Kyle J. Van Gorkom

CONTACT

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Education

2017–Present **Ph.D. in Optical Sciences**, *University of Arizona*, Tucson, AZ.
Characterization of deformable mirrors and wavefront sensing and control for MagAO-X, an extreme adaptive optics instrument for high contrast imaging at visible wavelengths

2010–2014 **B.S. in Physics & Philosophy**, *Brandeis University*, Waltham, MA.
Highest honors, *summa cum laude*, mathematics minor
Thesis: *Investigating Optical Continuum Flux as a Measure of Quasar Central Engine Power*

Professional Experience

2019–Present **Optical Engineer**, *NASA Goddard Space Flight Center*.
- Development of metrology techniques for ultra-stable structures under consideration for future flagship NASA astrophysics missions (LUVOIR/HabEx)
- PI of IRAD/CIF project "Using Goddard's High Speed Interferometry to Characterize Deformable Mirror Dynamics and Stability"

2014–2019 **Research & Instrument Analyst**, *Space Telescope Science Institute*.
Instruments Division, Telescopes Group
- Phase retrieval for Hubble focus maintenance. PI of the *HST Cycle 24 Focus & Optical Monitor* calibration program.
- Pipeline development, analysis, and data collection support of Center of Curvature interferometry of the James Webb primary
- Point-spread function simulations and algorithm development for the Webb coronagraphy pipeline and exposure time calculator
- Exoplanet simulations to quantify and reduce planet-planet confusion for direct imaging missions

2012–2014 **Undergraduate Research Assistant**, *Brandeis Radio Astronomy Group*.
Investigated the robustness of optical continuum flux as a measure of quasar central engine power to place constraints on quasar jet orientation

Summer 2013 **REU Intern**, *University of Michigan Ann Arbor*.
- Satellite dynamics modeling in the development of the Miniature Tether Electrodynamics Experiment (MiTEE).
- Numerically characterized the on-orbit behaviors of a coupled cubesat, femtosat, and non-rigid conducting tether

Honors and Awards

2017 James C. Wyant Graduate Student Scholarship in Optical Sciences

2017 STScI Team Achievement Award

2014 Phi Beta Kappa

2014 Physics Faculty Prize

2012 Cariana Prize in Philosophy

Teaching Experience

Fall 2013 Teaching Assistant for *Introductory Astronomy* *Brandeis University*

Refereed Publications

submitted
- **Kyle J. Van Gorkom**, J. R. Males, et al. (submitted). "Characterizing deformable mirrors for MagAO-X". In: *Journal of Astronomical Telescopes, Instruments, and Systems*.

2021
- Sebastiaan Y. Haffert et al., including **Kyle J. Van Gorkom** (2021). "Data-driven subspace predictive control of adaptive optics for high-contrast imaging". In: *Journal of Astronomical Telescopes, Instruments, and Systems* 7.2, pp. 1–22. DOI: 10.1117/1.JATIS.7.2.029001. URL: https://doi.org/10.1117/1.JATIS.7.2.029001.

2019
- Kelsey L. Miller et. al, including **Kyle J. Van Gorkom** (2019). "Spatial linear dark field control and holographic modal wavefront sensing with a vAPP coronagraph on MagAO-X". In: *Journal of Astronomical Telescopes, Instruments, and Systems* 5.4, pp. 1–18. DOI: 10.1117/1.JATIS.5.4.049004. URL: https://doi.org/10.1117/1.JATIS.5.4.049004.

2017
- Babak Saif et al., including **Kyle J. Van Gorkom** (Aug. 2017). "Measurement of picometer-scale mirror dynamics". In: *Applied Optics* 56.23, p. 6457. DOI: 10.1364/ao.56.006457.

2015
- **Kyle J. Van Gorkom**, John F. C. Wardle, et al. (July 2015). "Comparing different indicators of quasar orientation". In: *MNRAS* 450.4, pp. 4240–4247. DOI: 10.1093/mnras/stv912. arXiv: 1504.08044 [astro-ph.GA].

Presentations and Proceedings

2020
- Jared R. Males et al., including **Kyle J. Van Gorkom** (Dec. 2020). "MagAO-X first light". In: *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*. Vol. 11448. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, p. 114484L. DOI: 10.1117/12.2561682.

- Laird M. Close et al., including **Kyle J. Van Gorkom** (Dec. 2020). "Prediction of the planet yield of the MaxProtoPlanetS high-contrast survey for H-alpha protoplanets with MagAO-X based on first light contrasts". In: *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*. Vol. 11448. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 114480U. DOI: 10.1117/12.2561677.

2019
- Keira J. Brooks et al., including **Kyle J. Van Gorkom** (Jan. 2019). "WebbPSF Update: Providing High-Fidelity Time variable Point Spread Functions for JWST Based on Thermal Modeling". In: *American Astronomical Society Meeting Abstracts #233*. Vol. 233. American Astronomical Society Meeting Abstracts, p. 245.19.

