

## Michael P. Fitzgerald

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CONTACT INFORMATION	Department of Physics and Astronomy Physics and Astronomy Building, P.O. Box 951547 University of California, Los Angeles Los Angeles, CA 90095-1547 USA	<i>Voice:</i> (310) 206-7853 <i>Fax:</i> (310) 206-7254 <i>E-mail:</i> mpfitz@ucla.edu
RESEARCH INTERESTS	Formation and evolution of circumstellar material, particularly extrasolar planets. Indirect and direct techniques for detection and characterization of planetary systems. High-contrast imaging of exoplanets and circumstellar debris. Design and construction of astronomical instruments.	
EDUCATION	<b>University of California, Berkeley</b> Ph.D., Astrophysics, 2007 M.A., Astrophysics, 2002  <b>California Institute of Technology</b> B.S., Engineering and Applied Science, 2000	
TECHNICAL PROJECTS	Co-Principal Investigator, Keck HISPEC instrument Co-Principal Investigator, TMT MODHIS instrument Co-Investigator, Keck SCALES instrument Co-Investigator, Keck LIGER instrument Co-Lead Organizer, TMT Planetary Systems Imager instrument Co-Principal Investigator, NIRSPEC Upgrade project Principal Investigator, OSIRIS Imager Upgrade project Lead Co-Investigator, Precision Near-Infrared Radial Velocities with NIRSPEC (concept study) Co-Investigator, Keck Adaptive Optics Optimization Project Lead Co-Investigator, Gemini Planet Imager Exoplanet Survey	<b>2019 – present</b> <b>2018 – present</b> <b>2018 – present</b> <b>2017 – present</b> <b>2016 – present</b> <b>2015 – 2020</b> <b>2013 – 2020</b> <b>2013 – 2015</b> <b>2011 – 2023</b> <b>2011 – present</b>
SELECTED ROLES AND ACTIVITIES	Executive Committee Member, Keck KPIC instrument Director, UCLA Infrared Laboratory Associate Director, University of California Observatories Co-Chair, Keck Observatory Adaptive Optics Future Study Group Keck Observatory Science Steering Committee Member University of California Observatories Advisory Committee Member UCLA Chapter Lead, Institute for Scientist and Engineer Educators	<b>2022 – present</b> <b>2020 – present</b> <b>2020 – present</b> <b>2019 – 2024</b> <b>2018 – 2024</b> <b>2017 – present</b> <b>2013 – 2020</b>
OTHER PROFESSIONAL ACTIVITY HIGHLIGHTS	Co-Lead Organizer, “Astrophotonics,” CfAO Retreat Co-Lead Organizer, “Keck High-Contrast Testbed,” CfAO Retreat Co Organizer, CfAO Spring Retreat Co-Lead Organizer, “Getting to Know Your Adaptive Optics System,” CfAO Retreat Co-Lead Organizer, High-Contrast Imaging Session, Center for Adaptive Optics Retreat Lead Organizer, High-Contrast Imaging Session, Center for Adaptive Optics Retreat Lead Organizer, High-Contrast Imaging Session, Center for Adaptive Optics Retreat Co-Lead, Keck Institute for Space Studies Workshop, “Exoplanet Imaging and Characterization: Coherent Differential Imaging and Signal Detection Statistics”	<b>2024</b> <b>2023</b> <b>2022</b> <b>2020</b> <b>2019</b> <b>2018</b> <b>2017</b> <b>Aug., Dec. 2016</b>

HONORS AND  
AWARDS

UCLA Dept. of Physics & Astronomy Teaching Award (Astro 180)	<b>Spring 2023</b>
UCLA Dept. of Physics & Astronomy Teaching Award (Astro 3)	<b>Spring 2022</b>
UCLA Dept. of Physics & Astronomy Teaching Award (Astro 180)	<b>Fall 2017</b>
NASA Group Achievement Award, Exoplanet Laser Frequency Comb Team	<b>2017</b>
UCLA Dept. of Physics & Astronomy Teaching Award (Astro 3)	<b>Spring 2017</b>
UCLA Dept. of Physics & Astronomy Teaching Award (Astro 180)	<b>Winter 2017</b>
UCLA Dept. of Physics & Astronomy Teaching Award (Astro 180)	<b>Spring 2016</b>
UCLA Dept. of Physics & Astronomy Teaching Award (Astro 283)	<b>Winter 2016</b>
UCLA Dept. of Physics & Astronomy Teaching Award (Astro 283)	<b>Winter 2014</b>
2008–2009 AAAS Newcomb Cleveland Prize	<b>2010</b>
Michelson Postdoctoral Fellow	<b>September, 2007 – June, 2010</b>

ACADEMIC  
EXPERIENCE

**University of California, Los Angeles**

*Professor*

**July, 2021 – present**

*Associate Professor*

**July, 2015 – June, 2021**

*Assistant Professor*

**July, 2009 – June, 2015**

Research includes adaptive optics, coronagraphy, near- and mid-infrared imaging of circumstellar debris disks and extrasolar planets, and the design and construction of astronomical instrumentation. Member of the Infrared Laboratory. Instructor in the Department of Physics and Astronomy.

