Ole Wittig

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Education

Master Sc. 10/2024 - current
Heidelberg University, Heidelberg, Germany
Fields of study: cosmology, astrophysics, computational astrophysics
Current Grade: 1.0

Bachelor Sc. 10/2020 - 04/2024
Heidelberg University, Heidelberg, Germany
Fields of study: physics, astronomy & astrophysics
Grade: 1.2

Projects

Astronomisches Recheninstitut, Heidelberg University 12/2024 - current

Advisors: Dr. Max Gronke, Dr. Chris Byrohl

- Designing a realistic model of galactic outflows, improving the accuracy of previous models
- Exploring the model's parameter space using ML techniques, revealing degeneracies and comparing to analytical solutions
- Fitting the model to observed Ly-α spectra, inferring properties of various sources

Universitätssternwarte, LMU Munich 06/2024 - 08/2024

Advisors: Prof. J. Mohr, Dr. M. Klein

- Updated stellar mass fractions of SPT-selected galaxy clusters, correctly incorporating new weak-lensing halo mass measurements.
- Analyzed and fitted a scaling relation using an MCMC routine, resulting in a flatter stellar-to-halo mass relation.
- Compared new stellar masses with cosmological simulations, showcasing discrepancies originating from various sources.

Institute for Theoretical Astrophysics, Heidelberg 04/2023 - 02/2024

Advisors: Dr. D. Nelson, Dr. R. Ramesh

- Traced baryonic matter through time using Monte-Carlo tracer particles in the TNG50 simulation, quantifying the origin of gas composing $z = 0$ in situ stars.
- Analyzed large datasets efficiently, extracting trends of various quantities in galaxy stellar mass.
- Presented findings at the Extragalactic Seminar of the University of Innsbruck.
- Published a first-author manuscript on A&A in March 2025.

Publications

Wittig, O., Ramesh, R., Nelson, D. (2025). *Tracing the cosmological origin of gas fuelling in situ star formation in TNG50 galaxies.* Astronomy & Astrophysics, 695, A121.

Schools & Conferences

ESO Gruber Summer school 06/2025
ESO Garching, Munich, Germany

Topics: Exoplanets, Transients, AGNs, Galaxy evolution, and the high-redshift universe, hands-on sessions on using data from JWST, VLT, ALMA, and more.

WE-Heraeus and NARIT Cosmology School 2025 10/2025
Chiang Mai, Thailand

Topics: Cosmology, galaxy formation, the Milky Way, ΛCDM, hands-on sessions on cosmological simulations.

Invited Talks

Seminar on Extragalactic Astrophysics and Cosmology 10/2024
"Tracing the origin of gas fuelling in situ star formation."
Institute for Astro- and Particle Physics, University of Innsbruck

Technical Background

Experience with computer clusters:

- VERA, supercomputer of the MPG
- USM-CL, local cluster of the USM (LMU Munich)
- BwUniCluster3.0, cluster of the federal state of Baden-Württemberg

Experience with programming languages/software:

- Proficient: Python, Numpy, SciPy, LaTeX
- Competent: bash, slurm, ssh, C++, UNIX

Experience in using Gadget-4 to run cosmological simulations.

Teaching

Lab Tutor 2023 - current
Supervising undergraduate students in conducting experiments on various basic physics topics.

Co-Curricular Activities

- **Languages:** German (Native Speaker), English (Proficient), Greek (Basic), French (Basic)
- **Sports:** PADI Open Water Diver