



Session 18

Characterization and mitigation of anthropogenic seismicity: Towards a sustainable green energy development

Conveners:

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Anthropogenic seismicity stemming from technological operations like ore mining, reservoir impoundment, oil and gas extraction, wastewater injection, hydraulic fracturing, and geothermal energy production pose a harmful effect on green energy development, as well as the sustainable utilization and storage of conventional and unconventional georesources. Seismic activity induced by human engineering operations can lead to structural damage to buildings and engineering structures, diminish public acceptance towards green energy production, and, in some cases, result in fatalities. As the demand for (renewable) energy resources continues to grow, deeper understanding of the seismo-mechanical processes associated with occurrence of anthropogenic seismicity and their implications to hazards and risks, is essential. This session welcomes contributions that aims to discuss various aspects of anthropogenic seismicity:

- 1) Mechanisms: Investigating and understanding the relation between complex physical and engineering factors driving seismic response, seismic hazard and risk, and occurrence of runaway events.
- 2) Monitoring: Presenting new technological developments for tracking slow and fast (a)seismic processes in a wide frequency band from laboratory studies, through in-situ laboratories, to the geo-reservoir scale.
- 3) Methods and processing: Development and application of the state-of-the art techniques for data processing including Machine Learning techniques.
- 4) Mitigation strategies: Discussing innovative solutions and regulatory measures aimed at minimizing the seismic hazard and risk associated, and the role of science in informing responsible practices.
- 5) Interdisciplinary Collaboration: Encouraging cross-disciplinary cooperation among seismologists, geologists, engineers, social scientists, and policymakers to comprehensively address the multifaceted challenges of anthropogenic seismicity.
- 6) Case Studies: Spotlighting case studies from different geological settings to explore the diversity of responses to human technological activity and their implications for local communities and infrastructure.

