

Seminar

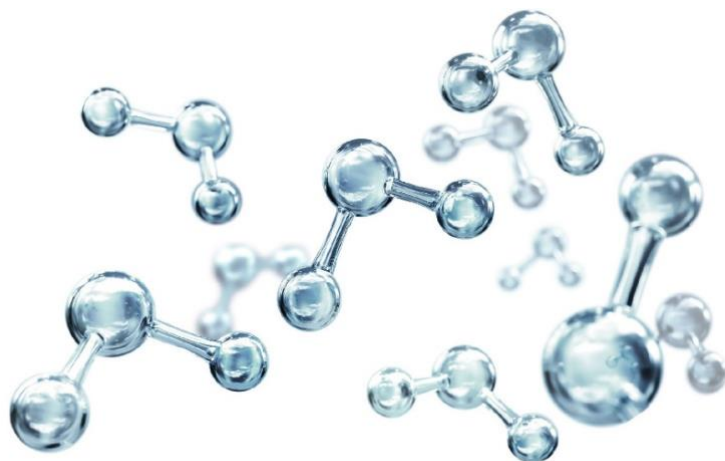
20th of October 2022
12:00 h

Zoom Virtual Meeting:

<https://tuhh.zoom.us/j/82631283465>

Meeting-ID: 826 3128 3465

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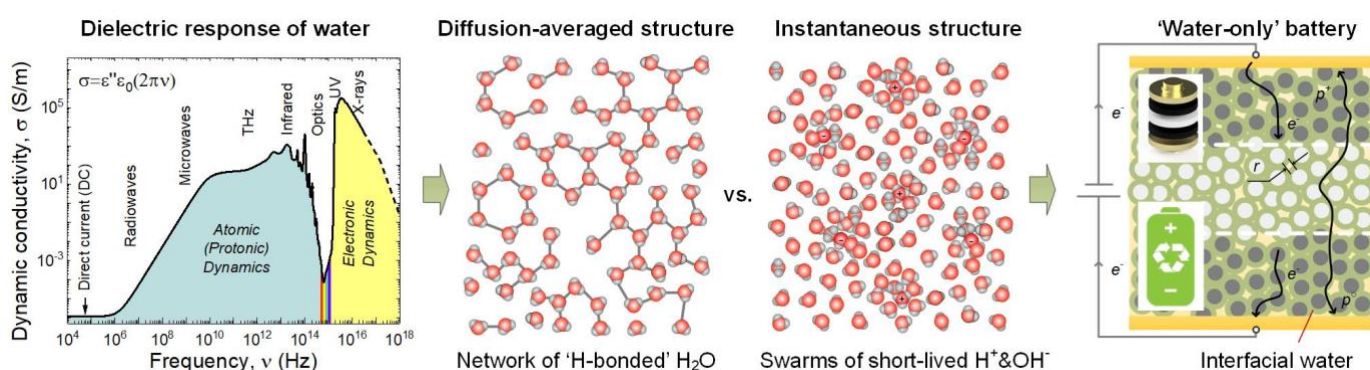


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The electrodynamics of water and ice: from basic principles to applications

The electrodynamic properties of water are well known, yet poorly understood. In this talk, I will discuss on the same footing the interaction of electromagnetic waves with water at different frequencies from radio waves to the infrared region [1]. I will address the atomic-molecular mechanisms behind the dielectric response from DC to sub-picoseconds proton exchange reactions [2]. I will discuss the role of the excess proton in the dielectric response of water and infrared spectrum in particular [3]. As a consequence of this consideration, I will show the difference between the instantaneous and diffusion-averaged structures and what this difference means for water modelling. I will briefly review the AC dielectric properties of aqueous electrolytes [4]. I will discuss the recent observations of the anomalous dielectric properties of confined water [5]. Finally, I will demonstrate the proof of the concept of environmentally-neutral water-only energy storage with hydrogen ions [6].



References

- [1] V. Artemov, The Electrodynamics of Water and Ice, *Springer*, Series in Chemical Physics **124** (2021).
- [2] V. Artemov, *Phys. Chem. Chem. Phys.*, **21**, 8067 (2019).
- [3] V. Artemov, E. Uykur, S. Roh, A. Pronin, H. Ouerdane, and M. Dressel, *Sci. Rep.*, **10**, 11320 (2020).
- [4] V. Artemov, A. Ryzhov, H. Ouerdane, K. Stevenson, *ChemRxiv* (2021).
- [5] V. Artemov, E. Uykur, P. O. Kapralov, A. Kiselev, K. Stevenson, H. Ouerdane, M. Dressel, *J. Phys. Chem. Lett.*, **11**, 3623 (2020).
- [6] S. Ponomarenko, A. Ryzhov, A. Radenovic, K. Stevenson, V. Artemov, *arXiv:2204.10127* (2022).