

## CURRICULUM VITAE

RENU MALHOTRA

### APPOINTMENTS

- 2016 to present* Louise Foucar Marshall Science Research Professor,  
and Regents Professor, The University of Arizona, Tucson, AZ
- 2022-2023* (on sabbatical leave from the UA)  
Visiting Professor, Canadian Institute for Theoretical Astrophysics, Toronto, Canada
- 2011-2016* Chair, Theoretical Astrophysics Program,  
The University of Arizona, Tucson, AZ
- 2010-2011* (on sabbatical leave from the UA)  
Visiting scholar: Planetary Science Institute, Tucson, AZ,  
Institute for Advanced Study, Princeton NJ, and  
Institute for Theory & Computation, Harvard-Smithsonian Center  
for Astrophysics, Cambridge, MA.
- 2004 to present* Professor, Department of Planetary Sciences,  
The University of Arizona, Tucson, AZ
- 2000 to 2004* Associate Professor, Department of Planetary Sciences,  
The University of Arizona, Tucson, AZ
- 1991 to 2000* Staff Scientist, Lunar and Planetary Institute, Houston, TX
- 1989 to 1991* Research Associate, Planetary Sciences, Caltech, Pasadena, CA
- 1988 to 1989* Research Associate, Astronomy Department, Cornell University
- 1983 to 1988* Graduate Assistant, Physics Department, Cornell University

### EDUCATION

Ph.D., Physics, Cornell University, Ithaca, NY, August 1988.  
M.S., Physics (5 year program), Indian Institute of Technology,  
Delhi, India, 1983.

### HONORS and AWARDS

Lecar Prize, Harvard-Smithsonian Center for Astrophysics, 2018  
Thomas Gold Lecturer, Cornell University, 2018  
Appointed Regents' Professor in the Arizona state university system, 2016  
Appointed Louise Foucar Marshall Science Research Professor, 2016  
National Academy of Sciences, Elected Member 2015  
American Academy of Arts and Sciences, Elected Fellow 2015  
Galileo Circle Fellow, The University of Arizona, 2010  
Distinguished Alumnus, Indian Institute of Technology, Delhi, India–2006  
Kavli Frontiers of Science Fellow, National Academy of Sciences, 2000  
Harold C. Urey Prize, American Astronomical Society–Division for  
Planetary Sciences, 1997  
Asteroid 6698 named “Malhotra”, International Astronomical Union, 1997  
President's Gold Medal for Physics, IIT-Delhi, 1983

PUBLICATIONS

- Dietrich, J., Malhotra, R., Apai, D., Statistical Distribution Function of Orbital Spacings in Planetary Systems, *AJ* 167, id.46 (2024); arXiv:2312.02349
- Markwardt, L, Holler, BJ, Lin, HW, Gerdes, DW, Adams, FC, Malhotra, R, Napier, KJ, First Near-IR Spectroscopic Survey of Neptune Trojans with JWST: Distinct Surface Compositions of Red vs Ultra-Red Neptune Trojans, *ApJL*, submitted (2023); arXiv:2310.03998
- Castro-Cisneros, J.D., Malhotra, R., Rosengren, A.J., Orbital pathways for a Lunar-Ejecta Origin of the Near-Earth Asteroid Kamo‘oalewa, *Communications Earth & Environment*, 4:372 (2023)
- Malhotra, R., Roy, S., Modeling the Free Inclinations of the Classical Kuiper Belt with the von Mises–Fisher Distribution, *RNAAS* 7, 143 (2023)
- Matheson, I., Malhotra, R., Keane, J.T., A von Mises–Fisher Distribution for the Orbital Poles of the Plutinos, *MNRAS* 522, 3298-3307 (2023)
- Matheson, I., Malhotra, R., A Measurement of the Kuiper Belt’s Mean Plane from Objects Classified by Machine Learning, *AJ* 165, 241 (2023)
- Schwamb, M.E., et al. (including Malhotra, R.), Tuning the Legacy Survey of Space and Time (LSST) Observing Strategy for Solar System Science, *ApJS* 266, id.22 (2023)
- Malhotra, R., Chen, Z., Non-perturbative investigation of low eccentricity exterior mean motion resonances, *MNRAS*, 521(1), 1253-1263 (2023)
- Volk, K., Malhotra, R., Orbital Dynamics Landscape near the Most Distant Known Trans-Neptunian Objects, *ApJ* 937 119 (2022)
- Malhotra, R., Ito, T., Pluto on the Edge of Chaos, *PNAS*, 119(15) e2118692119 (2022)
- Dietrich, J., Apai, D., Malhotra, R., An Integrative Analysis of the HD219134 Planetary System and the Inner Solar System: Extending DYNAMITE with Enhanced Orbital Dynamical Stability Criteria, *AJ*, 163(2), id.88 (2022)
- Malhotra, R., New results on orbital resonances, *Proceedings of the International Astronomical Union*, 15 (S364), 85-101 (2022); ArXiv:2111.06372
- Sharkey, B., Reddy, V., Malhotra, R., et al., Characterizing Earth Quasi-Satellite (469219) 2016 HO3 Kamo‘oalewa, *Communications Earth & Environment*, 2:231 (2021)
- Zaveri, N., Malhotra, R., Pluto’s Resonant Orbit Visualized in 4D, *AAS Journals, RNAAS*, 5, 235 (2021)
- Reiland, N., Rosengren, A., Malhotra, R., Bombardelli, C., Assessing and Minimizing Collisions in Satellite Mega-Constellations, *Advances in Space Research*, 67(11):3755-3774 (2021)
- Agol, E., et al., Refining the transit timing and photometric analysis of TRAPPIST-1: Masses, radii, densities, dynamics, and ephemerides, *AAS-PSJ*, 2, id. 1 (2021)
- Hendler, N., Malhotra, R., Observational Completion Limit of Minor Planets from the Asteroid Belt to Jupiter Trojans, *AAS-PSJ*, 1, id. 75 (2020)
- Petrovich, C., Diego, J.M., Kratter, K.M., Malhotra, R., A disk-driven resonance as the origin of high inclinations of close-in planets, *ApJ Letters*, 902, id. L5 (2020)
- Volk, K., Malhotra, R., Dynamical instabilities in systems of multiple short-period planets are likely driven by secular chaos: a case study of Kepler-102, *AJ*, 160(3), id.98 (2020)
- Malhotra, R., Zhang, N., On the Divergence of First Order Resonance Widths at Low Eccentricities, *MNRAS*, 496:3152-3160 (2020)
- Malhotra, R., Ingersoll, A.P., Adam P. Showman (1968-2020), *Icarus* 345, eid 113780 (2020)
- Amato, D., Malhotra, R., Sidorenko, V., Rosengren, A.J., Lunar close encounters compete with the circum-terrestrial Lidov-Kozai effect, *CMDA*, 132(6-7), id.35 (2020)
- Hendler, N.; Pascucci, I.; Pinilla, P.; Tazzari, M.; Carpenter, J.; Malhotra, R.; Testi, L., The evolution of dust-disk sizes from a homogeneous analysis of 1-10 Myr-old stars, *ApJ*, 895, article id. 126 (2020)
- Markwardt, L., Gerdes, D.W., Malhotra, R., Becker, J.C., Hamilton, S.J., Adams, F.C., 2020, Search for L5 Earth Trojans with DECam, *MNRAS*, 492(4), 6105-6119 (2020)
- Malhotra, R., Resonant Kuiper Belt Objects – a Review, *Geoscience Letters*, 6:12 (2019)
- Lan, L., Malhotra, R., Neptune’s resonances in the Scattered Disk, *CMDA*, 131(8), article id. 39, 26 pp. (2019)
- Volk, K., Malhotra, R., Not a simple relationship between Neptune’s migration speed and Kuiper belt inclination excitation, *AJ*, 158(2), article id. 64, 13 pp. (2019)

