

## Title: Water and ion transport at the nanoscale

### Abstract:

Nanofluidics is the emerging field of science that investigates the behaviors of fluids confined at the molecular level. Over the past decade, the ability to reduce the dimensions of fluidic devices to the nanometre scale (by using nanotubes or nanopores, for example) has led to the discovery of unexpected water- and ion-transport phenomena. More recently, van der Waals assembly of two-dimensional materials has allowed the creation of artificial channels with ångström-scale precision. Such channels push fluid confinement to the molecular scale, wherein the limits of continuum transport equations are challenged. In such confined channels transport of water molecules or ionic species is affected by direct interactions with the channel walls and it becomes strongly dependent on the channel wall material. We explore how water and ionic transport are coupled in such confinement. Further we will discuss how advanced fabrication technique can lead to the creation of fluidic channel presenting highly non linear ionic transport leading to memory like behaviours and paving the way for complex iontronic functionalities



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