



## **Call for Participation in IODP Exp 343: Japan Trench Fast Drilling Project (JFAST)**

CDEX/JAMSTEC  
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CDEX currently plans to implement IODP Expedition 343: Japan Trench Fast Drilling Project, beginning 1 April 2012. The expedition goal is to drill ~1000 meters below sea floor (mbsf) into the fault zone of the Tohoku Earthquake (~7000 meters below sea level), collect core and LWD data, and emplace a “CORK”-type observatory.

### **Rapid Response Drilling**

Based on the ICDP/SCEC International Workshop on Rapid Response Drilling, this project seeks to collect data and cores addressing fundamental questions regarding stress, faulting-related fluid flow, and the structural and mechanical characteristics of the earthquake rupture zone can be addressed uniquely through rapid response drilling. The expedition will follow normal IODP rules for designation of co-chief scientists, scientific staffing, and follow the IODP Sample, Data and Obligations Policy, which defines data moratorium, data access and publication responsibilities.

### **Scientific Objectives of the expedition**

The Expedition 343 science objectives are:

- 1) What was the stress state on the fault that controls rupture during the earthquake and was the stress completely released? Time decaying temperature measurements will be used to estimate the frictional heat produced at the time of the earthquake, which can be used to infer the level of dynamic friction. Rupture to the toe of accretionary wedge; measurements of current stress and stress during the earthquake can be used to explore different models to explain how dynamic slip occurred.
- 2) What are the characteristics of large earthquakes in the fault zone, and how can we distinguish present and past events in fault zone cores? Evidence of melting and other processes that contribute to dynamic strength reduction will be looked for in core samples. Trace elements will be used to estimate the thermal history of the recent and past events. High-speed friction and petrophysical experiments on fault material can be used to characterize the frictional behavior of the fault.

Secondary science objectives include carrying out other geological, geochemical, and microbiological observations to the greatest extent possible during drilling in accordance with the IODP Measurements Document. Please read the Expedition 343 J-FAST fact sheet (available for download at <http://www.iodp.org/expeditions/>) for further details.

### **Operation Plan**

Operations planned for this expedition include:

- Drill the pilot hole with Logging-While-Drilling (LWD) and Measurement-while-drilling (MWD) to total depth (TD), currently planned for ~ 1,000 mbsf;
- Run casing and completion assembly (including long-term temperature and pore pressure observatory) in LWD-MWD hole to a depth of ~800 mbsf. (Casing to 100 m below fault, ~900 m);
- Drill the main hole with Rotary coring barrel (RCB) drilling (with center bit) to ~300 mbsf; and continue with RCB coring to ~1,000 mbsf.



### **Expedition Schedule**

Current plans have the expedition beginning on 1 April 2012, and finishing upon return to port on 22 May 2012. The total number of planned offshore operations days will be 45 days; the beginning and ending dates depend on the location of the pre-expedition port call, which is at this time is not yet fixed. The Science Party will board *Chikyu* from dockside at the Port of Shimizu, and will disembark in mid-May at the same port. This schedule is subject to change. Updates and the latest information on research expeditions can be found on the CDEX website (<http://www.jamstec.go.jp/Chikyu/eng/>).

### **Science Party**

Scientists with interest and expertise in faulting and earthquake mechanics, stress in the crust, physical, friction and temperature measurements, hydrogeological properties and their evolution, pore fluid properties and processes, core-log-seismic integration (CLSI) in structurally-complex settings, borehole instrumentation, and deep subsurface biology are invited to apply. A shipboard party size of 27 scientists is anticipated. Shipboard duties will likely include sedimentology/lithostratigraphy, structural geology, physical properties, observatory installation and *in situ* stress, log analysis and core-log-seismic integration, paleomagnetism, microbiology, micropaleontology, geochemistry (organic and inorganic).

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Table 1. *D/V Chikyu* Schedule for Exp. 343

<b>Exp. #</b>	<b>Exp. Name</b>	<b>Schedule</b>	<b>Duration (on site)</b>	<b>Co-chief Scientists</b>	<b>EPM</b>
343	Japan Trench Fast Drilling Project	1 April – 21 May 2012	45 days	Fred Chester Jim Mori	TBD

Above schedule is subject to change.

The schedule includes transit and portcall, actual operation on site is appeared in duration column.