Jaren N. Ashcraft

PH.D., M.S. OPTICAL SCIENCES · NHFP SAGAN FELLOW

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Appointments

University of California, Santa Barbara *Santa Barbara, CA*
NHFP SAGAN FELLOW *Present*
- Proposal Title: "Optimizing the Vector Field for Next-generation Astrophysics"
- Advisor: Dr. Maxwell Millar-Blanchaer

Education

University of Arizona *Tucson AZ*
PH.D., M.S., OPTICAL SCIENCES *Aug 2019 - Aug 2024*
- Thesis Title: "Ray-based Physical Optics for the Design of Astronomical Observatories"
- Advisor: Dr. Ewan Douglas, Co-advisor: Dr. Daewook Kim

University of Rochester *Rochester NY*
B.S. OPTICAL ENGINEERING (HIGH HONORS) CERT. NANOSCIENCE AND NANOENGINEERING *Aug 2015 - May 2019*
- Advisor: Dr. Thomas Brown, Bryan McIntyre

Research Professional History

UC Santa Barbara NHFP Sagan Fellow *Santa Barbara, CA*
ADVISOR: DR. MAXWELL MILLAR-BLANCHAER *Present*
- Lead parameter study on sensitivity of HWO to polarization aberrations
- Design and fabricate metasurfaces for polarization aberration compensation
- Develop novel techniques for high-precision full-Mueller polarimetry

University of Arizona Research Assistant *Tucson, AZ*
ADVISOR: DR. EWAN DOUGLAS *Aug 2019 - Apr 2014*
- Assess influence of polarization aberrations on high-contrast imaging instruments
- Derivation of novel method for Gaussian Beamlet Decomposition optical propagation
- Design and assembly of a vacuum-compatible coronagraph testbed
- Modeling and performance predictions for freeform astronomical telescopes

NASA Goddard Space Flight Center Visiting Technologist *Goddard, MD*
ADVISOR: DR. BREANN SITARSKI *Jan 2024 - Mar 2024*
- Polarization aberration modeling of the LUVOIR-A ECLIPS Coronagraph
- Integration of polarization and exoplanet yield calculations to constrain HWO's baseline architecture

W.M Keck Observatory Visiting Scholar *Kamuela, HI*
ADVISORS: DR. PETER WIZINOWICH, DR. MAX MILLAR-BLANCHAER *Jun 2023 - Sep 2023*
- Polarimetric performance estimation of ORKID imaging path
- Phase retrieval algorithm development for daytime calibration

NASA Jet Propulsion Laboratory Visiting Technologist *Pasadena, CA*
ADVISORS: DR. BRIAN MONACELLI, BRANDON DUBE *Feb 2023 - May 2023*
- Modeling polarization aberrations in an early-concept habitable worlds observatory
- Developing novel spatially-varying thin-film optimization method for minimizing polarization aberrations

Subaru Telescope Visiting Technologist *Hilo, Hi*
ADVISOR: DR. OLIVIER GUYON *May 2022 - Aug 2023*
- Polarization aberration simulation of VAMPIRES imaging path
- Design of a pupil-imaging mode for VAMPIRES for polarized pupil measurements

Awards, Fellowships, & Grants

2024	**NASA Hubble Fellowship Program**, Prize Fellowship in Astronomy	*$ 314,000*
2022	**Philip and Joan Slater Scholarship in Optical Sciences**, Departmental Award	*$ 2,000*
2021	**Romeo and Erlinda Mercado Scholarship in Optical Sciences**, Departmental Award	*$ 5000*
2021	**NASA Space Technology Graduate Research Opportunity**, 3-year Graduate Fellowship	*$ 215,000*
2020	**Philip and Joan Slater Scholarship in Optical Sciences**, Departmental Award	*$ 2,000*
2019	**John Hayes and Jane Quale Endowed Scholarship in Optical Sciences**, First-year Graduate Fellowship	*$ 24,000*
2017	**Fujimara Award**, Institute of Optics Departmental Award	
2015	**Whipple Science and Research Scholarship**, Undergraduate Merit Scholarship	

Publications In Prep

1. **Ashcraft, J. N.**, Anche R. A., Haffert S. Y., et al. "Polarization aberrations in next generation ELTs II. Influence of Segment-to-segment variations". Astronomy & Astrophysics, *in prep*.

