Scientific Program

Day 1 (May 11, 2026)

08:00–08:45: Welcome coffee

08:45–09:00: Opening remarks

Session 1. Volcano-Tectonic Systems

(Convenors Roland Bürgmann and Raffaele Azzaro)

09:00–10:30: Session 1 (Part 1)

09:00 - 09:30 **Valerio Acocella** (invited) - Volcano-tectonic systems: opportunities and challenges (25'+5' Q/A)
09:30 - 10:00 **Xing Tan** (invited) - Deep Learning for a Clearer View of Magmatic Processes (25'+5' Q/A)
10:00 - 10:20 **Yonis Yusuf** - Crustal Architecture and Tectonic Evolution of the Somali Margin: Implications for Deep-Subsurface Investigations (15'+5' Q/A)

10:20–10:50: Coffee break

10:50–12:10: Session 1 (Part 2)

10:50 - 11:10 **Steven Brooks** - Fault Behaviour on Mt. Etna: seismotectonics constraints from mid-term Sentinel-1 InSAR Time Series (2015–2025) (15'+5' Q/A)
11:10 - 11:30 **Raffaele Azzaro** - Recent tectonic activity in the southern flank of Mt. Etna (15'+5' Q/A)
11:30 - 11:50 **Emanuele Casarotti** - Quantitative comparison of different structural models of Campi Flegrei using full waveform similarity (15'+5' Q/A)

11:50–12:20: **Lightning talks** (Posters of all sessions: one-slide, 90-second presentation for each poster)

12:20–14:00: Lunch and Posters

Session 2. 3-D distribution of deformation: strain localization and faulting across deforming regions

(Convenors Taka'aki Taira and Pierfrancesco Burrato)

14:00–15:15: Session 2 (Part 1)

14:00–14:25 **Mauro Buttinelli** - Toward a comprehensive seismotectonic model of the central Apennines (Italy): lessons learned by the last major seismic sequences and implications for seismic hazard assessment (20'+5' Q/A)
14:25–14:50 **Zachary Smith** - Impacts of hydrothermal alteration and preexisting structures on earthquake hazards (20'+5' Q/A)
14:50–15:15 **Nicolò Parrino** - Is the Seismic Cycle of the 2001 Bhuj Earthquake Characteristic? (20'+5' Q/A)

15:15–15:30 Coffee break

15:30–16:20: Session 2 (Part 2)

15:30–15:55 **Yiting Cai** - Global modulation of stress and seismicity in subduction interfaces by surface loads (20'+5' Q/A)
15:55–16:20 **Bo Rong** - Conjugate faulting and rapid seismic deformation of Gorda intraplate faults (20'+5' Q/A)

16:20–16:30: Break

16:30–17:30: Panel Discussion (TBA)

Day 2 (May 12, 2026)

08:00–09:00: Welcome coffee

Session 3. Precursors to failure and transient phenomena during the seismic cycle

(Convenors Chris Marone and Elena Spagnuolo)

09:00-09:05 **Introduction to Session 3 -** Precursors to failure and transient phenomena during the seismic cycle

09:05-09:30 **Rodolfo Console** - PHYSICS-BASED SIMULATIONS OF SEISMICITY ALONG THE SAN ANDREAS FAULT (20' + 5' Q/A)
09:30-09:55 **Stefano Aretusini** - Laboratory fluid injections reveal fault structure controls on slip behavior (20' + 5' Q/A)
09:55-10:30 **Luigi Passarelli** (invited) - Scaling of seismic and aseismic moments of natural and induced earthquakes (25' + 10' Q/A)

10:30–11:00 Coffee break

11:00–11:35 **Giacomo Pozzi** - Spontaneous complexity in the dynamics of slow laboratory earthquakes (invited) (25' + 10' Q/A)
11:35-12:00 **Nelly-Wangue Moussissa** - Understanding temporal changes in crustal dv/v: Isolating episodic hydrological signatures in California's Central Valley (20' + 5' Q/A)
12:00-12:25 **Sergio Vinciguerra** - Time delay neural networks reveal pressure-independent fault rupture processes in laboratory acoustic emission (20' + 5' Q/A)

12:30–14:00: Lunch

Session 4. Observational and numerical constraints to dynamic rupture propagation

(Convenors Weiqiang Zhu and Massimo Cocco)

14:00–15:30: Session 4 (Part 1)

14:00 - 14:20 **Taka'aki Taira** - Dynamic source parameters inferred from moment rate functions using the empirical Green's function approach for northern California earthquakes (15'+5' Q/A)

14:20 - 14:50 **Simona Colombelli** (invited) - Scaling of rupture initiation from P-wave onset: insights from earthquakes and laboratory experiment (25'+5' Q/A)
14:50 - 15:10 **Akos Kiss** - Observations of laboratory earthquake rupture: implications for earthquake early warning (15'+5' Q/A)
15:10 - 15:30 **Valeria Longobardi** - The deterministic behaviour of earthquake rupture beginning (15'+5' Q/A)

