# WEEKLY CALENDAR
## 10 May 2005

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# General Seminar

3:40PM / Thursday, 12 May 2005 / Room 109, Nicholson Hall
Host:   Dr. Robert Svoboda

*[Refreshments served at 3:15PM in Room 229, Nicholson Hall]*

## Measuring Geo-nus and the Search for a Geo-ractor with KamLAND and a New Experiment, Hanohano, in the mid-Pacific

### Prof. John G. Learned
### Department of Physics & Astronomy
### University of Hawaii

Electron anti-neutrinos are produced by the decay of radioactive elements throughout the earth, predominantly by Uranium and Thorium, but also Potassium. Geologists have no means to directly sample the content of the deep earth, and there is much uncertainty about the actual composition. The total heat flux from the earth and its origins are not well known.  Measurement of the U/Th content of the mantle is therefore of great interest. KamLAND has made initial measurments of this never before detected flux, but the results are not definitive and are in any case dominated by the radioactivity of the crustal region around Japan.

There has been speculation that a natural reactor may be operating in the core of the earth (and other planets), providing the heat to drive flow which produces the earth's magnetic field, which of course has implications for life on earth. We have analyzed the KamLAND data for evidence for such, taking advantage of the time-varying Japanese reactor activity to extrapolate to zero input from power reactors.

However, on both topics, a new experiment far from the continental crust and far from human-made power reactors, will provide an opportunity for definitive measurements. I will present initial thoughts about such a kiloton scale detector for placement in the Pacific Ocean near Hawaii, essentially a KamLAND in the ocean, which we call Hanohano, and which instrument is under design study in Hawaii at this time.