2. **Ashcraft J. N.**, Douglas E., Dube B., Mulhal K. et al. "Poke: a Pythonic Interface for Raytracing and Physical Optics". Journal of Open Source Software *in prep*

Peer-Reviewed Publications

1. **Ashcraft J. N.**, Dube B., Menneson B., Ziemer J., et al. "A comparison of polarization aberrations from existing mirror coatings for coronagraphic imaging of habitable worlds". SPIE Journal of Astronomical Telescopes, Instruments, and Systems *in review*

2. **Ashcraft J. N.**, Douglas E., Dube B., Mulhal K. et al. "Katsu: Integrated polarimetry and polarization simulation". Journal of Open Source Software *in review*

3. Lucas, M., Norris, B., Guyon, O. et al (incl. **Ashcraft, J. N.**), "The Next Generation of Visible High-Contrast Imaging and Polarimetry with SCExAO/VAMPIRES". Publications of the Astronomical Society of the Pacific *in review*.

4. **Ashcraft, J. N.**, Ewan S. Douglas, et al., "A generalized expression for accelerating beamlet decomposition simulations," Opt. Express 32, 18068-18086 (2024)

5. Anche R. A. **Ashcraft, J. N.**, et al., "Simulation of high-contrast polarimetric observations of debris disks with the Roman Coronagraph Instrument". 2023 Publications of the Astronomical Society of the Pacific, 135 125001

6. **Ashcraft J. N.**, Douglas E., Kim D., Riggs A.J., "Hybrid propagation physics for the design and modeling of astronomical observatories: a coronagraphic example," J. Astron. Telesc. Instrum. Syst. 9(4) 048003 (16 November 2023) https://doi.org/10.1117/1.JATIS.9.4.048003

7. Anche R. A. **Ashcraft, J. N.**, Haffert S. Y., et al. 2023. Polarization aberrations in next generation ELTs I. Effect on the Coronagraphic Performance. Astronomy & Astrophysics, doi: 10.1051/0004-6361/202245651.

8. Douglas E., Debes J., Menneson B., Nemati B., **Ashcraft, J. N.**, et al. 2022. Sensitivity of the Roman Coronagraph Instrument to Exozodiacal Dus. Publications of the Astronomical Society of the Pacific, vol. 134, no. 1032, p. 024402, Feb. 2022, doi: 10.1088/1538-3873/ac3f7b.

9. Kim D., Choi H., **Ashcraft J. N.,** et al. 2021. Advances in Optical Engineering for Future Telescopes, Opto-Electronic Advances Adv4, 210040 (2021) . doi:10.29026/oea.2021.210040

Presentations

INVITED TALKS

Jan 2024. *Polarization Aberrations: High-Contrast Imaging Limits for Next-generation Observatories*. Invited talk: NASA Goddard Exoplanet Seminar, Goddard, MD.

May 2023. *Polarization Aberrations: High-Contrast Imaging Limits for Next-generation Observatories*. Invited talk: UCSB Astronomy Seminar, Santa Barbara, CA.

Oct 2022. *Open-source Beam Propagation Tools for Integrated Simulation of High-contrast Imaging Instruments*. Invited student talk: Optical Sciences Industrial Affiliates, Tucson, AZ.

SELECTED CONFERENCE PRESENTATIONS

Ashcraft, J, Douglase E., Kim D., Riggs A.J., et al. 2023. *Poke: An open-source ray-based physical optics platform*. SPIE Optics + Photonics, San Diego, CA.

Ashcraft, J, Kim, D., Choi, H., Heap S., et al. 2021. *Cosmic Evolution through UV Surveys (CETUS): Optical Design and Modeling Efforts Supporting UV Observatories in Space*. SPIE Optics + Photonics, San Diego, CA.

