

Konstantin Batygin
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Curriculum Vitae
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Education

Ph.D., Planetary Science (2012) California Institute of Technology
M.S., Planetary Science (2010) California Institute of Technology
B.S., Astrophysics (2008) (with honors) University of California, Santa Cruz

Academic Employment

Assistant Professor, Caltech	Jun. 2014 - present
Harvard ITC Postdoctoral Fellow, Harvard Center for Astrophysics	Nov. 2012 - Jun. 2014
Postdoctoral Fellow, Observatoire de la Cote d'Azur, Nice, France	Jul. 2012 - Nov. 2012
Visiting Scientist, Observatoire de la Cote d'Azur, Nice, France	Feb. 2011 - Mar. 2011
Graduate Research Assistant/Teaching Assistant, Caltech	Sep. 2008 - Jun. 2012
Research Assistant, UCO/Lick Observatory	Mar. 2006 - Sep. 2008
Supplemental Instructor, University of California, Santa Cruz	Mar. 2006 - Jun. 2006
Research Assistant, NASA Ames Research Center	Jul. 2005 - Jan. 2006

Advising Experience

Stephen Markham, Caltech (Graduate Student, Planetary Science) 2016
Bhawna Motwani, Caltech (Graduate Student, Astronomy) 2016 -
Walker Melton, Caltech (Undergraduate Student, Physics) 2016
Natalia Storch, Caltech (Postdoc, Physics/Astronomy) 2016 -
Richard Zhu, Caltech (Undergraduate Student, Physics) 2015
Elizabeth Bailey, Caltech (Graduate Student, Planetary Science), 2016 -
Abhijit Puranam, Caltech (Undergraduate Student, Physics/Planetary Science), 2015 - 2017
Henry Ngo, Caltech (Graduate Student, Planetary Science, joint with H. Knutson) 2015
Peter Buhler, Caltech (Graduate Student, Planetary Science, joint with H. Knutson) 2015
Katherine Deck, Caltech (Postdoc, Planetary Science/Astronomy), 2014 - 2017
Christopher Spalding, Caltech (Graduate Student, Planetary Science), 2013 - 2018
Gongjie Li, Harvard (Graduate Student, Astrophysics, joint with A. Loeb, S. Naoz), 2012 - 2014
Juliette Becker, Caltech (Undergraduate Student, Astrophysics), 2011 - 2013
Hayden Betts, Polytechnic School (High School Student), 2011

Teaching Experience

Astro/Geo 133 "Formation and Evolution of Planetary Systems" undergraduate/graduate class
Astro/Geo 137 "Planetary Physics" undergraduate/graduate class
Astro/Geo 198 "Extrasolar Planets" special topics seminar

Awards

Garfinkel Memorial Lectureship (Yale) - 2017
AAS WWT Prize in research - 2016
Popular Science Brilliant 10 - 2016
Forbes 30 Under 30: Science - 2015
Harvard ITC Prize Fellowship - 2012
Recognition of Excellence in Teaching Assistance (Caltech) - 2011
NASA NESSF Graduate Fellowship (Caltech) - 2010
Steck Award (Best Senior Thesis in UC Santa Cruz) - 2008
Dean's Award (UC Santa Cruz) - 2008
Chancellor's Award (UC Santa Cruz) - 2008

Professional Service

Referee for *ApJ*, *ApJL*, *AJ*, *A&A*, *Nature*, *Nature Astronomy*, *Science*, *Science Advances*, *MNRAS*, *CMDA*, *PNAS*, *Earth Moon and Planets*, panelist for various NASA and NSF programs, LOC/SOC for various conferences, chair of the LOC for 2015 AAS/DDA conference.

Selected Colloquia and Invited Conference Talks (2013-2017)

AAS Conference Plenary Talk, June 6 2017
University of Geneva Exoplanet Colloquium, May 12 2017
University of Bern CSH Colloquium, May 10 2017
University of Zurich Astrophysics Colloquium, May 8 2017
University of Heidelberg Physics Colloquium, May 5 2017
University of Copenhagen StarPlan Seminar, May 2 2017
Yale University Boris Garfinkel Lecture, April 27 2017
University of Washington Astronomy Colloquium, April 20 2017
IEEE Aerospace Conference Plenary Talk, March 9 2017
Rice University Physics and Astronomy Colloquium, Feb 1 2017
APS Conference, Jan 31 2017
Earnest C. Watson Lecture Series at Caltech, December 7 2016
University of Chicago Astronomy and Astrophysics Colloquium, November 30 2016
Dixie State University Forum November 16 2016
Princeton University Astrophysics Seminar, November 7 2016
Observatoire de la Cote d'Azur Planetary Science Seminar, November 2 2016
CfA Colloquium, Harvard University October 27 2016
USC Center for Applied Mathematical Sciences Colloquium, October 10 2016
UCLA Earth, Planetary and Space Sciences Colloquium, October 6 2016
CalState LA Physics Colloquium, September 29 2016
National Academy of Sciences Annual Meeting, May 1 2016
CSU Northridge Physics & Astronomy Colloquium, April 27 2016
CMA Lecture Series at JPL, April 5 2016
UC Berkeley Astronomy Colloquium, March 10, 2016
University of Toronto Center for Planetary Science Colloquium, February 24 2016

