

Evento organizzato nell'ambito di Engineering
Physics Colloquia



Ca' Foscari
University
of Venice
Department of
Molecular Sciences
and Nanosystems

How X-rays can help to reveal water's mysteries

21 Ottobre 2025, ore 11.00

Physics Laboratory, Beta Building
Scientific Campus, Via Torino 155, Mestre (VE)

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Sarà possibile seguire
il seminario anche da
remoto, collegandosi
al seguente link:

<https://unive.zoom.us/j/88011015392>

Password: seminar1

Organizzazione di
Domenico De Fazio
Achille Giacometti

Water is ubiquitous and the most important liquid for life on Earth. Although the water molecule is seemingly simple, various macroscopic properties of water are most anomalous, such as the density maximum at 4°C or the divergence of the heat capacity upon cooling. The fundamental origin of these anomalies is yet to be fully understood. Computer-simulations suggest the anomalous behaviour of ambient and supercooled water to be explained by a two-state model of water. An important role in this ongoing debate plays the amorphous forms of water. Since the discovery of two distinct amorphous states of ice with different densities (high- and low-density amorphous ice, HDA and LDA), it has been discussed whether and

how this phenomenon of polyamorphism at high pressures is connected to the occurrence of two distinct liquid phases (HDL and LDL). X-ray scattering experiments on both supercooled water and amorphous ice are of major importance for our understanding of water. In recent years, our pump-probe experiments on amorphous ices pushed the limits of studying the liquid state under extreme conditions. In my talk, I will give an overview of recent experiments on supercooled water and amorphous ices, and further introduce other experimental techniques, such as X-ray photon correlation spectroscopy (XPCS). Our experimental results are consistent with a picture of two different states of water.