Ashcraft, J., Smith, G., Douglas, E., et al. 2021. *The Versatile CubeSat Telescope: Going to Large Apertures in Small Spacecraft*, SPIE Optics + Photonics, San Diego, CA.

Ashcraft, J. and Douglas E. *Poke: Augmenting Diffraction Models with Gaussian Beamlet Decomposition and Polarization Ray Tracing*. AAS 241 Chambliss Award Poster, Seattle, WA.

Teaching Experience

Fall 2022	**Qualifying Examination Review Team**, Geometrical Optics Lead, University of Arizona
Fall 2018	**Intro to Optics - OPT 101**, Teaching Assistant, University of Rochester
Spring 2018	**MATLAB for Optics II - OPT 212**, Head Teaching Assistant, University of Rochester
Fall 2017	**Intro to Optics - OPT 101**, Research Project Supervisor, University of Rochester
Spring 2017	**Geometrical Optics - OPT 241**, Teaching Assistant, University of Rochester
Spring 2017	**MATLAB for Optics I - OPT 211**, Head Teaching Assistant, University of Rochester
Fall 2016	**Intro to Optics - OPT 101**, Teaching Assistant, University of Rochester

Mentoring

2023	**William Melby**, *Dual-rotating retarder Mueller Polarimetry for HWP characterization*, Physics Undergraduate, UC Santa Barbara
2022	**Guransh Mann**, *Full mueller polarimetry of high-contrast testbeds*, Electrical Engineering Undergraduate, University of Arizona
2020	**Bianca Payan**, *Updating optical propagation models of Roman-CGI*, Astronomy Undergraduate, University of Arizona
2018	**Rob Moore**, *Manufacturing single-mode Fiber lasers for injection-locked fiber lasers*, Optics Undergraduate, University of Rochester

Professional Development

SERVICE

2024	**Akamai Workforce Initiative**, Instructional Staff
2023	**SPIE Journal of Astronomical Telescopes, Instruments, and Systems**, Reviewer
2023	**SPIE Optics + Photonics**, Astronomical Polarimetry Session Chair
2019-2023	**Akamai Workforce Initiative**, Alumni Panelist, Hana Hou Conference Organizing Committee

Development and Outreach

The Practical Optics Workshop (POW), Chair of a student-lead team of tutors that lead workshops on how to use optical modeling software. I was the primary tutor for the Introductory and Advanced CODE V and Zemax OpticStudio Workshops.

The Practical Optical Design Seminar (PODS), Founder and chair of PODS. A student-lead optical design research team that aims to learn more about optical modeling by conducting a research project. Lead a design study of Cubesat objectives to maximize performance in a limited volume.

The Student Optics Chapter (SOCk), Vice president and treasurer. An Optica and SPIE affiliated pre-professional organization for professional development and outreach. Oversaw the development of remote outreach and social activities during the COVID-19 pandemic.

Optics and Photonics Winter School Committee, First student member. Contribute to planning and organization of College of Optical Science's winter school. Student poster session judge.

OSA Student Chapter President, Secretary, of the Optical Society (now Optica) student chapter at the University of Rochester. Responsible for the coordinate of professional development and outreach initiatives.

Open-Source Software

Poke: A ray-based physical optics package that enables the direct integration of commercial ray tracers into open-source diffraction codes. Supports polarization ray tracing and gaussian beamlet decomposition. Creator and lead developer.

Katsu: A platform for integrating polarization simulations based on Mueller calculus with full Stokes and Mueller polarimetry in the laboratory. Creator and lead developer.

prysm: A physical optics and first-order modeling package developed in support of high-contrast imaging simulation. Contributing developer to the polarization and thinfilms submodules.