- Astronomy 3 — Nature of the Universe (Spring 2012, Spring 2014, Winter 2015, Spring 2017, Winter 2019, Spring 2022, Fall 2022, Fall 2024, Winter 2025)
- Astronomy 142 — Data and Computation in Astrophysics (Fall 2023, Fall 2025)
- Astronomy 180 — Astrophysics Laboratory (Winter 2011, Fall 2011, Fall 2012, Fall 2013, Fall 2014, Spring 2016, Winter 2017, Fall 2017, Fall 2018, Fall 2019, Spring 2023)
- Astronomy 283 — Numerical and Statistical Methods in Astronomy (Winter 2012, Winter 2013, Winter 2014, Winter 2016, Winter 2018, Winter 2020, Winter 2022, Winter 2024, Winter 2026)
- Physics 5A — Physics for Life Sciences Majors: Mechanics and Energy (Spring 2018)
- Physics 6A — Physics for Life Sciences Majors: Mechanics (Spring 2015)

**Lawrence Livermore National Laboratory**

*Michelson Postdoctoral Fellow*

**September, 2007 – June, 2010**

Research includes adaptive optics coronagraphy and mid-infrared imaging of circumstellar debris disks and extrasolar planets. Optical and opto-mechanical design of an adaptive optics polarimeter. Advised by Dr. Bruce Macintosh.

**University of California, Berkeley**

*Graduate Student*

**August, 2000 – August, 2007**

Ph.D. research and graduate-level coursework in astrophysics. Course topics included radiation processes, gas and fluid dynamics, instrumentation, stellar structure and evolution, the interstellar medium, stellar dynamics and galactic structure, cosmology, and astrophysical computational techniques. Scientific research included study of circumstellar debris through adaptive optics coronagraphy, detection of substellar companions, and high-precision astrometry with adaptive optics. A particular emphasis was on advancing experimental technique. Instrumentation work included implementation of new detector readout schemes on the IRCAL camera, and development of a point-spread function reconstructor on the Lick adaptive optics system. Primarily advised by Professor James Graham.

*Graduate Student Instructor*

**August – December, 2002**

Head graduate student instructor conducting upper-level undergraduate optical astronomy laboratory.

- AY 120 — Optical Astronomy Laboratory (Fall 2002)

Graduate Student Instructor

August, 2000 – May, 2001

Conducted discussion sections and office hours for introductory astronomy courses.

- AY 12 — The Planets (Spring 2001)
- AY 10 — Introduction to Astronomy (Fall 2000)

### California Institute of Technology

Undergraduate Student

September, 1996 – June, 2000

Courses included classical and quantum physics, mechanical engineering, electrical engineering (emphasis on digital circuits), optics (including astronomical instrumentation), continuous and discrete-time signal processing, computational and neural systems, applied mathematics, and control of dynamical systems.

### PUBLICATIONS

López, R.<sup>†</sup> **Fitzgerald, M. P.** et al. “The Warp of HD 110058.” In preparation.

Finnerty, L.,<sup>†</sup> **Fitzgerald, M. P.**, Xin, Y., Xuan, J. W., Inglis, J., Agrawal, S., Baker, A., Bartos, R., Blake, G. A., Calvin, B., Cetre, S., Delorme, J.-R., Doppmann, G., Echeverri, D., Hsu, C.-C., Jovanovic, N., Liberman, J., Lopez, R. A., Martin, E. C., Mawet, D., Morris, E., Pezzato, J., Ruffio, J.-B., Sappey, B., Schofield, T., Skemer, A., Venenciano, T., Wallace, J. K., Wallack, N. L., Wang, J. J. and Wang, J., “Atmospheric composition of six ultra-hot Jupiters from high-resolution spectroscopy.” In preparation.

Goyal, S., Xin, Y., Mawet, D., Jovanovic, N., and **Fitzgerald, M.** “Analysis of Angular-Differential Post-Processing Algorithms for Exoplanet Direct Detection with a Photonic Lantern Nuller.” Submitted to *Journal of Astronomical Telescopes, Instruments, and Systems*.

Kenchington Goldsmith, H.-D., Jovanovic, N., Pai Asnodkar, A., Kim, Y.J.,<sup>†</sup> Ahmed, S., Gatkin, P., and **Fitzgerald, M. P.** “Tri-coupler geometries for achromatic nulling interferometry in the near infrared.” Submitted to *Optics Express*.

