

Tuan Do

CONTACT INFORMATION

Physics and Astronomy Department
UCLA
430 Portola Plaza, Box 951547
Los Angeles, CA, 90095-1547
Office Phone: 310-794-9466

Email: tdo@astro.ucla.edu

RESEARCH INTERESTS

Milky Way structure, Galactic center, nuclear star clusters, stellar dynamics, star formation, stellar evolution, AGN variability, high angular resolution imaging

EDUCATION

University of California, Los Angeles, Los Angeles, CA USA

Ph.D., Astronomy, 2010

- Thesis Title: Physical processes in the vicinity of a supermassive black hole
- Advisor: Professor Andrea Ghez

M.S., Astronomy, 2006

- Thesis Topic: Reconstructing the mass loss history of pre-planetary nebulae with Spitzer
- Advisor: Professor Mark Morris

University of California, Berkeley, Berkeley, CA USA

B.A., Physics and Astrophysics, 2004

RESEARCH EXPERIENCE

University of California, Los Angeles, Los Angeles, CA, USA

Assistant Research Scientist

December 2014 to present

As Deputy Director of the UCLA Galactic Center Group, I am leading the scientific operations of the group and exploring new avenues of research for the future. My research included: understanding the formation and evolution of the Milky Way nucleus; using the local Milky Way dwarf satellite galaxies to study cosmology and the nature of dark matter

Dunlap Institute for Astronomy and Astrophysics, University of Toronto, ON, Canada

Dunlap Fellow

August 2012 to November 2014

My research included: measuring the stellar population and dynamical properties of the Milky Way nuclear star cluster; using the local Milky Way dwarf satellite galaxies to measure the Milky Way potential; and developing simulations for science cases for the next generation Thirty Meter Telescope.

University of California, Irvine, Irvine, CA, USA

TMT Postdoctoral Fellow

September 2010 to July 2012

Simulating the instrumental performance and the science cases for the integral field spectrograph IRIS on the Thirty Meter Telescope (TMT) with Prof. Betsy Barton.

University of California, Los Angeles, Los Angeles, CA, USA

Graduate Research Assistant with Andrea Ghez **2006 to 2010**

Using laser guide star adaptive optics observations to study the near-infrared emission from the Galactic black hole Sgr A* and the stellar population and distribution in the central 0.5 pc of the Galaxy.

Graduate Research Assistant with Mark Morris **2004 to 2006**

Using Spitzer far infrared observations of dust shells around pre-planetary nebulae to reconstruct the mass loss history of post-main sequence stars.

University of Arizona, Tucson, AZ, USA

Research for Undergraduates Program **June to August 2003**

- NSF funded summer research program.

University of California, Berkeley, Berkeley, CA, USA

Undergraduate researcher **June 2001 to May 2003**

- Research on magnetic substorms associate with solar wind activity.

TEACHING

University of California, Los Angeles, Los Angeles, CA, USA

Adjunct Professor

- Astro 115 - Statistical Mechanics and Astrophysics - upper division course on statistical mechanics and applications in astrophysics, 31 students, **Winter 2016**

University of Toronto, Toronto, ON, Canada

- Teacher outreach committee - outreach to science teachers in local schools
- Laboratory instructor and local organizing committee, Dunlap Instrumentation Summer School
- Summer Undergraduate Research Program (SURP), organizing committee member
- Lead designer and instructor for SURP short course
- Education and Public Outreach Committee member

University of California, Los Angeles, Los Angeles, CA, USA

Teaching Assistant

- Astro 5 - Life in the universe **Fall 2008**
- Astro 6 - Cosmology **Winter 2005**
- Astro 3 - Nature of the universe **Fall 2004**

UCLA planetarium coordinator **2005-2007**

Center for Adaptive Optics, Santa Cruz, CA, USA

Laboratory Instructor **August 2006, 2007, 2008, & 2009**

- Part of a team that developed and taught the laboratory portion of the Adaptive Optics Summer School, a week long course designed to familiarize graduate students and post-docs with the theory and applications of adaptive topics.