Undergraduate Research

University of Rochester Senior Design Lead   *Rochester, NY*
Advisor: Dr. Thomas Brown   *Aug 2018 - May 2019*
- Design and lab validation of a polarimetric scatterometer for asthma trigger detection

Akamai Optical Engineering Intern   *Santa Cruz, CA*
Advisor: Dr. Renate Kupke, Darren Dillon, Nicholas MacDonald   *Jun 2018 - Aug 2018*
- Testbench assembly for analyzing the mode scrambling and focal ratio degradation for shaped-core optical fibers
- Fiber characterization for fiber-fed spectrographs on the Automated Planet Finder and Thirty Meter Telescope

Lasers and Photonic Systems group Research Assistant   *Rochester, NY*
Advisor: Dr. John Marciante   *Aug 2017 - May 2018*
- Development of a method for rapid assembly of single-mode fiber lasers

UR Integrated Nanosystems Laboratory   *Rochester, NY*
Advisor: Dr. Brian McIntyre   *Aug 2017 - May 2018*
- Development of a method to generate optical stack interference filters with physical vapor deposition

University of Hawaii Institute for Astronomy REU   *Hilo, HI*
Advisor: Dr. Christoph Baranec   *May 2017 - Aug 2017*
- Design of a telescope simulator for calibration of the Robo-AO 2.0 instrument on the UH 88"

Akamai Optical Engineering Intern   *Pukalani, HI*
Advisor: Dr. Jeff Kuhn, Dr. Andre Fehlman   *Jun 2016 - Aug 2016*
- Calibration and testing of a HgCdTe photodetector in a cryogenic environment

First-Author Conference Proceedings

1. **Jaren N. Ashcraft,** Ewan S. Douglas, Ramya M. Anche, Kyle Van Gorkom, Emory Jenkins, William Melby, Maxwell Millar-Blanchaer, "The space coronagraph optical bench (SCoOB): 3. Mueller matrix polarimetry of a coronagraphic exit pupil," Proc. SPIE

2. **Jaren N. Ashcraft,** Sebastiaan Y. Haffert, Maggie Kautz, Laird Close, Jared Males "High-Contrast Imaging at First-Light of the GMT: Optimized coatings enabling high-throughput observations for GMagAO-X," Proc. SPIE

3. **Jaren N. Ashcraft,** Ewan S. Douglas, Ramya M. Anche, Justin Hom, Maxwell Millar-Blanchaer, "Theoretical limits on polarization differential imaging for the GSMTs imposed by polarization aberrations," Proc. SPIE

4. **Jaren N. Ashcraft,** Ewan S. Douglas, Daewook Kim, A. J. E. Riggs, Ramya Anche, Trent Brendel, Kevin Derby, Brandon D. Dube, Quinn Jarecki, Emory Jenkins, Kian S. Milani, "Poke: an open-source, ray-based physical optics platform," Proc. SPIE 12664, Optical Modeling and Performance Predictions XIII, 1266404 (28 September 2023); `https://doi.org/10.1117/12.2678001`

5. **Jaren N. Ashcraft**, Trenton Brendel, Simran Agarwal, Joel Berkson, Alexander D. Hedglen, Hyukmo Kang, Yanqi Zhang, Heejoo Choi, Daewook Kim, "The practical optics workshop: educating the optical engineers of tomorrow," Proc. SPIE 12213, *Optics Education and Outreach VII, 122130H* (3 October 2022); `https://doi.org/10.1117/12.2632801`

6. **Jaren N. Ashcraft**, Heejoo Choi, Ewan S. Douglas, Kevin Derby, Kyle Van Gorkom, Daewook Kim, Ramya Anche, Alex Carter, Olivier Durney, Sebastiaan Haffert, Lori Harrison, Maggie Kautz, Jennifer Lumbres, Jared R. Males, Kian Milani, Oscar M. Montoya, George A. Smith, "The space coronagraph optical bench (SCoOB): 1. Design and assembly of a vacuum-compatible coronagraph testbed for spaceborne high-contrast imaging technology," Proc. SPIE 12180, Space Telescopes and Instrumentation 2022: Optical, Infrared, and Millimeter Wave, 121805L (27 August 2022); `https://doi.org/10.1117/12.2628855`