Hsu, C.-C., Wang, J. J., Xuan, J. W., Zhang, Y., Ruffio, J.-B., Mawet, D., Finnerty, L.,<sup>†</sup> Horstman, K., Cronin, J., Xin, Y., Sappey, B., Echeverri, D., Jovanovic, N., Baker, A., Bartos, R., Blake, G. A., Calvin, B., Cetre, S., Delorme, J.-R., Doppmann, G. W., **Fitzgerald, M. P.**, Konopacky, Q. M., Liberman, J., Lopez, R. A., Morris, E., Pezzato, J., Schofield, T., Skemer, A., Wallace, J. K., and Wang, J. “Distinct Rotational Evolution of Giant Planets and Brown Dwarf Companions.” *Astronomical Journal*, 171 (2026): 224 (30pp).

Finnerty, L.,<sup>†</sup> **Fitzgerald, M. P.**, Xuan, J. W., Echeverri, D., Jovanovic, N., Mawet, D., Blake, G. A., Baker, A., Bartos, R., Calvin, B., Cetre, S., Delorme, J.-R., Doppmann, G., Horstman, K., Hsu, C.-C., Inglis, J., Liberman, J., Lopez, R. A., Morris, E., Pezzato-Rovner, J., Ruffio, J.-B., Sappey, B., Schofield, T., Skemer, A., Wallace, J. K., Wallack, N. L., Wang, J. J., Wang, J., and Xin, Y. “Possible stratospheric emission in the warm Neptune GJ 436 b.” *Astronomical Journal*, 171 (2026): 226 (15pp).

Finnerty, L.,<sup>†</sup> Kesseli, A., Pearson, K., Beichman, C., and **Fitzgerald, M. P.**, “Limits on the post-eclipse emission spectrum of HD 80606 b from high-resolution spectroscopy.” *Astronomical Journal*, 171 (2026): 213 (17pp).

Wang, G., Xuan, J. W., Gonzalez Picos, D., Zhang, Z., Zhang, Y., Mawet, D., Hsu, C.-C., Wang, J. J., Blake, G. A., Ruffio, J.-B., Horstman, K., Sappey, B., Xin, Y., Finnerty, L.,<sup>†</sup> Echeverri, D., Jovanovic, N., Baker, A., Bartos, R., Calvin, B., Cetre, S., Delorme, J.-R., Doppmann, G. W., **Fitzgerald, M. P.**, Liberman, J., Lopez, R. A., Morris, E., Pezzato-Rovner, J., Phillips, C. L., Schofield, T. Skemer, A., Wallace, J. K., Wang, J., “Chemical and Isotopic Homogeneity Between

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<sup>†</sup>Student under supervision

the L Dwarf CD-35 2722 B and its Early M Host Star.” *Astrophysical Journal*, 997 (2026): 195 (13pp).

Zhang, J., Huber, D., Bottom, M., Weiss, L. M., Xuan, J. W., Kraus, A. L., Hsu, C.-C., Wang, J. J., Dai, F., Horstman, K., Baker, A., Bartos, R., Calvin, B., Cetre, S., Clark, C. A., Ciardi, D. R., Delorme, J.-R., Doppmann, G. W., Echeverri, D. Finnerty, L.,<sup>†</sup> **Fitzgerald, M. P.**, Howell, S. B., Isaacson, H., Jovanovic, N., Lester, K. V., Liberman, J., López, R. A., Mawet, D., Morris, E., Pezzato-Rovner, J., Ruffio, J.-B., Sappey, B., Schofield, T., Skemer, A. Wallace, J. K., Wang, J., Xin, Y. and Van Zandt, J. “Dynamical Architectures of S-type Transiting Planets in Binaries II: A Dichotomy in Orbital Alignment of Small Planets in Close Binary Systems.” *Astronomical Journal*, 171 (2026): 77 (28pp).

Kalas, P., Wang, J. J., Millar-Blanchaer, M. A., Ren, B. B., Wyatt, M. C., Kennedy, G. N., Sommer, M., Esposito, T. M., De Rosa, R. J., **Fitzgerald, M.** “Fireworks around Fomalhaut: A second violent planetesimal collision imaged in just 20 years.” *Science*, 391 (2025): 371 (4pp).

Jones, N. K., Wang, J. J., Nielsen, E. L., De Rosa, R. J., Peck, A. E., Roberson, W., Ruffio, J.-B., Xuan, J. W., Macintosh, B. A., Ammons, S. M., Bailey, V. P., Barman, T. S., Bulger, J., Chiang, E., Chilcote, J. K., Duchene, G., Esposito, T. M., **Fitzgerald, M. P.**, Follette, K. B., Goodsell, S., Graham, J. R., Greenbaum, A. Z., Hibon, P., Ingraham, P., Kalas, P., Konopacky, Q. M., Liu, M. C., Marchis, F., Maire, J., Marois, C., Matthews, B., Mawet, D., Metchev, S., Millar-Blanchaer, M. A., Oppenheimer, R., Palmer, D. W., Patience, J., Perrin, M. D., Poyneer, L., Pueyo, L., Rajan, A., Rameau, J., Ren, B., Sanghi, A., Savransky, D., Rantakyro, F. T., Schneider, A. C., Sivaramakrishnan, A., Smith, A. J. R. W., Song, I., Soummer, R., Thomas, S., Ward-Duong, K., and Wolff, S. G. “HD 143811 AB b: A Directly Imaged Planet Orbiting a Spectroscopic Binary in Sco-Cen,” *Astrophysical Journal Letters* 995 (2025): L41 (12pp).

