



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

November 6 to 26, 2024
Potsdam, Germany

Scientific Programme

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

List of institutions, lecturers and assistants contributing to the International Training Course on "Seismology, Hazard Assessment and Risk Mitigation", November 6 to 26, 2024 in Potsdam, Germany

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**International Training Course on
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Potsdam, Germany, November 6 to 26, 2024

1. Opening Day		
Wednesday, Nov. 6		H, VR 1-2
09:00 - 10:00		<i>Dr. Simone Cesca Welcome</i>
		<i>Prof. Dr. Susanne Buijer /NN (tbc) Presentation of the Helmholtz-Centre Potsdam - GFZ German Research Centre for Geosciences</i>
		<i>Dr. Simone Cesca Presentation of the ITC 2024</i>
		<i>Prof. Dr. Torsten Dahm The Eifel Large-N experiment</i>
10:00 - 10:30		<i>Break for a welcome drink - Group Photo</i>
10:30 - 11:00		<i>Dr. Andrey Babeyko Seismically triggered tsunamis: history, physics, numerics and early warning</i>
11:00 - 11:30		<i>Dr. C. Sens-Schönfelder The use of ambient seismic noise for the monitoring of geological and environmental processes</i>
11.30 - 12:00		<i>Prof. Dr. Thomas Walter, Prof. Dr. Mahdi Motagh InSAR – Remote Monitoring of Natural Hazards</i>
12:00 - 13:30		<i>Lunch Break</i>
13:30 - 15:00	1.1	T. DAHM Aims and fundamentals of seismology
15:00 - 15:30		<i>Coffee break</i>
15:30 - 17:00	1.2	T. DAHM, C. MILKEREIT Digital signal processing in seismology
Evening:		
18:00 - 19:00		Dinner participants + lecturers
19:00 - 21:00		Informal get-together of participants and lecturers

2. Seismology, Instrumentation, Seismogram Analysis, Earthquake Source Parameter, and Wave Propagation

Thursday, Nov. 7		A42
08:30 - 10:00	2.1	T. DAHM Seismic sources and source parameters
10:30 - 12:00	2.2	T. DAHM Theory of wave propagation: Basics of numerical methods
13:30 - 15:00	2.3	M. ISKEN Waveform based detection and location
15:30 - 17:00	2.4	M. ISKEN, S. CESCA Waveform based seismic catalog generation practical
Friday, Nov. 8 SeisComp – data acquisition		
08:30 - 10:00	2.5	J. SAUL Event Location and Magnitudes
10:30 - 12:00	2.6	P. EVANS SeisComP setup
13:30 - 15:00	2.7	P. EVANS SeisComP quick start
15:30 - 17:00	2.8	P. EVANS, J. SAUL SeisComp Playback demonstration
Saturday, Nov. 9		<i>Cultural Walk Potsdam</i>
Sunday, Nov. 10		<i>Leisure Time</i>
Monday, Nov. 11 Seiscomp – detection, location, magnitude		
08:30 - 10:00	2.9	P. EVANS Event location with SeisComP
10:30 - 12:00	2.10	P. EVANS FDSN/EIDA/ORFEUS services and data access

13:30 - 15:00	2.11	P. EVANS SeisComP Practical
15:30 - 17:00		Scientific Presentations of the Participants (1-5)
Tuesday, Nov. 12 Statistical seismology		
08:30 - 10:00	2.12	S. HAINZL Earthquake statistics I: Frequency-Magnitude distribution
10:30 - 12:00	2.13	S. HAINZL Computer Exercise: Analysis of an earthquake catalog
13:30 - 15:00	2.14	S. HAINZL Earthquake statistics II: Aftershocks & Seismicity models
15:30 - 17:00		Scientific Presentations of the Participants (5-8)
Wednesday, Nov. 13 Data Processing with Pyrocko		
08:30 - 10:00	2.15	S. HEIMANN Introduction to Pyrocko
10:30 - 12:00	2.16	S. HEIMANN, P. BÜYÜKAKPINAR Earthquake data access, agencies and formats
13:30 - 15:00	2.17	P. BÜYÜKAKPINAR, S. HEIMANN Data visualization and pre-processing
15:30 - 17:00	2.18	S. HEIMANN, P. BÜYÜKAKPINAR Green's functions and synthetic seismograms
Thursday, Nov. 14 Moment tensor		
08:30 - 10:00	2.19	S. CESCA Source inversion in seismology
10:30 - 12:00	2.20	S. HEIMANN, G. PETERSEN, S. CESCA Source inversion with Grond
13:30 - 15:00	2.21	G. PETERSEN, S. HEIMANN, S. CESCA Source inversion exercise
15:30 - 17:00	2.22	G. PETERSEN, S. HEIMANN, S. CESCA Source inversion exercise

