

# Eric L. Nielsen

## Curriculum Vitae

Kavli Institute for Particle Astrophysics and Cosmology  
Stanford University  
452 Lomita Mall  
Stanford, CA 94305

Office: (650) 736-3669  
Cel: (408) 394-4582  
[enielsen@stanford.edu](mailto:enielsen@stanford.edu)

### Professional Experience

Physical Science Research Scientist, Stanford University 2017-present  
Postdoctoral Researcher, SETI Institute and Stanford University, 2014-2017  
Research Advisors: Franck Marchis and Bruce Macintosh  
Research Fellow, Institute for Astronomy, University of Hawaii, 2011-2014  
Research Advisor: Michael C. Liu

### Education

Ph.D. Astronomy, Steward Observatory, University of Arizona. Thesis Title: *On the Road to Imaging Extrasolar Planets: Null Results, Other Discoveries Along the Way, and Signposts for the Future*, 2011.

Thesis Advisor: Laird M. Close

B.A. University of California, Berkeley, Physics and Astrophysics Undergraduate  
Research Assistant, 2001-2003.

Advised by Debra Fischer

### Awards and Fellowships

- 3) **Michelson Graduate Fellowship:** Steward Observatory, 2005-2008  
Awarded to 3 graduate students per year to support research in extrasolar planet science and detection technology, by the Michelson Science Center, sponsored by NASA Origins and Navigator Program
- 2) **Steward Observatory Fellowship:** Steward Observatory, 2003-2004.  
Given to 1 of 12 entering graduate students to support first-year research
- 1) **Dorothea Klumpke Roberts Prize:** University of California, Berkeley, 2003  
Given by the Berkeley Astronomy Department, for outstanding scholarly achievement by either an upper-level undergraduate student, or an outstanding graduate student early in his/her research career [won as an undergraduate]

### Service, Teaching, Outreach, and Committees

Journal Referee, ApJ, A&A, AN.

Instructor of Record, Stanford University. *The Origin and Development of the Cosmos*, 2017

Teaching Assistant, Steward Observatory. *Introduction to Astronomy*, 2007, 2010,  
*Astronomy 203: Stars*, 2009

Steward Observatory Graduate Admissions Committee, 2008.

Steward Observatory, Outreach: Mirror Lab LSST “High Fire” Event, 2008, MathMovesU Day construction of 1000 Galileoscopes by high school students.  
Institute for Astronomy, Outreach: Stargazing at the Honolulu Zoo, 2012, 2013. IfA Open House, 2012, 2013. Transit of Venus, 2012. Solar Eclipse, 2013. Hawaii Children and Youth Day, 2013. Punahou School Lacy Veach Day, 2013.  
Stanford KIPAC Outreach Committee Member 2014-2016. Bay Area Science Day 2014, KIPAC Open House 2015-2018, Public Lecture at San Mateo College Astronomy Society Meeting 2016.  
Stanford KIPAC Outreach Committee co-Chair 2016-present.  
Keck Strategic Planning Group Member: Keck and Planet-Finding, 2015-2016.  
Origins Space Telescope Exoplanet Working Group Member 2016-present.  
Wide-Field InfraRed Survey Telescope (WFIRST) Coronagraph SIT Member 2016-present.  
NASA Exoplanet Standards Team Member 2016-present  
HabEx Auxiliary Exoplanet Information Working Group Member 2017-present  
Gemini Planet Imager Steering Committee Member 2018-present

## **Mentoring**

Sarah Blunt, Brown University undergraduate. SETI REU 2015, Leadership Alliance REU 2016. Brown University research for credit 2016-2017. Now graduate student at Harvard Center for Astrophysics.  
Jasmine Garani, Stony Brook University undergraduate. SETI REU 2016. Stony Brook University research for credit 2016-2017. Leadership Alliance REU 2017. Now graduate student at Arizona State University.  
Adam Stanford-Moore, Stanford University undergraduate. Summer research 2018, undergraduate thesis advisor 2018-present.  
Kathlynn Simotas, Stanford University undergraduate. Summer research 2018.

## **Invited Talks**

- 15) *The Gemini Planet Imager Exoplanet Survey*  
Exoplanets Orbiting Hot Stars, Nashville, Tennessee, 2018
- 14) *Mapping the Distributions of Exoplanet Populations from NICI to GPI*  
FLASH Colloquium, UC Santa Cruz, Santa Cruz, California, 2016
- 13) *Mapping the Distribution of Exoplanet Populations from NICI to GPI*  
Sagan/Michelson Fellows Symposium, Pasadena, California, 2015
- 12) *Mapping the Distribution of Exoplanet Populations from NICI to GPI*  
Center for Integrative Planetary Science Seminar, UC Berkeley, Berkeley, California 2015
- 11) *Mapping the Distribution of Exoplanet Populations from Direct Imaging Surveys*  
IAU Symposium 314: Young Stars and Planets near the Sun, Atlanta, Georgia 2015
- 10) *The Gemini NICI Planet-Finding Campaign: Probing the Origin of Substellar Companions*  
MPIA Colloquium, Heidelberg, Germany, 2014

- 9) *The Gemini NICI Planet-Finding Campaign: Probing the Origin of Substellar Companions*  
Leiden Observatory Seminar, Leiden, Netherlands, 2014
- 8) *The Gemini NICI Planet-Finding Campaign: Probing the Origin of Substellar Companions*  
SAC, Aarhus University Colloquium, Aarhus, Denmark, 2014
- 7) *The Gemini NICI Planet-Finding Campaign: Probing the Origin of Substellar Companions*  
Royal Observatory, Edinburgh Colloquium, Edinburgh, Scotland, 2014
- 6) *The Gemini NICI Planet-Finding Campaign: Constraints on Large Separation Giant Planets*  
Sagan/Michelson Fellows Symposium, Pasadena, California, 2012
- 5) *On the Road to Imaging Extrasolar Planets: Null Results, Other Discoveries Along the Way, and Signposts for the Future*  
Sagan/Michelson Fellows Symposium, Pasadena, California, 2009
- 4) *A Uniform Analysis of 118 Stars with High-Contrast Imaging: Long Period Extrasolar Giant Planets Are Rare around Sun-like Stars*  
AAS Meeting #214, Pasadena, California 2009
- 3) *Searching for Extrasolar Planets with Simultaneous Differential Imaging*  
Michelson Fellow Symposium, Pasadena, California 2005
- 2) *AB Dor C: Observational Calibration of Theoretical Cooling Curves for Young, Low-Mass Objects*  
Ultra-Low Mass Star Formation and Evolution Workshop, La Palma 2005
- 1) *AB Dor C: Calibrating models of brown dwarfs and low-mass stars at young ages*  
Aspen Winter Conference on Astrophysics, Aspen, Colorado 2005

