Dr. Vanessa P. Bailey

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Education

Ph.D., M. S., Astronomy, University of Arizona, Tucson, AZ
B.S. Astrophysics & Physics, Univ. of Minnesota, Minneapolis, MN

Research Experience

Staff Scientist 2017+
Jet Propulsion Laboratory, Pasadena, CA

- Nancy Grace Roman Space Telescope Coronagraph Instrument 2017+
  - Instrument Technologist 2019+
  - Community Participation Program Co-Chair 2023+
  - Project Science team member 2017+
- Exoplanet Exploration Program Coronagraph Technology Roadmap 2023
  - Sub-group lead for visible-light-only coronagraph instrument design point
- Arcsecond Space Telescope Enabling Research in Astrophysics 2019 – 2021
  - Science team member
  - PI of JPL internal grant funding FY20 science operations including JPL operations team and MIT/JPL exoplanet science team

Postdoctoral Researcher
Stanford University Physics Department, Stanford, CA

- Gemini Planet Imager
  - Assessed performance of GPI adaptive optics system and identified areas for targeted improvement; supported observation planning and execution

Graduate Research Assistant
University of Arizona Astronomy Department, Tucson, AZ

- Large Binocular Telescope Interferometer Adaptive Optics
  - Assisted integration and test of wavefront sensor; implemented non-common path aberration mitigation; supported observation planning and execution

- High-contrast imaging survey of debris disk-hosting stars for disk-sculpting planets
  - Discovered planet-mass companion HD 106906 b (Bailey et al., ApJL 2014)
  - Awarded time on LBT/LBTI, Magellan/MagAO, VLT/NaCo, Gemini/NICI, and MMT/Clio

Advising and Mentoring

- Isabel Kain (Undergraduate) — Summer 2020
- Tyler Smith (Undergraduate/PhD student) — 2019 - 2021
- Melisa Tallis (post-B.S. researcher) — March 2016 – 2019
  - Tallis, et al., JATIS (2020). ADS
- W. Jerry Xuan (Undergraduate student. Primary advisor: Dimitri Mawet) — 2018
  - Xuan, et al, AJ (2018) ADS
- Pierre-Cécil König (Master's student) — Summer 2016
- Ya-Lin Wu (PhD student; primary advisor: Laird Close) — 2015 – 2016
  - Wu, et al., ApJ (2016) ADS
- Co-organized weekly science & skills seminar series for six students — Summer 2016

Professional Development

Alan Alda Share the Science	March 2023
JPL Technical Women's Leadership Journey	Spring 2021
NASA APPEL Team Leadership	January 2021
JPL Crucial Conversations Course	Aug 20-21, 2019
JPL Project Systems Engineering Course	May 20-21, 2018

Publications

Peer reviewed papers, first author

1. **Bailey, V. P.;** Meshkat, T.; Reiter, M.; Morzinski, K.; Males, J.; Su, K. Y. L.; Hinz, P. M.; Kenworthy, M.; Stark, D.; Mamajek, E.; Briguglio, R.; Close, L. M.; Follette, K. B.; Puglisi, A.; Rodigas, T.; Weinberger, A. J.; and Xompero, M. *HD 106906 b: A Planetary-mass Companion Outside a Massive Debris Disk.* ApJ, 780, L4 (2014). ADS
2. **Bailey, V. P**.; Hinz, P. M.; Currie, T.; Su, K. Y. L.; Esposito, S.; Hill, J. M.; Hoffmann, W. F.; Jones, T.; Kim, J.; Leisenring, J.; Meyer, M.; Murray-Clay, R.; Nelson, M. J.; Pinna, E.; Puglisi, A.; Rieke, G.; Rodigas, T.; Skemer, A.; Skrutskie, M. F.; Vaitheeswaran, V.; and Wilson, J. C. *A Thermal Infrared Imaging Study of Very Low Mass, Wide-separation Brown Dwarf Companions to Upper Scorpius Stars: Constraining Circumstellar Environments*. ApJ, 767, 31 (2013). ADS

