

## AOB Seminar

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講演題目: Unintended Earthquakes: The Science Behind Injection-Induced Seismicity

Relatively small ( $M_w < 6$ ) earthquakes in unusual locations have become an important topic of scientific and political discussion in both North America and Europe because of the concern that some of them have been induced by industrial activity. It has long been understood that earthquakes can be induced by impoundment of reservoirs, surface and underground mining, withdrawal of fluids and gas from the subsurface, and injection of fluids into underground formations. Injection induced earthquakes, in particular, have become a focus of discussion as the widespread application of directional drilling and hydraulic fracturing has transformed the energy economy in the U.S. Industry, the public and regulatory agencies are all concerned by the possibility that damaging earthquakes could be induced as part of the process to stimulate the production of natural gas and oil from tight shale and coal bed formations, or by disposal of wastewater associated with their stimulation and production. Similar concerns have emerged worldwide concerning seismicity associated with large-scale hydraulic stimulations intended to enhance geothermal energy production. In this talk, we review the science behind injection induced earthquakes, examine the evidence linking recent earthquakes and industrial activities, and discuss the key scientific challenges to be met in better understanding the physics of injection-induced seismicity and mitigating its impact.