## **Other Talks**

- 21) *The Gemini Planet Imager Exoplanet Survey: a Trend in Wide Separation Giant Planet Occurrence Rate with Stellar Mass*  
CIPS Colloquium, Berkeley, California 2018
- 21) *Orbits of Moving Group Binaries*  
Know thy Star, Know thy Planet, Pasadena, California 2017
- 20) *Giant Planets: from GPI to TMT*  
TMT Science Forum, Mysore, India 2017
- 19) *The Gemini Planet Imager Exoplanet Survey*  
Exoclipse, Boise, Idaho 2017
- 18) *The Gemini Planet Imager Exoplanet Survey: Early Constraints on Wide-Separation Giant Planet Populations*  
KIPAC Tea Talk, Stanford, California 2017
- 17) *The Gemini Planet Imager Exoplanet Survey: Early Constraints on Wide-Separation Giant Planet Populations*  
Bay Area Exoplanet Meeting, Stanford, California 2016
- 16) *Astrometric Confirmation and Preliminary Orbital Parameters of the Young Exoplanet 51 Eridani b with the Gemini Planet Imager*  
Extreme Solar Systems III, Kona, Hawaii 2015

- 15) *Mapping the Distribution of Exoplanet Populations from NICI to GPI*  
CIPS Colloquium, Berkeley, California 2015
- 14) *Mapping the Distribution of Exoplanet Populations from NICI to GPI*  
In the Spirit of Lyot III, Montreal, Canada 2015
- 13) *Mapping the Distribution of Exoplanet Populations from NICI to GPI*  
Bay Area Exoplanet Meeting, Mountain View, California 2015
- 12) *The Orbit of the Young Exoplanet beta Pictoris b*  
Thirty Years of beta Pic and debris disk studies, Paris, France 2014
- 11) *The Gemini NICI Planet-Finding Campaign: Statistical Constraints on Planet Populations*  
Observing Planetary Systems II, Santiago, Chile 2012
- 10) *The Gemini NICI Planet-Finding Campaign: Statistical Constraints on Planet Populations*  
Institute for Astronomy Star and Planet Formation Day, Honolulu, Hawaii, 2011
- 9) *The Gemini NICI Planet-Finding Campaign: Statistical Constraints on Planet Populations*  
Extreme Solar Systems II, Moran, Wyoming 2011
- 8) *A Uniform Analysis of 118 Stars with High-Contrast Imaging: Long Period Extrasolar Giant Planets Are Rare around Sun-like Stars*  
In The Spirit of Lyot, Paris, France October 2010
- 7) *On the Road to Imaging Extrasolar Planets: Null Results, Other Discoveries Along the Way, and Signposts for the Future*  
Thesis Talk, AAS Meeting #215, Washington D. C. 2010
- 6) *A Uniform Analysis of 118 Stars with High-Contrast Imaging: Long Period Extrasolar Giant Planets Are Rare around Sun-like Stars*  
Steward Observatory/NOAO Friday Lunch Astronomy Symposium Hour, Tucson, Arizona, 2009
- 5) *A Uniform Analysis of 118 Stars with High-Contrast Imaging: Long Period Extrasolar Giant Planets Are Rare*  
Steward Observatory Internal Symposium, Tucson, Arizona, 2008
- 4) *Constraints on Extrasolar Planet Populations*  
Physics and Astrophysics of Planetary Systems, Les Houches, France, 2008
- 3) *Constraints on Extrasolar Planet Populations from VLT NACO and MMT Direct Imaging Surveys*  
LAPLACE Symposium, Tucson, Arizona, 2007
- 2) *Simulating Extrasolar Planet Populations to Evaluate Direct Imaging Surveys*  
IAUC 200: Direct Imaging of Exoplanets: Science & Techniques, Nice, France 2005
- 1) *AB Dor C: Calibrating Brown Dwarf/Extrasolar Planet Models at Young Ages*  
Steward Observatory Internal Symposium, Tucson, Arizona, 2004

## **Press Releases**

- 6) *Gemini Planet Imager Exoplanet Survey — One Year into the Survey*  
SETI Press Release 2015 <http://www.seti.org/seti-institute/press-release/gemini-planet-imager-exoplanet-survey-one-year-in>

- 5) *New Instrument Image a Young Cousin of Jupiter*  
SETI Press Release 2015 <http://www.seti.org/seti-institute/press-release/new-instrument-images-young-cousin-jupiter>
- 4) *Gas-Giant Exoplanets Cling Close to Their Parent Stars*  
Gemini Press Release 2013 <http://www.gemini.edu/node/12025>
- 3) *Brown Dwarf Careens Around a Young Solar Analogue*  
Gemini Press Release, 2010 <http://www.gemini.edu/node/11495>
- 2) *Back on Track: New Technique for Observing Faint Companion*  
ESO Press Release, 2007  
<http://www.eso.org/public/outreach/press-rel/pr-2007/pr-28-07.html>
- 1) *Benchmark Survey Shows that Giant Outer Extrasolar Planets are Rare*  
University of Arizona Press Release, 2007 <http://uanews.org/node/13392>