Peck, A. E., Roberson, W., Nielsen, E. L., De Rosa, R. J., Jones, N., Wang, J., Macintosh, B. A., Lewis, B. L., Duchene, G., Metchev, S., Abbas, A., Xuan, J. W., Sanghi, A., Patience, J., Barman, T. S., Bulger, J., Chilcote, J. K., Esposito, T. M., **Fitzgerald, M. P.**, Follette, K. B., Gallamore, H., Goodsell, S., Graham, J. R., Greenbaum, A. Z., Hibon, P., Ingraham, P., Kalas, P., Konopacky, Q. M., Marchis, F., Maire, J., Marois, C., Matthews, B., Mawet, D., Millar-Blanchaer, M. A., Oppenheimer, R., Palmer, D. W., Perrin, M. D., Poyneer, L., Pueyo, L., Rajan, A., Rameau, J., Rantakyro, F. T., Ren, B., Ruffio, J.-B., Savransky, D., Song, I., Schneider, A. C., Sivaramakrishnan, A., Smith, A. J. R. W., Soummer, R., Thomas, S., Ward-Duong, K., and Wolff, S. G. “Characterization of the Host Binary of the Directly Imaged Exoplanet HD 143811 AB b.” *Astrophysical Journal Letters*, 995 (2025): L40 (16pp).

Gibbs, A.,<sup>†</sup> and **Fitzgerald, M. P.** “Simulations of Flare Chemistry in Brown Dwarf Companions to Active M Dwarfs.” *Astrophysical Journal*, 993 (2025): 41 (12pp).

Kim, Y. J.,<sup>†</sup> **Fitzgerald, M. P.**, Vievard, S., Lin, J.,<sup>†</sup> Xin, Y., Lucas, M. Guyon, O., Lozi, J., Deo, V., Huby, E., Lacour, S., Lallement, M., Amezcua-Correa, R., Leon-Saval, S., Norris, B., Nowak, M., Sallum, S., Sarrazin, J., Taras, A., Yerolatsitis, S., and Jovanovic, N. “On-sky demonstration of subdiffraction-limited astronomical measurement using a photonic lantern.” *Astrophysical Journal Letters*, 993 (2025): L3 (16pp).

Unni, A., Sallum, S., Benac, P.,<sup>†</sup> **Fitzgerald, M. P.**, Brodheim, M., McGurk, R., Skemer, A., and Deich, W. T. S., “SCALES-DRP: a data reduction pipeline for an upcoming Keck thermal infrared spectrograph.” *Proceedings of the SPIE* 13627 (2025): 136271L (16pp).

Benac, P.,<sup>†</sup> **Fitzgerald, M. P.**, Wang, E., Magnone, K., Johnson, C., Skemer, A. J., Hinz, P., MacDonald, N., Sandford, D., Stelter, R. D., Deich, W., Miles, B. E., Sallum, S., Greene, T., Loose, M., and Blank, R. “Laboratory testing and characterization of a hybrid fast/slow readout mode for

the H2RG detectors in SCALES.” *Proceedings of the SPIE* 13627 (2025): 136271K (18pp).

Jovanovic, N., Kim, Y. J.,<sup>†</sup> Ahmed, S., Kenchington Goldsmith, H.-D., **Fitzgerald, M. P.**, Gatkine, P., and Mawet, D. “Developing photonic components for nulling applications.” *Proceedings of the SPIE* 13627 (2025): 136270O (11pp).

Calvin, B.,<sup>†</sup> **Fitzgerald, M. P.**, Chambouleyron, V., Dillon, D., Fowler, J., Jensen-Clem, R., Por, E., and Salama, M. “Simultaneous control of the segmented primary mirror and adaptive optics system with a Shack-Hartmann wavefront sensor.” *Proceedings of the SPIE* 13627 (2025): 136270B (22pp).

Finnerty, L.,<sup>†</sup> Inglis, J., **Fitzgerald, M. P.**, Echeverri, D., Jovanovic, N., Mawet, D., Blake, G. A., Baker, A., Bartos, R., Calvin, B., Cetre, S., Delorme, J.-R., Doppmann, G., Horstman, K., Hsu, C.-C., Liberman, J. Lopez, R. A., Morris, E., Pezzato-Rovner, J., Ruffio, J.-B., Sappey, B., Schofield, T., Skemer, A., Wallace, J. K., and Wallack, N. L. “The watery atmosphere of HD 209458 b revealed by joint K- and L-band high-resolution spectroscopy.” *Astronomical Journal*, 170 (2025): 223 (17pp).

