



Thursday 12th December 2024

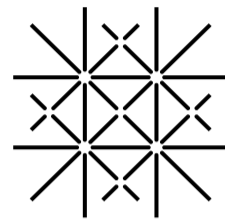
h 11 am (Rome time) - Aula 4 DST



Three decades of Orientation Imaging in Structural Geology – Visualization and Analysis of Rock Properties

Prof. Renée Heilbronner

University of Basel

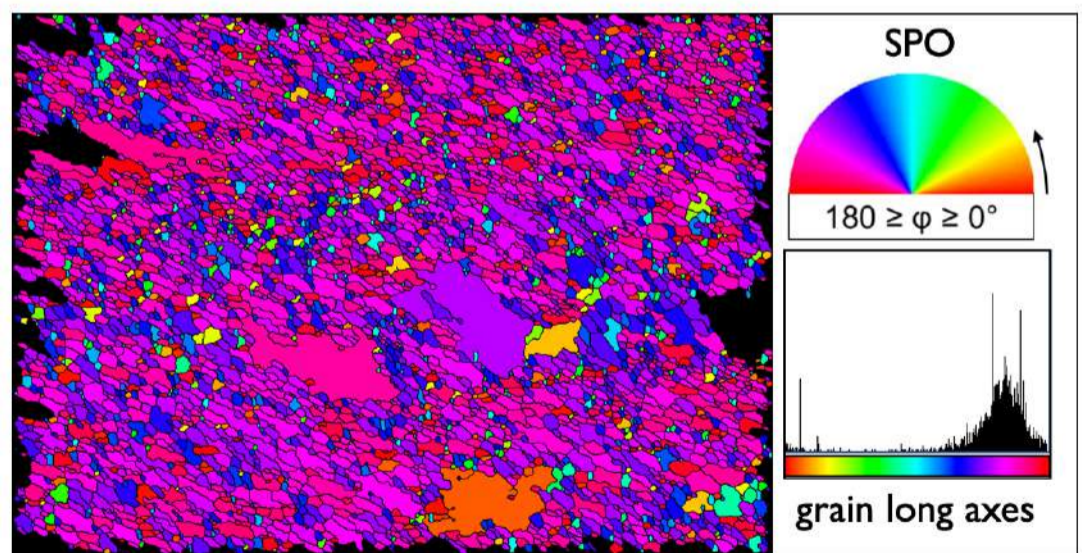
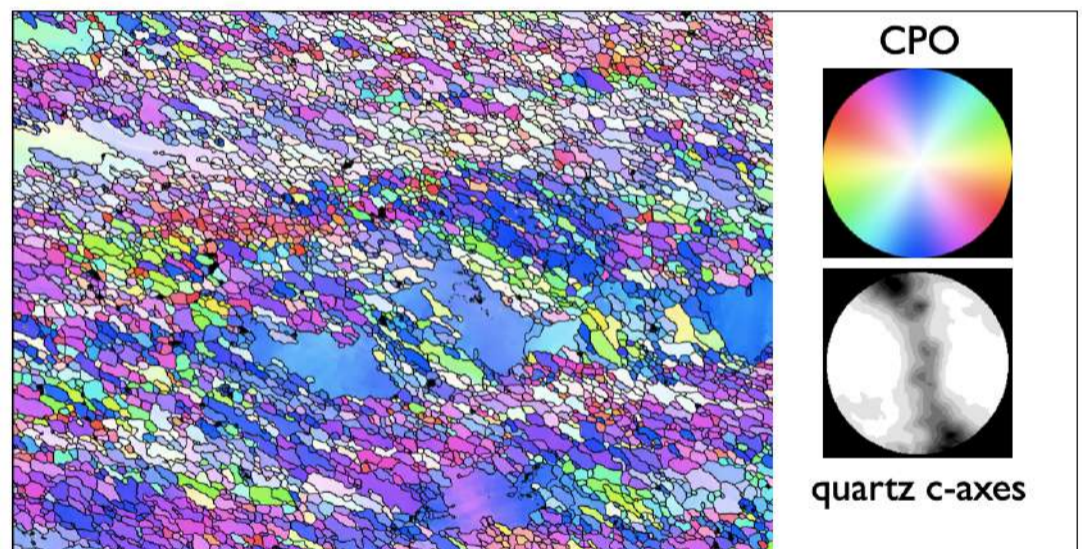


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Rock properties depend on the mineral composition as well as the spatial arrangement, shape and size of its components. With deformation, the crystallographic and shape preferred orientation (CPO and SPO) of its constituents change.

