Curriculum vitae

Personal Information

Name **Timo Kist**
Address Gorlaeus Building, Einsteinweg 55, 2333 CA Leiden, The Netherlands
Tel +49 152 09423551
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Education

August 2022 - July 2026 **PhD candidate in Astronomy**
at Leiden Observatory, The Netherlands
Topic: Precision cosmological measurements with machine learning and likelihood free inference
Advisor: Prof. Dr. Joseph F. Hennawi

September 2019 - March 2022 **Master of Science in Theoretical Physics**, *grade: with distinction (1.0)*
at the University of Göttingen, Germany
Thesis topic: Robustness of slow contraction to cosmic initial conditions: dependence on the shape of the scalar field potential
Advisor: Dr. Anna Ijjas (Max Planck Institute for Gravitational Physics)

September 2018 - February 2021 **Bachelor of Science in Mathematics**, *grade: very good (1.5)*
at the University of Göttingen, Germany
Thesis topic: Spectral theory of random Schrödinger operators
Advisor: Prof. Dr. Ingo Witt

September 2016 - August 2019 **Bachelor of Science in Physics**, *grade: very good (1.3)*
at the University of Göttingen, Germany
Thesis topic: Temporal evolution of spatial inhomogeneities in condensates with interactions of varying range
Advisor: Prof. Dr. Fabian Heidrich-Meisner

Research Experience

March 2022 - April 2022 **Visiting student** at Princeton University, United States of America in the research group of *Paul Steinhardt*

April 2021 - March 2022 **Research assistant** at the Max Planck Institute for Gravitational Physics, Hanover, Germany, in the research group of *Anna Ijjas*

May 2020 - July 2020 **Research assistant** at Aalto University, Finland in the research groups of *Christian Flindt* and *Jose Lado*

August 2019 - May 2020 **Erasmus exchange student** at the University of Helsinki, Finland Master's Program in Particle Physics and Astrophysical Sciences

Teaching Experience

Leiden Observatory, The Netherlands:

February 2025 - July 2025 **Bachelor student supervision** *(Benjamin Ben Harosh)*
October 2024 - January 2025 **Teaching assistant** *(Bayesian Statistics for Astrophysics)*
February 2024 - May 2024 **Teaching assistant** *(Modern Astrostatistics)*
September 2022 - January 2023 **Teaching assistant** *(Galaxies: structure, dynamics and evolution)*

University of Göttingen, Germany:

September 2021 **Tutor** *(exam preparation course of Theoretical Physics III: Quantum Mechanics)*
April 2021 – September 2021 **Teaching assistant** *(Theoretical Physics III: Quantum Mechanics)*
October 2020 – March 2021 **Teaching assistant** *(Experimental Physics III as minor subject)*
April 2019 – September 2019 **Teaching assistant** *(Experimental Physics IV: Atomic and Quantum Physics)*

Skills and Competences

Languages German (native), English (C1), Dutch (B2), Finnish (A2), Danish (A2)
Programming Languages Python (incl. JAX, NumPyro), C, C++, Fortran
Visualization Matplotlib, HoloViews, VisIt, Veusz
Operating Systems Unix/Linux, Mac
Other Latex, Jupyter, Slurm, Google Cloud, Mathematica

Publications

August 2025 (Submitted) **Timo Kist** et al.: *First constraints on the local ionization topology in front of two quasars at z ~ 7.5*, arXiv: 2508.21818

August 2025 (Submitted) **Timo Kist**, Joseph F. Hennawi and Frederick B. Davies: *Inferring local quasar IGM damping wing constraints*, arXiv: 2508.21812

April 2025 (Submitted) **Timo Kist**, Joseph F. Hennawi and Frederick B. Davies: *A local, topology-independent parameterization of quasar IGM damping wings*, arXiv:2504.14746

May 2025 (Refereed Article) Joseph F. Hennawi, **Timo Kist**, Frederick B. Davies and John Tamanas: *Precisely measuring the cosmic reionization history from IGM damping wings towards quasars*, MNRAS (2025), 539, 2621, arXiv:2406.12070

April 2025 (Refereed Article) **Timo Kist**, Joseph F. Hennawi and Frederick B. Davies: *Quantifying the precision of IGM damping wing measurements towards quasars*, MNRAS (2025), 538, 2704, arXiv:2406.12071

August 2022 (Refereed Article) **Timo Kist** and Anna Ijjas: *The robustness of Slow Contraction and the shape of the scalar field potential*, Journal of Cosmology and Astroparticle Physics 8 (2022) 046, arXiv: 2205.01519

September 2021 (Refereed Article) **Timo Kist**, Jose Lado and Christian Flindt: *Lee-Yang theory of criticality in interacting quantum many-body systems*, Physical Review Research 3, 033206 (2021), arXiv: 2109.01412

Peer Review

Since 2025 Referee for Monthly Notices of the Royal Astronomical Society (MNRAS)

Telescope Proposals

JWST (94 hours) Ushering in the JWST Era of Precision Constraints on Reionization: A Survey of Faint Quasar IGM Damping Wings at $6.5 < z < 7.4$
PI: Joseph F. Hennawi, *Co-PIs:* Frederick B. Davies, **Timo Kist**, Daming Yang

Talks

December 2025 (planned) **The Baryon Cycle from Reionization to the Cosmic Noon**, *Puerto Varas, Chile:* Towards precision constraints on reionization with quasar IGM damping wings

December 2025 (planned, lightning talk) **Highly accreting supermassive black holes across all cosmic times**, *Santiago de Chile, Chile:* A census of the high-z quasar lifetime distribution

June 2025 **EAS Annual Meeting 2025**, *Cork, Ireland:* Towards Precision Constraints on Reionization History with Quasar IGM Damping Wings

May 2025 **Netherlands Astronomy Conference 2025**, *Berg en Dal, Netherlands:* Towards Precision Constraints on Reionization History with Quasar IGM Damping Wings

August 2024 (lightning talk) **Cosmic Dawn Revealed by JWST**, *Santa Barbara, CA, USA:* Towards Precision Constraints on Reionization History with Quasar IGM Damping Wings

July 2024 **The Origin and Evolution of SMBHs**, *Sexten, Italy:* Towards Precision Constraints on Reionization History and SMBH Growth with Quasar IGM Damping Wings

June 2024 **Cosmic Dawn at High Latitudes**, *Stockholm, Sweden:* Towards Precision Constraints on Reionization History with Quasar IGM Damping Wings

June 2024 **Exploring the Dark Side of the Universe - Tools**, *Noirmoutier, France:* Learning Reionization History with Quasar IGM Damping Wings

May 2024 **Cosmo 21**, *Chania, Greece:* Learning Reionization History with Quasar IGM Damping Wings

August 2023 **Cosmology 2023**, *Trieste, Italy:* Constraining the Reionization History with High-z Quasar Damping Wings

August 2023 **MPIA Galaxy Coffee**, *Heidelberg, Germany:* Constraining the Reionization History with High-z Quasar Damping Wings

June 2023 **Reionization in the Summer**, *Heidelberg, Germany:* Constraining the Reionization History with High-z Quasar Damping Wings

April 2023 **Future Cosmology**, *Cargèse, France:* Learning Reionization History from High-redshift Quasars

April 2022 **Bouncing Cosmology Group Year-End Workshop**, *Princeton, NJ, USA:* The robustness of slow contraction and the shape of the scalar field potential

Posters

June 2023 **First Light**, *Cambridge, MA, USA:* Constraining Reionization History with High-Redshift Quasars