SPIE Conference proceedings, first author

1. **Bailey, V. P.;** Bendek, E.; Monacelli, B.; Baker, C.; Bedrosian, G.; Cady, E.; Douglas, E. S.; Groff, T.; Hildebrandt, S. R.; Kasdin, N. J.; Krist, J.; Macintosh, B.; Mennesson, B.; Morrissey, P.; Poberezhskiy, I.; Subedi, H. B.; Rhodes, J.; Roberge, A.; Ygouf, M.; Zellem, R. T.; Zhao, F.; Zimmerman, N. T., *Nancy Grade Roman Space Telescope Coronagraph Instrument Overview and Status.* In Techniques and Instrumentation for Detection of Exoplanets XI, Proc. SPIE, vol. 12680, *submitted*
2. **Bailey, V. P.;** Bottom, M.; Cady, E; Cantalloube, F.; de Boer, J.; Groff, T.; Krist, J.; Millar-Blanchaer, M. A.; Vigan, A.; Chilcote, J.; Choquet, E.; De Rosa, R. J.; Girard, J. H.; Guyon, O.; Kern, B.; Lagranage, A.-M.; Macintosh, B.; Males, J. R.; Marois, C.; Meshkat, T.; Milli, J.; N'Diaye, M.; Ngo, H.; Nielsen, E. L.; Rhodes, J.; Ruane, G.; van Holstein, R. G.; Wang, J. J.; Xuan, W. J., *Lessons for WFIRST CGI from ground-based high-contrast systems.* In Space Telescopes and Instrumentation 2018: Optical, Infrared, and Millimeter Wave, Proc. SPIE, vol. 10698, p. 10698P (2018). ADS
3. **Bailey, V. P.;** Poyneer, L. A.; Macintosh, B. A.; Savransky, D.; Wang, J. J.; De Rosa, R. J.; Follette, K. B.; Ammons, S. M.; Hayward, T.; Ingraham, P.; Maire, J.; Palmer, D. W.; Perrin, M. D.; Rajan, A.; Rantakyro, F. T.; Thomas, S.; and Veran, J.-P. *Status and performance of the Gemini Planet Imager adaptive optics system.* In Adaptive Optics Systems V, Proc. SPIE, vol. 9909, p. 99090V (2016). ADS
4. **Bailey, V. P.;** Hinz, P. M.; Puglisi, A. T.; Esposito, S.; Vaitheeswaran, V.; Skemer, A. J.; Defrere, D.; Vaz, A.; and Leisenring, J. M. *Large binocular telescope interferometer adaptive optics: on-sky performance and lessons learned*. In Adaptive Optics Systems IV, Proc. SPIE, vol. 9148, p. 914803 (2014). ADS
5. **Bailey, V. P.;** Vaitheeswaran, V.; Codona, J.; Hinz, P.; Durney, O.; Esposito, S.; Pinna, E.; and Puglisi, A. *Characterization of synthetic reconstructors for the pyramid wavefront sensor unit of LBTI*. In Adaptive Optics Systems II, Proc. SPIE, vol. 7736, p. 77365G (2010). ADS

Peer reviewed papers, second author

1. Tallis, M.; **Bailey, V. P.;** Macintosh, B.; Poyneer, L. A.; Ruffio, J.-B.; Hayward, T.; Rantakyrö, F. T.; Chilcote, J. K.; Savransky, D.; *Effects of mirror seeing on high-contrast adaptive optics instruments,* JATIS, 6, 015002 (2020). ADS
2. Meshkat, T.; **Bailey, V. P.;** Su, K. Y. L.; Kenworthy, M. A.; Mamajek, E. E.; Hinz, P. M.; and Smith, P. S. *Searching for Planets in Holey Debris Disks with the Apodizing Phase Plate.* ApJ, 800, 5 (2015). ADS
3. Meshkat, T.; **Bailey, V. P.;** Rameau, J.; Bonnefoy, M.; Boccaletti, A.; Mamajek, E. E.; Kenworthy, M.; Chauvin, G.; Lagrange, A.-M.; Su, K. Y. L.; and Currie, T. *Further Evidence of the Planetary Nature of HD 95086 b from Gemini/NICI H-band Data*. ApJ, 775, L40 (2013). ADS
4. Currie, T.; **Bailey, V. P.;** Fabrycky, D.; Murray-Clay, R.; Rodigas, T.; and Hinz, P. *High-contrast 3.8 μm Imaging of the Brown Dwarf/Planet-mass Companion to GJ 758.* ApJ, 721, L177 (2010) ADS