15:30–15:45: Coffee break

15:45–17:15: Session 4 (Part 2)
15:45 - 16:15 **Francesco Mosconi** (invited) - Rupture dynamics and seismic radiation of fluid-induced micro-earthquakes (25'+5' Q/A)
16:15 - 16:35 **Chiara Cornelio** - Dynamic rupture propagation with laboratory derived slip-weakening constitutive laws (15'+5' Q/A)

16:35 - 17:35 **Panel Discussion on source dynamics and the physical basis for EEW**

Day 3 (May 13, 2026)

08:00–09:00: Welcome coffee

Session 5. Real-time earthquake characterization and early warning

(Convenors Richard Allen and Aldo Zollo)

09:00–10:30: Session 5 (Part 1)

09:00: **Simone Atzori** - Towards real-time monitoring with space geodesy: the INGV Finite Source project (15' + 5' Q/A)

09:20: **Angie Lux** - Recent Performance of the ShakeAlert Earthquake Early Warning System (15' + 5' Q/A)

09:40: **Ran Nof** - Closing the Offshore Gap: Integrating Distributed Acoustic Sensing into Operational EEW Networks (15' + 5' Q/A)

10:00: **Claudio Strumia** - DAS-based EEW systems: perspectives and challenges for offshore and inland monitoring (15' + 5' Q/A)

10:20 –10:40: Coffee break

10:40–12:30: Session 5 (Part 2)

10:40: **Richard Allen** - MyShake: Harnessing personal smartphones for early warning, building safety and ground motion modeling (15' + 5' Q/A)

11:00: **Junhao Song** - Leveraging a multi-task deep learning model to enhance the California statewide earthquake focal mechanism catalog (15' + 5' Q/A)

11:20 - 12:30 Discussion: Steps towards implementation of EEW in Italy

12:30–14:00: Lunch

16:00: Departure for L'Aquila

Posters

Session 1

Scarponi M., Di Luccio F., Piromallo C., Sun D., Bi H.: *Forward modelling of regional S-waveforms in the central-southern Apennines (Italy): evidences for lateral crustal velocity contrasts and shallow axial attenuation*.

Spina L., Posati A., Taddeucci J., Pennacchia F., La Spina G., Perugini D.: *Seismic and acoustic markers of solid loading in volcanic jets: a laboratory approach*.

Session 2

Attolico A., De Gori P., Anselmi M., Lucente F.P., Tinti E.: *Effect of Site Corrections on Source-Parameter Estimation in the Ridgecrest Stress Drop Validation Study*.

Cirella A., Calderoni G., Akinci A.: *Linking Stress Drop and Slip Heterogeneity to Assess Source Rupture Directivity for Earthquakes in Central Italy*.

Rodriguez Piceda C., Mildon Z., Andrews B.J., Yin Y., Ampuero J-P., Sgambato C., van den Ende M.: *Normal fault interactions through the seismic cycle of the Italian Apennines*.

Rong B., Song J., Zhu W., Giunchi C., Cianetti S., Michelini A., Allen R.: *A deep-learning-enhanced earthquake catalog for Italy: implications for earthquake and faulting behavior*.

Valoroso L., Bagh S., De Gori P., Granados-Chavarrìa I., Improta L., Piccinini D., Roselli P., Di Luccio F.: *Seismicity and Vp and Vp/Vs models around the Mefite d'Ansanto deep-CO2 degassing site (Southern Apennines, Italy)*.

Session 3

Coppola L., Volpe G., Giorgetti C., Pozzi G., Wibberley C., Bourgeois F., Collettini C.: *Mineralogical control on fluid induced fault slip behavior: frictional healing vs velocity dependence of friction.*

Woo S., Volpe G., Coppola L., Collettini C., Son M.: *Frictional properties and fluid-induced reactivation of fault rocks from a granitic EGS reservoir.*

De Santis A., Campuzano S.A., Cianchini G., D'Arcangelo S., De Caro M., Di Giovambattista R., Ippolito A., Orlando M., Perrone L., Sabbagh D., Soldani M., Zhang X., Xiong P., Alimoradi H., Rahimi H., Ariana Varela-Mendez: *Geosystemic Insights into Pre-Seismic Buildup: Evidence from Two Major Recent Earthquakes.*

Session 4

Calderoni G., Di Giovambattista R., Ponte M., and La Rocca M.: *Fluid-modulated rupture efficiency and nucleation in a structurally partitioned fault system: the 2010–2014 Mt. Pollino swarm (Southern Apennines, Italy).*

Dublanchet P., Tinti E., Mosconi F., Cocco M.: *Inferring Fault Stress and Aseismic Slip During Earthquake Sequences: Insights From Modeling of a Hydromechanical Experiment.*

Poggiali G., Tinti E., Meier M.A., Cocco M.: *Focal Mechanisms and Fracture Network Activation Patterns from the M0A and M0B Hydraulic Stimulation Experiments at the Bedretto Underground Laboratory (Switzerland).*

Akinci, A., Pitarka, A., Artale Harris, P., Graves, R., Tsuda, K., Cuius, A.: *Broadband Simulation-Based Analysis of Rupture Heterogeneity and Ground-Motion Variability During the 2023 Mw 7.8 Kahramanmaraş–Türkiye Earthquake.*