Chittidi, J. S., MacGregor, M. A., Lovell, J. B., Duchene, G., Wyatt, M., Panic, O., Kalas, P., Pan, M., Hughes, A. M., Wilner, D. J., Kennedy, G. M., Matra, L., **Fitzgerald, M. P.**, and Su, K. Y. L. “High Resolution ALMA Data of the Fomalhaut Debris Disk Confirms Apsidal Width Variation.” *Astronomical Journal Letters*, 990 (2025): L40 (10pp).

Horstman, K. A., Ruffio, J.-B., Wang, J. J., Hsu, C.-C., Baker, A., Finnerty, L.,<sup>†</sup> Xuan, J. W., Echeverri, D., Xin, Y., Mawet, D., Blake, G. A., Bartos, R., Bond, C. Z., Calvin, B., Cetre, S., Delorme, J.-R., Doppmann, G., **Fitzgerald, M. P.**, Jovanovic, N., Lopez, R., Martin, E. C., Morris, E., Pezzato, J., Ruane, G., Sappey, B., Schofield, T., Skemer, A., Venenciano, T., Wallace, J. K., and Wizinowich, P. “Fringing analysis and forward modeling of Keck Planet Imager and Characterizer (KPIC) spectra.” *Journal of Astronomical Telescopes, Instruments, and Systems*, 11 (2025): 035004 (13pp).

Hong, K. S.,<sup>†</sup> Finnerty, L.,<sup>†</sup> and **Fitzgerald, M. P.** “Velocity shift and SNR limits for high-resolution spectroscopy of hot Jupiters using Keck/KPIC.” *Astronomical Journal*, 170 (2025): 110 (12pp).

Finnerty, L.,<sup>†</sup> Xin, Y., Xuan, J. W., Inglis, J., **Fitzgerald, M. P.**, Agrawal, S., Baker, A., Bartos, R., Blake, G. A., Calvin, B.,<sup>†</sup> Cetre, S., Delorme, J.-R., Doppmann, G., Echeverri, D., Hsu, C.-C., Jovanovic, N., Liberman, J., López, R. A., Martin, E. C., Mawet, D., Morris, E., Pezzato, J., Ruffio, J.-B., Sappey, B., Schofield, T., Skemer, A., Venenciano, T., Wallace, J. K., Wallack, N. L., Wang, J. J., and Wang, J. “Water dissociation and rotational broadening in the atmosphere of KELT-20 b from high-resolution spectroscopy.” *Astronomical Journal* 169 (2025): 333 (19pp),

Xin, Y., Echeverri, D., Jovanovic, N., Lin, J.,<sup>†</sup> Kim, Y. J.,<sup>†</sup> Mawet, D., Leon-Saval, S., Amezcua-Correa, R., Yerolatsitis, S., **Fitzgerald, M.**, Gatkine, P., Norris, B., Ruane, G., and Sallum, S. “Implicit Electric Field Conjugation with a Photonic Lantern Nuller.” *Journal of Astronomical Telescopes, Instruments, and Systems* 11 (2025): 025004 (11pp).

Lin, J.,<sup>†</sup> **Fitzgerald, M. P.**, Xin, Y., Kim, Y. J.,<sup>†</sup> Guyon, O., Norris, B., Betters, C., Leon-Saval, S., Ahn, K., Deo, V., Lozi, J., Vievard, S., Levinstein, D., Sallum, S., and Jovanovic, N. “Experimental and on-sky demonstration of spectrally dispersed wavefront sensing using a photonic lantern.” *Optics Letters* 50 (2025): 2780 (4pp)

Calvin, B.,<sup>†</sup> **Fitzgerald, M. P.**, and Ragland, S. “The Simultaneous Operation of a Controllable Segmented Primary Mirror and Single Conjugate Adaptive Optics System part 2 - Simulated Operation.” *Journal of Astronomical Telescopes, Instruments, and Systems*, 11 (2025): 019004 (18pp).

Calvin, B.,<sup>†</sup> and **Fitzgerald, M. P.**, “The Simultaneous Operation of a Controllable Segmented Primary Mirror and Single Conjugate Adaptive Optics System part 1 - Design Concept and Sensitivity Analysis.” *Journal of Astronomical Telescopes, Instruments, and Systems*, 11 (2025): 019003 (16pp).

Jovanovic, N., Echeverri, D., Delorme, J.-R., Finnerty, L.,<sup>†</sup> Schofield, T., Wang, J. J., Xin, Y., Xuan, J., Wallace, J. K., Mawet, D., Sanghi, A., Baker, A., Bartos, R., Bond, C. Z., Calvin, B., Cetre, S., Doppmann, G., **Fitzgerald, M. P.**, Fucik, J., Gao, M., Ge, J., Guthery, C., Horstman, K., Hsu, C.-C., Liberman, J., Leifer, S., Lilley, S., Lopez, R., Marin, E., Martin, E. C., Mennesson, B., Morris, E., Nash, R., Pezzato, J., Porter, M., Roberts, M., Ruane, G., Ruffio, J.-R., Sappey, B., Serabyn, E., Shen, B., Skemer, A., Wang, J., Wetherell, E., Wizinowich, P., Salama, M., Chambouleyron, V., Jensen-Clem, R., and Beichmn, C. “Technical description and performance of the phase II version of the Keck Planet Imager and Characterizer.” *Journal of Astronomical Telescopes, Instruments, and Systems*, 11 (2025): 015005 (28pp).