7. **Jaren N. Ashcraft**, Heejoo Choi, Sara R. Heap, Robert A. Woodruff, Dae Wook Kim, "Cosmic evolution through UV surveys (CETUS): point spread function analysis of three mirror anastigmat telescope," Proc. SPIE 11820, *Astronomical Optics: Design, Manufacture, and Test of Space and Ground Systems III*, 118200H (24 August 2021); `https://doi.org/10.1117/12.2598879`

8. **Jaren N. Ashcraft**, Ewan S. Douglas, Daewook Kim, George A. Smith, Kerri Cahoy, Tom Connors, Kevin Z. Derby, Victor Gasho, Kerry Gonzales, Charlotte E. Guthery, Geon Hee Kim, Corwynn Sauve, Paul Serra, "The versatile CubeSat Telescope: going to large apertures in small spacecraft," Proc. SPIE 11819, *UV/Optical/IR Space Telescopes and Instruments: Innovative Technologies and Concepts X*, 1181904 (20 August 2021); `https://doi.org/10.1117/12.2594884`

9. **Jaren N. Ashcraft**, Ewan S. Douglas, "An open-source Gaussian beamlet decomposition tool for modeling astronomical telescopes," Proc. SPIE 11450, *Modeling, Systems Engineering, and Project Management for Astronomy IX*, 114501D (13 December 2020); `https://doi.org/10.1117/12.2561921`

Contributed Conference Proceedings

1. William Melby, Manxuan Zhang, Maxwell A. Millar-Blanchaer, Anthony D. Manni, Douglas S. Hobbs, **Jaren N. Ashcraft**, "Half-wave plate characterizations for the Keck NIRC2 polarimetry mode," Proc. SPIE, Astronomical Telescopes and Instrumentation 2024.

2. Manxuan Zhang, Maxwell A. Millar-Blanchaer, Boris Safanov, **Jaren N. Ashcraft**, "Developing an instrumental polarization characterization routine for SCExAO VAMPIRES," Proc. SPIE, Astronomical Telescopes and Instrumentation 2024.

3. Miles Lucas, Barnaby Norris, Olivier Guyon, Michael Bottom et al (incl. **Jaren N. Ashcraft**) "Visible-light high-contrast imaging polarimetry at Subaru," Proc. SPIE, Astronomical Telescopes and Instrumentation 2024.

4. Lucinda Lilley, Barnaby Norris, Peter Tuthill, Eckart Spalding, Miles Lucas, Manxuan Zhang, Michael Bottom, Maxwell Millar-Blanchaer, Boris Safonov, Olivier Guyon, Julien Lozi, Vincent Deo, Sebastien Vievard, Kyohoon Ahn, **Jaren N. Ashcraft**, "Polarimetric, non-redundant aperture masking with next generation VAMPIRES: new instrumental capabilities, scientific outcomes, and image reconstruction techniques," Proc. SPIE, Astronomical Telescopes and Instrumentation 2024.

5. Ramya M. Anche, Ewan S. Douglas, **Jaren N. Ashcraft**. et al "High-contrast polarimetric observations of debris disks through the Roman Coronagraph Instrument," Proc. SPIE, Astronomical Telescopes and Instrumentation 2024.

6. Ramya M. Anche, Kyle Van Gorkom, **Jaren N. Ashcraft**, Ewan S. Douglas, Emory Jenkins, Sebastiaan Y. Haffert, Maxwell A. Millar-Blanchaer, "The space coronagraph optical bench (SCoOB): 5. End-to-end simulations of polarization aberrations," Proc. SPIE, Astronomical Telescopes and Instrumentation 2024.

7. Kyle Van Gorkom, Ewan S. Douglas, Kian Milani, **Jaren N. Ashcraft**, Ramya M. Anche, Emory Jenkins, Patrick Ingraham, Sebastiaan Y. Haffert, Daewook Kim, Heejoo Choi, Olivier Durney, "The space coronagraph optical bench (SCoOB): 4. vacuum performance of a high contrast imaging testbed," Proc. SPIE, Astronomical Telescopes and Instrumentation 2024.

