

Tectonics as a controlling factor for carbonate platforms architecture and later unsettling

(Proposer: Dr. Marcello Caggiati, Prof. Matteo Massironi)

The Southern Alps are characterized by extremely diverse stratigraphic successions, mainly due to their complex and long geological history, spanning from the Paleozoic to the Cenozoic. On the other hand, geologists focused their research on this region since the XIX century, and a huge amount of information is available to date, including sedimentological and structural data, as well as high-resolution biostratigraphy and geochronology. For this reason, the Southern Alps represent an excellent lab where to develop detailed research and geological evolutionary models.

A significant part of the sedimentary cover is composed of carbonates, related both to deposition on platform and on surrounding basins. In certain circumstances, synsedimentary tectonics partly ruled their relationships and the architecture evolution of the whole platform-basin systems. Often, this complex scenario has been complicated by following polyphase tectonics, related to changing geodynamic settings during both the Mesozoic and the Cenozoic.

The aim of this project is to decouple syn-sedimentary tectonics from later alpine stages in the Venetian Southern Alps. Selected cases should be investigated through detailed studies on the field, focused on the stratigraphy and sedimentology of carbonate platforms, to discriminate effects related to tectonics (e.g., fault-scarp breccia bodies, shelf-break trajectory changes, etc.). Also, data on outcropping fault planes, cross-cutting relationship and kinematic indicators will be collected on the field and through the use of photogrammetrically reconstructed Digital Outcrop Models. The whole data-set will be processed, tested for self-consistency and interpreted using 3D geological models to be reconstructed with proprietary (Petrel, Move) or open-source software (P-Zero). This will allow the researcher to understand the original scenario at time of deposition and to add further knowledge on the benefit/downsides of syn-sedimentary tectonics on carbonate platform evolution as well as on the processes of normal faults reactivation in contractional regimes.

The candidate should have a good knowledge on Italian Southern Alps geological evolution and skills on the use of GIS software, reconstruction and analysis of 3D geological models

Scientific Collaboration: Ferrara University, Milano Bicocca University

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