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SCUOLA DI DOTTORATO
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**CORSO DI DOTTORATO IN
SCIENZE DELLA TERRA**

COORDINATORE PROF. STEFANO POLI



Dipartimento di Scienze della Terra

14 Maggio 2008 - ore 14.30 - Aula Taramelli

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Building the crust at mid-ocean ridges: the scientific ocean drilling perspective

In April 1961, 13.5m of basalts were drilled offshore Guadalupe Island, together with a few hundred meters of Miocene sediments, below about 3500 of water. This first time exploit, reported by John Steinbeck for Life Magazine, opened the way for scientific success and operational adventures in drilling the oceanic lithosphere.

This lecture will draw from results of over 30 years of ocean drilling at mid-ocean ridges and in older igneous ocean crust, illustrating important milestones that led to further understanding the crustal accretion processes at mid-ocean ridges, and to refine early ocean crust models. Deep drilling in the fast-spread crust of the Pacific ocean has partially opened the curtain and revealed the ocean crust down to gabbros thought to represent the top of the magma chamber at the ridge axis. Along the slow-spreading Southwest Indian Ridge and Mid-Atlantic Ridge, several drilling and geomarine expeditions have revealed a different and more variable crustal architecture, reflecting peculiar modes of crustal construction. This is illustrated by drilling results in oceanic core complexes, such as the Atlantis Massif at 30°N near the Mid-Atlantic Ridge.

There is still a long way to go to explore the fundamental plate tectonics processes that are recorded in the ocean lithosphere. Future objectives include penetrating the entire ocean crust and the Moho, down to the upper mantle peridotites, and instrumenting mid-ocean ridge boreholes to monitor active processes.