8. Ramya M. Anche, Sebastiaan Y. Haffert, **Jaren N. Ashcraft**, Kian Milani, Kyle Van Gorkom, Kevin Derby, Ewan S. Douglas, Maxwell A. Millar-Blanchaer, "Estimation of polarization aberrations and their effect on the coronagraphic performance for future space telescopes," Proc. SPIE 12680, Techniques and Instrumentation for Detection of Exoplanets XI, 126800R (5 October 2023); `https://doi.org/10.1117/12.2677486`

9. Ramya M. Anche, Grant Williams, Hill Tailor, Chris Packham, Daewook Kim, **Jaren N. Ashcraft**, Ewan S. Douglas, "Polarimetric modeling and assessment of science cases for Giant Magellan Telescope-Polarimeter (GMT-Pol)," Proc. SPIE 12690, Polarization Science and Remote Sensing XI, 126900F (3 October 2023); `https://doi.org/10.1117/12.2676777`

10. Manxuan Zhang, Maxwell Millar-Blanchaer, Boris Safonov, Miles Lucas, Lucinda Lilley, **Jaren Ashcraft**, Barnaby Norris, Julien Lozi, Olivier Guyon, Michael Bottom, "Characterizing the instrumental polarization of SCExAO VAMPIRES," Proc. SPIE 12680, Techniques and Instrumentation for Detection of Exoplanets XI, 126800S (5 October 2023); `https://doi.org/10.1117/12.2677599`

11. Christopher B. Mendillo, **Jaren N. Ashcraft**, Kevin Zhang Derby, Ewan S. Douglas, Daewook Kim, Jared Males, "Reflective lyot stop low-order wavefront control for future large space telescope coronagraphs," Proc. SPIE 12680, Techniques and Instrumentation for Detection of Exoplanets XI, 126802E (5 October 2023); `https://doi.org/10.1117/12.2677654`

12. Kevin Z. Derby, Sebastiaan Haffert, **Jaren Ashcraft**, Kian Milani, Heejoo Choi, Young-Sik Kim, Laird Close, Christopher Mendillo, Supriya Chakrabarti, Gregory Allan, Leonid Pogorelyuk, Kerri Cahoy, Mamadou N'Diaye, Daewook Kim, Jared Males, Ewan Douglas, "Tolerance analysis of a self-coherent camera for wavefront sensing and dark hole maintenance," Proc. SPIE 12180, *Space Telescopes and Instrumentation 2022: Optical, Infrared, and Millimeter Wave*, 1218069 (27 August 2022); `https://doi.org/10.1117/12.2629578`

13. Kyle Van Gorkom, Ewan S. Douglas, **Jaren N. Ashcraft**, Sebastiaan Haffert, Daewook Kim, Heejoo Choi, Ramya M Anche, Jared R. Males, Kian Milani, Kevin Derby, Lori Harrison, Olivier Durney, "The space coronagraph optical bench (SCoOB): 2. Wavefront sensing and control in a vacuum-compatible coronagraph testbed for spaceborne high-contrast imaging technology," Proc. SPIE 12180, *Space Telescopes and Instrumentation 2022: Optical, Infrared, and Millimeter Wave*, 121805M (27 August 2022); `https://doi.org/10.1117/12.2630704`

14. Kevin Z. Derby, James B. Breckinridge, James E. Harvey, Tony Hull, Charles F. Lillie, **Jaren N. Ashcraft**, Heejoo Choi, Ewan S. Douglas, Daewook Kim, "Curved primary aperture segmentation enabling a robust quasi-Airy pattern point spread function," Proc. SPIE 12188, *Advances in Optical and Mechanical Technologies for Telescopes and Instrumentation V*, 121880N (29 August 2022); `https://doi.org/10.1117/12.2628819`