- Su, K.Y.L., ..., R. Malhotra, et al., Extreme Debris Disk Variability – Exploring the Diverse Outcomes of Large Asteroid Impacts During the Era of Terrestrial Planet Formation, *AJ*, 157(5), id. 202 (2019)
- Malhotra, R., The case for a deep search for Earth’s Trojan asteroids, *Nature Astronomy* 3:193-194 (2019)
- Walsh, K. J., ..., R. Malhotra, et al., Craters, boulders and regolith of (101955) Bennu indicative of an old and dynamic surface, *Nature Geoscience* 12:242-246 (2019)
- B. Rizk, C. Drouet D’Aubigny, C.W. Hergenrother, B.J. Bos, D.R. Golish, R. Malhotra, ... et al., OSIRIS-REx low-velocity particles during outbound cruise, *Advances in Space Research*, 63(1):672-691 (2019)
- Malhotra, R., Lan, L., Volk, K., Wang, X., Neptune’s 5:2 Resonance in the Kuiper Belt, *AJ*, 156, article id. 55 (2018)
- Trilling, D.E., Bellm, E.C., Malhotra, R., On the Detectability of Planet X with LSST, *AJ*, 155, article id. 243, 5 pp. (2018)
- Cambioni, S., Malhotra, R., The mid-plane of the main asteroid belt, *AJ*, 155, article id. 143, 10 pp. (2018)
- Malhotra, R., Prospects for unseen planets beyond Neptune, in “Serendipities in the Solar System and Beyond”, ASP Conference Series, Vol. 513, p. 45, Proceedings of a conference held 10-13 July 2017 at National Central University, Taiwan. Edited by Chung-Ming Ko, Chan-Kao Chang, and Po-Chieh Yu. ArXiv:1711.03444 (2018)
- Strom, R.G., Marchi, S., Malhotra, R., Ceres and the terrestrial planets impact cratering record, *Icarus*, 302:104-108 (2018)
- Seaman, R., ..., R. Malhotra, et al., A near-Sun Solar System Twilight Survey with LSST, White Paper submitted in response to the Call for LSST Cadence Optimization White Papers, ArXiv:1812.00466 (2018)
- Apai, D., ..., R. Malhotra, et al., A comprehensive understanding of planet formation is required for assessing planetary habitability and for the search for life, White paper submitted to the NAS Committee on Exoplanet Science Strategy, ArXiv:1803.08682 (2018)
- Su, K.Y.L., MacGregor, M.A., Booth, M., Wilner, D.J., Flaherty, K., Hughes, A.M., Phillips, N.M., Malhotra, R., Hales, A.S., Morrison, S., Ertel, S., Matthews, B.C., Dent, W.R.F., Casassus, S., ALMA 1.3 mm Map of the HD 95086 System, *AJ*, 154, article id. 225 (2017)
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- Wang, X., Malhotra, R., Mean motion resonances at high eccentricities: the 2:1 and the 3:2 interior resonances, *AJ*, Volume 154, article id. 20 (2017)
- JeongAhn, Y., Malhotra, R., Simplified derivation of the collision probability of two objects in independent Keplerian orbits, *AJ* 153, article id. 235, 11 pp. (2017)
- Malhotra, R., Wang, X., Eccentricity distribution in the main asteroid belt, *MNRAS* 465:4381-4389 (2017)
- Malhotra, R., Volk, K., Wang, X., Corraling a distant planet with extreme resonant Kuiper belt objects, *ApJ* 824:L22 (2016)
- Yoshida, F., Ito, T., ..., Malhotra, R., et al., Lightcurves of the Karin family asteroids, *Icarus* 269:15-22 (2016)
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- JeongAhn, Y., Malhotra, R., The current impact flux on Mars and its seasonal variation, *Icarus*, *Icarus*, 262, 140-153 (2015)
- Su, K.Y.L., Morrison, S., R. Malhotra, et al., 2014, Debris distribution in HD 95086: A young analog of HR 8799, *ApJ*, 799, id. 146 (2015).
- Morrison, S., and Malhotra, R., Planetary chaotic zone clearing: destinations and timescales, *ApJ*, 799, id. 41 (2015).
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- Rodigas, T.J., Malhotra, R., Hinz, P.M., 2014, Predictions for Shepherding Planets in Scattered Light Images of Debris Disks, *ApJ*, 780, 65.
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- Su, K.Y.L., G.H. Rieke, R. Malhotra, et al., 2013, Asteroid belts in debris disk twins: Vega and Fomalhaut, *ApJ*, 763:118(14pp).
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- Burns, J. A., et al., 2010, Commission 7: Celestial Mechanics and Dynamical Astronomy, Transactions of the International Astronomical Union, Series B, 27, 120
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- Moro-Martín, A., J.M. Carpenter, M.R. Meyer, L.A. Hillenbrand, R. Malhotra, et al., 2007, Are Debris Disks and Massive Planets Correlated?, *ApJ*, 658:1312-1321.
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- Malhotra, R. 1994, A mapping method for the gravitational few-body problem with dissipation, *Cel. Mech. & Dyn. Astron.* 60:373-385.
- Malhotra, R. 1993, The origin of Pluto’s peculiar orbit, *Nature* 365:819-821.
- Malhotra, R. 1993, Orbital resonances in the Solar Nebula: strengths and weaknesses, *Icarus* 106:264-73. (Special issue on Planet Formation.)
- Malhotra, R. 1993, Three-body effects in the planetary system of PSR1257+12, *Astrophys. J.* 407:266-275.
- Malhotra, R. 1992, Orbital Dynamics of PSR1257+12 and its Two Planetary Companions, in *Planets Around Pulsars*, eds. J.A. Phillips, S.E. Thorsett, and S.R. Kulkarni, ASP Conference Series 72:399-410. Pub.: Astronomical Society of the Pacific, San Francisco.
- Malhotra, R., D. Black, A. Eck and A. Jackson, 1992, Resonant orbital evolution of the putative planetary system of PSR1257+12, *Nature* 356:583-35.
- Malhotra, R. 1991, Tidal origin of the Laplace resonance and the resurfacing of Ganymede, *Icarus* 94:399-412.
- Malhotra, R. and S.F. Dermott, 1990, The role of secondary resonances in the orbital history of Miranda, *Icarus* 85:444–480.
- Malhotra, R. 1990, Capture probabilities for secondary resonances, *Icarus* 87:249–264.
- Dermott, S.F., P.D. Nicholson, R. Gomes and R. Malhotra, 1990, Modelling the IRAS Solar System dust bands, *Advances in Space Research* 10(3):171–180.
- Malhotra, R., K. Fox, C.D. Murray and P.D. Nicholson, 1989, Secular perturbations of the Uranian satellites: Theory and practice, *Astron. & Astrophys.* 221:348–358.
- Dermott, S.F., R. Malhotra and C.D. Murray, 1988, Dynamics of the Saturnian and Uranian satellites: A chaotic route to melting Miranda? *Icarus* 76:295–334.

#### INVITED CONFERENCE PRESENTATIONS

- “Orbital resonance phenomena in the solar system and in exo-planetary systems”, International Workshop on Celestial Mechanics and Dynamical Astronomy, Central University of Rajasthan–India, January 2023
- “The mysteries of gaps and pile-ups at planetary resonances”, Numbers & Nature: Honoring the Life and Legacy of Mitchell Feigenbaum, MIT, Cambridge MA, June 2022
- “Some new results on interior first order mean motion resonances”, Brazilian Colloquium on Orbital Dynamics XX, Sao Paulo Brazil (virtual), December 2021
- “New results on orbital resonances”, IAU Symposium 364 – Multi-scale (time and mass) dynamics of space objects, Iasi, Romania, October 2021
- “Asteroid belt dynamics and statistics”, AAS-Division for Dynamical Astronomy, August 2020
- “Planet migration in the Solar system”, Conference for Undergraduate Women in Physics, The University of Oklahoma, Norman OK, January 2020
- “The case for a deep search for Earth’s Trojan Asteroids”, Earths in Solar Systems, Tucson AZ, Sep 2019
- “The Solar System – Planets/Minor Planets/Seen/Unseen”, Workshop on Planetary Science with CMB + Optical/IR Surveys”, University of Pennsylvania, Philadelphia, April 2019
- “Orbital dynamics and planetary habitability”, Pop-Up Institute on Planetary Habitability at The University of Texas at Austin, June 2018
- “Bombardment History of the Planets”, Pop-Up Institute on Planetary Habitability at The University of Texas at Austin, June 2018
- “Dynamics of Planetary Systems”, Pop-Up Institute on Planetary Habitability at The University of Texas at Austin, June 2018
- “Resonant Kuiper Belt Objects - a Review”, Planetary Sciences Distinguished Lecture, AOGS Conference, Honolulu HI, June 2018
- “Planet migration in the Solar system: a new paradigm and its LPI origins”, LPI 50th Anniversary Science Symposium, Houston, TX, March 2018
- “Prospects for Unseen Planets Beyond Neptune”, Symposium: Serendipities in the Solar System and Beyond, IANCU-Taiwan, July 2017
- “The mass function of planets”, Inner Solar Systems meeting, American Astronomical Society, AAS Meeting #230, id.#111.01, June 2017