Session 5

Marta Pischiutta, Anna Kaiser, Rodolfo Puglia, Elena Manea: *A systematic analysis of directional site amplification effects at stations of the seismic network (NZ), to test the relation with local geological and morphological proxies.*

Session Descriptions

Day 1 (May 11, 2026)

Session 1. Volcano-Tectonic Systems

(Convenor Roland Bürgmann and Raffaele Azzaro)

This session invites presentations on studies of natural laboratories in volcanic areas, such as the complex caldera dynamics of Campi Flegrei and Long Valley and the active magmatism, deformation and seismicity of Mount Etna and Kilauea. By integrating diverse geophysical investigations—from micro-seismicity and high-resolution seismic imaging to multi-sensor geodetic monitoring and physics-based modeling—the session aims to provide a comprehensive view of subsurface processes. We encourage an interdisciplinary approach that crosses between laboratory simulations and natural observations, specifically targeting the interplay between magma transport, active faulting, and surface deformation. We seek to better characterize the evolving states of volcanic unrest and the

fundamental mechanisms governing magma-fault interactions across different volcano-tectonic systems.

Session 2. 3-D distribution of deformation: strain localization and faulting across deforming regions

(Convenors Taka'aki Taira and Pierfrancesco Burrato)

This session explores the multi-scale, 3-D distribution of crustal deformation, focusing on the mechanisms governing strain localization and faulting in complex tectonic settings. By bridging the gap between deep-seated geodynamic processes and surface expressions of faulting, we invite contributions that utilize diverse methodologies—from space geodesy and seismology to structural geology through field observations and laboratory experiments, paleoseismology and numerical modeling of paleogeodetic markers.

The discussion will emphasize comparative studies, but will not be limited to, between two of the world's best-instrumented natural laboratories: the Central Apennines in Italy and the San Andreas fault system in California. These regions provide unique opportunities to investigate how crustal heterogeneity, fluid migration, and structural inheritance influence the transition from distributed strain to localized failure. In the framework of the INGV-BSL Memorandum of Understanding, we encourage submissions that integrate multidisciplinary data to improve our 3-D understanding of active tectonics, earthquake physics, and the evolution of fault systems across deforming plate boundaries as well as different space-time scales.

Day 2 (May 12, 2026)

Session 3. Precursors to failure and transient phenomena during the seismic cycle

(Convenors Chris Marone and Elena Spagnuolo).

We invite presentations on a broad range of topics related to the transient phenomena and precursory events preceding failure. Such phenomena, for example changes in b-value or the occurrence of slow slip prior to failure, have been known for 50+ years but remain poorly understood. We encourage input from lab results related to precursory changes in elastic wave speed and from other areas including field studies and theory. One goal would be to foster better connections with rapidly expanding interest in the use of AI to identify and interpret precursory changes prior

to earthquake-like failure and post-seismic changes related to frictional healing and crack closure.

Session 4. Observational and numerical constraints to dynamic rupture propagation

(Convenors Weiqiang Zhu and Massimo Cocco).

This session is dedicated to discussing recent advances in modeling and interpreting dynamic rupture propagation during earthquakes, while also addressing open questions and conflicting evidence arising from both the complexity of seismogenic processes and the paucity of experimental data. Particular interest is given to nucleation and the initial stages of dynamic propagation. Contributions from observations during natural and laboratory earthquakes are welcome. Interest extends to the dynamics of microearthquakes and to contributions aimed at discussing the differences between the physical and chemical processes that cause small and large earthquakes. Studies on natural and anthropogenic earthquakes are encouraged.

Day 3 (May 13, 2026, morning)

Session 5. Real-time earthquake characterization and early warning

(Convenors Richard Allen and Aldo Zollo)

Implementation of earthquake early warning systems around the globe is motivating the deployment of denser geophysical observation systems and the exploration of new sensor networks including low-cost sensors, smartphones, fiber optic cables, strainmeters and geodetic instrumentation. In this session we will review new approaches to rapid earthquake detection, and other hazard reduction strategies that leverage these new sensor networks.

Day 3 & Day 4 (May 13, afternoon, and May 14, 2026) Field Trip (TENTATIVE ITINERARY):

The planned excursion will start at approximately 4:00 p.m. on May 13 from Sala Baldini. We will make a stop at the INGV headquarters to pick up additional

participants, with an anticipated departure time of 5:00 p.m. The destination for the overnight stay is Santo Stefano di Sessanio (AQ).

On May 14, the tour of the surrounding area will begin early in the morning, visiting sites including San Pio delle Camere, Paganica, Camarda, and Assergi. The return to Sala Baldini is scheduled for around 8:00 p.m.. An additional stop will be at the INGV headquarters.

General information about the field trip:

- All associated costs will be covered by INGV using funds allocated through the existing MoU between INGV and BSL.
- Participation is limited to a maximum of 50 attendees.
- Due to the nature of the funding source, accommodation for the two-day trip will be prioritized for personnel from INGV and BSL, session conveners, and national and international guests. Following the accommodation of the aforementioned individuals, registrations of colleagues from other institutions will be considered.
- Appropriate clothing and footwear are mandatory.