Sappey, B., Konopacky, Q., Do Ó, C. R., Barman, T., Ruffio, J.-B., Wang, J., Theissen, C. A., Finnerty, L.,<sup>†</sup> Xuan, J., Hortsman, K., Mawet, D., Zhang, Y., Inglis, J., Wallack, N. L., Sanghi, A., Baker, A., Bartos, R., Blake, G. A., Bond, C. Z., Calvin, B.,<sup>†</sup> Cetre, S., Delorme, J.-R., Doppmann, G., Echeverri, D., **Fitzgerald, M. P.**, Hsu, C.-C., Jovanovic, N., Liberman, J., Lopez, R. A., Martin, E. C., Morris, E., Pezzato-Rovner, J., Phillips, C. L., Ruane, G., Schofield, T., Skemer, A., Venenciano, T., Wallace, J. K., Wang, J., Wizinowich, P., and Xin, Y. “HD 206893 B at High Spectral Resolution with the Keck Planet Imager and Characterizer (KPIC).” *Astronomical Journal*, 169 (2025): 175 (30pp).

Finnerty, L.,<sup>†</sup> Xin, Y., Xuan, J. W., Inglis, J., **Fitzgerald, M. P.**, Agrawal, S., Baker, A., Bartos, R., Blake, G. A., Calvin, B., Cetre, S., Delorme, J.-R., Doppmann, G., Echeverri, D., Horstman, K., Hsu, C.-C., Jovanovic, N., Liberman, J., Lopez, R., Martin, E. C., Mawet, D., Morris, E., Pezzato-Rovner, J., Ruffio, J.-B., Sappey, B., Schofield, T., Skemer, A., Venenciano, T., Wallace, J. K., Wallack, N. L., Wang, J. J., and Wang, J. “True mass and atmospheric composition of the non-transiting hot Jupiter HD 143105 b.” *Astronomical Journal*, 169 (2025): 94 (14pp).

Hsu, C.-C., Wang, J. J., Blake, G. A., Xuan, J. W., Zhang, Y., Ruffio, J.-B., Horstman, K., Cronin, J., Sappey, B., Xin, Y., Finnerty, L.,<sup>†</sup> Baker, A., Echeverri, D., Mawet, D., Jovanovic, N., Do O, C. R., Bartos, R., Calvin, B., Cetre, S., Delorme, J.-R., Doppmann, G. W., **Fitzgerald, M. P.**, Liberman, J., Lopez, R. A., Morris, E., Pezzato-Rovner, J., Schofield, T., Skemer, A., Wallace, J. K., and Wang, J. “PDS 70b Shows Stellar-like Carbon-to-Oxygen Ratio.” *Astrophysical Journal Letters*, 977 (2024): L47 (9pp).

Lewis, B. L.,<sup>†</sup> Li, Y., Gibbs, A.,<sup>†</sup> **Fitzgerald, M. P.**, Brandt, T., Bardalez Gagliuffi, D., An, Q., Chen, M., Bowens-Rubin, R., Salama, M., Lozi, J., Jensen-Clem, R., and Mazin, B. “SCEXAO/CHARIS Spectroscopic Characterization of Cloudy L/T Transition Companion Brown Dwarf HIP 93398 B.” *Astrophysical Journal*, 977 (2024): 247 (15pp).

Lin, J.,<sup>†</sup> and **Fitzgerald, M. P.** “Nonlinear techniques for few-mode wavefront sensors.” *Applied Optics*, 63 (2024): 8738 (10pp).

Vievard, S., Lallement, M., Leon-Saval, S., Guyon, O., Jovanovic, N., Huby, E., Lacour, S., Lozi, J., Deo, V., Ahn, K., Lucas, M., Sallum, S., Norris, B., Betters, C., Amezcua-Correa, R., Yerolatsitis, S., **Fitzgerald, M. P.**, Lin, J.,<sup>†</sup> Kim, Y. J.,<sup>†</sup> Gatkine, P., Kotani, T., Tamura, M., Currie, T., Kenchington, H.-D. Martin, G., and Perrin, G. “Spectroscopy using a visible photonic lantern at the Subaru telescope: Laboratory characterization and first on-sky demonstration on Ikiiki ( $\alpha$  Leo) and ‘Aua ( $\alpha$  Ori).” *Astronomy & Astrophysics* 691 (2024): A140 (14pp).