- “Earth Trojan Asteroid Survey with the OSIRIS-REx Spacecraft—Science motivations, Science Team Meeting, Tucson AZ, April 2017
- “A few points on the dynamical evolution of the young solar system”, Planet Day, Center for Planetary Science, University of Toronto, March 2017
- “The Solar System Beyond Neptune”, Keynote talk for Workshop on Solar System Puzzles, IANCU-Taiwan, July 2016.
- “The mass function of planets in the Galaxy”, Earths in Other Solar Systems—All Hands Meeting, Tucson AZ, September 2015.
- “The Galaxy is teeming with small planets”, Lunar and Planetary Laboratory Conference, Tucson AZ, August 2015.
- “A few points on the dynamical structure of planetary systems”, SPF 1: Star and Planet Formation in the Southwest, March 2015, Biosphere 2 Center, AZ.
- “The dynamical history of our solar system”, 39th COSPAR Scientific Assembly, Mysore, India, July 2012
- “The solar system in time”, Women in Science and Technology, Indian Institute of Technology, New Delhi, India, March 8, 2011
- “Planet migration”, AOGS 2010 – 7th Annual Meeting, Hyderabad, India, July 5-9, 2010.
- “Planet migration in the solar system”, ‘Putting our Solar System in Context’, European Science Foundation Conference, Obergurgl, Austria, April 25-30, 2010.
- “Planet migration in the solar system”, ‘Exoplanets Rising’ – a conference at the Kavli Institute for Physics, Santa Barbara CA, Mar 29–April 2, 2010.
- “Basics of planet migration theory”, UCF Winter School 2010: Exoplanets for Planetary Scientists, Orlando FL, Jan 6-8, 2010.
- “On the importance of a few dwarf planets”, AAS meeting, June 8-11, 2009
- “Finding order in Kuiper Belt chaos”, Theoretical Institute for Advanced Research in Astrophysics, Hsinchu, Taiwan, December 12-16, 2008
- “Planetary scattering and migration: lessons from Pluto”, and “Dynamical clearing”, Great Planet Debate: a Scientific conference and Educator workshop, Applied Physics Laboratory, MD, Aug 14-16, 2008
- “Bombardment of the Terrestrial Planets and Migration history of the giant planets”, Formation, Composition and Early Evolution of Outer Giant and Dwarf Planets and of their Satellites, conference at NASA-Ames, December 6-7, 2007
- “Secular resonances in planetary systems”, Annual Meeting of the AAS Division for Dynamical Astronomy—American Astronomical Society, Halifax, Nova Scotia, June 25-29, 2006.
- “Planets in debris disks”, May Symposium: A decade of extra-solar planets around normal stars, Space Telescope Science Institute, May 1-5, 2005.
- “Exo-planetary debris disks”, Planet Formation Conference, Aspen Institute for Physics, Aspen, CO, Feb 8-12, 2005.
- “The Kuiper Belt”, TPF/Darwin Conference, San Diego CA, July 26-29, 2004.
- “Dynamics of exo-planetary systems”, Astrophysics of Planetary Systems, Cambridge MA, May 17-20, 2004.
- “Asteroids, KBOs and other debris in planetary systems”, Planet Formation Conference, Kavli Institute for Theoretical Physics, UC–Santa Barbara, CA, March 15–19, 2004.
- “Outer Solar System Science with the InterStellar Probe”, *Exploring the Outer Heliosphere*, National Academies, Beckman Institute, UC-Irvine, 6–7 May 2003.
- “Kuiper Belt Dust”, *First Decadal Review of the Edgeworth-Kuiper Belt*, Antofagasta, Chile, March 10-14, 2003.
- “Chaos and Stability in Planetary Systems”, *American Physical Society – April 2002 Meeting*, Albuquerque, NM, April 20-23, 2002.
- “Stability of Planetary Systems”, *Gordon Research Conference on Origins of Solar Systems*, Connecticut College, New London, CT, June 17-22, 2001.
- “Separatrix crossing phenomena in the Solar system”, *Workshop on Nonlinear Astrophysics*, University of Florida, Gainesville, FL, 15-17 February 2001
- “Chaos and stability in the Solar system”, *Frontiers of Science*, National Academy of Sciences, Irvine, CA, 22-23 September 2000
- “Kuiper Belt Dynamics”, *Kuiper Belt Workshop*, 3-4 September 1998, Lowell Observatory, Flagstaff, AZ.

- “Orbital Resonances and Chaos in the Solar System”, *International Workshop on Planetary Sciences*, 3-6 November 1997 in Rio de Janeiro, Brazil.
- “The Kuiper Belt: a review”, *23rd General Assembly of the International Astronomical Union*, 18-26 August 1997 in Kyoto, Japan.
- “The Kuiper Belt: A window on the early Solar system”, *Harold C. Urey Prize Lecture*, Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, July 28-August 1, 1997, Cambridge, MA.
- “Dynamical structure in the Kuiper Belt”, *28th Annual Meeting of the Division of Dynamical Astronomy*, 13–16 April 1997, Flagstaff, AZ.
- “Implications of the Kuiper Belt for the Solar system”, *Asteroids, Comets and Meteors Conference*, July 10 1996, Versailles, France.
- “The Origin of Pluto’s orbit and implications for the Kuiper Belt”, *Kuiper Belt Workshop*, June 8 1996, Toronto, Canada.
- “Orbital dynamics and tidal evolution of the Icy Galilean satellites”, *Icy Galilean Satellites Conference*, Feb 1 1994, San Juan Capistrano, CA.
- “Dynamical models for pulsar-planet systems”, *Aspen Winter Conference on Astrophysics: Millisecond Pulsars*, Jan 3-7, 1994, Aspen, CO.
- “Heliocentric motion of Pluto”, *Pluto–Charon Conference*, July 5-9, 1993, Flagstaff, AZ.
- “Orbital resonances and chaotic dynamics in the Solar System”, *Marlar Graduate Lectures*, August 10-14, 1992, Department of Space Physics and Astronomy, Rice University.
- “Tidal Evolution of the Galilean Resonances: Implications for the Ganymede-Callisto Dichotomy”, *American Geophysical Union Spring Meeting*, May 11-16, 1992, Montreal
- “Orbital Dynamics of PSR1257+12 and its Two Planetary Companions”, *Workshop on Planets around Pulsars*, April 30-May 1, 1992, Caltech, Pasadena, CA.

#### COLLOQUIA/SEMINARS

- Indian Institute of Technology–Hyderabad, December 2023
- University of Arizona, Aerospace and Mechanical Engineering Seminar, October 2023
- University of Arizona, Origins Seminar, December 2022
- Associaçao Laboratorio Interstitucional de e-Astronomia LineA, Rio de Janeiro - RJ - Brasil (webinar), October 2022
- Canadian Institute for Theoretical Astrophysics, Toronto ON, September 2022
- University of Colorado, Boulder CO, April 2022
- Tsinghua University, Aerospace Engineering Seminar (virtual), December 2021
- Indian Institute of Technology-Roorkee, India, May 2021
- University of Arizona, Physics Department Colloquium, Tucson AZ, February 2020
- University of Arizona, Aerospace Engineering Seminar, Tucson AZ, February 2020
- Wittenberg University, IBM Lecture and Physics Colloquium, Springfield OH, September 2019
- Northern Arizona University, Flagstaff AZ, April 2019
- University of Houston, Physics Department Colloquium, Houston TX, November 2018
- Harvard University and Smithsonian Institution, Center for Astronomy Colloquium and Lecar Prize Lecture, Cambridge MA, Sep 2018
- Harvard University, Institute for Theory & Computation luncheon seminars, Cambridge MA, Sep 2018
- The University of Arizona, Lunar and Planetary Laboratory Colloquium, Tucson AZ, August 2018
- Cornell University, Thomas Gold Lecture, Ithaca NY, May 2018
- Cornell University, Astronomy Lunch Seminar, Ithaca NY, May 2018
- Cornell University, Joint Physics-Astronomy Colloquium, Ithaca NY, April 2018
- Raman Research Institute, Bengaluru, India, January 2018
- Herzberg Institute for Astronomy, Victoria BC, 25 April 2017
- University of British Columbia, Astronomy, Vancouver BC, 24 April 2017
- National Optical Astronomy Observatories, Tucson AZ, December 02, 2016
- University of Chicago, Astronomy, February 24, 2016.
- University of Florida, Astronomy, January 28, 2016.