IAU XXIX General Assembly, August 12 2015
UC Santa Cruz Astronomy Colloquium, April 15 2015
SETI Institute Seminar Series, April 14 2015
SPF1 Planet Formation Conference, March 25 2015
UCLA Planetary Science Seminar, CA October 24 2014
US Naval Observatory Scientific Colloquium, October 24 2014
MIRA Circumstellar Disks and Planet Formation Conference, October 14 2014
Cornell University Astronomy and Space Sciences Colloquium, April 13 2014
UCLA Astrophysics Colloquium, Los Angeles, CA, March 5 2014
SWRI Planetary Science Colloquium, March 4 2014
Lund University Astronomy Seminar, November 7 2013
Observatoire de la Cote d'Azur Planetary Science Colloquium, October 31 2013
CIERA/Northwestern University Astrophysics Seminar, October 15 2013

Publications (1st-3rd author)

1. [An Analytic Criterion for Turbulent Disruption of Planetary Resonances](#) (2017) **K. Batygin** & F. Adams, *The Astrophysical Journal*, 153, 120
2. [Generation of Highly Inclined Trans-Neptunian Objects by Planet Nine](#) (2016) **K. Batygin** & M. Brown, *The Astrophysical Journal Letters*, 833, 3
3. [Solar Obliquity Induced by Planet Nine](#) (2016) E. Bailey, **K. Batygin**, M. Brown, *The Astronomical Journal*, 152, 126
4. [Dynamical Constraints on the Core Mass of Hot Jupiter HAT-P-13b](#) (2016) P. B. Buhler, H. A. Knutson, **K. Batygin**, B. J. Fulton, J. J. Fortney, *The Astrophysical Journal*, 821, 26
5. [In Situ Formation and Dynamical Evolution of Hot Jupiter Systems](#) (2016) **K. Batygin**, P. H. Bodenheimer, G. Laughlin, *The Astrophysical Journal*, 829, 114
6. [Spin-orbit Misalignment as a Driver of the Kepler Dichotomy](#) (2016) C. Spalding & **K. Batygin**, *The Astrophysical Journal*, 830, 5
7. [Pathway to Planet Nine](#) (2016) **K. Batygin**, *Physics World*, July 2016 issue
8. [Born of Chaos: the Violent Biography of Our Solar System](#) (2016) **K. Batygin**, G. Laughlin, A. Morbidelli, *Scientific American*, May 2016 issue (cover story)
9. [Observational Constraints on the Orbit and Location of Planet Nine in the Outer Solar System](#) (2016) M. Brown & **K. Batygin**, *The Astrophysical Journal Letters*, 824, 2
10. [Resonant Removal of Exomoons During Planetary Migration](#) (2016) C. Spalding, **K. Batygin**, F. Adams, *The Astrophysical Journal*, 817, 18
11. [Evidence for a Distant Giant Planet in the Solar System](#) (2016) **K. Batygin** & M. Brown, *The Astronomical Journal*, 151, 22
12. [Magnetic Origins of the Stellar Mass-Obliquity Correlation in Planetary Systems](#) (2015) C. Spalding & **K. Batygin**, *The Astrophysical Journal*, 811, 82
13. [Spin-Spin Coupling in the Solar System](#) (2015) **K. Batygin** & A. Morbidelli, *The Astrophysical Journal*, 810, 110B
14. [Capture of Planets Into Mean-Motion Resonances and the Origins of Extrasolar Orbital Architectures](#) (2015) **K. Batygin**, *Monthly Notices of the Royal Astronomical Society*, 451, 2589B
15. [Jupiter's Decisive Role in the Inner Solar System's Early Evolution](#) (2015) **K. Batygin** & G. Laughlin, *Proceedings of the National Academy of Sciences*, 112, 4214B