2018
- Jared R. Males et al., including **Kyle J. Van Gorkom** (2018). "MagAO-X: project status and first laboratory results". In: *Adaptive Optics Systems VI*. Ed. by Laird M. Close, Laura Schreiber, and Dirk Schmidt. Vol. 10703. International Society for Optics and Photonics. SPIE, pp. 76–89. DOI: 10.1117/12.2312992. URL: https://doi.org/10.1117/12.2312992.
- Jennifer Lumbres et al., including **Kyle J. Van Gorkom** (July 2018). "Modeling coronagraphic extreme wavefront control systems for high contrast imaging in ground and space telescope missions". In: *Adaptive Optics Systems VI*. Ed. by Laird M. Close, Laura Schreiber, and Dirk Schmidt. Vol. 10703. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 107034Z. DOI: 10.1117/12.2313780. arXiv: 1807.04729 [astro-ph.IM].
- Kelsey Miller et al., including **Kyle J. Van Gorkom** (2018). "Focal plane wavefront sensing and control strategies for high-contrast imaging on the MagAO-X instrument". In: *Adaptive Optics Systems VI*. Ed. by Laird M. Close, Laura Schreiber, and Dirk Schmidt. Vol. 10703. International Society for Optics and Photonics. SPIE, pp. 559–575. DOI: 10.1117/12.2312809. URL: https://doi.org/10.1117/12.2312809.
- **Kyle J. Van Gorkom**, Kelsey L. Miller, et al. (2018). "Characterization of deformable mirrors for the MagAO-X project". In: *Adaptive Optics Systems VI*. Ed. by Laird M. Close, Laura Schreiber, and Dirk Schmidt. Vol. 10703. International Society for Optics and Photonics. SPIE, pp. 1266–1272. DOI: 10.1117/12.2323450. URL: https://doi.org/10.1117/12.2323450.
- Laird M. Close et al., including **Kyle J. Van Gorkom** (2018). "Optical and mechanical design of the extreme AO coronagraphic instrument MagAO-X". In: *Adaptive Optics Systems VI*. Ed. by Laird M. Close, Laura Schreiber, and Dirk Schmidt. Vol. 10703. International Society for Optics and Photonics. SPIE, pp. 1227–1236. DOI: 10.1117/12.2312280. URL: https://doi.org/10.1117/12.2312280.
- Lauren H. Schatz et al., including **Kyle J. Van Gorkom** (2018). "Design of the MagAO-X pyramid wavefront sensor". In: *Adaptive Optics Systems VI*. Ed. by Laird M. Close, Laura Schreiber, and Dirk Schmidt. Vol. 10703. International Society for Optics and Photonics. SPIE, pp. 671–679. DOI: 10.1117/12.2312171. URL: https://doi.org/10.1117/12.2312171.

- Marshall D. Perrin et al., including **Kyle J. Van Gorkom** (Aug. 2018). "Updated optical modeling of JWST coronagraph performance contrast, stability, and strategies". In: *Space Telescopes and Instrumentation 2018: Optical, Infrared, and Millimeter Wave*. Ed. by Makenzie Lystrup et al. Vol. 10698. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, p. 1069809. DOI: 10.1117/12.2313552.

2017
- Babak Saif et al., including **Kyle J. Van Gorkom** (Sept. 2017). "JWST center of curvature test method and results". In: *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*. Vol. 10401. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 104010T. DOI: 10.1117/12.2273974.
- Michael McElwain et al., including **Kyle J. Van Gorkom** (June 2017). "JWST Point Spread Function Quality and Stability: Integrated Modeling, Ground Testing, and Space Validation". In: *American Astronomical Society Meeting Abstracts #230*. Vol. 230. American Astronomical Society Meeting Abstracts, p. 114.10.

2016
- **Kyle J. Van Gorkom**, Laurent Pueyo, et al. (June 2016). "Improving JWST Coronagraphic Performance with Accurate Image Registration". In: *American Astronomical Society Meeting Abstracts #228*. Vol. 228. American Astronomical Society Meeting Abstracts, p. 317.03.
- **Kyle J. Van Gorkom** and Chris Stark (2016). "Quantifying Confusion in the Hunt for ExoEarths". In: *High Contrast Imaging in Space Workshop*.
- Marshall D. Perrin et al., including **Kyle J. Van Gorkom** (June 2016). "An Update on Simulating Imaging, Spectroscopic, and Coronagraphic PSFs for JWST (and WFIRST too!)" In: *American Astronomical Society Meeting Abstracts #228*. Vol. 228. American Astronomical Society Meeting Abstracts, p. 216.20.

Other Publications

2015
- Chris Stark and **Kyle J. Van Gorkom** (2015). "An APT Implementation of the JWST Coronagraph SODRM". In: *JWST-STScI-004706*.
- Chris Stark, **Kyle J. Van Gorkom**, and L. Pueyo (2015). "How to Implement a JWST Coronagraphic Observation Sequence in APT". In: *JWST-STScI-004707*.