Remote sensing in the geomorphological study of alluvial plains

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In the last decade an enormous amount of information about the landforms of the alluvial environments has been supported by a wealth of data derived by airborne laser altimetry (LiDAR) and remote-sensed images. In particular, high-resolution multispectral images from satellites, airplanes and drones have been acquired with a high temporal frequency and allow to observe the surface of alluvial plains and valley floors with unprecedent detail and in different climatic and vegetational conditions. This situation supports the possibility to develop new methodological processes for recognize, characterize and explain even subtle traces and morphologies of small-size landforms forming both the alluvial and coastal plain environments.
The PhD candidate will produce and analyse geo-database of indirect data collected through remote-sensed technologies. The results will be compared and validated with field data, obtained during new geomorphological and stratigraphic surveys carried out on selected target areas. A major goal is the characterization of alluvial surfaces through the morphometric description (even in automatic or semi-automatic techniques), aiming at identify different paleohydrographic patterns and variables. Besides the natural processes, also the traces and the landforms created or affected by the ancient anthropogenic activity will be considered as a topic of interest. In particular, the traces related to the mutual interaction between the alluvial landscape and the ancient settlement strategies.

Collaborations with national and international research institutes are planned for learning innovative methods and carrying out specific analyses (CNR-ISMAR Bologna; Utrecht University, ETH Ion Beam Lab Zurich).

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