

Kaspar von Braun

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Research Interests:

- Detection & characterization of exoplanetary systems, variable stars, Galactic star clusters, observational techniques, interstellar extinction, astrobiology, low-mass stars

Education:

- Ph. D. Astronomy & Astrophysics, July 2002, University of Michigan
 Dissertation: Eclipsing Binaries in Globular Clusters (advisor: M. Mateo)
- M. Sc. Astronomy, May 1996, University of Michigan
- Graduate Student Research Assistant, 8/1994 – 7/2002, U of Michigan Astronomy
- Graduate Student Instructor, 1/1995 – 7/2002, U of Michigan Astronomy
- Vordiplom Physik 1993, Ludwig-Maximilians-Universität Munich, Germany
- Research Intern, Max Planck Institute for Extraterrestrial Physics, Spring 1993/94

Academic Appointments:

- Staff Scientist 3/2007 – present, NASA Exoplanet Science Institute, Caltech
- Postdoctoral Scholar 1/2006 – 3/2007, Michelson Science Center, Caltech
 Research: Extrasolar Planet Transits in Galactic Open Clusters and around Late K/M Dwarfs; Large-Field Variability Surveys; Spitzer Space Telescope Observations of Eclipsing Binaries (supervisors: D.R. Ciardi, G.T. van Belle)
- Carnegie Fellow 2002 – 2005, Carnegie / Department of Terrestrial Magnetism
 Research: Extrasolar Giant Planet Transits in Galactic Open Clusters (EXPLORE/OC) and in Galactic Fields (EXPLORE) (supervisor: S. Seager)
- NASA Astrobiology Institute Fellow, 2004, Carnegie/DTM
- NASA Associate, 2003/4, Carnegie/DTM
- NSF Associate, 2003/4, Carnegie/DTM

Selected Seminars, Workshops, Colloquia, Conferences, etc

- Member: American Astronomical Society, Deutsche Physikalische Gesellschaft, International Astronomical Union
- Selected Invited Colloquium/Seminar Talks (last three years):
 - American Museum of Natural History, NY (12/09): “*Transiting Planets*”
 - Greater IPAC Science Symposium, Caltech (1/09): “*Observational Mishaps*”
 - American Astronomical Society Conference, Long Beach, CA, USA (1/09): “*Exoplanet Community Report on Radial Velocities*”
 - Starry Night Festival, Yucca Valley, CA (10/08): “*Extrasolar Planets*”
 - American Astronomical Society, St. Louis (6/08): “*Directly Determined Linear Radii and Effective Temperatures of Exoplanet Host Stars*”

- NASA Goddard Space Flight Center (5/08): “*Directly Determined Linear Radii and Effective Temperatures of Exoplanet Host Stars*”
- Cerro Tololo Interamerican Observatory, Chile (4/08): “*Directly Determined Linear Radii and Effective Temperatures of Exoplanet Host Stars*”
- JPL Exoplanet Fair (2/08): “*Directly Determined Linear Radii and Effective Temperatures of Exoplanet Host Stars*”
- Greater IPAC Science Symposium, Caltech (10/07): “*Fundamental Stellar Parameters of a Binary Blue Straggler in the Globular Cluster NGC 3201*”
- Michelson Workshop, Caltech (7/07): “*Transit Survey Design Considerations*”
- JPL (5/07): “*Time-Series Observations of the Eclipsing Binary GU Boötis*”
- Greater IPAC Science Symposium, Caltech (10/06): “*Transits and Eclipses*”
- Selected Workshops (last five years):
 - Sagan Workshop (Exoplanetary Atmospheres), Caltech (7/09)
 - Michelson Workshops (Interferometry, Transits), Caltech (7/06, 7/07)
 - Astrobiology Graduate Conference, University of California San Diego (7/05)
 - Hawaii Astrobiology Winter School, Hawaii (1/05)
 - Workshop “Mathematical Problems in Astronomical Imaging”, UCLA (1/04)

Synergistic Activities:

- Creation of database of astronomical images (“Observational Mishaps”) which suffer from problems commonly encountered during observing runs to assist astronomers in diagnosing and eliminating their image problems at the observatory itself.
- Referee for the *Astronomical Journal*, *Astrophysical Journal*, *Publications of the Astronomical Society of the Pacific*.
- Member of various Time Allocation Committees.
- Extensive Teaching Experience: at U of Michigan, taught as teaching assistant and/or principal instructor *all* 100-level astronomy classes.
- Numerous volunteer activities: public talk at George Mason University’s Retirement Center, multiple outreach presentations of various aspects of astronomy to Michigan middle and elementary schools, Image of the Month (illustration of current astronomical topics to Michigan schools), open houses at U of Michigan’s 16” telescope, planetarium shows and presentations in German to UM students.