Selected peer-reviewed papers, substantive coauthor

- Krishnamurthy, A.; Knapp, M.; Günther, M. N.; Daylan, T.; Demory, B.-O.; Seager, S.; **Bailey, V. P.;** Smith, M. W.; Pong, C. M.; Hughes, K.; Donner, A.; Di Pasquale, P.; Campuzano, B.; Smith, C.; Luu, J.; Babuscia, A.; Bocchino, R. L., Jr.; Loveland, J.; Colley, C.; Gedenk, T.; Kulkarni, T.; White, M.; Krajewski, J.; Fesq, L., *Transit Search for Exoplanets around Alpha Centauri A and B with ASTERIA*, AJ, 161, 275 (2021) ADS
- Seager, S.; Knapp, M.; Demory, B.-O.; Krishnamurthy, A.; Huang, C. X.; Badenas Agusti, M.; Shporer, A.; Weisserman, D.; Becker, J.; Vanderburg, A.; Smith, M. W.; Pong, C. M.; **Bailey, V. P.;** Donner, A.; Di Pasquale, P.; Campuzano, B.; Smith, C.; Luu, J.; Babuscia, A.; Bocchino, R. L. Jr.; Loveland, J.; Colley, C.; Gedenk, T.; Kulkarni, T.; Hughes, K.; White, M.; Krajewski, J.; Fesq, L.; Ricker, G.; Vanderspek, R.; Latham, D. W.; Jenkins, J. M.; Winn, J. N.; Caldwell, D. A.; Collins, K. A.; Dragomir, D.; Fausnaugh, M.; Glidden, A.; Schlieder, J. E.; Twicken, J. D.; Wohler, B., *HD 219134 Revisited: Planet d Transit Upper Limit and Planet f Transit Nondetection with ASTERIA and TESS,* AJ, 161, 117 (2021) ADS
- Knapp, M.; Seager, S.; Demory, B.-O.; Krishnamurthy, A.; Smith, M. W.; Pong, C. M.; **Bailey, V. P.**; Donner, A.; Di Pasquale, P.; Campuzano, B.; Smith, C.; Luu, J.; Babuscia, A.; Bocchino, R. L., Jr.; Loveland, J.; Colley, C.; Gedenk, T.; Kulkarni, T.; Hughes, K.; White, M. Krajewski, J.; Fesq, *Demonstrating High-precision Photometry with a CubeSat: ASTERIA Observations of 55 Cancri e*, AJ, 160, 23 (2020) ADS
- Xuan, W. J.; Mawet, D.; Ngo, H.; Ruane, G.; **Bailey, V. P**.; Choquet, É.; Absil, O.; Alvarez, C.; Bryan, M.; Cook, T.; Femenía C., Bruno; Gomez Gonzalez, C.; Huby, E.; Knutson, H. A.; Matthews, K.; Ragland, S.; Serabyn, E.; Zawol, Z.; *Characterizing the Performance of the NIRC2 Vortex Coronagraph at W. M. Keck Observatory,* AJ, 156, 156 (2018) ADS
- Wu, Y.-Y.; Close, L. M.; **Bailey, V. P.;** Rodigas, T. J.; Males, J. R.; Morzinski, K. M.; Follette, K. B.; Hinz, P. M.; Puglisi, A.; Briguglio, R.; Xompero, M.; *Magellan AO System z′, Y S , and L′ Observations of the Very Wide 650 AU HD 106906 Planetary System,* ApJ, 823, 24 (2016) ADS

On "builders' list" for the Gemini Planet Imager 1.0 and the Large Binocular Telescope Instrument.

A full list of first author and co-author refereed papers and SPIE proceedings can be found on ORCID (orcid.org/0000-0002-5407-2806).