## Publication List

### First Author Refereed Publications

- 9) *The Gemini Planet Imager Exoplanet Survey: Giant Planet and Brown Dwarf Demographics From 10--100 AU*  
**Nielsen E.L.**, De Rosa, R.J., Macintosh, B., Wang, J.J., Ruffio, J.-B., Chiang, E., Marley, M.S., Saumon, D., Savransky, D. et al. 2018. AJ submitted
- 8) *Evidence That the Directly Imaged Planet HD 131399 Ab Is a Background Star*  
**Nielsen, E.L.**, De Rosa, R.J., Rameau, J., Wang, J.J., Esposito, T.M., Millar-Blanchaer, M.A., Marois, C., Vigan, A., et al. 2017 AJ 154 218.
- 7) *Dynamical Mass Measurement of the Young Spectroscopic Binary V343 Normae AaAb Resolved with the Gemini Planet Imager*  
**Nielsen, E. L.**, De Rosa, R.J., Wang, J., Rameau, J., Song, I., Graham, J. R., Macintosh, B., Ammons, M., Bailey, V.P. et al. 2016 AJ 152 175.
- 6) *The Gemini NICI Planet-Finding Campaign: The Orbit of the Young Exoplanet beta Pictoris b*  
**Nielsen, E. L.**, Liu, M.C., Wahhaj, Z., Biller, B. A., Hayward, T. L., Males, J. R., Close, L. M., Morzinski, K. M., Skemer, A. J., et al. 2014 ApJ 794 158.
- 5) *The Gemini NICI Planet-Finding Campaign: The Frequency of Giant Planets around Young B and A Stars*  
**Nielsen, E. L.**, Liu, M. C., Wahhaj, Z., Biller, B. A., Hayward, T. L., Close, L. M., Males, J. R., Skemer, A. J., Chun, M., et al. 2013 ApJ 776 4.
- 4) *The Gemini NICI Planet-Finding Campaign: Discovery of a Multiple System Orbiting the Young A Star HD 1160*  
**Nielsen, E. L.**, Liu, M.C., Wahhaj, Z., Biller, B. A., Hayward, T. L., Boss, A., Bowler, B., Kraus, A., Shkolnik, E. L et al. 2012 ApJ 750 53.
- 3) *A Uniform Analysis of 118 Stars with High-Contrast Imaging: Long Period Extrasolar Giant Planets Are Rare*  
**Nielsen, E. L.** & Close, L. M. 2010 ApJ 717 878.
- 2) *Constraints on Extrasolar Planet Populations from VLT NACO/SDI and MMT SDI and Direct Adaptive Optics Imaging Surveys: Giant Planets are Rare at Large Separations*  
**Nielsen, E. L.**, Close, L. M., Biller, B. A., Masciadri, E., and Lenzen, R. 2008 ApJ 674 466.
- 1) *AB Doradus C: Age, Spectral Type, Orbit, and Comparison to Evolutionary Models*  
**Nielsen, E. L.**, Close, L. M., Guirado, J. C., Biller, B. A., Lenzen, R., Brandner, W., Hartung, M., and Lidman, C. 2005 AN 326 1033

### Second Author Refereed Publications with Significant Contributions

- 4) *Occurrence Rates from Direct Imaging Surveys*  
Bowler, B.P. and **Nielsen, E.L.**, 2018 Handbook of Exoplanets.
- 3) *Orbits for the Impatient: A Bayesian Rejection-sampling Method for Quickly Fitting the Orbits of Long-period Exoplanets*  
Blunt, S., **Nielsen, E.L.**, De Rosa, R.J., Konopacky, Q.M., Ryan, D., Wang, J.J., Pueyo, L., Rameau, J., et al. 2017 AJ 153 229.

2) *Constraints on the Architecture of the HD 95086 Planetary System with the Gemini Planet Imager*

Rameau, J., **Nielsen, E.L.**, De Rosa, R.J., Blunt, S.C., Patience, J., Doyon, R., Graham, J.R., Lafreniere, D., Macintosh, B., et al. 2016 ApJ 822 29.

1) *Astrometric Confirmation and Preliminary Orbital Parameters of the Young Exoplanet 51 Eridani b with the Gemini Planet Imager*

De Rosa, R.J., **Nielsen, E.L.**, Blunt, S.C., Graham, J.R., Konopacky, Q.M., Marois, C., Pueyo, L., Rameau, J., Ryan, D.M., et al. 2015 ApJ 814 3.

## Other Refereed Publications

47) *SCEXAO/CHARIS Near-Infrared Direct Imaging, Spectroscopy, and Forward-Modeling of kappa And b: A Likely Young, Low-Gravity Superjovian Companion*

Currie, T., Brandt, T.D., Uyama, Taichi, **Nielsen, E.L.**, Blunt, S., Guyon, O., Tamura, M., Marois, C., Mede, K. et al. 2018 AJ in press.

46) *A Bayesian Framework for Exoplanet Direct Detection and Non-detection*

Ruffio, J.-B., Mawet, D., Czekala, I., Macintosh, B., De Rosa, R.J., Ruane, G., Bottom, M., Pueyo, L., Wang, J.J. et al. 2018 AJ 156 196.

45) *Dynamical Constraints on the HR 8799 Planets with GPI*

Wang, J.J., Graham, J.R., Dawson, R., Fabrycky, D., De Rosa, R.J., Pueyo, L., Konopacky, Q., Macintosh, B., Marois, C. et al. 2018 AJ 156 192.

44) *Direct Imaging of the HD 35841 Debris Disk: A Polarized Dust Ring from Gemini Planet Imager and an Outer Halo from HST/STIS*

Esposito, T.M., Duchene, G., Kalas, P., Rice, M., Choquet, E., Ren, B., Perrin, M.D., Chen, C.H., Arriaga, P., Chiang, E. et al. 2018 AJ 156 47.

43) *GPI Spectra of HR 8799 c, d, and e from 1.5 to 2.4 microns*

Greenbaum, A.Z., Pueyo, L., Ruffio, J.-B., Wang, J.J., De Rosa, R.J., Aguilar, J., Rameau, J., Barman, T., Marois, C. et al. 2018 AJ 155 226.

42) *Automated data processing architecture for the Gemini Planet Imager Exoplanet Survey*

Wang, J.J., Perrin, M.D., Savransky, D., Arriaga, P., Chilcote, J.K., De Rosa, R.J., Millar-Blanchaer, M.A., Marois, C., et al. 2018 JATIS 4a8002.

41) *Individual, Model-independent Masses of the Closest Known Brown Dwarf Binary to the Sun*

Garcia, E.V., Ammons, S.M., Salama, M., Crossfield, I., Bendek, E., Chilcote, J., Garrel, V., Graham, J.R., Kalas, P. et al. 2017 ApJ 846 97.

40) *Characterizing 51 Eri b from 1 to 5 microns: A Partly Cloudy Exoplanet*

Rajan, A., Rameau, J., De Rosa, R.J., Marley, M.S., Graham, J.R., Macintosh, B., Marois, C., Morley, C., Patience, J. et al. 2017 AJ 154 10.