Microstructural analysis is usually performed on thin sections or surfaces, i.e., the data is usually collected on a 2-dimensional plane. In this presentation, I will go "back to the roots" of orientation imaging, I will discuss how rock properties can be mapped, and present a few examples that highlight the fundamental difference between CPO and SPO.



The Speaker

Renée Heilbronner is a professor emerita of the University of Basel. Her research area was (... and still is...) the microstructural analysis of deformed rocks. Already in the last century, she designed a computer-based method for analyzing quartz textures using the polarization microscope and, over the years, she developed a number of methods for strain, shape and grain size analysis. She has taught many workshops about digital image and texture analysis and written a whole textbook about it. Now she looks back and finds that there is still ... "room for improvement".





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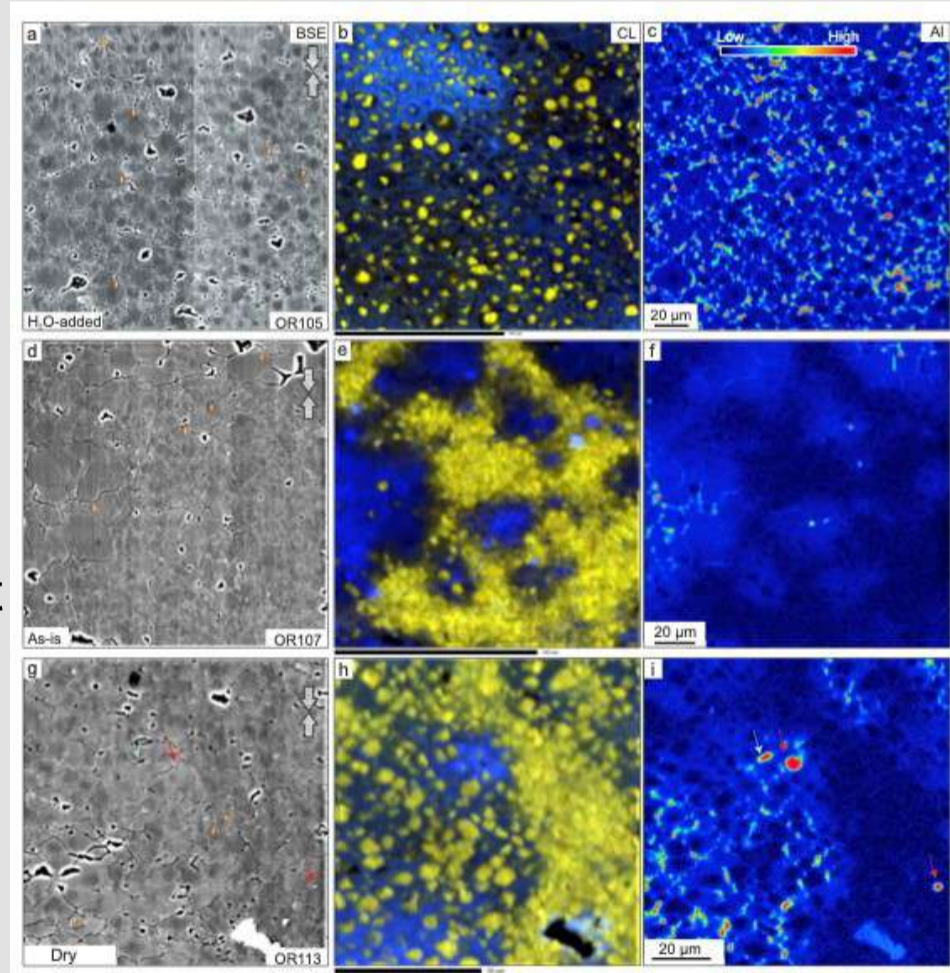
Water weakening in quartz: a review and new results

Prof. Holger Stünitz

The Arctic University of Norway
Université d'Orléans



Quartz is one of the most common minerals of the crust. Its mechanical strength is extremely high, similar to diamond in the absence of any H₂O. However, even small amounts of molecular H₂O weaken quartz substantially, so that it is often found to represent one of the weakest minerals in crustal shear zones in greenschist to upper amphibolite facies shear zones. The processes and mechanisms responsible for the weakening are not completely understood. The presentation will review the pertinent state of knowledge on quartz weakening and will present new experimental results that demonstrate that are responsible for the most important weakening effects. These new results require a revision of some of our present paradigms of quartz plasticity. It is suggested that some of the results can be applied to the deformation properties of other silicates, too.



The Speaker

Holger Stünitz is professor emeritus of the University of Tromsø and Orléans University. His main research activity has focussed on the interaction of mineral reactions on deformation of silicates and the role of H₂O on quartz deformation. The methods of his research include microstructural analysis, mainly by electron microscopy and experiments at high temperatures and pressures.



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Webinars of geology