UCLA iPLEX, Los Angeles CA, November 20, 2015.  
 SETI Institute, Mountain View CA, July 21, 2015.  
 Southwest Research Institute, Boulder CO, April 23, 2015.  
 University of California–Berkeley, March 17, 2015  
 University of California–Berkeley, March 15, 2015  
 Institute for Advanced Studies, Princeton NJ, April 8, 2014.  
 Colorado State University, Physics, Fort Collins CO, October 7, 2013.  
 Canadian Institute for Theoretical Astrophysics, April 22, 2013.  
 UNAM, Ensenada, Mexico, April 16-18, 2012, Lecture series on Solar System Dynamics.  
 The University of Arizona, Astrobiology, Oct 21, 2011.  
 Ohio State University, Columbus OH, Sep 22, 2011.  
 Institute for Theory & Computation, Harvard-Smithsonian Center for Astrophysics, Apr 7, 2011.  
 Tata Institute for Fundamental Research, Mumbai, India, March 9, 2011.  
 Southwest Research Institute, Boulder CO, Feb 15, 2011.  
 Rutgers University, New Brunswick NJ, Oct 8, 2010.  
 Institute for Advanced Study, Princeton NJ, Sep 23, 2010.  
 Joint NOAO-SO Colloquium, Tucson AZ, Nov 05, 2009.  
 Lunar and Planetary Institute, Houston TX, Dec 5, 2008.  
 Lowell Observatory, Flagstaff AZ, September 11, 2008.  
 LaPLace Center for Astrobiology, The University of Arizona, March 28, 2008.  
 Arizona State University, School for Earth and Space Exploration, August 29, 2007)  
 The University of Arizona, Theoretical Astrophysics (February 20, 2006).  
 Harvard University, Center for Astrophysics (September 15, 2005)  
 Harvard University, Institute for Theory and Computation (September 13, 2005)  
 Southwest Research Institute, Boulder CO (May 23, 2005)  
 Caltech, Pasadena CA (April 26, 2005)  
 University of California, Santa Cruz CA (April 8, 2005)  
 National Optical Astronomy Observatories, Tucson AZ (April 01, 2005)  
 Planetary Science Institute, Tucson AZ (2004)  
 The University of Arizona, Mathematics (2004)  
 University of California, Berkeley (2002)  
 The University of Arizona, Theoretical Astrophysics (2002)  
 Northwestern University, Evanston IL, (2002)  
 The University of Arizona, Mathematics (2002)  
 Ohio State University, Columbus OH (2002)  
 The University of Arizona, Dept. Mathematics (2001)  
 University of Colorado, Boulder CO (2001)  
 Carnegie Institution of Washington, Washington DC (2001)  
 Planetary Science Institute, Tucson AZ (2001)  
 National Optical Astronomy Observatories, Tucson AZ (2000)  
 University of Michigan, Ann Arbor MI (1999)  
 The University of Arizona, Tucson AZ (1999)  
 California Institute of Technology, Pasadena CA (1999)  
 University of Washington, Seattle WA (1997)  
 The University of Arizona, Tucson AZ (1997)  
 Massachusetts Institute of Technology, Cambridge MA (1997)  
 Institute for Astronomy, Honolulu HI (1996)  
 University of Colorado, Boulder CO (1996)  
 Lunar and Planetary Institute, Houston (1996)  
 University of Florida, Gainesville FL (1994)  
 Meudon Observatory, Meudon, France (1994)  
 Lunar and Planetary Institute, Houston TX (1994)  
 NASA-Ames Space Science Division, CA (1993)

Colorado State University, Fort Collins CO (1993)  
 Johnson Space Center, Houston TX (1993)  
 SouthWest Research Institute, San Antonio TX (1993)  
 Institute for Theoretical Physics, UC-Santa Barbara CA (1992)  
 University of Illinois, Urbana-Champaign IL (1992)  
 Lunar and Planetary Institute, Houston TX (1991)  
 University of Maryland, College Park MD (1991)  
 California Institute of Technology, Pasadena CA (1990)  
 California Institute of Technology, Pasadena CA (1989)  
 Cornell University, Ithaca NY (1989)  
 Cornell University, Ithaca NY (1988)

### CONTRIBUTED CONFERENCE PRESENTATIONS/ABSTRACTS

- Malhotra, R., “Overview: Solar system dynamical evolution and Lunar orbit evolution from the Lunar crater record”, Endurance Science Workshop, Caltech, Pasadena CA, August 2023
- Malhotra, R., Ito, T., “A closer examination of the orbital distribution of Plutinos”, Asteroids, Comets, Meteors Conference, Flagstaff, AZ. LPI Contribution No. 2851, id. 2311, June 2023
- Ito, T., Malhotra, R., “The role of the major planets in the libration of Pluto’s argument of perihelion”, Asteroids, Comets, Meteors Conference, Flagstaff, AZ. LPI Contribution No. 2851, id. 2391, June 2023
- Roy, S., Malhotra, R., “Modeling the Free Inclinations of the Classical Kuiper Belt with the von Mises–Fisher Distribution”, Asteroids, Comets, Meteors Conference, Flagstaff, AZ. LPI Contribution No. 2851, id. 2467, June 2023
- Castro-Cisneros, J.D., Malhotra, R., Rosengren, A.J., “The Near-Earth Asteroid Kamo’oalewa (469219) and its possible origin as Lunar-Ejecta”, Asteroids, Comets, Meteors Conference, Flagstaff, AZ. LPI Contribution No. 2851, id. 2585, June 2023
- Jiao, Y., Cheng, B., Huang, Y., Asphaug, E. Gladman, B., Malhotra, R., Michel, P., Yu, Y., Baoyin, H., “Exploring Asteroid (469219) Kamo’oalewa’s Possible Origin from Lunar Crater Giordano Bruno”, Asteroids, Comets, Meteors Conference, Flagstaff, AZ. LPI Contribution No. 2851, id. 2195, June 2023
- Volk, K., Spencer, D., Malhotra, R., Ragozzine, D., Spoto, F., Micheli, M., Hsieh, H., “Small Body Dynamics Tool (SBDynT): developing user-friendly open-source software for dynamical characterization of small solar system bodies”, Asteroids, Comets, Meteors Conference, Flagstaff, AZ. LPI Contribution No. 2851, id. 2227, June 2023
- Spencer, D., Volk, K., Ragozzine, D., Malhotra, R., SBDynT: Characterizing the Solar System Small Bodies by Proper Elements and Chaos, AAS–DDA meeting #54, id.203.02, May 2023
- Castro-Cisneros, J.D., Malhotra, R., Rosengren, A., “The Dynamical Fate of Lunar Ejecta and the Possible Origin of Earth’s Quasi-satellite Kamo’oalewa”, AAS Division on Dynamical Astronomy meeting #54, id. 503.01, May 2023
- Dietrich, J., Apai, D., R. Basant, Malhotra, R., An Integrated Analysis of Exoplanet Systems and Predicting Hidden Planets, AAS Meeting #241, id.344.03D, BAAS 55, 2, January 2023
- Markwardt, L., Lin, H-W., Gerdes, D.W., Malhotra, R., Adams, F.C., Characterizing Trojan Asteroid Populations Throughout the Solar System, AAS Meeting #241, id.136.09, BAAS 55, 2, January 2023
- Markwardt, L., Lin, H-W., Gerdes, D.W., Malhotra, R., Adams, F.C., Napier, K., Surfaces of Neptune Trojans as Revealed by JWST, AGU Fall Meeting (Chicago IL), id.P26A-03, December 2022
- Malhotra, R., Ito, T., Pluto near the edge of chaos”, Annual meeting of the AAS-DPS 511.03, Oct2022.
- Dietrich, J., Apai, D., R. Basant, Malhotra, R., “An Integrated Analysis of Multi-planet Systems and Predicting Hidden Planets”, Annual AAS-DPS Meeting 201.07, October 2022
- Castro-Cisneros, J.D., Malhotra, R., Rosengren, A., “Earth’s quasi-satellite Kamo’oalewa’s possible origin as lunar ejecta”, 44th COSPAR Scientific Assembly 16-24 July, 2022. Abstract B1.1-0038-22.
- Castro-Cisneros, J.D., Malhotra, R., Rosengren, A., “Earth’s Quasi-satellite Kamo’oalewa’s Possible Origin as Lunar Ejecta”, AAS Division on Dynamical Astronomy meeting #53, id. 204.04, April 2022
- Castro-Cisneros, J.D., Malhotra, R., Rosengren, A., “Kamo’oalewa and the possibility of Co-Orbital Dynamical Outcomes of Lunar Ejecta”, International workshop on Co-orbital Motion: modeling, understanding and exploitation (Virtual), March 2022