16. Migration of Two Massive Planets Into (and Out of) First Order Mean Motion Resonances (2015) K. Deck & **K. Batygin**, *The Astrophysical Journal*, 810, 119
17. Dynamical Evolution of Multi-Resonant Systems: the Case of GJ876 (2015) **K. Batygin**, K. Deck, M. Holman, *The Astronomical Journal*, 149, 167B
18. Chaotic Disintegration of the Inner Solar System (2015) **K. Batygin**, A. Morbidelli, M. J. Holman, *The Astrophysical Journal*, 799, 120B
19. Alignment of Protostars and Circumstellar Disks During the Embedded Phase (2014) C. Spalding, **K. Batygin**, F. Adams, *The Astrophysical Journal Letters*, 797, L29
20. Non-axisymmetric Flows on Hot Jupiters with Oblique Magnetic Fields (2014) **K. Batygin**, S. Stanley, *The Astrophysical Journal*, 794, 10B
21. Pre-Late Heavy Bombardment Evolution of the Earth's Obliquity (2014) G. Li & **K. Batygin**, *The Astrophysical Journal*, 795, 67L
22. Early Excitation of Spin-Orbit Misalignments in Close-in Planetary Systems (2014) C. Spalding & **K. Batygin**, *The Astrophysical Journal*, 790, 42S
23. On the Spin-Axis Dynamics of a Moonless Earth (2014) G. Li & **K. Batygin**, *The Astrophysical Journal*, 790, 69L
24. Spin-Orbit Angle Distribution and the Origin of (Mis)Aligned Hot Jupiters (2014) A. Crida & **K. Batygin**, *Astronomy & Astrophysics*, 567A, 42C
25. Magnetic and Gravitational Disk-Star Interactions: An Interdependence of PMS Stellar Rotation Rates and Spin-Orbit Misalignments (2013) **K. Batygin** & F. Adams, *The Astrophysical Journal*, 778, 169B
26. Dynamical Measurements of the Interior Structure of Exoplanets (2013) J. C. Becker & **K. Batygin**, *The Astrophysical Journal*, 778, 2
27. Magnetically Controlled Circulation on Hot Extrasolar Planets (2013) **K. Batygin**, S. Stanley, D. J. Stevenson, *The Astrophysical Journal*, 776, 53
28. Analytical Treatment of Planetary Resonances (2013) **K. Batygin** & A. Morbidelli, *Astronomy & Astrophysics*, 566, 28B
29. Mass-Radius Relationships for Very Low Mass Gaseous Planets (2013) **K. Batygin** & D. J. Stevenson, *The Astrophysical Journal Letters*, 769, 9B
30. Dissipative Divergence of Resonant Orbits (2013) **K. Batygin** & A. Morbidelli, *The Astronomical Journal*, 145, 1B
31. The Mass, Orbit, and Tidal Evolution of the Quaoar–Weywot System (2013) W. C. Fraser, **K. Batygin**, M. E. Brown, A. Bouchez, *Icarus* 222, 357
32. A Primordial Origin for Misalignments Between Stellar Spin Axes and Planetary Orbits (2012) **K. Batygin**, *Nature*, 491, 418
33. Instability-Driven Dynamical Evolution Model of a Primordially 5-Planet Outer Solar System (2012) **K. Batygin**, M. E. Brown, H. Betts, *The Astrophysical Journal Letters*, 744, L1
34. Explaining Why the Uranian Satellites Have Equatorial Prograde Orbits Despite the Large Planetary Obliquity (2012) A. Morbidelli, K. Tsiganis, **K. Batygin**, A. Crida, R. Gomes, *Icarus*, 219, 737M
35. Formation and Evolution of Planetary Systems in Presence of Highly Inclined Stellar Perturbers (2011) **K. Batygin**, A. Morbidelli, K. Tsiganis, *Astronomy & Astrophysics*, 533, 7B
36. Onset of Secular Chaos in Planetary Systems: Period Doubling and Strange Attractors (2011) **K. Batygin**, A. Morbidelli, *Celestial Mechanics and Dynamical Astronomy*, 111, 219
37. Retention of a Primordially Cold Classical Kuiper Belt in an Instability-Driven Model for Solar System Formation (2011) **K. Batygin**, M. E. Brown, W. C. Fraser, *The Astrophysical Journal*, 738, 13B