1. Feldmeier-Krause A., Kerzendorf W., Neumayer N., Schoedel R., Nogueras-Lara F., **Do T.**, de Zeeuw P. T., Kuntschner H., “*KMOS view of the Galactic Centre II. Metallicity distribution of late-type stars*”, 2017, MNRAS, 464, 194
2. B. N. Sitarski, G. Witzel, A. M. Ghez, M. R. Morris, **T. Do**, J. R. Lu, S. Naoz, A. Boehle, G. Martinez, S. Chappell, R. Schoedel, L. Meyer, S. Yelda, E. E. Becklin, K. Matthews, “*The post-periapse evolution of galactic center source G1: the second case of a resolved tidal interaction with a supermassive black hole*”, 2016, ApJ Submitted
3. A. Boehle, A. M. Ghez, R. Schoedel, L. Meyer, S. Yelda, S. Albers, G. D. Martinez, E. E. Becklin, **T. Do**, J. R. Lu, K. Matthews, M. R. Morris, B. Sitarski, G. Witzel, “*An Improved Distance and Mass Estimate for Sgr A* from a Multi-Star Orbit Analysis*”, 2016, ApJ, 830, 17B
4. Vayner A., Wright S. A., **Do T.**, Larkin J. E., Armus L., Gallagher S. C., “*Providing Stringent Star Formation Rate Limits of $z \sim 2$ QSO Host Galaxies at High Angular Resolution*”, 2016, ApJ, 821, 64
5. Stephan A. P., Naoz S., Ghez A. M., Witzel G., Sitarski B. N., **Do T.**, Kocsis B., “*Merging Binaries in the Galactic Center: The eccentric Kozai-Lidov mechanism with stellar evolution*”, 2016, MNRAS, 460, 3494
6. Skidmore W., TMT International Science Development Teams, Science Advisory Committee, “*Thirty Meter Telescope Detailed Science Case: 2015*”, 2015, Research in Astronomy and Astrophysics, 15, 1945
7. **Do T.**, Kerzendorf W., Winsor N., Stostad M., Morris M. R., Lu J. R., Ghez A. M., “*Discovery of Low-metallicity Stars in the Central Parsec of the Milky Way*”, 2015, ApJ, 809, 143
8. Stostad M., **Do T.**, Murray N., Lu J. R., Yelda S., Ghez A., “*Mapping the Outer Edge of the Young Stellar Cluster in the Galactic Center*”, 2015, ApJ, 808, 106
9. Witzel G., Ghez A. M., Morris M. R., Sitarski B. N., Boehle A., Naoz S., Campbell R., Becklin E. E., Canalizo G., Chappell S., **Do T.**, Lu J. R., Matthews K., Meyer L., Stockton A., Wizinowich P., Yelda S., “*Detection of Galactic Center Source G2 at $3.8 \mu\text{m}$ during Periapse Passage*”, 2014, ApJL, 796, L8
10. **Do T.**, Wright S. A., Barth A. J., Barton E. J., Simard L., Larkin J. E., Moore A. M., Wang L., Ellerbroek B., “*Prospects for Measuring Supermassive Black Hole Masses with Future Extremely Large Telescopes*”, 2014, AJ, 147, 93
11. Mieda E., Wright S. A., Larkin J. E., Graham J. R., Adkins S. M., Lyke J. E., Campbell R. D., Maire J., **Do T.**, Gordon J., “*Efficiency Measurements and Installation of a New Grating for the OSIRIS Spectrograph at Keck Observatory*”, 2014, PASP, 126, 250
12. Yelda S., Ghez A. M., Lu J. R., **Do T.**, Meyer L., Morris M. R., Matthews K., “*Properties of the Remnant Clockwise Disk of Young Stars in the Galactic Center*”, 2014, ApJ, 783, 131