- Sharkey, B., Reddy, V., Malhotra, R., et al., “Earth’s quasi-satellite (469219) Kamo’oalewa may be a fragment of the Moon”, 49th Lunar and Planetary Science Conference, The Woodlands, Texas. LPI Contribution No. 2678, id. 1620, March 2022
- Malhotra, R., “Assessing the Origins of Earth Quasi-Satellite (469219) Kamo’oalewa ”, Alien Earths–All Hands Meeting, Tucson AZ, January 2022.
- Malhotra, R., What really goes on in the chaotic zones of the planets, from Earth to Neptune, AAS-DDA annual meeting, 53:305.04, May 2021
- Zaveri, N., Malhotra, R., 2021, Pluto’s Resonant Orbit Visualized in 4D, AAS-DDA annual meeting, 53:107.02
- Matheson, I., Malhotra, R., Rosengren, A., 2021, A measurement of the Kuiper Belt midplane from AI-classified objects, AAS-DDA annual meeting, 53:501.03
- Castro-Cisneros, J.D., Malhotra, R., Rosengren, A., 2021, Near-Earth Asteroid Kamo’oalewa as lunar ejecta, AAS-DDA annual meeting, 53:305.03
- Pearce, L., Malhotra, R., 2021, An investigation of chaotic planetary dynamics induced by the wide stellar binary companion to Boyajian’s star, AAS-DDA annual meeting, 53:204.05
- Volk, K., Malhotra, R., Graham, S., 2021, Mapping Neptune’s resonances into the distant solar system, AAS-DDA annual meeting 53:305.01
- Markwardt, L., Gowman, G., Gerdes, D.W., Malhotra, R., Adams, F.C., 2021, Latest Results from DECam Search for L5 Earth Trojans, LPSC #2548, id.2538, March 2021
- Malhotra, R., Volk, K., 2020, Corraling a distant unseen planet with orbital resonances—an update, AAS-DPS annual meeting #52, id. 304.05, October 2020
- Volk, K., Malhotra, R., 2020, Characterizing and predicting dynamical instabilities in multiplanet systems, AAS-DPS annual meeting #52, id. 312.01, October 2020
- Volk, K., Malhotra, R., 2020, Dynamical instabilities in systems of multiple short-period planets are likely driven by secular chaos: a case study of Kepler-102, AAS-DDA annual meeting #103.1, August 2020
- Volk, K., Malhotra, R., 2020, Kepler-102: a case study for using dynamical constraints to characterize exoplanet systems, American Astronomical Society meeting #235, id. 249.04, Honolulu HI, Jan 2020
- Markwardt, L., Gerdes, D.W., Malhotra, R., Becker, J.C., Hamilton, S.J., Adams, F.C., 2020, Searching for L5 Earth Trojans with DECam, American Astronomical Society meeting #235, id. 329.01, Honolulu HI, January 2020
- Hendler, N., Malhotra, R., 2019, Observational completion limit of minor planets from the asteroid belt to Jupiter Trojans, Asteroid Science in the Age of Hayabusa2 and OSIRIS-REx, 2019, Tucson, AZ
- Reiland, N., Rosengren, A., Malhotra, R., Bombardelli, C., 2019, Assessing and Minimizing Collisions in Satellite Mega-Constellations, Proceedings of the Advanced Maui Optical and Space Surveillance Technologies Conference, Wailea, Maui, Hawaii, 2019
- Markwardt, L., Gerdes, D.W., Malhotra, R., Becker, J.C., Hamilton, S.J., Adams, F.C., 2019, Search for L5 Earth Trojans with DECam, EPSC-DPS Joint Meeting 2019, Geneva, Switzerland
- JeongAhn, Y., Malhotra, R., Reyes-Ruis, M., 2019, Impact fluxes on 2014 MU69 and Pluto and their variations over secular timescales, EPSC-DPS Joint Meeting 2019, Geneva, Switzerland
- Malhotra, R., 2019, Mean motion resonance widths at low and high eccentricity, American Astronomical Society, DDA meeting #50, id. #301.01
- Amato, D., Rosengren, A., Malhotra, R., Sidorenko, V., Bau, G., 2019, The dynamical demise of Luna-3 , American Astronomical Society, DDA meeting #50, id. #302.01
- Volk, K., Malhotra, R., 2019, Not a simple relationship between Neptune’s migration speed and Kuiper belt inclination excitation, American Astronomical Society, DDA meeting #50, id. #201.05
- Volk, K., Malhotra, R., 2018, A statistical exploration of the dynamical stability of Kepler and K2 multiplanet systems, American Astronomical Society, DPS meeting #50, id. 413.04
- Lan, L., Malhotra, R., 2018, Neptune’s 5:2 mean motion resonance in the Kuiper Belt, American Astronomical Society, DDA meeting #49, id. #103.03
- Su, K.Y.L., MacGregor, M.A., Booth, M., Wilner, D.J., Malhotra, A.S., Morrison, OST STDT, 2018, ALMA 1.3 Millimeter Map of the HD 95086 System – A Young Analog of the HR 8799 System, American Astronomical Society, AAS Meeting #231, id. #147.08