3. Engineering Seismology, seismic hazard and risk assessment, Seismic Hazard Assessment and Seismic Risk		
Friday, Nov. 15		Ground shaking site effects
08:30 - 10:00	3.1	F. COTTON Introduction into Seismic Hazard and Risk Assessment
10:30 - 12:00	3.2	F. COTTON, S. T. LAI Factors controlling strong ground-shaking characteristics
13:30 - 15:00	3.3	D. BINDI Introduction to strong motion seismology
15:30 - 17:00	3.4	D. BINDI Strong motion data and processing
Evening: 18:30 - 21:00		<i>Cultural Presentations (1-8)</i>
Saturday, Nov. 16		<i>Leisure Time</i>
Sunday, Nov. 17		<i>Leisure Time</i>
Monday, Nov. 18		Strong motion, hazard
08:30 - 10:00	3.5	F. COTTON Principles of seismic hazard analysis I
10:30 - 12:00	3.6	F. COTTON Principles of seismic hazard analysis II
13:30 - 15:00	3.7	D. BINDI Ground motion models in PSHA
15:30 - 17:00	3.8	K. LOVIKNES Modelling site effects for regional hazard and risk assessment
Tuesday, Nov. 19		Strong motion, hazard: Site effects
08:30 - 10:00	3.9	F. COTTON Seismic hazard assessment in practice: lessons learned from recent earthquakes
10:30 - 12:00	3.10	F. COTTON Challenges of Seismic hazard assessment: uncertainty evaluation, city effects and effects of climate change on seismic risk

13:30 - 15:00	3.11	M. PILZ, M. OHRNBERGER Seismic site effects: Introduction
15:30 - 17:00	3.12	M. PILZ, M. OHRNBERGER Assessment of site effects: Single station methods
Wednesday, Nov. 20 Site effects		
08:30 - 10:00	3.13	M. PILZ, M. OHRNBERGER Assessment of site effects: Array-based methods
10:00 - 12:00	3.14	M. PILZ, M. OHRNBERGER Inversion of H/V and dispersion curves
13:30 - 15:00		Scientific Presentations of the Participants (9-12)
15:30 - 17:00		Scientific Presentations of the Participants (13-16)
4. Geodesy		
Thursday, Nov. 21 Geodesy		
08:30 - 10:00	4.1	M. MOTAGH Introduction to SAR Interferometry (InSAR) and multi-temporal InSAR analysis
10:30 - 12:00	4.2	M. MOTAGH Introduction to SAR processing using SNAP
13:30 - 15:00	4.3	M. MOTAGH, M. HAGIGHIHI Practical exercise in SNAP for extracting earthquake deformation field using SAR offset tracking (1)
15:30 - 17:00	4.4	M. MOTAGH, M. HAGIGHIHI Practical exercise in SNAP for extracting earthquake deformation field using SAR offset tracking (2)
Friday, Nov. 22		
8:30 - 10:00	4.5	Z. DENG, A. BRACK GNSS – satellites, signals, observations
10:30 - 12:00	4.6	Z. DENG, A. BRACK GNSS – positioning, accuracy, applications
13:30 - 15:00	4.7	Z. DENG, A. BRACK GNSS – practical task I

15:30 - 17:00	4.8	Z. DENG, A. BRACK GNSS – practical task II
Evening: 18:30 - 21:00		<i>Cultural Presentation (9-16)</i>
Saturday, Nov. 23 <i>Leisure Time</i>		
Sunday, Nov. 24 <i>Leisure Time</i>		
Monday, Nov. 25		
08:30 - 17:00		Expert Day I During 2 days participants will form small working groups and will closely work together with an expert. The participants can choose according to their interest and availability. We also 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.
Tuesday, Nov. 26		
08:30 - 17:00		Expert Day II
Evening: 18:30 - 20:30		Closing Dinner - Hand out of the certificates
Wednesday, Nov. 27 Departure of Participants		