Next Generation Methods for Simulating Exoplanet Atmospheres

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The era of Hubble brought about many advancements and discoveries in the field of exoplanet atmospheric characterisation. However, the spectral resolution and density of data from JWST and the upcoming ESA Ariel Space Mission requires us to re-evaluate the fundamental assumptions we make in how we infer and interpret observations. This talk examines the limitations of current methods and how new-generation tools and TauREx are addressing these challenges. In particular we will see how the TauRex framework handles problems such as cloud-modelling through YunMa, stellar contamination with ASteRA and disequilibrium with FRECKLL. We will also look at the application of machine learning in addressing both modelling and retrieval challenges.