



ÉCOLE DOCTORALE SCIENCES DE LA TERRE



Subject offered for a contract starting in September 2012

SUBJECT TITLE: Formation and Evolution of Andaman Spreading Centre

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Host lab/ Team: **IPGP- Team Geosciences Marines et Tectonique et mécanique de la lithosphère - UMR7154**

Financing: **Doctoral contract with or without assignment**

For more information go to <http://ed109.ipgp.fr>, section: Offres de these (PhD offer), You must apply on the Doctoral School website

Presentation of the subject: (1 or 2 pages)

The Andaman Sea Spreading Centre (ASSC) is a back-arc spreading centre separating the Burmese sliver plate in NW with the Sunda plate (Eurasia) in SE. It connects the Sagaing strike-slip fault in the north in Myanmar with the West Andaman and Sumatra strike-slip faults in the south. The present spreading at the ASSC initiated about 4 Ma ago at a rate of 16 mm/yr and then increased to 38 mm/yr about 2 Ma ago leading to a total seafloor spreading of 118 km (Kamesh Raju et al., 2004). The ASSC consists of three main segments separated by an overlapping spreading centre and a long transform fault. Unlike other ocean spreading centres situated in deep sea, the ASSC is a marginal spreading centre and hence covered by more 1 km thick sediments, which make it a very special spreading centre for several reasons; (a) The presence of sediments hinder lava flow on the seafloor and insulate melt from the efficient hydrothermal circulation, changing the dynamics of the crustal accretion process. (b) The sediments also preserve stratigraphic records of magmatic, tectonic, and thermal events associated with seafloor spreading, and hence provide clues to the spatial and temporal variability of these processes.

As a part of speculative seismic survey for oil and gas exploration in the Andaman Sea, Petroleum Geoservices (PGS) acquired a grid of deep seismic reflection data (7000 km) in 2008 in the Andaman Sea covering the ASSC (Singh et al., 2010). In this project, students will interpret these data along with earthquake, bathymetry and other geophysical data, to shed light upon (1) evolution of the Andaman Spreading Centre, (2) development of long transform fault, and (3) the geodynamics of the Andaman Sea in the light of subduction.

Students with background in geology and geophysics are invited to apply. The students will work closely geophysicists and geologists at IPG Paris and at PGS, and will have opportunity to work in industry during the Ph.D. He/she will receive training in seismic data interpretation, seismic stratigraphy, earthquakes and geodynamical modelling.

References:

- Kamesh Raju, K. A., T. Ramprasad, P. S. Rao, B. R. Rao, and J. Varghese (2004). New insights into the tectonic evolution of the Andaman basin, northeast Indian Ocean. *Earth Planet. Sci. Lett.*, 221, 145-162.
- Singh et al. (2010). Seismic images of melt lens, Moho and deep penetrating faults at the sedimented Andaman Sea Spreading Centre, AGU Fall Meeting, V12A-05.