39) *Improving and Assessing Planet Sensitivity of the GPI Exoplanet Survey with a Forward Model Matched Filter*

Ruffio, J.-B., Macintosh, B., Wang, J.J., Pueyo, L., **Nielsen, E.L.**, De Rosa, R.J., Czekala, I., Marley, M.S., Arriaga, P. et al. 2017 ApJ 842 14.

38) *Complex Spiral Structure in the HD 100546 Transitional Disk as Revealed by GPI and MagAO*

- Follette, K.B., Rameau, J., Dong, R., Pueyo, L., Close, L.M., Duchene, G., Fung, J., Leonard, C., Macintosh, B., Males, J.R. et al. 2017 AJ 153 264.
- 37) *An Optical/Near-infrared Investigation of HD 100546 b with the Gemini Planet Imager and MagAO*  
Rameau, J., Follette, K.B., Pueyo, L., Marois, C., Macintosh, B., Millar-Blanchaer, M., Wang, J.J., Vega, D., Doyon, R., et al. 2017 AJ 153 244.
- 36) *No Difference in Orbital Parameters of RV-detected Giant Planets between 0.1 and 5 au in Single versus Multi-stellar Systems*  
Ngo, H., Knutson, H.A., Bryan, M.L., Blunt, S., **Nielsen, E.L.**, Batygin, K., Bowler, Brendan P., Crepp, J.R., Hinkley, S. et al. 2017 AJ 153 242.
- 35) *Integral Field Spectroscopy of the Low-mass Companion HD 984 B with the Gemini Planet Imager*  
Johnson-Groh, M., Marois, C., De Rosa, R.J., **Nielsen, E.L.**, Rameau, J., Blunt, S., Vargas, J., Ammons, S.M., Bailey, V.P. et al. 2017 AJ 153 190.
- 34) *1-2.4 micron Near-IR Spectrum of the Giant Planet beta Pictoris b Obtained with the Gemini Planet Imager*  
Chilcote, J., Pueyo, L., De Rosa, R.J., Vargas, J., Macintosh, B., Bailer, V.P., Barman, T., Bauman, B., Bruzzone, S., et al. 2017 AJ 153 182.
- 33) *Imaging an 80 AU Radius Dust Ring Around the F5V Star HD 157587*  
Millar-Blanchaer, M.A., Wang, J., Kalas, P., Graham, J.R., Duchene, G., **Nielsen, E.L.**, Perrin, M., Moon, D.-S., Padgett, D., et al. 2016 AJ 152 128.
- 32) *The International Deep Planet Survey II: The frequency of directly imaged giant exoplanets with stellar mass*  
Galicher, R., Marois, C., Macintosh, B., Zuckerman, B., Barman, T., Konopacky, Q., Song, I., Patience, J., Lafreniere, D., Doyon, R., **Nielsen, E.L.**, 2016 A&A in press.
- 31) *The Orbit and Transit Prospects for beta Pictoris b constrained with One Milliarcsecond Astrometry*  
Wang, J.J., Graham, J.R., Pueyo, L., Kalas, P., Millar-Blanchaer, M.A., Ruffio, J.-B., De Rosa, R.J., Ammons, S.M., Arriaga, P., et al. 2016 AJ in press.
- 30) *Bringing "The Moth" to Light: A Planet-sculpting Scenario for the HD 61005 Debris Disk*  
Esposito, T.M., Fitzgerald, M.P., Graham, J.R., Kalas, P., Lee, E.J., Chiang, E., Duchene, G., Wang, J., Millar-Blanchaer, M.A., **Nielsen, E.L.**, et al. 2016 AJ 152 85.
- 29) *Discovery of a Substellar Companion to the Nearby Debris Disk Host HR 2562*  
Konopacky, Q.M., Rameau, J., Duchene, G., Filippazzo, J.C., Giorla Godfrey, P.A., Marois, C., **Nielsen, E.L.**, Pueyo, L., Rafikov, R.R., et al. 2016 ApJ 829 4.
- 28) *Searching for Scatterers: High-Contrast Imaging of Young Stars Hosting Wide-Separation Planetary-Mass Companions*  
Bryan, M.L., Bowler, B.P., Knutson, H.A., Kraus, A.L., Hinkley, S., Mawet, D., **Nielsen, E.L.**, Blunt, S.C. 2016 ApJ 827 100.
- 27) *The Peculiar Debris Disk of HD 111520 as Resolved by the Gemini Planet Imager*  
Draper, Z.H., Duchene, G., Millar-Blanchaer, M.A., Matthews, B.C., Wang, J.J., Kalas, P., Graham, J.R., Padgett, D., Ammons, S.M., et al. 2016 ApJ 826 147.
- 26) *Spectroscopic Characterization of HD 95086 b with the Gemini Planet Imager*  
De Rosa, R.J., Rameau, J., Patience, J., Graham, J.R., Doyon, R., Lafreniere, D., Macintosh, B., Pueyo, L., Rajan, A., et al. 2016 ApJ 824 121.