Observing:

- Extensive observing experience: over 300 nights total at: MDM 1.3m & 2.4m, CTIO 0.9m & 4m, SMARTS 1m, KPNO 2.1m & 4m, LCO 1m & 2.5m, Magellan 6.5m, CHARA Interferometer
- *UBVRIJHK* and Spitzer Space Telescope 24- μ m direct imaging, near-IR/optical/near-UV spectroscopy (single/multi-slit, multi-fibers, Echelle) at low/med/high resolution, single baseline *HK* band interferometry.
- Engineering of Echelle CCD at MDM 1.3m, including linearity measurements, bias / gain determination, dark current / read noise reduction, etc.

- Observing techniques: unassisted observing at KPNO 2.1m, LCO 1m, CTIO 0.9m, MDM 1.3m, and MDM 2.4m include complete telescope operation, problem-identification and troubleshooting.
- Training of collaborators in observing techniques at MDM and LCO Observatories.

Data Reduction / Analysis / Computing:

- High-precision absolute and relative stellar photometry in crowded fields.
- Management of large datasets and databases (up to thousands of observational epochs per monitored cluster or field with 30,000 to 60,000 stars per image per filter).
- Time series & monitoring studies, low- and high-amplitude variability detection.
- Spitzer Space Telescope / MIPS 24- μ m time series data analysis.
- Analysis and interpretation of time series and periodic signals, period determination & phasing of real-time data, classification of variable star type, planetary transit detection algorithms, elimination of false positives, light curve fitting.
- Establishment and optimization of entire photometry reduction pipelines including pioneering a technique of differential dereddening of GC fields, development of OC target selection process, performing quasi-real-time data reduction while observing to implement dynamic observing strategy, etc.

Languages:

- German & English (native fluency), French (fluent), Spanish (basic)

Journal Publications (reverse chronological order)

- *Refinement of Predicted Exoplanet Transit Ephemerides and Observing Strategies* – Kane, S. R., Mahadevan, S., **von Braun, K.**, Laughlin, G., & Ciardi, D. R. 2009, PASP, accepted (astro-ph/0910.0010)
- *Exoplanetary Transit Constraints Based upon Secondary Eclipse Considerations* – Kane, S. R., & **von Braun, K.** 2009, PASP, 121, 1096
- *Observational Window Functions in Planet Transit Searches* – **von Braun, K.**, Kane, S. R., & Ciardi, D. R. 2009, ApJ, 702, 779
- *The LAEX and NASA Portals for CoRoT Public Data* – Solano, E., et al. 2009, A&A, 506, 455
- *Directly Determined Linear Radii and Effective Temperatures of Exoplanet Host Stars* – van Belle, G. T. & **von Braun, K.** 2009, ApJ, 694, 1085
- *Strong Water Absorption in the Dayside Emission Spectrum of the Exoplanet HD 189733b* – Grillmair, C., et al. 2008, Nature, 456, 767
- *Constraining Orbital Parameters Through Planetary Transit Monitoring* -- Kane, S. R., & **von Braun, K.** 2008, ApJ, 689, 492
- *Spitzer 24-micron Time-Series Observations of the Eclipsing M-dwarf Binary GU Bootis* -- **von Braun, K.**, van Belle, G. T., Ciardi, D. R., López-Morales, M., Hord, D. W., and Wachter, S. 2008, ApJ, 677, 545
- *The Astrobiology Primer – An Outline of General Knowledge* – Editors: Mix, L. J., Armstrong, J. C., Mandell, A. M., Mosier, A. C., Raymond, S. N., Stewart, F. J., **von Braun, K.**, and Zhaxybayeva, O. 2006, Astrobiology, 6, 735 (astro-ph/0610926)

