

Seminar

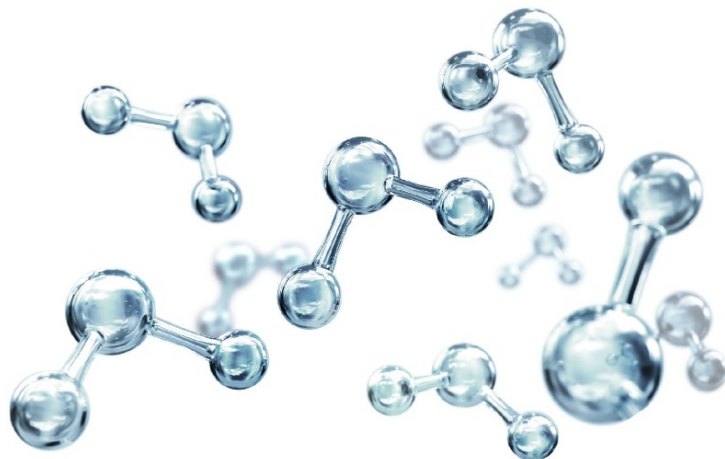
2nd of May 2024
12:00 h

Zoom Virtual Meeting:

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

Meeting-ID: 826 3128 3465

Password: 978444



Prof. Dr. Aleksandra Radenovic

École Polytechnique Fédérale de Lausanne (EPFL)

Nanofluidics: Exploring New Frontiers

In this talk, I will introduce two novel types of nanofluidic platforms. The geometry of the first nanofluidic platform combines the benefits of reduced sensing regions typically seen in 2D material nanopores with the asymmetric geometry of capillaries, resulting in ionic selectivity, stability, and scalability. The proposed nature-inspired growing method provides a flexible nanopore platform for various nanofluidic research applications, such as biosensing, energy science, and filtration technologies.

The second nanofluidic platform with a large entrance asymmetry is designed for in-memory processing, which can be mass-produced and behaves as performant memristive charge threshold switches with discontinuous current-voltage characteristics. The device's performance and reliability enabled the building of a logic circuit composed of two interactive ionic channels and an electronic resistor, which opens the way to the design of nanofluidic neural networks for brain-inspired ionic computations.

[1] Chernev, Andrey, Yunfei Teng, Mukeshchand Thakur, Victor Boureau, Lucie Navratilova, Nianduo Cai, Tzu-Heng Chen, Liping Wen, Vasily Artemov, and **Aleksandra Radenovic**. 2023 "Nature-Inspired Stalactite Nanopores for Biosensing and Energy Harvesting." *Advanced Materials* 2302827.

[2] Emmerich, Theo, Yunfei Teng, Nathan Ronceray, Edoardo Lopriore, Riccardo Chiesa, Andrey Chernev, Vasily Artemov, Massimiliano Di Ventra, Andras Kis, and **Aleksandra Radenovic**. 2023. "Ionic logic with highly asymmetric nanofluidic memristive switches." arXiv preprint arXiv:2306.07617.