DiSCourse Seminar

The Digital Science Center and the Institute for Astro- and Particle Physics at the University of Innsbruck would like to invite you to the following talk:

Sebastian Grandis
University of Innsbruck

Data Science in Cosmology

Several aspects of Data Science are central to observational cosmology, which aims to infer the structure and evolution of the Universe from observations of extragalactic sources collected by ever more powerful observatories. Inference from such observations of the Cosmos proceeds in the framework of Bayesian inference. In recent years, these have been increasingly supplemented by tailored AI tools. In this seminar, we outline four applications of advanced data science techniques: 1) the inference of cosmological parameters from the distribution of observed quantities of galaxy clusters, 2) the deep learning based generation of realistic images of galaxies for image simulations for the ongoing European Space Agency (ESA) mission Euclid, 3) the decomposition of populations of galaxies in different classes with variational inference, and 4) the design of deep learning segmentation algorithms of set-like datasets for the forthcoming ESA mission Plato. These examples showcase the wide range of data science applications needed to further our understanding of the Cosmos from the large amount of observations provided by current and future astronomical observations like the ESA missions Euclid and Plato.

About the speaker

Sebastian Grandis is a Senior Scientist at the Institute for Astro- and Particle Physics at the University of Innsbruck. His primary research interest is to map large-scale structures in the Cosmos and their evolution over cosmic time through extragalactic observations. Using advanced inference and AI models, he analyzes these data to determine the composition of the Universe.

Date, Time, Place:

Friday, 6 March 2026, 12:00 (CET), hybrid

Participants are invited to join the event at the Digital Science Center, Innrain 15, Open Space Area (1st floor) *or* online via Big Blue Button.