



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

November 6 to 26, 2024  
Potsdam, Germany

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**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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## Scientific Programme

**International Training Course on  
Seismology, Seismic Data Analysis,  
Hazard Assessment and Risk Mitigation**  
Potsdam, Germany, November 6 to 26, 2024  
(venue: Albert-Einstein Str. A42/131)

<b>1. Opening Day</b>		
<b>Wednesday, Nov. 6</b>		<b>A42, 129/130</b>
09:00 - 10:00		<i>Dr. Simone Cesca</i> Welcome
		<i>Prof. Dr. Charlotte Krawczyk</i> Presentation of the Helmholtz-Centre Potsdam - GFZ German Research Centre for Geosciences
		<i>Dr. Simone Cesca</i> Presentation of the ITC 2024
		<i>Prof. Dr. Torsten Dahm</i> The Eifel Large-N experiment
10:00 - 10:30		Coffee break - Group Photo
10:30 - 11:00		<i>Dr. C. Sens-Schönfelder</i> The use of ambient seismic noise for the monitoring of geological and environmental processes
11:00 - 11:30		<i>Dr. Andrey Babeyko</i> Seismically triggered tsunamis: history, physics, numerics and early warning
11:30 - 12:00		<i>Prof. Dr. Mahdi Motagh</i> InSAR – Remote Monitoring of Natural Hazards
12:00 - 13:30		Lunch Break
13:30 - 15:00	1.1	T. DAHM Aims and fundamentals of seismology
15:00 - 15:30		Coffee break
15:30 - 17:00	1.2	T. DAHM Seismic sources and source parameters
<b>Evening:</b>		
17:30 - 18:30		Dinner (Fingerfood) participants + lecturers
18:30 - 20:00		Informal get-together of participants and lecturers

<b>2. Seismology, Instrumentation, Seismogram Analysis, Earthquake Source Parameter, and Wave Propagation</b>		
<b>Thursday, Nov. 7</b>		<b>A42, 131</b>
08:30 - 10:00	2.1	S. CESCA Waveform based detection and location
10:30 - 12:00	2.2	P. BÜYÜKAKPINAR, S. CESCA Waveform based seismic catalog generation practical
13:30 - 15:00	2.3	T. DAHM Theory of wave propagation: Basics of numerical methods
15:30 - 17:00	2.4	T. DAHM, C. MILKEREIT Digital signal processing in seismology
SeisComp – data acquisition		
<b>Friday, Nov. 8</b>		
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
<b>Saturday, Nov. 9</b>		<i>Cultural Walk Potsdam</i>
<b>Sunday, Nov. 10</b>		<i>Leisure Time</i>
Seiscomp – detection, location, magnitude		
<b>Monday, Nov. 11</b>		
08:30 - 10:00	2.9	S. HAINZL Earthquake statistics I: Frequency-Magnitude distribution
10:30 - 12:00	2.10	S. HAINZL Computer Exercise: Analysis of an earthquake catalog

13:30 - 15:00	2.11	S. HAINZL Earthquake statistics II: Aftershocks & Seismicity models
15:30 - 17:00		Scientific Presentations of the Participants (1-5)
<b>Tuesday, Nov. 12</b> <span style="float: right;">Statistical seismology</span>		
08:30 - 10:00	2.12	P. EVANS Event location with SeisComP
10:30 - 12:00	2.13	P. EVANS FDSN/EIDA/ORFEUS services and data access
13:30 - 15:00	2.14	P. EVANS SeisComP Practical
15:30 - 17:00		Scientific Presentations of the Participants (5-8)
<b>Wednesday, Nov. 13</b> <span style="float: right;">Data Processing with Pyrocko</span>		
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
<b>Thursday, Nov. 14</b> <span style="float: right;">Moment tensor</span>		
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

<b>3. Engineering Seismology, seismic hazard and risk assessment, Seismic Hazard Assessment and Seismic Risk</b>		
<b>Friday, Nov. 15</b>		Ground shaking site effects
08:30 - 10:00	3.1	G. WEATHERILL Introduction into Seismic Hazard and Risk Assessment
10:30 - 12:00	3.2	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
<b>Evening:</b> 18:30 - 21:00		<i>Cultural Presentations (1-8)</i>
<b>Saturday, Nov. 16</b>		<i>Excursion to Leipzig</i>
<b>Sunday, Nov. 17</b>		<i>Leisure Time</i>
<b>Monday, Nov. 18</b>		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
<b>Tuesday, Nov. 19</b>		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
<b>Wednesday, Nov. 20</b> <span style="float: right;">Site effects</span>		
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)
<b>4. Geodesy</b>		
<b>Thursday, Nov. 21</b> <span style="float: right;">Geodesy</span>		
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. HAGHIGHI Practical exercise in SNAP for extracting earthquake deformation field using SAR offset tracking (1)
15:30 - 17:00	4.4	M. MOTAGH, M. HAGHIGHI Practical exercise in SNAP for extracting earthquake deformation field using SAR offset tracking (2)
<b>Friday, Nov. 22</b>		
8:30 - 10:00	4.5	B. MÄNNEL GNSS – satellites, signals, observations
10:30 - 12:00	4.6	B. MÄNNEL GNSS – positioning, accuracy, applications
13:30 - 15:00	4.7	Z. DENG GNSS – practical task I

15:30 - 17:00	4.8	Z. DENG GNSS – practical task II
<b>Evening:</b> 18:30 - 21:00		<i>Cultural Presentation (9-16)</i>
<b>Saturday, Nov. 23</b> <span style="float: right;"><i>Leisure Time</i></span>		
<b>Sunday, Nov. 24</b> <span style="float: right;"><i>Leisure Time</i></span>		
<b>Monday, Nov. 25</b>		
08:30 - 17:00		<b>Expert Day I</b> 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.
<b>Tuesday, Nov. 26</b>		
08:30 - 17:00		<b>Expert Day II</b>
<b>Evening:</b> 18:30 - 20:30		Closing Dinner - Hand out of the certificates
<b>Wednesday, Nov. 27</b> <span style="float: right;">Departure of Participants</span>		