- 25) *Extreme AO Observations of Two Triple Asteroid Systems with SPHERE*  
Yang, B., Wahhaj, Z., Beauvalet, L., Marchis, F., Dumas, C., Marsset, M., **Nielsen, E.L.**, Vachier, F., 2016 ApJ 820 35.
- 24) *The PDS 66 Circumstellar Disk as Seen in Polarized Light with the Gemini Planet Imager*  
Wolff, S.G., Perrin, M., Millar-Blanchaer, M.A., **Nielsen, E.L.**, Wang, J., Cardwell, A., Chilcote, J., Dong, R., Draper, Z.H., et al. 2016 ApJ 818 15.
- 23) *First Scattered-light Image of the Debris Disk around HD 131835 with the Gemini Planet Imager*  
Hung, Li-Wei, Duchene, G., Arriaga, P., Fitzgerald, M.P., Maire, J., Marois, C., Millar-Blanchaer, M.A., Bruzzone, Sebastian, Rajan, A., et al. 2015 ApJ 815 14.
- 22) *Deep Imaging of an Asymmetric Debris Disk in the HD 106906 Planetary System*  
Kalas, P.G., Rajan, A., Wang, J.J., Millar-Blanchaer, M.A., Duchene, G., Chen, C., Fitzgerald, M.P., Dong, R., Graham, J.R., et al. 2015 ApJ 814 32.
- 21) *Discovery and spectroscopy of the young jovian planet 51 Eri b with the Gemini Planet Imager*  
Macintosh, B., Graham, J.R., Barman, T., De Rosa, R.J., Konopacky, Q., Marley, M.S., Marois, C., **Nielsen, E.L.**, Pueyo, L., et al. 2015 Science 350 64.
- 20) *Improving signal-to-noise in the direct imaging of exoplanets and circumstellar disks with MLOCI*  
Wahhaj, Z., Cieza, L.A., Mawet, D., Yang, B., Canovas, H., de Boer, J., Cassassus, S., Menard, F., Schreiber, M.R., Liu, M.C., Biller, B.A., **Nielsen, E.L.**, and Hayward, T.L. 2015 A&A 581 24.
- 19) *Gemini Planet Imager Observations of the AU Microscopii Debris Disk: Asymmetries within One Arcsecond*  
Wang, J.J., Graham, J.R., Pueyo, L., **Nielsen, E.L.**, Millar-Blanchaer, M., De Rosa, R.J., Kalas, P., Ammons, S.M., Bulger, J. et al. 2015 ApJ 811 19.
- 18) *Beta Pictoris' Inner Disk in Polarized Light and New Orbital Parameters for Beta Pictoris b*  
Millar-Blanchaer, M.A., Graham, J.R., Pueyo, L., Kalas, P., Dawson, R.I., Wang, J., Perrin, M.D., Moon, D.-S., Macintosh, B. et al. 2015 ApJ 811 18.
- 17) *Planets Around Low-mass Stars (PALMS). V. Age-dating Low-mass Companions to Members and Interlopers of Young Moving Groups*  
Bowler, B.P., Shkolnik, E.L., Liu, M.C., Schlieder, J.E., Mann, A.W., Dupuy, T.J., Hinkley, S., Crepp, J.R., Johnson, J.A., et al. 2015 ApJ 806 62.
- 16) *The Gemini NICI Planet-Finding Campaign: asymmetries in the HD 141569 disc*  
Biller, B.A., Liu, M.C., Rice, K., Wahhaj, Z., **Nielsen, E.L.**, Hayward, T., Kuchner, M.J., Close, L.M., Chun, M., et al. 2015 MNRAS 450 4446.
- 15) *Astrometric Calibration of the Gemini NICI Planet-Finding Campaign*  
Hayward, T.L., Biller, B.A., Liu, M.C., **Nielsen, E.L.**, Wahhaj, Z., Chun, M., Ftaclas, C., Hartung, M., and Toomey, D.W. 2014 PASP 126 1112.
- 14) *The Gemini NICI planet-finding campaign: The offset ring of HR 4796 A*  
Wahhaj, Z., Liu, M.C., Biller, B.A., **Nielsen, E.L.**, Hayward, T.L., Kuchner, M., Close, L.M., Chun, M., Ftaclas, C., and Toomey, D.W. 2014 A&A 567 34.

- 13) *Magellan Adaptive Optics First-light Observations of the Exoplanet beta Pic b. I. Direct Imaging in the Far-red Optical with MagAO+VisAO and in the Near-IR with NICI*  
Males, J.R., Close, L.M., Morzinski, K.M., Wahhaj, Z., Liu, M.C., Skemer, A.J., Kopon, D., Follette, K.B., Puglisi, A., et al. 2014 ApJ 786 32.
- 12) *The Gemini NICI Planet-Finding Campaign: The Companion Detection Pipeline*  
Wahhaj, Z., Liu, M. C., Biller, B. A., **Nielsen, E. L.**, Close, L. M., Hayward, T. L., Hartung, M., Chun, M., Ftaclas, C., et al. 2013 ApJ 779 80.
- 11) *The Gemini NICI Planet-Finding Campaign: The Frequency of Giant Planets around Young Moving Group Stars*  
Biller, B. A., Liu, M. C., Wahhaj, Z., **Nielsen, E. L.**, Hayward, T. L., Males, J. R., Skemer, A, Close, L. M., Chun, M., et al. 2013 ApJ 777 160.
- 10) *The Gemini NICI Planet-finding Campaign: The Frequency of Giant Planets around Debris Disk Stars*  
Wahhaj, Z., Liu, M. C., **Nielsen, E. L.**, Biller, B. A., Hayward, T. L., Close, L. M., Males, J. R., Skemer, A., Ftaclas, C., et al. ApJ 2013 773 179.
- 9) *The Gemini NICI Planet-finding Campaign: Discovery of a Substellar L Dwarf Companion to the Nearby Young M Dwarf CD-35 2722*  
Wahhaj, Z., Liu, M. C., Biller, B. A., Clark, F., **Nielsen, E. L.**, Close, L. M., Hayward, T. L., Mamajek, E. E., Cushing, M., et al. 2011 ApJ 729 139
- 8) *The Gemini NICI Planet-finding Campaign: Discovery of a Close Substellar Companion to the Young Debris Disk Star PZ Tel*  
Biller, B. A., Liu, Michael C., Wahhaj, Z., **Nielsen, E. L.**, Close, L. M., Dupuy, T. J., Hayward, T. L., Burrows, A., Chun, M., et al. 2010 ApJ 720 82
- 7) *An Imaging Survey for Extrasolar Planets around 45 Close, Young Stars with the Simultaneous Differential Imager at the Very Large Telescope and MMT*  
Biller, B. A., Close, L.M., Masciadri, E., Nielsen, E. L., Lenzen, R., Brandner, W., McCarthy, D., Hartung, M., Kellner, S., et al. 2007 ApJS 173 143
- 6) *New Photometry and Spectra of AB Doradus C: An Accurate Mass Determination of a Young Low-Mass Object with Theoretical Evolutionary Tracks*  
Close, L. M., Thatte, N., **Nielsen, E. L.**, Abuter, R., Clarke, F., and Tecza, M. 2007 ApJ 665 736
- 5) *Very high contrast integral field spectroscopy of AB Doradus C: 9-mag contrast at 0.2 arcsecond without a coronagraph and using spectral deconvolution*  
Thatte, N., Abuter, R., Tecza, M., **Nielsen, E. L.**, Clarke, F. J., and Close, L. M. 2007 MNRAS 378 1229
- 4) *NACO-SDI Direct Imaging Search for the Exoplanet epsilon Eri b*  
Janson, M., Brandner, W., Henning, T., Lenzen, R., McArthur, B., Benedict, G. F., Reffert, S., **Nielsen, E. L.**, Close, L. M., Biller, B. A., Kellner, S., Gunther, E., Hatzes, A., Masciadri, E., Geissler, K., and Hartung, M. 2007 AJ 133 2442
- 3) *Improved age constraints for the AB Doradus quadruple system. The binary nature of AB Doradus B*  
Janson, M., Brandner, W., Lenzen, R., Close, L., **Nielsen, E. L.**, Hartung, M., Henning, T., and Bouy, H. 2007 A&A 462 615
- 2) *A Reflective Gaussian Coronagraph for Extreme Adaptive Optics: Laboratory Performance*

