# Dr. Thales A. Gutcke

NASA Hubble fellow

Princeton University
Department of Astrophysical Sciences
4 Ivy Lane, NJ, 08544
thales@princeton.edu
thalesada.github.io
ORCID:0000-0001-6179-7701


Born on March 11, 1988 in Bodrum, Turkey
Citizenship: USA & Germany

## Academic Positions

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|---|---|
| 2021 - 2024 | Hubble fellow, Princeton University |
| 2024 - 2026 | Lyman Spitzer, Jr. fellow, Princeton University |
| 2018 - 2021 | Independent fellow, Max Planck Institute for Astrophysics, Garching |
| 2018 | Postdoctoral researcher, Max Planck Institute for Astronomy, Heidelberg |
| 2016 - 2018 | Visiting scholar, New York University Abu Dhabi |

## Education

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|---|---|
| 2018 | Max Planck Institute for Astronomy, PhD in Astrophysics, magna cum laude |
| 2014 | Max Planck Institute for Astronomy, M.S. in Physics |
| 2011 | University of Heidelberg, B.S. in Physics |

## Interests

What forms of feedback regulate star formation in galaxies?
Under what conditions do baryons alter the dark matter distribution?
Where is the boundary between star clusters and dwarf galaxies?
What is the chemical composition and morphology of the interstellar medium?
Promoting diversity and equal opportunity in astronomy and in life

## References

Prof. Carlos Frenk (collaborator) - c.s.frenk@durham.ac.uk
Prof. Volker Springel (collaborator) - volker@mpa-garching.mpg.de
Prof. Andrea Macciò (PhD adviser) - maccio@nyu.edu

## Grants & Fellowships

| | |
|---|---|
| 2022 | Princeton Scientific Writing Fellowship |
| 2021 | NASA Hubble Fellowship |
| 2021 | Lyman Spitzer, Jr. Fellowship, Princeton |
| 2021 - 2023 | 40 M c/hrs at Leibniz Supercomputing Center (LRZ) |
| 2018 - 2021 | 20 M c/hrs at Max Planck Computing and Data Facility (MPCDF) |
| 2018 | MPA independent research fellowship |
| 2018 | CCA/CfA joint postdoctoral fellowship (declined) |
| 2017 | German Academic Exchange Service (DAAD) grant to host a student |
| 2014 | International Max Planck Research School (IMPRS) fellowship |
| 2014 | PhD grant from the German Research Council (DFG, SFB 881, A1) |

## Collaborations

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|---|---|
| 2022 - present | All Sky Automated Survey for SuperNovae (ASAS-SN) collaboration |
| 2021 - present | PI of *LYRA* computing allocation (Leibniz Center/SuperMUC-NG, 40 M c/hrs) |
| 2020 - 2021 | Co-I of *Virgo* computing allocation (DiRAC/COSMA, 30 M c/hrs) |
| 2020 - present | Project lead for flagship program "LYRA", Virgo Consortium |
| 2014-2018 | NIHAO simulations collaboration |

## Observing experience

| | |
|---|---|
| 2022 | PI on GEMINI-N proposal, 1.7 hours awarded |
| 2017 - present | Co-I on 4 ESO-VLT/MUSE proposals (> 100 h awarded) |
| 2017 | 16 nights observing at ESO La Silla, Chile |

## Teaching & Mentoring

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|---|---|
| 2022 | Graduate course, *Proposal Writing for Quantitative Disciplines*, Princeton |
| 2022 | *Pedagogy in Practice*, teaching workshop, Princeton |
| 2021 - present | Co-advisor of graduate student Jessica May Hislop |
| 2020 - 2021 | Co-advisor of graduate student Alejandra Fresco |
| 2017 | "DAAD RISE Germany" supervisor for Rokas Žemaitis |
| 2015 | M.S. physics lab instructor, University of Heidelberg |
| 2014 | B.S. physics lab instructor, University of Heidelberg |

## Service Activities

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| 2022 - present | NASA Community College Network "subject matter expert" |
| 2021 | "Future Leader" at AURA annual meeting |
| 2020 - present | Reviewer for ANR and DiRAC computing proposals |
| 2018 - present | Referee for MNRAS |
| 2019 - 2021 | Journal Club Coordinator (MPA) |
| 2017 | Equal Opportunity Officer (MPIA) |
| 2014 - 2016 | Graduate student representative (MPIA) |