- Cambioni, S.; Malhotra, R.; Hergenrother, C. W.; Rizk, B.; Kidd, J. N.; Drouet d'Aubigny, C.; Chesley, S. R.; Shelley, F.; Christensen, E.; Farnocchia, D.; Lauretta, D. S., 2018, An upper limit on Earth's Trojan Asteroid population from OSIRIS-REx, 49th Lunar and Planetary Science Conference, March 2018, at The Woodlands, Texas. LPI Contribution No. 2083, id. 1149
- Malhotra, R., Volk, K., 2017, The Midplane of the Kuiper Belt and Its Unexpected Warps, American Astronomical Society, DPS meeting #49, #405.11
- Cambioni, S., Malhotra, R., 2017, The Midplane of the Asteroid Belt and Its Warps, American Astronomical Society, DPS meeting #49, #201.04
- Reddy, V., Kuhm, O., Thirouin, A., Conrad, A., Malhotra, R., Sanchez, J.A., Veillet, C., Ground-based Characterization of Earth Quasi Satellite (469219) 2016 HO3, American Astronomical Society, DPS meeting #49, #204.07
- Malhotra, R., 2017, Evidence for distant Earth(s) in the Solar System, Earths in Other Solar Systems–All Hands Meeting, Tucson AZ, September 2017.
- Hergenrother, C. W.; Malhotra, R.; Rizk, B.; Kidd, J. N.; Drouet d'Aubigny, C.; Chesley, S. R.; Lauretta, D. S., A Search for Earth Trojan Asteroids with the OSIRIS-REx Spacecraft, 48th Lunar and Planetary Science Conference, March 2017, at The Woodlands, Texas. LPI Contribution No. 1964, id. 2892
- Malhotra, R., Volk, K., Wang, X., 2016, Corraling a distant unseen planet with extreme resonant Kuiper belt objects, American Astronomical Society, DPS meeting #48, #200.04
- JeongAhn, Y., Malhotra, R., et al., 2016, Spatial distribution of steep lunar craters may be linked to size-dependent orbital distribution of impactors, American Astronomical Society, DPS meeting #48, #215.07
- Volk, K., Malhotra, R., 2016, Evidence for a distant unseen solar system planet: Assessing observational biases in the extreme Kuiper belt population, American Astronomical Society, DPS meeting #48, #120.11
- Malhotra, R., 2016, The mass distribution function of planets in the Galaxy, American Astronomical Society, DDA meeting #47, #204.01
- Volk, K., Malhotra, R., Wang, X., 2016, Dynamics of the most distant Kuiper belt objects, American Astronomical Society, DDA meeting #47, #105.03
- Wang, X., Malhotra, R., 2016, High eccentricity MMRs in the circular planar restricted three-body problem, American Astronomical Society, DDA meeting #47, #103.04
- Malhotra, R., JeongAhn, Y., Mars/Moon Impact Rate Ratio of Kilometer-Size Impactors, 47th Lunar and Planetary Science Conference, March 2016, The Woodlands, Texas. LPI Contribution No. 1903, p. 2935
- Malhotra, R., Oort Cloud Comet Encounters with Mars, Earth, Venus and Mercury, 46th Lunar and Planetary Science Conference, March 2015, The Woodlands, Texas. LPI Contribution No. 1832, p. 2467
- McEwen, A., Daubar, I., Ivanov, B., Oberst, J., Malhotra, R., JeongAhn, Y., Byrne, S., 2015, Current Impact Rate on Earth, Moon, and Mars, 46th Lunar and Planetary Science Conference, March 2015, The Woodlands, Texas. LPI Contribution No. 1832, p. 1854
- Jones, R.L., Zeljko, I., Malhotra, R., et al., 2014, Solar System Science with LSST, American Astronomical Society, DPS meeting #46, #214.13
- Morrison, S.J., Malhotra, R., Su, K.Y.L., 2014, The Planetary System of HD 95086 — A Young Analog of HR 8799?, American Astronomical Society, DPS meeting #46, #204.03
- Su, K.Y.L., Morrison, S.J., Malhotra, R., et al., 2014, The Debris Structures of HD 95086 — A Young Analog of HR 8799, American Astronomical Society, DPS meeting #46, #204.02
- JeongAhn, Y., Malhotra, R., 2014, The current impactor flux on Mars and its seasonal variation, American Astronomical Society, DPS meeting #46, #203.08
- Malhotra, R., 2014, A few points on the dynamical evolution of the young solar system, American Astronomical Society, DDA meeting #45, #400.01
- Morrison, S.J., Malhotra, R., 2014, Planetary chaotic zone clearing: destinations and timescales, American Astronomical Society, DDA meeting #45, #400.02
- Malhotra, R., Petrovich, C., Tremaine, S., 2013, In-situ Planet Formation: Implications for Planets near Resonances, American Astronomical Society, DPS meeting #45, #300.05
- Volk, K., Malhotra, R., 2013, Ordering Mean Motion Resonances with the Farey Tree: Application to the Kuiper Belt, American Astronomical Society, DPS meeting #45, #414.01
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- Malhotra, R., Jeongahn, Y., 2011, Dynamical investigations on the leading/trailing asymmetry of lunar rayed craters, Joint EPSC-DPS meeting, #2011-1215
- Minton, D.A., Malhotra, R., 2011, The sweeping  $\nu_6$  secular resonance during giant planet migration: implications for models of the primordial excitation and depletion of the asteroid belt, Joint EPSC-DPS meeting, #2011-591
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- JeongAhn, Y., Malhotra, R., 2010, Co-orbital Asteroids of Earth as Candidates for Asymmetric Impactors on the Moon, American Astronomical Society, DPS meeting #42, #13.03
- Volk, K., Malhotra, R., 2010, Resonant Pathways to the Distant Kuiper Belt, TNO Conference, Philadelphia, PA.
- Volk, K., Malhotra, R., 2010, Orbital inclination evolution and correlations with physical properties of KBOs, American Astronomical Society, DDA meeting #41, #2.03
- Malhotra, R., Ito, T., 2009, Asymmetric Impacts Of Near-earth Asteroids On The Moon, American Astronomical Society, DPS meeting #41, #27.01
- Malhotra, R., Minton, D.A., 2009, Dynamical Erosion of the Asteroid Belt and Implications for the Rate of Large Impacts on the Terrestrial Planets, American Astronomical Society, DPS meeting #41, #27.02
- Volk, K., Malhotra, R., 2009, Resonant Channels to the Distant Kuiper Belt, American Astronomical Society, DPS meeting #41, #62.03
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- Minton, D.A., Malhotra, R., 2009, Dynamical Erosion of the Asteroid Belt, American Astronomical Society, DDA meeting #40, #12.05
- Volk, K., Malhotra, R., 2009, Dynamical Pathways to the High-Perihelion Scattered Disk, American Astronomical Society, DDA meeting #40, #5.03
- Belbruno, E., Moro-Martin, A., Malhotra, R., 2009, Minimal Energy Transfer of Solid Material Between Planetary Systems, American Astronomical Society, DDA meeting #40, #2.05
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- Volk, K., Malhotra, R., 2008, Reassessing the Classical Kuiper Belt as a Source of the Jupiter Family Comets, American Astronomical Society, DPS meeting #40, #47.01
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- Malhotra, R., Dynamical cause of the Late Heavy Bombardment, 38th Lunar and Planetary Science Conference, March 12-16, 2007, League City, Texas. LPI Contribution No. 1338, p. 2373
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- Moro-Martín, A., and Malhotra, R., 2003, Dust Outflows from Planetary Systems, AAS Meeting 203, #17.11
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- Bernstein, G.M., Allen, R.L., Brown, M.E., Holman, M.J., Malhotra, R., Trilling, D.E., 2003, The Size Distribution of Kuiper Belt Objects from a Deep HST/ACS Survey, AAS–DPS Annual meeting #35, #49.03
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- Hahn, J. and Malhotra, R., 1998. Orbital evolution of planets embedded in a massive debris disk, *LPSC XXIX*, paper no. 1398.

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## TEACHING & MENTORING

### PhD Dissertations:

- Jose Daniel Castro-Cisneros* (Physics, graduate student), 2021–present
- Ian Matheson* (Aerospace Engineering, graduate student), 2020–present
- Youngmin JeongAhn* - Planetary Sciences, PhD 2015  
(currently Postdoctoral Associate, KASI, Korea)
- Kathryn Volk* - Planetary Sciences, PhD 2013  
(currently Associate Staff Scientist, U. Arizona)
- David A. Minton* - Planetary Sciences, PhD 2009  
(currently Associate Professor, Purdue University)
- Amaya Moro-Martin* - Astronomy, PhD 2004  
(currently Assistant Astronomer, Space Telescope Science Institute)

Matthew Tiscareno - Planetary Sciences, PhD 2004  
(currently Senior Research Scientist, SETI Institute)

Post-docs

Kathryn Volk, 2015–2017  
Stephen Kortenkamp, 2002-2004  
Takashi Ito, 2002-2004  
Joseph Hahn, 1997-2000

Other advisees/mentees

Garett Brown (Astronomy, graduate student at University of Toronto), 2022-  
Larissa Markwardt (Astronomy, graduate student at University of Michigan), 2018-  
Supriya Roy (high school student, Stanford Online High School), 2023  
Jeremy Dietrich (Astronomy, graduate student), 2021-2023  
Zherui Chen (undergraduate student, Tsinghua University, China), 2022  
David Lomeli (Physics & Astronomy, undergraduate student), 2020-2022  
Ilia Korgachin (Queens University-Canada, post baccalaureate student), 2020-2021  
Nihaal Zaveri (UC-Santa Cruz, post baccalaureate student), 2020-2021  
Hamish Hay (Planetary Sciences, graduate student), 2016-2020  
Rachel Smullen (Astronomy, graduate student), 2016-2020  
Nathan Reiland (Aerospace Engineering, graduate student), 2018-2020  
Theodore Broeren (Applied Mathematics, graduate student), 2019  
Jelena Spegar (Astronomy and Mathematics, undergraduate student), 2018  
Michael Hammer (Astronomy, graduate student), 2018  
Adam Sutherland (Astronomy, graduate student), 2018  
Nan Zhang (visiting undergraduate student, Tsinghua University, China), 2018  
Lei Lan (visiting graduate student, Tsinghua University, China), 2017–2018  
Po-yen Liu (visiting graduate student, National Central University of Taiwan), 2017–2018  
Nathaniel Hendler (Planetary Sciences, graduate student), 2017-2020  
Saverio Cambioni (Planetary Sciences, graduate student), 2017-2018  
Xianyu Wang (visiting graduate student from Tsinghua University, China), 2015–2016  
Sonia Cornejo (Latin America Summer Program, undergraduate), 2016  
Timothy Rodigas (Astronomy, graduate student), 2012-2013  
Sarah Morrison (Planetary Sciences, graduate student), 2011-2015  
Brenae Bailey (Applied Mathematics, graduate student), 2007-2009  
Tatiana Michtchenko (University of Sao Paulo, Brazil), 2002-2003