15. Ramya M. Anche, Ewan S. Douglas, Kian Milani, **Jaren Ashcraft**, John Debes, "Simulations of polarimetric observations of debris disks through the Roman Coronagraph Instrument," Proc. SPIE 12180, *Space Telescopes and Instrumentation 2022: Optical, Infrared, and Millimeter Wave*, 1218056 (27 August 2022); `https://doi.org/10.1117/12.2629497`

16. Kian Milani, Ewan S. Douglas, **Jaren Ashcraft**, "Updated simulation tools for Roman coronagraph PSFs," Proc. SPIE 11819, *UV/Optical/IR Space Telescopes and Instruments: Innovative Technologies and Concepts X*, 118190E (20 August 2021); `https://doi.org/10.1117/12.2594807`

17. Paul Serra, Ondrej Čierny, William Kammerer, Ewan S. Douglas, Dae Wook Kim, **Jaren N. Ashcraft**, George Smith, Charlotte Guthery, Tom Vergoossen, Alexander Lohrmann, Robert Bedington, Chithrabhanu Perumangatt, Alexander Ling, Kerri Cahoy, "Optical front-end for a quantum key distribution cubesat," Proc. SPIE 11852, *International Conference on Space Optics — ICSO 2020*, 118523C (11 June 2021); `https://doi.org/10.1117/12.2599542`

18. Ewan S. Douglas, **Jaren N. Ashcraft**, Ruslan Belikov, John Debes, Jeremy Kasdin, John Krist, Brianna I. Lacy, Bijan Nemati, Kian Milani, Leonid Pogorelyuk, A.J. Eldorado Riggs, Dmitry Savransky, Dan Sirbu, "A review of simulation and performance modeling tools for the Roman coronagraph instrument," Proc. SPIE 11443, *Space Telescopes and Instrumentation 2020: Optical, Infrared, and Millimeter Wave*, 1144338 (16 December 2020); `https://doi.org/10.1117/12.2561960`

19. Erin R. Maier, Ewan S. Douglas, Dae Wook Kim, Kate Su, **Jaren N. Ashcraft**, James B. Breckinridge, Heejoo Choi, Elodie Choquet, Thomas E. Connors, Olivier Durney, Kerry L. Gonzales, Charlotte E. Guthery, Christian A. Haughwout, James C. Heath, Justin Hyatt, Jennifer Lumbres, Jared R. Males, Elisabeth C. Matthews, Kian Milani, Oscar M. Montoya, Mamadou N'Diaye, Jamison Noenickx, Leonid Pogorelyuk, Garreth Ruane, Glenn Schneider, George A. Smith, Christopher C. Stark, "Design of the vacuum high contrast imaging testbed for CDEEP, the Coronagraphic Debris and Exoplanet Exploring Pioneer," Proc. SPIE 11443, *Space Telescopes and Instrumentation 2020: Optical, Infrared, and Millimeter Wave*, 114431Y (13 December 2020); `https://doi.org/10.1117/12.2560878`

20. Yi-Ting Feng, **Jaren N. Ashcraft**, James B. Breckinridge, James E. Harvey, Ewan S. Douglas, Heejoo Choi, Charles Lillie, Tony Hull, Dae Wook Kim, "Topological pupil segmentation and point spread function analysis for large aperture imaging systems," Proc. SPIE 11568, *AOPC 2020: Optics Ultra Precision Manufacturing and Testing*, 115680I (5 November 2020); `https://doi.org/10.1117/12.2575809`

21. Jake R. Rosvold, Luis Alemán Castañeda, **Jaren N. Ashcraft**, Dylan Beckman, Maximillian C. Bruggeman, Pellegrino Conte, Shenghan Gao, Qi Jin, Nicholas Kochan, Zilong Li, Yuxuan Liu, Matthew Page, John Piotrowski, Jordan Rabinowitz, Colleen Stone, Julie L. Bentley, "Comparing optical design complexity of high zoom ratio lenses within the VIS, SWIR, and LWIR," Proc. SPIE 11106, *Zoom Lenses VI*, 111060B (9 September 2019); `https://doi.org/10.1117/12.2528875`