave data inversion - III | |
| 10.30 – 12.00 | S. PAROLAI, D. BINDI, M. PILZ 3.6 Exercise: Surface wave data inversion - IV | |
| 13.30 – 15.00 | S. PAROLAI, D. BINDI, M. PILZ 3.7 Exercise: Surface wave data inversion - V | |
| 15.30 – 17.00 | S. PAROLAI, D. BINDI, M. PILZ 3.8 Exercise: Surface wave data inversion - VI | |
| Wednesday, Aug. 21 | | A27 |
| 08.30 – 10.00 | S. PAROLAI 3.9 Risk Estimation – Introduction | |

- 10.30 – 12.00 M. PITTORE, S. TYAGUNOV
3.10 Risk: Exposure Modeling
- 13.30 – 15.00 M. PITTORE, S. TYAGUNOV
3.11 Risk: Vulnerability Model
- 15.30 – 17.00 M. PITTORE, S. TYAGUNOV
3.12 Risk: Loss Modeling

Evening:
19.30 – 21.00 *Cultural Presentation (7-13)*

4. InSAR

Thursday, Aug. 22 A27

- 08.30 – 10.00 T. WALTER
4.1 InSAR Principles and Theory of Radar Interferometry
- 10.30 – 12.00 T. WALTER, H. SUDHAUS
4.2 InSAR Practical Considerations
- 13.30 – 15.00 T. WALTER, H. SUDHAUS
4.3 Pixel Tracking

15.30 *Travel to Windischeschenbach by bus*

Friday, Aug. 23 KTB Site

- 08.30 – 10.00 M. PILZ, C. MILKEREIT
Array measurements
- 10.30 – 12.00 M. PILZ, C. MILKEREIT
Array measurements and analysis
- 13.30 – 15.00 M. PILZ, C. MILKEREIT
Array measurements and analysis
- 15.30 – 16.00 M. PILZ, C. MILKEREIT
Array measurements and analysis

16.00 – 17.30
Visit of the Deep Crustal Laboratory, KTB site

17.30 -19.30
Travel to Zandt (Wettzell)

Dinner & Accommodation in Zandt, (Wettzell)

Saturday, Aug. 24 10.00 - 12.00
Visit of the Geodetic Observatory Wettzell

12.30 - 17.30
Travel to Eisenach

(Visit Wartburg Castle)
Dinner & Accommodation in Eisenach

Sunday, Aug. 25 08.30 - 10.00
Travel to Göttingen

10.00 - 13.00
Visit of the Wiechert Earthquake station in Göttingen

13.00 - 18.00
Travel to Potsdam

5. Strong Motion Data Analysis

Monday, Aug. 26 A27

- 08.30 – 10.00 D. BINDI
5.1 Introduction to Strong Motion Seismology
- 10.30 – 12.00 D. BINDI
5.2 Strong Motion data processing
- 13.30 – 15.00 D. BINDI
5.3 Exercise on Strong Motion data processing
- 15.30 – 17.00 D. BINDI
5.4 Exercise on Strong Motion data processing

Tuesday, Aug. 27 A27

- 08.30 – 10.00 D. BINDI
5.5 Introduction to Ground Motion Prediction Equation (GMPE)
- 10.30 – 12.00 D. BINDI
5.6 Ground Motion Prediction Equation
- 13.30 – 15.00 D. BINDI
5.7 Exercise on Ground Motion Prediction Equation
- 15.30 – 17.00 D. BINDI
5.8 Exercise on Ground Motion Prediction Equation

6. Earthquake Hazard Assessment

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| Wednesday, Aug. 28 | | A27 |
| 08.30 – 10.00 | R. WAHLSTRÖM 6.1 Macroseismic and Strong Motion Parameters | |
| 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 | |
| 15.30 – 17.00 | R. WAHLSTRÖM 6.4 Ground Motion Parameters and attenuation | |
| Thursday, Aug. 29 | | A27 |
| 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 | M. SØRENSEN 6.8 Methodology of seismic hazard assessment. "Global Seismic Hazard Assessment Program" | |
| Friday, Aug. 30 | | A27 |
| 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 Gutenberg-Richter relationship and dependent events, Exercise | |
| Evening: 19.30 – 21.00 | <i>Cultural Presentation (14-19)</i> | |

Saturday, Aug. 31 *Leisure Time*

Sunday, Sept. 1 *Leisure Time*

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|------------------------|--|---------------------|
| Monday, Sept. 2 | Expert Day | Different locations |
| 08.30 - 17.00 | During 3 days the participants will work together in small groups with experts. The participants can choose according to their interest. We would like to encourage general discussions on seismology and seismic hazard. Please bring with you your own data or papers about research ideas or a list of questions. | |
| 3 Expert Days | <p>Seismology</p> <ul style="list-style-type: none"> Earthquake Data Analysis, Routine Data processing SC3 Offline Data processing Seismic Moment Tensor Determination Installation, Integration of Seismological Stations importing real-time data, providing data Station layout, VSAT data transmission Calibration of Broadband Seismic Sensors Regional Moment Tensor Analysis Teleseismic Wave Analysis with Seismic Handler <p>Modeling</p> <ul style="list-style-type: none"> Seismic Wave propagation (teleseismic) Tsunami Modeling from deterministic Scenarios and Probabilistic Tsunami Hazard Assessment Slip Inversion with GPS, INSAR and seismic data Sumatra and Tohoku earthquakes <p>Engineering Seismology</p> <ul style="list-style-type: none"> Microzonation, Instruments and methods, Array techniques, Surface waves data analysis, borehole instrumentation, <p>Seismic Hazard Assessment</p> <ul style="list-style-type: none"> Historical and intensity data Strong Motion Data Analysis Ground Motion Prediction Equations Statistical Earthquake Catalogue Analysis ETAS model, De-Clustering Triggered versus tectonic events <p>Deformation monitoring with InSAR</p> <ul style="list-style-type: none"> Data sources, Data analysis and interpretation Dislocation Model in Layered Half Space <p>Seismic Risk Estimation</p> <ul style="list-style-type: none"> Exposure, Vulnerability, Estimating Losses OpenQuake, GEM Global Earthquake Model | |

Tuesday, Sept. 3

08.30 – 17.00

Expert Day**Wednesday, Sept. 4**

08.30 – 17.00

Expert Day**Final Count Down****Thursday, Sept. 5**

08.30 – 10.00

Scientific Presentations of the Participants (1-3)

10.30 – 12.00

Scientific Presentations of the Participants (4-6)

13.30 – 15.00

Scientific Presentations of the Participants (7-9)

15.30 – 17.00

Scientific Presentations of the Participants (10-14)

Evening:

19.30 – 21.00

*Cultural Presentation (20-26)***Friday, Sept. 6**

08.30 – 10.00

Scientific Presentations of the Participants (15-17)

10.30 – 12.00

Scientific Presentations of the Participants (18-21)

13.30 – 16.00

Scientific Presentations of the Participants (22-26)

16.15 – 17.00

Final Discussion

Evening:

19.30

Closing of the Training Course 2013

Handing out of the course certificates

Saturday, Sept. 7

Departure of Participants

Sunday, Sept. 8

Departure of Participants