Graduate courses:

*Asteroids, Comets, Kuiper Belt Objects*: graduate elective in planetary science, 3 credit units, Fall 2011, Fall 2013, Fall 2014, Fall 2016, Fall 2018  
*Solar System Dynamics*: graduate elective in astronomy, core class in planetary science, 3 credit units, Fall 2003, Fall 2005, Fall 2009, Spring 2014, Spring 2016, Spring 2018, Spring 2020, Spring 2022, Spring 2024  
*Advanced Solar System Dynamics*: graduate elective in planetary science, 3 credit units, Spring 2021

Undergraduate courses:

*The Universe and Humanity*: general education–tier 1; 3 credit units, enrollment ~40; Spring 2017, Spring 2019  
*Asteroids, Comets, Kuiper Belt Objects*: upper level undergraduate elective in planetary science, 3 credit units, enrollment ~5–10/semester; Fall 2011, Fall 2013, Fall 2014, Fall 2016, Fall 2018  
*Our Golden Age of Planetary Exploration*: general education–tier II; 3 credit units, enrollment ~150/semester; Spring 2010  
*Planet Earth: Evolution of a Habitable World*: general education–tier I; 3 credit units, enrollment ~150/semester; Fall 2001, Spring 2002, Fall 2002, Spring 2004, Fall 2004, Spring 2006, Spring 2007, Spring 2008  
*New Views of the Solar System*: first year colloquium, 1 credit unit, enrollment ~15–20/semester; Spring 2005

NATIONAL/INTERNATIONAL SERVICE

Indian Institute of Technology-Delhi – Alumni Awards Selection Committee (2023)  
 NASA Early Career Awards (2023)  
 NASA Senior Review–New Horizons (2022)  
 NASA NEO-Surveyor Peer Review Board (2021-2022)  
 Universities Space Research Association, Chair of the Council of Institutions and Member of the Board of Trustees (2020–2022)  
 American Academy of Arts and Sciences – Class I Section 4 Membership Panel (2019-2020)  
 National Academy of Sciences – service on various committees (2018–)  
 American Astronomical Society-Division for Dynamical Astronomy, Vera Rubin Prize Committee, Chair (2018)  
 American Astronomical Society-Division for Planetary Sciences, Prize Sub-Committee (2017)  
 American Astronomical Society-Division for Dynamical Astronomy, Vera Rubin Prize Selection Committee (2017)  
 American Astronomical Society-Division for Dynamical Astronomy, Awards Review Committee (2016)  
 Morrison Planetarium of the California Academy of Sciences, Science Advisor (2015–2016)  
 Celestial Mechanics Institute, Elected Member (2014–)  
 LSST–Science Advisory Committee (2014–2018)  
 Harvard University – Ad Hoc Tenure Review Committee (2013)  
 Aspen Center for Physics, Winter Conference on Exoplanets in Multi-body Systems in the Kepler Era, Scientific Organizing Committee (2012-2013)  
 American Astronomical Society-Division for Planetary Sciences 2011 Scientific Organizing Committee (chair) Kavli Prize nomination, 2009  
 International Astronomical Union – Commission 7 (elected member), 2006  
 NOAO Solar System Time Allocation Committee, 2006–2008  
 NASA Outer Planets Research Program Review Panel, 2006  
 IAU Symposium on Extrasolar Planets–2007, Suzhou, China: Scientific Organizing Committee, 2005–2007  
 Protostars & Planets V (International Conference in Hawaii in 2005, book 2006): Scientific Advisory Committee, 2002–2006  
 Interstellar Probe Science and Technology Definition Team, 1999–2004  
 LPSC Program Committee 1997–2000  
 NASA Origins of Solar Systems Research Program: Management Operations Working Group, 1998–2000  
 NASA Planetary Geophysics Research Program Review panel 1998–1999  
 Kuiper Belt Workshop, Toronto, 1996: co-organiser  
 Icy Galilean Satellites Conference, San Juan Capistrano, California: Scientific Organising Committee, 1994  
 LPSC Program Committee 1993–1994  
 Referee for 5–10 professional journal papers per year  
 Reviewer for 5–10 research grant proposals per year

UNIVERSITY/DEPARTMENT SERVICE

LPL Awards Committee, Chair 2023-2024  
 LPL Promotion & Tenure Committee, 2023-2024  
 LPL Curriculum Committee, 2023-2024  
 LPL Promotion & Tenure Committee, Chair, 2021-2022  
 LPL Faculty Recruitment Committee, 2021-2022  
 LPL-KASI joint workshop on Apophis space mission, Chair, 2021  
 LPL Awards Committee, Chair 2019-2021  
 Invited research presentation to Steward Observatory Advisory Board, 2020  
 LPL Marketing & Branding Committee, Chair, 2019-2020  
 LPL Awards Committee, 2019-2020  
 LPL Buyout Committee (ad hoc), 2019-2020  
 University Representative to USRA, 2011–present

Steward Observatory Faculty Status (Promotion & Tenure Review) Committee, 2018-2019  
 College of Science Women's Leadership Steering Committee, 2018-2019  
 LPL Awards Committee, Chair, 2018-2019  
 LPL Computer Committee, 2018-2019  
 LPL Red Team reviewer, 2018  
 UA-Reviewer for Packard Fellowship Proposals, 2018-2019  
 LPL Faculty Status (Promotion & Tenure Review) Committee, Chair, 2016-2018  
 UA-Henry Koffler Prize Selection Committee, Chair, 2017  
 LPL Professor of Practice – Promotion & Tenure ad hoc Review Committee, 2016-2017  
 LPL Awards Committee, 2016-2018  
 Theoretical Astrophysics Program, Chair, 2011-2016  
 LPL Journal Club co-organizer, 2014-2015  
 College of Science Galileo Circle Fellows Selection Committee, 2014-2016  
 LPL Faculty Status (Promotion & Tenure Review) Committee, 2013-2015  
 Standing member, LPL Graduate Student Candidacy Examination Committees, 2013  
 College of Science Honors Convocation, Keynote speaker, Fall 2012  
 Lunar and Planetary Laboratory-Strategic Planning Committee, 2012  
 Lunar and Planetary Laboratory-Director Search Committee, 2011  
 Lunar and Planetary Laboratory-Strategic Planning Committee, 2011  
 Lunar and Planetary Laboratory-Strategic Planning Committee, Chair, 2009  
 Academic Program Review of UA Astronomy Department, 2009  
 Lunar and Planetary Laboratory-Faculty Peer Review Committee, 2009  
 Lunar and Planetary Laboratory-Faculty Peer Review Committee, Chair, 2008  
 Lunar and Planetary Laboratory-Computer Committee, 2008, 2009  
 Lunar and Planetary Laboratory-Library Committee, Chair, 2008  
 Blitzer Award Committee, UA, 2006-2008  
 Theoretical Astrophysics Program Steering Committee, UA, 2005-present  
 UA-Templeton Steering Committee, UA, 2005-2008  
 Lunar and Planetary Laboratory-Promotion and Tenure Committee, 2005, 2006, 2007  
 Academic Program Review of UA Planetary Sciences Department, 2006  
 Review Committee for LPL-Director, UA, 2005  
 Astrobiology Faculty Search Committee, UA, 2005  
 Astrobiology Graduate Student Bessey Award Committee, UA, 2004-2007  
 Pre-tenure Advising & Review planning committee, LPL, 2003  
 Centennial Awards Committee, UA, 2002-2004  
 Representative to Oral Comprehensive Examinations for Doctoral Candidacy, 2002-2005  
 Graduate Admissions & Advising Committee, LPL 2001-2002  
 Lunar and Planetary Laboratory Action Plan Committee, 2000  
 Computer Resources Committee, LPL 2000  
 Theoretical Astrophysics Colloquium Organizer, 2000-2001