38. Evolution of Ohmically Heated Hot Jupiters (2011) **K. Batygin**, D. J. Stevenson, P. H. Bodenheimer, *The Astrophysical Journal*, 738, 1B
39. Resolving the Sin(i) Degeneracy in Low-Mass Exoplanets (2011) **K. Batygin**, G. Laughlin, *The Astrophysical Journal*, 730, 98B
40. Early Dynamical Evolution of the Solar System: Pinning Down the Initial Conditions of the Nice Model (2010) **K. Batygin** & M. Brown, *The Astrophysical Journal*, 716, 1323
41. Inflating Hot Jupiters with Ohmic Dissipation (2010) **K. Batygin** & D. J. Stevenson, *The Astrophysical Journal Letters*, 714, L238
42. Determination of the Interior Structure of Transiting Planets in Multiple-Planet Systems (2009) **K. Batygin**, P. Bodenheimer, G. Laughlin, *The Astrophysical Journal Letters* 704, 409
43. A Quasi-stationary Solution to Gliese 436b's Eccentricity (2009) **K. Batygin**, G. Laughlin, S. Meschiari, E. Rivera, S. Vogt, P. Butler, *The Astrophysical Journal* 699, 23
44. On the Dynamical Stability of the Solar System (2008) **K. Batygin** & G. Laughlin, *The Astrophysical Journal*, 683, 1207

Additional Publications

45. Statistics of Long Period Gas Giant Planets in Known Planetary Systems (2016) M. L. Bryan, H. A. Knutson, A. W. Howard, H. Ngo, **K. Batygin**, J. R. Crepp, B. J. Fulton, S. Hinkley, H. Isaacson, J. A. Johnson, G. W. Marcy, J. T. Wright, *The Astrophysical Journal*, 821, 89
46. Direct Measure of Radiative and Dynamical Properties of an Exoplanet Atmosphere (2016) J. de Wit, N. K. Lewis, J. Langton, G. Laughlin, D. Deming, **K. Batygin**, J. J. Fortney, *The Astrophysical Journal Letters*, 820, L33
47. Friends of Hot Jupiters. IV. Stellar Companions Beyond 50 AU Might Facilitate Giant Planet Formation, but Most are Unlikely to Cause Kozai–Lidov Migration (2016) H. Ngo, H. A. Knutson, S. Hinkley, M. Bryan, J. R. Crepp, **K. Batygin**, I. Crossfield, B. Hansen, A. W. Howard, J. A. Johnson, D. Mawet, T. D. Morton, P. S. Muirhead, J. Wang, *The Astrophysical Journal*, 827, 8
48. Friends of Hot Jupiters. III. An Infrared Spectroscopic Search for Low-Mass Stellar Companions (2015) D. Piskorz, H. A. Knutson, H. Ngo, P. S. Muirhead, **K. Batygin**, J. R. Crepp, S. Hinkley, T. D. Morton, *The Astrophysical Journal*, 814, 148
49. Friends of Hot Jupiters. II. No Correspondence Between Hot-Jupiter Spin–Orbit Misalignment and the Incidence of Directly Imaged Stellar Companions (2015) H. Ngo, H. A. Knutson, S. Hinkley, J. R. Crepp, E. B. Bechter, **K. Batygin**, A. W. Howard, J. A. Johnson, T. D. Morton, P. S. Muirhead, *The Astrophysical Journal*, 800, 138
50. Friends of Hot Jupiters. I. A Radial Velocity Search for Massive, Long-Period Companions to Close-in Gas Giant Planets (2014) H. A. Knutson, B. J. Fulton, B. T. Montet, M. Kao, H. Ngo, A. W. Howard, J. R. Crepp, S. Hinkley, G. A. Bakos, **K. Batygin**, J. A. Johnson, T. D. Morton, P. S. Muirhead, *The Astrophysical Journal*, 785, 126
51. WASP-12b and HAT-P-8b are Members of Triple Star Systems (2014) E. Bechter, J. R. Crepp, H. Ngo, H. A. Knutson, **K. Batygin**, S. Hinkley, P. S. Muirhead, J. A. Johnson, A. W. Howard, B. T. Montet, C. Matthews, T. D. Morton, *The Astrophysical Journal*, 788, 2
52. The Absolute Magnitude Distribution of Kuiper Belt Objects (2014) W. C. Fraser, M. E. Brown, A. Morbidelli, A. Parker, **K. Batygin**, *The Astrophysical Journal*, 782:100
53. A Super-Earth and Two Neptunes Orbiting the Nearby Sun-like Star 61 Virginis (2010) S. S. Vogt, R. A. Wittenmyer, R. P. Butler, S. O’Toole, G. W. Henry, E. J. Rivera, S. Meschiari, G. Laughlin, C. G. Tinney, H. R. A. Jones, J. Bailey, B. D. Carter, **K. Batygin**, *The Astrophysical Journal*, 708, 1366