

The Earthquake Dissipative Engine: Energy Budget and Partition



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Short course on earthquake physics for Master's and PhD students (and anyone else who is interested), divided into four seminars lasting two hours each (eight hours in total). The lessons, in English, will be held in person at **the Dipartimento di Geoscienze (Università di Padova), Via Giovanni Gradenigo 6, Padova (Italy)** according to the following schedule:

Monday 27 Oct. 2025 - 16:30-18:30 classroom 2G

Part 1. The earthquake engine powerhouse

- Slab pull and push
- Elastic strain energy
- Fundamentals of Linear Elastic Fracture Mechanics (LEFM), stress intensity and fracture energy
- Energy flow in quasi-static cracks and in dynamically propagating ruptures
- A simplified model connecting waves, energy and rupture velocity

Tuesday 28 Oct. 2025 - 14:30-16:30 classroom 2H

Part 2. The earthquake engine dissipation

- Sliding friction at low and high slip rates
- Off fault damage and branching

Wednesday 29 Oct. 2025 - 10:30-12:30 classroom Lab Paleo

Part 3. The earthquake energy balance

- The zero-sum game
- Why only the fault surface? The divergence theorem on symmetrical tensors
- Modelling rupture on complex faults

Friday 31 Oct. 2025 - 14:30-16:30 classroom 2L

Part 4. A player in the earthquake far field

- Analysis of the seismic signal and Fourier transform
- Sound and waves: global seismology and the sonification of earthquakes

You can follow the course remotely by connecting to the link:

<https://unipd.zoom.us/j/84942096799?pwd=MDR3dHk2VHJqRjdRV0xLMGh1Yk9idz09>

Proposer: **Prof. Giulio Di Toro**

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