Title: ***Facies analysis and stratigraphic reconstruction of the Paleozoic and Early Mesozoic successions of the Northern Apennines***

Name of the supervisor: **Simonetta Cirilli**

Name(s) of a potential co-supervisor(s)

Enrico Capezzuoli, Roberto Rettori, Amalia Spina

Prospective **assistance** in the supervision (Lab activity, fieldwork, ….):

Fieldwork: Facies analysis, distribution, vertical and lateral variations;

laboratory activity: organic facies analysis; exam under microscope of thin sections to characterize microfacies and biofacies; studies on thermal maturity mostly based on organic matter.

Prerequisites: It is preferred (but not mandatory) have been attended the course on Sedimentary Petrography (for the sedimentological target) and Micropaleontology (for Biostratigraphic target).

Description of the planned research

Introduction: the Paleozoic and early Mesozoic successions of this area record a fundamental phase in the evolution of the Apennines fold-and-thrust belt of the northern Apennines. Although intensively studied, uncertainties in age attribution and depositional environments of some units make still open and problematic to reconstruct the stratigraphic architecture and paleogeography of this area in this time interval and, consequently, the reconstruction of the Tuscan basement stratigraphic–tectonic evolution.

objectives,

- to reconstruct the depositional environments, facies distribution and architecture,
- to provide a sedimentary petrographic characterization
- to define or precise the age attribution based on an integrated study of marine and continental fossil groups of high chronological and palaeoecological resolution
- to provide data for reconstructing the thermal history.

the **study area**: Mostly northern Apennine area (Liguria, Tuscany region)

the **research methods**

Field works on selected outcrops where detailed sedimentological and stratigraphical analyses will be performed.
Students more interested in biostratigraphy will focus the topic on biofacies as complementary method to sedimentology and stratigraphy
Students more interested on sedimentology and regional geology will focus on facies analysis, sedimentary petrology, organic facies and studies on thermal maturity.

Laboratory analyses will be performed on representative samples. These will be analysed by several techniques such as petrography, mineralogy and geochemistry in order to reconstruct the environment of deposition and the stratigraphic architecture. Addional analyses by means Raman, FTIR absorption and spettroscopy will be scheduled