## Invited Talks & Outreach

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| Nov 2022 | Colloquium, Department of Astronomy, Ohio State University, USA (*planned*) |
| May 2022 | Theory Seminar, Canadian Institute for Theoretical Astrophysics, Toronto, Canada |
| Apr 2022 | TAC Seminar, Theoretical Astrophysics Center, UC Berkeley, USA |
| Mar 2022 | Joint Astrophysical Colloquium, INAF - University of Bologna, Italy |
| Feb 2022 | Joint Colloquium, Steward Observatory/NSF's NOIRLab, Tucson, USA |
| Feb 2022 | IfA Colloquium, Institute for Astronomy, University of Hawaii, Manoa, USA |
| May 2021 | Seminar, ICRAR/UWA, Australia |
| Mar 2021 | Lorentz Center Workshop, Leiden, The Netherlands |
| 2016 - present | *Frequent public speaker*, including Dark Matter Day, MPIA open house day and Science March |

## Schools & Internships

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|---|---|
| Aug 2020 | Parallel Programming with MPI/OpenMP, ETH Zurich |
| Sept 2016 | 11th Heidelberg Summer School on Astrostatistics & Data Mining |
| Jan 2016 | HGSFP Winterschool, Obergurgl, Austria |
| Sept 2015 | Astro Hack Week, New York University |
| Aug 2013 | Adaptive Optics Summer School, University of California, Santa Cruz |
| April 2012 | Calibration and integration of the Yale Doppler Diagnostic Facility |

## Other Skills

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| Languages | English (native), German (native), French (interm.), Italian (interm.) |
| Coding Languages | Python, C/C++, MPI/OpenMP,HTML, Arduino IDE |
| Codes & Software | AREPO, Gasoline, CLOUDY, ZEMAX, SolidWorks, galfit, SUNRISE |

# Thales A. Gutcke: Publication List

## First author

1. **Gutcke**, **T. A**., Pfrommer, C., Bryan, G. L., Pakmor, R., Springel, V., and Naab, T., "LYRA III: The smallest Reionization survivors," *arXiv e-prints*, p. arXiv:2209.03366, Sept. 2022.

2. **Gutcke**, **T. A**., Pakmor, R., Naab, T., and Springel, V., "LYRA - II. Cosmological dwarf galaxy formation with inhomogeneous Population III enrichment," *MNRAS*, vol. 513, pp. 1372–1385, June 2022.

3. **Gutcke**, **T. A**., Pakmor, R., Naab, T., and Springel, V., "LYRA - I. Simulating the multiphase ISM of a dwarf galaxy with variable energy supernovae from individual stars," *MNRAS*, vol. 501, pp. 5597–5615, Mar. 2021.

4. **Gutcke**, **T. A**. and Springel, V., "Simulating a metallicity-dependent initial mass function: consequences for feedback and chemical abundances," *MNRAS*, vol. 482, pp. 118–125, Jan. 2019.

5. **Gutcke**, **T. A**., Macciò, A. V., Dutton, A. A., and Stinson, G. S., "Quenching versus quiescence: forming realistic massive ellipticals with a simple starvation model," *MNRAS*, vol. 466, pp. 4614–4624, Apr. 2017.

6. **Gutcke**, **T. A**., Stinson, G. S., Macciò, A. V., Wang, L., and Dutton, A. A., "NIHAO - VIII. Circum-galactic medium and outflows - The puzzles of H I and O VI gas distributions," *MNRAS*, vol. 464, pp. 2796–2815, Jan. 2017.

7. **Gutcke**, **T. A**., Fanidakis, N., Macciò, A. V., and Lacey, C., "The star formation and AGN luminosity relation: predictions from a semi-analytical model," *MNRAS*, vol. 451, pp. 3759–3767, Aug. 2015.

