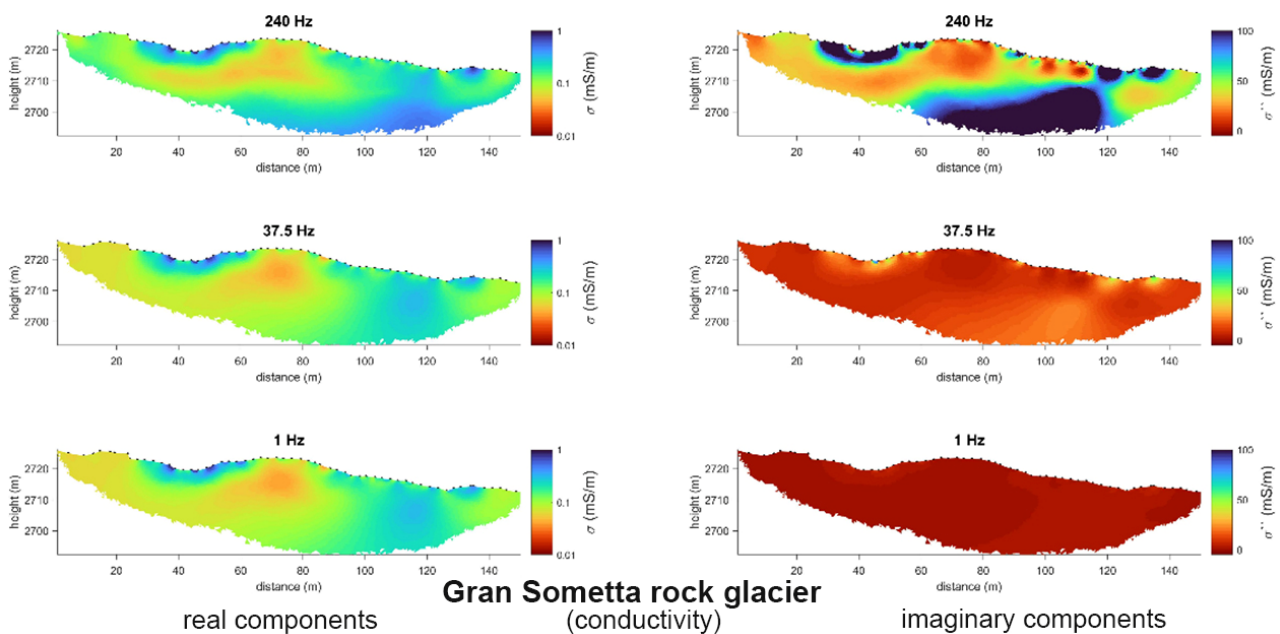


Seminario
**The “complex” electrical conductivity
of ice and frozen ground**

Giovedì, 23 novembre – ore 16:30, Aula Arduino

Relatore: **Dr. Adrian Flores-Orozco**

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The increase in temperature due to climate change has accelerated the degradation of permafrost. In particular, the loss of frozen ground and ice content in alpine permafrost may pose a treat for infrastructure, water resources and human life. Geophysical methods are the only method to reliably obtain quasi-continuous spatial and temporal information about subsurface properties and temporal changes. Among them, electrical resistivity tomography has been widely used for the characterization of permafrost sites and the monitoring of changes in subsurface temperature. In combination with refraction seismic, recent inversion approaches has demonstrated an improved ability to quantify changes in hydrogeological parameters of interest such as water and ice content. However, most of the petrophysical models advanced so far neglect the role of interfacial conductivity, which may severely over-estimate the porosity and water content resolved from electrical imaging results. In this talk, I will revise ongoing approaches in the investigation of alpine permafrost using geophysical electrical methods and demonstrate the importance of accounting for interfacial conductivity in the case of frozen ground, as presented in Figure 1. Moreover, I will present some of our recent results regarding the application of transient electromagnetic soundings to delineate ice-rich areas in alpine permafrost. To this end, we propose a stochastic modeling and inversion approach explicitly considering interfacial conductivity that permits us to evaluate the uncertainty of the resulting model parameters. The final objective is to provide quantitative interpretation of geophysical results in alpine permafrost investigations, yet with some information about the reliability of the imaging results.

Proponente: **Giorgio Cassiani**