

**Seminar on Physics and Chemistry
of the Atmosphere
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**Taking the pulse of the atmospheric water cycle from measurements
and models**

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Abstract

The hydrological cycle, with its feedbacks related to water vapor and clouds, is a large source of uncertainty in weather prediction and climate models. These uncertainties are linked to several of the current major challenges in meteorology and climate research, including the formation of extreme weather events, quantifying the impacts of man-made climate change, and deciphering the climate record from paleoarchives. This talk explores how combining precise measurements of stable isotopes in water vapor, rain and snow with advanced modelling tools allows to extract more details of the entire transport history from the isotope composition of atmospheric waters. The ability to observe where the water in precipitation comes from, and how and where it is affected by phase changes during its journey through the water cycle in the atmosphere, opens doors towards stronger theoretical and numerical constraints when modelling the coupled Earth System.