13. Kerzendorf W. E., Childress M., Scharwächter J., **Do T.**, Schmidt B. P., “*A Reconnaissance of the Possible Donor Stars to the Kepler Supernova*”, 2014, ApJ, 782, 27
14. **Do, T.**, Martinez, G. D., Yelda, S., Ghez, A. M., Bullock, J., Kaplinghat, M., Lu, J. R., Peter, A. G. H., Phifer, K., “*Three-dimensional stellar kinematics at the Galactic center: measuring the nuclear star cluster spatial density profile, black hole mass, and distance*”, 2013, ApJL, 779, L6
15. Phifer, K., **Do, T.**, Meyer, L., Ghez, A. M., Witzel, G., Yelda, S., Boehle, A., Lu, J. R., Morris, M. R., Becklin, E. E., and Matthews, K., “*Keck Observations of the Galactic Center Source G2: Gas Cloud or Star?*”, 2013, ApJL, 773, L13
16. Lu, J. R., **Do, T.**, Ghez, A. M., Morris, M. R., Yelda, S., and Matthews, K., “*Stellar Populations in the Central 0.5 pc of the Galaxy. II. The Initial Mass Function*”, 2013, ApJ, 764, 155
17. **Do, T.**, Lu, J. R., Ghez, A. M., Morris, M. R., Yelda, S., Martinez, G. D., Wright, S. A., and Matthews, K., “*Stellar Populations in the Central 0.5 pc of the Galaxy. I. A New Method for Constructing Luminosity Functions and Surface-density Profiles*”, 2013, ApJ, 764, 154
18. Meyer, L., Ghez, A. M., Schödel, R., Yelda, S., Boehle, A., Lu, J. R., **Do, T.**, Morris, M. R., Becklin, E. E., and Matthews, K., “*The Shortest-Known-Period Star Orbiting Our Galaxy’s Supermassive Black Hole*”, 2012, Science, 338, 84
19. Clarkson, W. I., Ghez, A. M., Morris, M. R., Lu, J. R., Stolte, A., McCrady, N., **Do, T.**, Yelda, S., “*Proper Motions of the Arches Cluster with Keck Laser Guide Star Adaptive Optics: The First Kinematic Mass Measurement of the Arches*”, 2012, ApJ, 751, 132
20. Yelda, S.; Lu, J. R.; Ghez, A. M.; Clarkson, W.; Anderson, J.; **Do, T.**; Matthews, K., “*Improving Galactic Center Astrometry by Reducing the Effects of Geometric Distortion*”, 2010, ApJ, 725, 331
21. Stolte, A.; Morris, M. R.; Ghez, A. M.; **Do, T.**; Lu, J. R.; Ballard, C.; Mills, E.; Matthews, K., “*Disks in the Arches cluster – survival in a starburst environment*”, 2010, ApJ, 718, 810
22. **Do, T.**; Ghez, A. M.; Morris, M. R.; Lu, J. R.; Matthews, K.; Yelda, S.; Larkin, J., 2009, “*High angular resolution integral-field spectroscopy of the Galaxy’s nuclear cluster: a missing stellar cusp?*”, ApJ, 703, 1323
23. Meyer, L.; **Do, T.**; Ghez, A.; Morris, M. R.; Yelda, S.; Schoedel, R.; Eckart, A.; “*A power-law break in the near-infrared power spectrum of the Galactic center black hole*”, 2009, ApJL, 694, 1
24. **Do, T.**; Ghez, A. M.; Morris, M. R.; Yelda, S.; Meyer, L.; Lu, J. R.; Hornstein, S. D.; Matthews, K.; “*A Near-Infrared Variability Study of the Galactic Black Hole: A Red Noise Source with No Detected Periodicity*”, 2009, ApJ, 691, 1021
25. Ghez, A. M.; Salim, S.; Weinberg, N. N.; Lu, J. R.; **Do, T.**; Dunn, J. K.; Matthews,

K.; Morris, M. R.; Yelda, S.; Becklin, E. E.; Kremenek, T.; Milosavljevic, M.; Naiman, J.; “*Measuring Distance and Properties of the Milky Way’s Central Supermassive Black Hole with Stellar Orbits*”, 2008, ApJ, 689, 1044

26. Meyer, L.; **Do, T.**; Ghez, A.; Morris, M. R.; Witzel, G.; Eckart, A.; Blanger, G.; Schodel, R.; “*A 600 Minute Near-Infrared Light Curve of Sagittarius A**”, 2008, ApJL, 688, 17

27. **Do, T.**; Morris, M. R.; Sahai, R.; Stapelfeldt, K.; “*A Spitzer Study of the Mass-Loss Histories of Three Bipolar Preplanetary Nebulae*”, 2007, AJ, 134, 1417