Kim, Y. J.,<sup>†</sup> **Fitzgerald, M. P.**, Lin, J.,<sup>†</sup> Lozi, J., Vievard, S., Xin, Y., Levinstein, D., Jovanovic,

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SELECTED  
PRESENTATIONS

Fitzgerald, M. P. “Future with Large Telescopes (TMT+)” Kavili ExoFrontiers Forum, Cambridge, UK, June 2019 (invited).

Fitzgerald, M. P. “Overview of the Planetary Systems Imager” Adaptive Optics for Extremely Large Telescopes 6, Quebec City, Canada, July 2019.

Fitzgerald, M. P. “Project Update for the Planetary Systems Imager” Thirty Meter Telescope Science Forum, Pasadena, California, USA, December 2018.

Fitzgerald, M. P. “The planetary systems imager: a high-contrast instrumentation platform for the Thirty Meter Telescope” SPIE Astronomical Telescopes and Instrumentation, Austin, Texas, USA, June 2018.

- Fitzgerald, M. P. “A Program for High-Contrast Imaging at TMT” Thirty Meter Telescope Science Forum, Mysore, India, November 2017.
- Fitzgerald, M. P. “TMT High-Contrast Exoplanet Science” Thirty Meter Telescope Science Forum, Kyoto, Japan, May 2016 (invited).
- Fitzgerald, M. P. “An Instrument for Imaging and Spectroscopy of Planetary Systems with TMT,” Adaptive Optics for ELTs 4, Lake Arrowhead, California, USA, October 2015.
- Fitzgerald, M. P. “The Gemini Planet Imager Exoplanet Survey Debris Disk Imaging Campaign,” The Sprit of Lyot 2015, Montreal, Canada, June.
- Fitzgerald, M. P. “Revealing Planet Formation through High-Contrast Imaging of Exoplanets and Circumstellar Debris,” University of Toronto, Canada, November 2014 (invited).
- Fitzgerald, M. P. “Revealing Planet Formation through High-Contrast Imaging of Exoplanets and Circumstellar Debris,” University of California, Los Angeles, USA, October 2014 (invited).
- Fitzgerald, M. P. “Planet Formation Revealed by High-Contrast Imaging,” California State University, Long Beach, USA, April 2014 (invited).
- Fitzgerald, M. P. “Formation of Extrasolar Planets,” Gemini North Adaptive Optics Workshop, Victoria, BC, Canada, June 2012 (invited).
- Fitzgerald, M. P. “High-Contrast Imaging of Extrasolar Planets and Circumstellar Debris,” California State University, Los Angeles, USA, May 2012 (invited).
- Fitzgerald, M. P. “Gemini Planet Imager: Instrument Status and Campaign Overview,” Center for Adaptive Optics Fall Retreat, Lake Arrowhead, California, USA, November 2011.
- Fitzgerald, M. P. “High Spatial Resolution Imaging of a Dynamically Perturbed Debris Disk,” Extreme Solar Systems II, Jackson, Wyoming, USA, September 2011.
- Fitzgerald, M. P. “Adaptive Optics Imaging of Circumstellar Debris Disks,” OCIW Colloquium, Pasadena, California, USA, June 2011 (invited).
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- Fitzgerald, M. P. “Adaptive Optics Coronagraphy of Circumstellar Debris Disks,” 214th Meeting of the American Astronomical Society, Pasadena, California, USA, June 2009 (invited).
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- Fitzgerald, M. P., Graham, J. R., Kalas, P. G., Duchêne, G. “Thermal Emission from a Newly Resolved Debris Disk: HD 131835,” 213th Meeting of the American Astronomical Society, Long Beach, California, USA, January 2009.

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Fitzgerald, M. P., Kalas, P. G., Duchêne, G., Pinte, C., Graham, J. R. “The AU Mic Debris Disk: Multiwavelength Imaging and Modeling,” Keck Science Meeting, University of California, Irvine, California, USA, September 2006.

Fitzgerald, M. P., Gates, E., Gavel, D., Palmer, D. “PSF Reconstruction at Lick.” Center for Adaptive Optics Spring Retreat, University of California, Santa Cruz, California, USA, March 2006.

Fitzgerald, M. P., Graham, J. R., Poyneer, L. A. “Experimental Characterization of High Contrast Imaging through Atmospheric Turbulence.” Center for Adaptive Optics Fall Retreat, Lake Arrowhead, California, USA, November 2005.

Fitzgerald, M. P., Graham, J. R., Kalas, P., and Matthews, B.C. “High Resolution Near-Infrared Imaging of the Debris Disk around AU Mic.” 205th Meeting of the American Astronomical Society, San Diego, California, USA, January 2005.

Fitzgerald, M. P., Kalas, P., Graham, J. R. “AO Coronagraphy of a Circumstellar Debris Disk: Multicolor Imaging of AU Microscopii.” Center for Adaptive Optics Fall Retreat, Lake Arrowhead, California, USA, November 2004.