Park, R., Close, L. M., Siegler, N., **Nielsen, E. L.**, and Stalcup, T. 2006 PASP 118 1591

1) *A dynamical calibration of the mass-luminosity relation at very low stellar masses and young ages*

Close, L. M., Lenzen, R., Guirado, J. C., **Nielsen, E. L.**, Mamajek, E. E., Brandner, W., Hartung, M., Lidman, C., and Biller, B. 2005 Nature 433 286

### **First Author Conference Proceedings**

4) *Mapping the Distribution of Exoplanet Populations with NICI and GPI*

**Nielsen, E.L.**, Liu, M.C., Wahhaj, Z., Biller, B.A., Hayward, T.L., Close, L.M., Macintosh, B., Savransky, D., Wang, J.J., Graham, J.R., et al. 2015 IAU Symposium 314: Young Stars and Planets Near the Sun. Atlanta, Georgia.

3) *The Gemini NICI Planet-Finding Campaign: The Frequency of Giant Planets around Young B and A Stars*

**Nielsen, E.L.**, Liu, M.C., Wahhaj, Z., Biller, B.A., Hayward, T.L., and the Gemini NICI Planet-Finding Campaign Team 2013 IAU Symposium 299: Exploring the Formation and Evolution of Planetary Systems. Victoria, Canada.

2) *Constraints on Extrasolar Planet Populations*

**Nielsen, E. L.**, Close L. M., Biller, B. A., Masciadri, E., and Lenzen, R. 2008 proceedings to Physics and Astrophysics of Planetary Systems, Les Houches School 2008. Les Houches, France.

1) *Simulating Extrasolar Planet Populations for Direct Imaging Surveys*

**Nielsen, E. L.**, Close, L. M., Biller, B. A. 2006 IAU Colloq. 200: Direct Imaging of Exoplanets: Science & Techniques, 111. Nice, France.

### **First Author Posters**

11) *Orbits of Moving Group Binaries: Measuring the Ages of Planet-Hosting Moving Groups with Gemini South GPI NRM and IGRINS*

Gemini Science Meeting, San Francisco, California 2018

10) *The Gemini Planet Imager Exoplanet Survey: Constraints on Wide-Separation Giant Planet Populations from the First 300 Stars*

Exoplanets II, Cambridge, United Kingdom 2018

9) *The Gemini Planet Imager Exoplanet Survey*

AAS #229 Grapevine, Texas 2017

8) *Gemini Planet Imager Exoplanet Survey: Implications for Giant Planet Populations*

Cool Stars 19, Uppsala, Sweden 2016

7) *A Unified Analysis of Brown Dwarf and Exoplanet Companions from Direct Imaging Surveys*

AAS #223, Washington D.C., 2014

6) *The Gemini NICI Planet-Finding Campaign: the Frequency of Giant Planets Around Young B and A Stars*

IAUS 299, Victoria, Canada 2013

5) *The Gemini NICI Planet-Finding Campaign: the Frequency of Giant Planets Around Young A Stars*

AAS #221, Long Beach, California, 2013

4) *Constraints on Extrasolar Planet Populations from VLT NACO and MMT Direct Imaging Surveys*

In the Spirit of Bernard Lyot: The Direct Detection of Planets and Circumstellar Disks in the 21st Century, Berkeley 2007

3) *Simulating Extrasolar Planet Populations for Direct Imaging Surveys*

Cool Stars XIV, Pasadena 2007

2) *Simulating Extrasolar Planet Populations*

Protostars and Planets V, Hilton Waikoloa Village 2005

1) *Searching for Extrasolar Planets at the VLT and MMT with Simultaneous Differential Imaging*

Second TPF/Dawin International Conference, San Diego 2004

**Other Conference Proceedings, Posters, and White Papers**

41) *Lessons for WFIRST CGI from ground-based high-contrast systems*

Bailey, V.P., Bottom, M., Cady, E., Cantalloube, F., de Boer, J., Groff, T., Krist, J., Millar-Blanchaer, M.A., Vigan, A. et al. 2018 SPIE 10698 6

40) *Characterization of lemniscate atmospheric aberrations in Gemini Planet Imager data*

Madurowicz, A., Macintosh, B.A., Ruffio, J.-B., Chilcote, J., Bailey, V.P., Poyneer, L., **Nielsen, E.L.**, Norton, A.P. 2018 SPIE 10703 6

39) *The Gemini Planet Imager: looking back over five years and forward to the future*

Macintosh, B., Chilcote, J.K., Bailey, V.P., de Rosa, R., **Nielsen, E.L.**, Norton, A., Poyneer, L., Wang, J., Ruffio, J.-B. et al. 2018 SPIE 10703 0

38) *Mining the GPIES database*

Savransky, D., Shapiro, J., Bailey, V., De Rosa, R., Wang, J., Ruffio, J.-B., **Nielsen, E.L.**, Tallis, M., Perrin, M. et al. 2018 SPIE 10703 0

37) *Upgrading the Gemini planet imager: GPI 2.0*

Chilcote, J.K., Bailey, V.P., De Rosa, R., Macintosh, B., **Nielsen, E.L.**, Norton, A., Millar-Blanchaer, M.A., Graham, J. 2018 SPIE 10702 44

36) *The Origins Space Telescope: Towards an Understanding of Temperate Planetary Atmospheres*