28. Morris, M. R.; Uchida, K.; **Do, T.**; “*A magnetic torsional wave near the Galactic Centre traced by a double helix nebula*”, 2006, Nature, 7082, 308

CONFERENCE
PROCEEDINGS

Moore A. M., Larkin J. E., Wright S. A., Bauman B., Dunn J., Ellerbroek B., Phillips A. C., Simard L., Suzuki R., Zhang K., Aliado T., Brims G., Canfield J., Chen S., Dekany R., Delacroix A., **Do T.**, Herriot G., Ikenoue B., Johnson C., Meyer E., Obuchi Y., Pazder J., Reshetov V., Riddle R., Saito S., Smith R., Sohn J. M., Uruguchi F., Usuda T., Wang E., Wang L., Weiss J., Wooff R., “*The Infrared Imaging Spectrograph (IRIS) for TMT: instrument overview*”, 2014, Proc. SPIE, 9147, 914724

Do T., Wright S. A., Barth A. J., Barton E. J., Simard L., Larkin J. E., Moore A. M., Wang L., Ellerbroek B., “*Prospects for Measuring Supermassive Black Hole Masses with TMT*”, 2014, Thirty Meter Telescope Science Forum, 40

Wright S. A., Larkin J. E., Moore A. M., **Do T.**, Simard L., Adamkovics M., Armus L., Barth A. J., Barton E., Boyce H., Cooke J., Cote P., Davidge T., Ellerbroek B., Ghez A. M., Liu M. C., Lu J. R., Macintosh B. A., Mao S., Marois C., Schoeck M., Suzuki R., Tan J. C., Treu T., Wang L., Weiss J., “*The infrared imaging spectrograph (IRIS) for TMT: overview of innovative science programs*”, 2014, Proc. SPIE, 9147, 91479S

Witzel G., Morris M., Ghez A., Meyer L., Becklin E., Matthews K., Lu J. R., **Do T.**, Campbell R., “*Near infrared variability of Sgr A* - spectral index measurements*”, 2014, IAU Symposium, 303, 274

Meyer L., Ghez A. M., Witzel G., **Do T.**, Phifer K., Sitarski B. N., Morris M. R., Boehle A., Yelda S., Lu J. R., Becklin E., “*The Keplerian orbit of G2*”, 2014, IAU Symposium, 303, 264

Lu J. R., Ghez A. M., Morris M. R., Clarkson W., Stolte A., **Do T.**, Yelda S., Anderson J., “*Young stars in the Galactic center*”, 2014, IAU Symposium, 303, 211

Paumard T., Morris M. R., **Do T.**, Ghez A., “*Regularized OSIRIS 3D spectroscopy at the circumnuclear disk ionization front*”, 2014, IAU Symposium, 303, 109

Ghez A. M., Witzel G., Sitarski B., Meyer L., Yelda S., Boehle A., Becklin E. E., Campbell R., Canalizo G., **Do T.**, Lu J. R., Matthews K., Morris M. R., Stockton A., “*Detection of Galactic Center Source G2 at 3.8 micron during Periapse Passage Around the Central Black Hole*”, 2014, The Astronomer’s Telegram, 6110, 1

van der Marel R. P., Anderson J., Bellini A., Besla G., Bianchini P., Boylan-Kolchin M., Chaname J., Deason A., **Do T.**, Guhathakurta P., Kallivayalil N., Lennon D., Massari

D., Meyer E., Platais I., Sabbi E., Sohn S. T., Soto M., Trenti M., Watkins L., “*Local Group and Star Cluster Dynamics from HSTPROMO: The Hubble Space Telescope Proper Motion Collaboration*”, 2014, Structure and Dynamics of Disk Galaxies, 480, 43

Yelda S., Meyer L., Ghez A., **Do T.**, “*Astrometry in the Galactic Center with the Thirty Meter Telescope*”, 2013, arXiv:1310.5744

Fitzgerald M. P., Witzel G., Britton M. C., Ghez A. M., Meyer L., Sitarski B. N., Cheng C., Becklin E. E., Campbell R. D., **Do T.**, Lu J. R., Matthews K., Morris M. R., Neyman C. R., Tyler G. A., Wizinowich P. L., Yelda S., “*Modeling anisoplanatism in the Keck II laser guide star AO system*”, 2012, Proc. SPIE, 8447,

