Introductory course on *Statistical modeling of extreme values*

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Extreme value theory is based on different principles than those of conventional statistics as it is designed to study and model exceptional events rather than the average characteristics of natural phenomena.

This introductory course will start by presenting exploratory tools to analyze the behavior of extreme values in geophysical data and insurance data. This will help to motivate the basic principles of the statistical modeling of extreme values and the distributions that characterize them.

The two common approaches for assessing the risk of extreme events at a given level, i.e. the block maxima and the peak over threshold approach, will be introduced and illustrated with real data examples. The course will then cover the non-stationary and the multi- variate extensions of the basic theory, as well as the treatment of spatio-emporal extremes.

Marked point process approaches, like Hawke's self-exciting point process model, which is particularly popular in earthquake modeling, will also be presented.

The R statistical software (freely available at www.r-project.org) will be used in the practicals as it contains many easily accessible resources for studying and modeling extremes.