

***Pito Deep - Revisiting Pacific  
Lower Crust, the 3rd Dimension of  
Magnetic Stripes and Long, Lost &  
New Found Hydrothermal Vents***

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**1:30 - 2:30 p.m.**

**Carriage House, Quissett Campus, WHOI**

**Summary:**

Pito Deep is a 6km deep rift/tectonic window in the southern Pacific Ocean formed by rotation of the Easter Microplate between two arms of the overlapping East Pacific Rise. The rift provides access to 4km vertical sections through fast spread ocean crust. A previous Atlantis/Alvin/Jason/DSL120 cruise in 2005 led by Jeff Karson extensively sampled the basalt/dike sequence in the rift. In Jan/Feb 2017 the RV Atlantis/Jason/Sentry returned to map and sample the gabbroic lower crust in 4 transects up the walls of Pito Deep. Here we'll report on the detailed, continental-style, mapping and sampling (over 350 samples) of a 2km (horizontal) by 1.2 km (vertical) section of fast spread gabbroic crust. Of particular note is the extensive occurrence of primitive troctolite at high levels within the crust. We also carried out detailed magnetic mapping of the walls of Pito Deep to determine the 3<sup>rd</sup> dimension of the magnetic polarity boundaries that define the magnetic stripes. These boundaries effectively define the 580°C isotherm within the gabbroic crust and place significant constraints on the processes/models of lower crustal formation. Additionally, we'll present the results of mapping the summit of Pito Seamount and the new active hydrothermal vent sites found there. Lastly we'll document use of a new underwater rock orientation tool designed by Jeff Gee & the use of 3-D photography to record both underwater outcrops and preserve 3-D rotatable images of rock samples before they are cut for sampling.