Fortney, J., Kataria, T., Stevenson, K., Zellem, R., **Nielsen, E.L.**, Cuartas-Restrepo, P., Gaidos, E., Bergin, E., Mexiner, M., et al. 2018 NAS Exoplanet White Papers

35) *Predicted capabilities and planet yields of an Origins Space Telescope coronagraph*

Meshkat, T., **Nielsen, E.L.**, Bergin, E., Close, L.M., De Rosa, R.J., Dong, Chuanfei, Fortney, J.J., Fraine, J. et al. 2018 NAS Exoplanet White Papers

34) *The Snapshot A Star SurveY (SASSY)*

Garani, J.I., **Nielsen, E.L.**, Marchis, F., Liu, M.C., Macintosh, B., Rajan, A., De Rosa, R.J., Wang, J., Esposito, T. et al. 2018 AAS 23134907

33) *Modeling an Optical and Infrared Search for Extraterrestrial Intelligence Survey with Exoplanet Direct Imaging*

Vides, C., Macintosh, B., Ruffio, J.-B., **Nielsen, E.L.**, Povich, M.S.

- 32) *Assessing the fundamental limits of multiple star formation: An imaging search for the lowest mass stellar companions to intermediate-mass stars*  
Duchene, G., Tzern Oon, J., Kantorski, P., De Rosa, R.J., Thomas, S., Patience, J., Pueyon, L., **Nielsen, E.L.**, et al. 2017 AAS 22934416
- 31) *The Snapshot A-Star SurveY (SASSY)*  
Garani, J., **Nielsen, E.L.**, Marchis, F., Liu, M.C., Macintosh, B., Rajan, A., De Rosa, R.J., Wang, J., Esposito, T. et al. 2017 AAS 22914619
- 30) *Gemini Planet Imager Calibrations, Pipeline Updates, and Campaign Data Processing*  
Perrin, M.D., Follette, K.B., Millar-Blanchaer, M., Wang, J., Wolff, S., Hung, L.-W., Arriaga, P., Savransky, D., et al. 2017 AAS 22914604
- 29) *Orbits for the Impatient: A Bayesian Rejection Sampling Method for Quickly Fitting the Orbits of Long-Period Exoplanets*  
Blunt, S.C., **Nielsen, E.L.**, De Rosa, R.J., Konopacky, Q.M., Ryan, D., Wang, J., Pueyo, L., Rameau, J., Marois, C. et al. 2017 AAS 22914602
- 28) *Gemini Planet Imager observational calibrations XI: pipeline improvements and enhanced calibrations after two years on sky*  
Perrin, M.D., Ingraham, P., Follette, K.B., Maire, J., Wang, J.J., Savransky, D., Arriaga, P., Bailey, V.P., et al. 2016 SPIE 9908 37.
- 27) *Simulations of Detectability of Extrasolar Planets by a Joint Doppler and WFIRST-AFTA Coronagraph Survey*  
Chontos, A., Macintosh, B., and **Nielsen, E.L.** 2016 APS APR L1021
- 26) *Characterizing Exoplanet Motions Using Random Orbit Generation for the Gemini Planet Imager Exoplanet Survey*  
Blunt, S.C., **Nielsen, E.L.**, Marchis, F., De Rosa, R., Konopacky, Q., Macintosh, B., Wang, J., Marois, C., Pueyo, L., et al. 2016 AAS 22713723
- 27) *Simulations of Detectability of Extrasolar Planets by a Joint Doppler and WFIRST-AFTA Coronagraph Survey*  
Chontos, A., Macintosh, B., and **Nielsen, E.L.** 2016 AAS 22713720
- 26) *The Gemini Planet Imager Exoplanet Survey (GPIES) Campaign Initial Results*  
Patience, J., Macintosh, B., Graham, J.R., Barman, T., De Rosa, R., Konopacky, Q., Marley, M., Marois, C., **Nielsen, E.L.**, et al. 2015 ESS 320201
- 25) *Discovery and follow-up of 51 Eri b, a directly-imaged Jupiter-like exoplanet and status of the GPIES campaign*  
Marchis, F., **Nielsen, E.L.**, Blunt, S., Rameau, J., Barman, T., De Rosa, R.J., Konopacky, Q., Marley, M.S., Marois, C., et al. 2015 DPS 4750101
- 24) *The Gemini Planet Imager*  
Graham, J.R., Macintosh, B., Perrin, M.D., Ingraham, P., Konopacky, Q.M., Marois, C., Poyneer, L. Bauman, B., Barman, T., et al. 2015 AAS 22542303
- 23) *Results from the Gemini NICI Planet-Finding Campaign*  
Biller, B.A., Liu, M.C., Wahhaj, Z., **Nielsen, E.L.**, Hayward, T.L., Chun, M.R., Close, L.M., Ftaclas, C., Males, J.R., et al. 2014 SPIE 9148 1.
- 22) *The Gemini NICI Planet-Finding Campaign*  
Liu, M. C., **Nielsen, E. L.**, Wahhaj, Z., Biller, B. A., Hayward, T., Close, L., Chun, M., Ftaclas, C., Toomey, D., et al. 2013 IAUS 299

21) *The Gemini NICI Planet-Finding Campaign: Planet Frequency for Young Moving Group Stars*

Biller, B. A., Liu, M. C., Wahhaj, Z., **Nielsen, E. L.**, Hayward, T. L., Close L. M., Chun, M., Ftaclas, C., Toomey, D. W., et al. 2013 AAS 22114927

20) *The Gemini NICI Planet-Finding Campaign: The Frequency of Giant Planets Around Debris Disk Stars*

Wahhaj, Z., Liu, M. C., **Nielsen, E. L.**, Biller, B. A., Hayward, T. L., Close, L. M., Chun, M., Ftaclas, C., Toomey, D. W., et al. 2013 AAS 22114926

19) *The Gemini NICI Planet-Finding Campaign: Combining Coronagraphy with Angular and Spectral Differencing Imaging*

Wahhaj, Z., Liu, M. C., Biller, B. A., **Nielsen, E. L.**, Chun, M., Close, L. M., Ftaclas, C., Hayward, T. L., Toomey, D. W., et al. 2011 Extreme Solar Systems II

18) *The Gemini NICI Planet-Finding Campaign: Discovery of a Substellar L Dwarf Companion to a Nearby Young M Dwarf*

Wahhaj, Z., Liu, M. C., Biller, B. A., Clarke, F., **Nielsen, E. L.**, Close, L. M., Cushing, M., Dupuy, T., Hayward, T. L., et al. 2011 AAS 21725310

17) *The Gemini NICI Planet-Finding Campaign: Discovery of a Close Substellar Companion to a Young Solar Analog*

Biller, B. A., Liu, M. C., Wahhaj, Z., **Nielsen, E. L.**, Close, L. M., Dupuy, T., Hayward, T. L., Burrows, A., Chun, M., et al. 2010 Lyot Conference.