Fitzgerald, M. P. “Astrometry with Adaptive Optics.” Astrometry 2004, Flagstaff, Arizona, USA, October 2004.

Fitzgerald, M. P. “Status of PSF Reconstruction at Lick Observatory.” Workshop on Adaptive Optics Point Spread Function Reconstruction, Victoria, British Columbia, Canada, May 2004.

Fitzgerald, M. P. “PSF Reconstruction at Lick - Introduction and Status Report.” Center for Adaptive Optics Fall Retreat, Yosemite, California, USA, September 2003.

#### COMPUTER SKILLS

- Languages: x86 ASM, DSP5600x ASM, BASIC, FORTRAN, Pascal, C, C++, Unix shell scripting, Tcl/Tk, Perl, Python.
- High-level numerical languages: Mathematica, Matlab, IDL, Numerical Python.
- Large-scale computing: MPI.
- Applications: L<sup>A</sup>T<sub>E</sub>X, common word processing, spreadsheet, database, and presentation software. Revision control systems (CVS, svn, bazaar, git). Optical design tools (e.g. ZEMAX), mechanical design (SolidWorks), and project management software.
- Operating Systems: Unix/Linux, Macintosh, Windows, VxWorks.
- General: Experience in digital circuit design, digital signal processors, real-time controllers, and UNIX system administration.

#### OTHER ACADEMIC AND PROFESSIONAL EXPERIENCE

- Professional Experience**
- *Keck Interferometer Project, Jet Propulsion Laboratory* **February – July, 2000**

Software development for fringe tracker. Under the direction of Drs. Mark Colavita and Gautam Vasisht.

### Caltech Summer Undergraduate Research Fellowships

- *Keck Interferometer Project, Jet Propulsion Laboratory* **June – August, 1999**  
See above.
- *Dept. of Artificial Intelligence, University of Edinburgh, Scotland* **June – August, 1998**  
Designed and implemented communications protocol for autonomous robotic vehicle. Under the direction of Dr. John Hallam.
- *Stephen Quake Laboratory, California Institute of Technology* **June – August, 1997**  
Assisted in design, fabrication, and testing of microfluidic arrays for processing of DNA samples. Under the direction of Professor Stephen Quake.

### Short Courses

- *Center for Adaptive Optics Professional Development Program* **March 2–6, 2007**  
Workshop on facilitating inquiry-based educational activities.
- *Center for Adaptive Optics Professional Development Workshop* **February 5–10, 2006**  
Introduction to facilitation of inquiry-based educational activities.
- *Center for Adaptive Optics Professional Development Workshop* **March 16–21, 2005**  
Introduction to inquiry-based education.
- *Michelson Summer School* **July 25–29, 2005**  
Emphasis on astrometric detection of extrasolar planets.
- *Michelson Summer School* **July 20–23, 2004**  
Emphasis on nulling interferometry and coronagraphy.
- *Center for Adaptive Optics Summer School* **August 9–15, 2003**  
Advanced instrumentation and techniques for adaptive optics.
- *Michelson Summer School* **June 24–28, 2002**  
Fundamentals of long-baseline interferometry with emphasis in the near infrared.
- *SPIE Short Course: High Dynamic Range Coronagraphy* **August 25, 2002**

### Other Pedagogy

- *Center for Adaptive Optics Summer School* **July 31 – August 5, 2016**  
Lecturer, “Measuring AO Performance.”
- *Center for Adaptive Optics Summer School* **August 3–8, 2014**  
Lecturer, “Measuring AO Performance.”
- *Center for Adaptive Optics Summer School* **August 4–9, 2013**  
Lecturer, “Measuring AO Performance.”
- *Center for Adaptive Optics Summer School* **August 5–10, 2012**  
Lecturer, “Measuring AO Performance.”
- *Dunlap Institute Instrumentation Summer School* **July 29–August 3, 2012**  
Laboratory Instructor, “Wavefront Sensing.”
- *UCLA Research Experience for Undergraduates* **Summer, 2011**  
Supervised an undergraduate research student.
- *Center for Adaptive Optics Summer School* **August 7–12, 2011**  
Lecturer, “Measuring AO Performance.”
- *Center for Adaptive Optics Summer School* **August 8–13, 2010**  
Lecturer, “Measuring AO Performance.”
- *Center for Adaptive Optics Summer School* **August 9–14, 2009**  
Director.
- *Center for Adaptive Optics Fall Retreat* **November 6–9, 2008**  
Instructor, Career Development Workshop: Project Management.
- *Center for Adaptive Optics Summer School* **August 4–8, 2008**  
Instructor, Fourier Optics laboratory.

- *Center for Adaptive Optics Summer School* **August 6–10, 2007**  
Instructor, Fourier Optics laboratory.
- *Center for Adaptive Optics Summer School* **August 4–11, 2006**  
Instructor, Fourier Optics laboratory.
- *Center for Adaptive Optics Mainland Internship Program* **Summer, 2006**  
Supervised a community college student.