## Contributing author

1. Farina, E. P., Schindler, J.-T., Walter, F., Bañados, E., Davies, F. B., Decarli, R., Eilers, A.-C., Fan, X., Hennawi, J. F., Mazzucchelli, C., Meyer, R. A., Trakhtenbrot, B., Volonteri, M., Wang, F., Worseck, G., Yang, J., **Gutcke**, **T. A**., Venemans, B. P., Bosman, S. E. I., Costa, T., De Rosa, G., Drake, A. B., and Onoue, M., "The X-shooter/ALMA Sample of Quasars in the Epoch of Reionization. II. Black Hole Masses, Eddington Ratios, and the Formation of the First Quasars," *arXiv e-prints*, p. arXiv:2207.05113, July 2022.
   ⇒ Co-I on observational proposal, provided the simulations for the proposal, edited the manuscript

2. Farina, E. P., Arrigoni-Battaia, F., Costa, T., Walter, F., Hennawi, J. F., Drake, A. B., Decarli, R., **Gutcke**, **T. A**., Mazzucchelli, C., Neeleman, M., Georgiev, I., Eilers, A.-C., Davies, F. B., Bañados, E., Fan, X., Onoue, M., Schindler, J.-T., Venemans, B. P., Wang, F., Yang, J., Rabien, S., and Busoni, L., "The REQUIEM Survey. I. A Search for Extended Ly$\alpha$ Nebular Emission Around 31 z>5.7 Quasars," *ApJ*, vol. 887, p. 196, Dec. 2019.
   ⇒ Co-I on observational proposal, provided the simulations for the proposal, helped develop the data reduction, edited the manuscript

3. Philcox, O., Rybizki, J., and **Gutcke**, **T. A**., "On the Optimal Choice of Nucleosynthetic Yields, Initial Mass Function, and Number of SNe Ia for Chemical Evolution Modeling," *ApJ*, vol. 861, p. 40, July 2018.
   ⇒ Ran and analysed the hydrodynamic simulations and wrote the simulation section

4. Dutton, A. A., Obreja, A., Wang, L., **Gutcke**, **T. A**., Buck, T., Udrescu, S. M., Frings, J., Stinson, G. S., Kang, X., and Macciò, A. V., "NIHAO XII: galactic uniformity in a ΛCDM universe," *MNRAS*, vol. 467, pp. 4937–4950, June 2017.
   ⇒ Advised and edited the manuscript

5. Wang, L., Dutton, A. A., Stinson, G. S., Macciò, A. V., **Gutcke**, **T. A**., and Kang, X., "NIHAO VII: predictions for the galactic baryon budget in dwarf to Milky Way mass haloes," *MNRAS*, vol. 466, pp. 4858–4867, Apr. 2017.
   ⇒ Advised, aided with the data reduction and edited the manuscript

6. Tala, M., Heeren, P., Grill, M., Harris, R. J., Stürmer, J., Schwab, C., **Gutcke**, **T. A**., Reffert, S., Quirrenbach, A., Seifert, W., Mandel, H., Geuer, L., Schäffner, L., Thimm, G., Seeman, U., Tietz, J., and Wagner, K., "A high-resolution spectrograph for the 72cm Waltz Telescope at Landessternwarte, Heidelberg," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, vol. 9908 of *Proc. SPIE*, p. 99086O, Aug. 2016.
   ⇒ Designed, built and calibrated the first version of the spectrograph

7. Tollet, E., Macciò, A. V., Dutton, A. A., Stinson, G. S., Wang, L., Penzo, C., **Gutcke**, **T. A**., Buck, T., Kang, X., Brook, C., Di Cintio, A., Keller, B. W., and Wadsley, J., "NIHAO - IV: core creation and destruction in dark matter density profiles across cosmic time," *MNRAS*, vol. 456, pp. 3542–3552, Mar. 2016.
   ⇒ Edited the manuscript

8. Dutton, A. A., Macciò, A. V., Stinson, G. S., **Gutcke**, **T. A**., Penzo, C., and Buck, T., "The response of dark matter haloes to elliptical galaxy formation: a new test for quenching scenarios," *MNRAS*, vol. 453, pp. 2447–2464, Nov. 2015.
   ⇒ Advised and edited the manuscript

9. Schwab, C., **Gutcke**, **T. A**., Spronck, J. F. P., Fischer, D. A., and Szymkowiak, A., "Investigating spectrograph design parameters with the Yale Doppler diagnostic facility," in *Ground-based and Airborne Instrumentation for Astronomy IV*, vol. 8446 of *Proc. SPIE*, p. 844695, Sept. 2012.
   ⇒ Designed, built and calibrated parts of the spectrograph, wrote half the manuscript