Yelda S., Ghez A. M., Lu J. R., **Do T.**, Meyer L., Morris M. R., “*Adaptive optics observations of the galactic center young stars*”, 2012, Proc. SPIE, 8447,

Do T., Ghez A., Lu J. R., Morris M. R., Yelda S., Martinez G. D., Peter A. H. G., Wright S., Bullock J., Kaplinghat M., Matthews K., “*Measuring the stellar luminosity function and spatial density profile of the inner 0.5 pc of the Milky Way nuclear star cluster*”, 2012, Journal of Physics Conference Series, 372, 012016

Ghez A. M., Morris M. R., **Do T.**, Yelda S., Lu J. R., Matthews K., “*Bringing our Galaxy’s Central Supermassive Black Hole and its Environs into Focus with Laser Guide Star Adaptive Optics*”, 2012, Twelfth Marcel Grossmann Meeting on General Relativity, 420

Lu J. R., Clarkson W., McCrady N., Ghez A. M., Morris M. R., Stolte A., Yelda S., **Do T.**, “*Clarifying our View of Star Formation in Massive Young Clusters with Adaptive Optics*”, 2011, UP2010: Have Observations Revealed a Variable Upper End of the Initial Mass Function?, 440, 63

Do, T.; Ghez, A. M.; Morris, M. R.; Lu, J. R.; Matthews, K.; Yelda, S.; Wright, S.; Larkin, J.; *Testing Stellar Cusp Formation Theories with Observations of the Milky Way Nuclear Star Cluster*, 2011, Proceedings from: The Galactic Center: a Window to the Nuclear Environment of Disk Galaxies. Astronomical Society of the Pacific, p.200

Ammons S. M., Sevenson S., Armstrong J. D., Crossfield I., Do T., Fitzgerald M., Harrington D., Hickenbotham A., Hunter J., Johnson J., Johnson L., Li K., Lu J., Maness H., Morzinski K., Norton A., Putnam N., Roorda A., Rossi E., Yelda S., “*The Adaptive Optics Summer School Laboratory Activities*”, 2010, Learning from Inquiry in Practice, 436, 394

Do, T.; Fitzgerald, M.; Ammons, S. M.; Crossfield, I.; Yelda, S.; Armstrong, J. D.; Sevenson, S.; *A Fourier Optics and Wavefront Sensing Laboratory Activity*, 2010, Proceedings of: Learning from Inquiry in Practice. Astronomical Society of the Pacific, p.160

Lu, Jessica R.; Ghez, Andrea M.; Yelda, Sylvana; **Do, Tuan**; Clarkson, Will; McCrady, Nate; Morris, Mark; *Recent results and perspectives for precision astrometry and photometry with adaptive optics*, 2010, Adaptive Optics Systems II. Edited by Ellerbroek, Brent L.; Hart, Michael; Hubin, Norbert; Wizinowich, Peter L. Proceedings of the SPIE, Volume 7736, pp. 77361

Do, T.; Ghez, A. M.; Morris, M. R.; Yelda, S.; Lu, J. R.; Hornstein, S. D.; Matthews, K.; “*Testing for periodicities in near-IR light curves of Sgr A**”, 2008, Journal of

Physics: Conference Series, Volume 131, Proceedings of “The Universe Under the Microscope - Astrophysics at High Angular Resolution”

MENTORSHIP

2013-2015 - Morten Stostad - undergraduate from University of Toronto - research project on the young stellar disk at the Galactic center.

2014-2016 - Nathan Winsor - undergraduate from Memorial University, Newfoundland, research on abundance measurements of stars in the Milky Way nuclear star cluster

2014-Present - Abhimat Krishna Gautam - graduate student at UCLA, research on stellar variability at the Galactic center

2014-Present - Devin Chu - graduate student at UCLA, research on stellar orbits around the Milky Way supermassive black hole

2016 Summer - Ryan Boyden - REU student from University of Massachusetts, Amherst, research on characterizing the initial mass function and kinematic properties of the young massive cluster Mercer 23

AWARDS AND HONORS

2012 - 2014 Dunlap Fellowship, Dunlap Institute, University of Toronto

2010 - Dissertation Year Fellowship, UCLA