16) *The Gemini NICI Planet-Finding Campaign*

Liu, M. C., Wahhaj, Z., Biller B. A., **Nielsen, E. L.**, Chun, M., Close, L., Ftaclas, C., Hartung, M., Hayward, T. L., Clarke, F., Reid, I. N., Shkolnik, E. L., Tecza, M., Thatte, N., Alencar, S., et al. 2010 SPIE 7736E 53.

15) *The Gemini NICI Planet-Finding Campaign: Deep Imaging of Stars in the Solar Neighborhood*

Biller, B. A., Wahhaj, Z., Liu, M., Chun, M., Close, L., Ftaclas, C., Hartung, M., Hayward, T., **Nielsen, E. L.**, Toomey, D., and the NICI Planet-Finding Campaign Team 2010 AAS 21544903.

14) *The Gemini NICI Planet-Finding Campaign*

Liu, M. C. Biller, B. A., Wahhaj, Z., Chun, M., Close, L., Ftaclas, C., Hartung, M., Hayward, T., **Nielsen, E. L.**, Toomey, D., Shkolnik, E., Reid, I., and the NICI Planet-Finding Campaign Team 2010 AAS 21544901.

13) *Observing Strategies for the NICI Campaign to Directly Image Extrasolar Planets*

Biller, B. A., Liu, M., Wahhaj, Z., Chun, M., Close, L., Ftaclas, C., Hartung, M., Hayward, T., **Nielsen, E. L.**, and Toomey, D. 2009 AAS 21430608.

12) *Direct Planet Imaging with NICI: Combining Angular and Spectral Difference Imaging*

Wahhaj, Z., Liu, M., Biller, B., Chun, M., Close, L., Ftaclas, C., Hartung, M., Hayward, T., **Nielsen, E. L.**, and Toomey, D. 2009 AAS 21423004.

11) *The Gemini NICI Planet-Finding Campaign*

Liu, M. C., Wahhaj, Z., Biller, B., Shkolnik, E., Chun, M., Ftaclas, C., Toomey, D., Close, L. M., **Nielsen, E. L.**, Hayward, T., Hartung, M., and Artigau, E. 2009 Proceedings of the 15th Cambridge Workshop on Cool Stars, Stellar Systems and the Sun.

10) *An Imaging Survey for Extrasolar Planets around 45 Close, Young Stars with SDI at the VLT and MMT*

Biller, B., Close, L., **Nielsen, E. L.**, Masciadri, E., Lenzen, R., Brandner, W., McCarthy, D., Henning, T., Hartung, M., Stapelfeldt, K., and Trauger, J. 2007 In the Spirit of Bernard Lyot: The Direct Detection of Planets and Circumstellar Disks in the 21st Century.

9) *A Survey of Close, Young Stars with SDI at the VLT and MMT*

Biller, B., Close, L., Masciadri, E., Lenzen, R., Brandner, W., McCarthy, D., Henning, T., **Nielsen, E. L.**, and Hartung, M. 2006 AAS 20917905.

8) *A reflective Gaussian coronagraph for ExAO: laboratory performance*

Park, R., Close, L.M., Siegler, N., **Nielsen, E. L.**, and Stalcup, T. 2006 SPIE 6272E 154

7) *Contrast limits with the Simultaneous Differential Extrasolar Planet Imager (SDI) at the VLT and MMT*

Biller, B. A., Close, L. M., Masciadri, E., Lenzen, R., Brandner, W., McCarthy, D., Henning, T., **Nielsen, E. L.**, Hartung, M., Kellner, S., Geissler, K., and Kaspar, M. 2006 SPIE 6272E 74

6) *Suppressing Speckle Noise for Simultaneous Differential Extrasolar Planet Imaging (SDI) at the VLT and MMT*

Biller, B. A., Close, L. M., Lenzen, R., Brandner, W., McCarthy, D., **Nielsen, E. L.**, Kellner, S., and Hartung, M. 2006 IAU Colloq. 200: Direct Imaging of Exoplanets: Science & Techniques, 53.

5) *A Survey of Close, Young Stars with SDI at the VLT and MMT*

Biller, B., Close, L., Masciadri, E., Lenzen, R., Brandner, W., McCarthy, D., Henning, T., **Nielsen, E. L.**, and Hartung, M. 2006 IAU Colloq. 200: Direct Imaging of Exoplanets: Science & Techniques 11.

4) *On the Age, Spectral Type, Orbit, and Comparison to Evolutionary Models of AB Dor C*

Close, L. M., **Nielsen, E. L.**, Guirado, J. C., Biller, B. A., Lenzen, R., Brandner, W., Hartung, M., and Lidman, C. 2006 IAU Colloq. 200: Direct Imaging of Exoplanets: Science & Techniques, 11.

3) *A Survey of the Closest, Youngest Stars with Simultaneous Differential Extrasolar Planet Imager (SDI) at the VLT and MMT*

Biller, B., Close, L., Lenzen, R., Brandner, W., McCarthy, D., Masciadri, E., Henning, T., **Nielsen, E. L.**, and Hartung, M. 2005 Protostars and Planets V.

2) *AB Dor C: The First Dynamical Calibration of the Mass-Luminosity-Age Relation at Very Low Masses and Young Ages*

Close, L., Guirado, J., **Nielsen, E. L.**, Biller, B., Brandner, W., Lenzen, R., Hartung, M., and Lidman, C. 2005 Protostars and Planets V.

1) *Suppressing speckle noise for simultaneous differential extrasolar planet imaging (SDI) at the VLT and MMT*

Biller, B. A., Close, L. M., Lenzen, R., Brandner, W., McCarthy, D. W., **Nielsen, E. L.**, and Hartung, M. 2004 SPIE 5490 389.