## PUBLIC OUTREACH

On unusual near-Earth asteroid Kamo'oalewa – UA News, October 23, 2023; and interviews with multiple online media (New York Times, CNN, Wired, NPR affiliates (KJZZ, AZPM), Space.com, LiveScience, MangoTV, CuriosityTV, etc.), October-November 2023  
 On solar system dynamics – consultation with BBC-PBS-NOVA The Planets 2, July 2023  
 On the unusual near-Earth asteroid Kamo'oalewa – interview for Curiosity Stream documentary, June 2023  
 On the stability and chaotic dynamics of the solar system – Interview for Live Science, May 2023  
 Q&A with Asian Pacific Islander Desi American Heritage Month Faculty Spotlight – University of Arizona – College of Science, April 2023  
 On tides and volcanoes of extra-terrestrial bodies – Interview for BBC Planets 2 documentary film, March 2023

“Stormy seas of chaos in the three body problem”, 2nd Place Winner, animated data art presentation at The Art of Planetary Science Exhibit, February 2023

Search for Planet 9, a film by Florence Tran written with Cécile Dumas, Vimeo, December 2022

On Milankovitch theory of climate cycles – consultation for Associated Press, July 2022

On lunar impact by a rocket body – consultation for Leonard David’s Inside Outer Space news blog, June 2022

Q&A with PNAS, April 2022

On interplanetary dust – consultation for Nature Astronomy, April 2022

Weird orbits and how they work, Live interview with Fraser Cain/Universe Today, YouTube, April 2022

Migratory planets and chaos in the young solar system, Phoenix Astronomical Society meeting, March 2022

On Planet 9 – Interview for podcast program, “Last Seen”, WBUR-Boston (NPR affiliate), February 2022

On the faint young Sun paradox – interview for Quanta magazine, January 2022

On Planet 9 – Interview for a documentary film, French Public TV, September 2021

On Planet 9 – Interview for a documentary program, ScreenGlue.com, UK, July 2021

Panel Discussion on “Talented Teachers with a Leadership Mindset”, IIT-Delhi Faculty Alumni Day, October 4, 2020; streamed on YouTube and FaceBook

Steward Observatory Advisory Board – presentation on Planet Nine, 2020

Plenary address and Q&A at Conference for Undergraduate Women in Physics at the University of Oklahoma, Norman, January 18, 2020

Q&A with Babbage Radio of the Economist magazine, December 2019

The Structure and Evolution of the Solar System, presentation to Seminarians of Sacred Heart Seminary and School of Theology, Hales Corners, Wisconsin, February 28, 2019

Q&A with Tucson’s Hard Science Fiction Writers Group, September 1, 2018

Radio interview - MicRobin Radio (AM970 in New York, New York), Dec 9, 2017

Prospects for Unseen Planets in the Distant Solar System, Huachuca Astronomy Club, August 11, 2017

The Search for Planet Nine, TEDx, Portland, OR, April 2017 (> 1 million views)

The Structure and Evolution of the Solar System, Saddlebrooke SkyGazers Club, February 12, 2017

The Structure and Evolution of the Solar System, Sun City-Oro Valley, October 20 2016

Pluto Matters, Benjamin Dean lecture, Morrison Planetarium, May 9, 2016

Planet Migration, Other Earths dinner presentation, April 20, 2016

The Structure and Evolution of the Solar System, UA Osher Lifelong Learning Institute, March 18, 2016

Science Advisor for California Academy of Sciences–Morrison Planetarium, 2015-2016

Pluto and the Kuiper Belt, UA-Summer Science Saturday Lecture Series, July 18 2015.

The Structure and Evolution of the Solar System, UA Lifelong Learning Institute, Oct 01, 2014

Jury panel for “The Art of Planetary Science”, UA, Oct 2014

Tracking the Planets: Ours and Theirs, Girls Need Their Space, UA, March 29, 2014

Fractions for Planets, art exhibit for “The Art of Planetary Science”, UA, Oct 2013

The Early History of the Solar System, Biosphere 2, AZ, Oct 22, 2011

Migrating planets, East Valley Astronomy Club, Mesa, AZ, Nov 5, 2009

Migrating Planets, Arizona Senior Academy Village, October 01, 2009

Migrating planets, LPL Public Evening Lecture, Tucson, AZ, Sep 15, 2009

Panelist for “Expanding Your Horizons Youth Conference”, UA-WISE, Tucson, AZ, March 28, 2009

Balancing work and family, Girl Scout Troop 794, Tucson, AZ, Feb 22, 2009

Lessons from Pluto, Basis High School, Tucson, AZ, Oct 24, 2008

Optical Illusions, Science Night at Catalina Foothills School District, Tucson, AZ, Dec 1, 2007

Video program on the Late Heavy Bombardment, National Geographic, Nov 27, 2006

Workshop on Space Science for K-12 teachers in the Catalina Foothills School District, Tucson, AZ, July 25–28, 2005

Video program on the Solar System, Coast Learning Systems Astronomy Telecourse, September 21, 2004

Presentation and discussion on new discoveries in the Solar System, Science Teachers Workshop, Catalina Foothills School District, Tucson, AZ, June 2004

*Popular writing/press:*

Pluto orbits in elegant arrangement with the giant planets, The Science Breaker, May 2023

- How Pluto walks a tightrope between a stable and a chaotic orbit, Keith Cooper, Space.com, April 2022
- Planetary migration: a brief history of the solar system’s evolution, article in IIT-Tech Ambit, June 2021
- Prospects for Unseen Planets Beyond Neptune, presentation to the UA Osher Lifelong Learning Institute, February 19, 2021
- On the Great Conjunction of December 2020 – Interviews with National Public Radio, New York Times, KPXX TV, December 2020
- “How the planets got their spots”, Economist magazine, December 2019
- Interview with PBS NOVA, WGBH Educational Foundation, Boston, MA, February 25, 2019
- Q&A with Transmitter Media (New York City), January 5, 2019
- Interview with Arizona Daily Star, Nov 8, 2018
- “An Indian orbiter reached Mars five years ago, and it’s still ticking”, Ars Technica, October 2019
- “La mystérieuse planète X serait plus proche que prévu du Soleil”, Le Figaro, March 2019
- “A Journey Into the Solar System’s Outer Reaches, Seeking New Worlds to Explore”, New York Times, December 2018
- “Did This Wrong-way Asteroid Come from Beyond the Solar System?”, Sky & Telescope, May 2018
- “Elon Musk’s Tesla in Space Could Crash Into Earth”, National Geographic News, February 2018
- “Forget Planet 9 – there’s Evidence of a Tenth Planet Lurking at the Edge of the Solar System”, Newsweek, June 2017
- “UA-led OSIRIS-REx team snaps photos of Jupiter and its moons ”, Arizona Daily Star, February 2017
- “In the motions of distant solar system objects, astronomers find hints of Planet Nine”, Los Angeles Times, October 2016
- “The Galaxy may be teeming with small planets”, Arizona Daily Star–Science Supplement, January 2016
- “Exploring our solar system’s past through Pluto”, Arizona Science podcast, AZPM.org, December 2015
- “Our wild wild solar system”, cover story in National Geographic magazine, July 2013
- NASA Solar System Exploration portal profile, <http://solarsystem.nasa.gov/people>, July 2013
- “What Would Happen If Earth and Mars Switched Places?”, Scientific American, blog by George Musser, June 2011
- AstroConfidential* column, Astronomy magazine, June 2011
- “Will Pluto ever collide with Neptune?”, Astronomy magazine, October 2007
- “Planets and planetary systems”, *Scholastic Encyclopedia* (2005)
- “Migrating Planets”, *Scientific American*, 281(3):56-63 (1999)
- “Chaotic planet formation”, *Nature*, 402:599-600 (1999)
- “Galileo reveals Ganymede’s secrets”, *Physics World*, March 1997
- “Bringing Order to Chaos”, *Mercury*, 26(4):33-34 (1997)
- “The Kuiper Belt: a review of the present status”, *Highlights of Astronomy*, 11A:223-228 (1998)
- “The origin of the Solar system”, *Encyclopedia of Earth Sciences*, McMillan Publishing, New York(1995)
- “Pluto and Charon: Planets on the edge”, *Lun. and Plan. Infm. Bull.*, August (1993)
- ℘ Numerous interviews with science journalists, on radio and in print and electronic media.