- *Deep Impact: Observations from a Worldwide Earth-Based Campaign* – Meech, K. J., et al. 2005, *Science*, 310, 265
- *Searching for Planetary Transits in Galactic Open Clusters: EXPLORE/OC* – **von Braun, K.**, Lee, B. L., Seager, S., Yee, H. K. C., Mallén-Ornelas, G., and Gladders, M. D. 2005, *PASP*, 117, 125
- *A Search for Eclipsing Binaries in Galactic Globular Clusters* – **von Braun, K.** 2003, *PASP*, 115, 272
- *The Ia Supernova 1999aw: a Probable 1999aa-like Event in a Low-luminosity Host Galaxy* – Strolger, L.-G., et al. 2002, *AJ*, 124, 2905
- *Photometry Results for the Globular Clusters M10 and M12: Extinction Maps, Color-Magnitude Diagrams, and Variable Star Candidates* – **von Braun, K.**, Mateo, M., Chiboucas, K., Athey, A., and Hurley-Keller, D. 2002, *AJ*, 124, 2067
- *Variable Stars in the Field of the Globular Cluster NGC 3201* – **von Braun, K.**, and Mateo, M. 2002, *AJ*, 123, 279
- *Multiwavelength Monitoring of the Narrow-Line Seyfert 1 Galaxy Arakelian 564. III. Optical Observations and the Optical—UV—X-ray Connection* – Shemmer, O., et al, *ApJ*, 561, 162
- *An Extinction Map and Color-Magnitude Diagram for the Globular Cluster NGC 3201* – **von Braun, K.**, and Mateo, M. 2001, *AJ*, 121, 1522
- *Color-Color Relations for Red Giants in Star Clusters* – **von Braun, K.**, Chiboucas, K., Minske, J. K., Salgado, J. F., and Worthey, G. 1998, *PASP*, 110, 810
- *Tests of the Tully-Fisher Relation. II. Scatter Using Optical Rotation Curves* – Raychaudhury, S., **von Braun, K.**, Bernstein, G. M., and Guhathakurta, P. 1997, *AJ*, 113, 2046

Conference Proceedings, Abstracts, & Other (reverse chronological order)

- *Constraints on Transit and Eclipse Probabilities of Long-Period Exoplanets from Orbital Elements* – **von Braun, K.**, & Kane, S. R. 2009, *AAS/DPS #41*, #68.06
- *The PTF Orion Planet Search-Project* -- van Eyken, J., et al. 2009, *BAAS*, 214, ?????
- *Scanning Radial Velocity Planets for Transit/Eclipse Signatures* -- Kane, S. R., and **von Braun, K.** 2009, *BAAS*, 214, 434.02
- *Observational Window Functions in Planet Transit Searches* -- **von Braun, K.**, Kane, S. R., and Ciardi, D. R. 2009, *BAAS*, 214, 434.03
- *The NASA/IPAC/NExSci Star and Exoplanet Database* – Berriman, G. B., et al. 2009, *Proceedings of the 15th Cambridge Workshop on Cool Stars, Stellar Systems and the Sun. AIP Conference Proceedings, Volume 1094*, pp. 421-424
- *Photometric Transit Detections of Radial Velocity Planets* – Kane, S. R., and **von Braun, K.** 2009, *BAAS*, 213, 402.04
- *Exoplanet Community Report on Radial Velocity* – Torres, G., et al. 2009, *BAAS*, 213, 310.06
- *The NStED Exoplanet Transit Survey Service* -- **von Braun, K.**, et al. 2009, *Transiting Planets, Proceedings of the International Astronomical Union, IAU Symposium, Volume 253*, p. 478-481 (astro-ph/0806.3979)

- *The NStED Stellar and Exoplanet Hosting Star Service* -- Ramirez, S., et al. 2009, Transiting Planets, Proceedings of the International Astronomical Union, IAU Symposium, Volume 253, p. 474-477 (astro-ph/0806.4611)
- *Transit Detection of Radial Velocity Planets* -- Kane, S. R., & **von Braun, K.** 2009, Transiting Planets, Proceedings of the International Astronomical Union, IAU Symposium, Volume 253, p. 358-361 (astro-ph/0807.0006)
- *Burrell-Optical-Kepler Survey (BOKS): A Variability Study in the Kepler Field* – Proctor, A. L., et al 2009, Transiting Planets, Proceedings of the International Astronomical Union, IAU Symposium, Volume 253, p. 416-419
- *Constraining Orbital Parameters of Extrasolar Planets Through Transit Monitoring* – **von Braun, K.**, and Kane, S. R. 2009, AAS/DPS #40, #11.22
- *Gattini: A Multisite Campaign for the Measurement of Sky Brightness in Antarctica* -- Moore, A., et al. 2008, in "Ground-based and Airborne Telescopes II". Edited by Stepp, Larry M. & Gilmozzi, Roberto. Proceedings of the SPIE, Volume 7012, pp. 701226-701226-10
- *Directly Determined Radii and Effective Surface Temperatures of Exoplanet Host Stars*: **von Braun, K.** and van Belle, G.T. 2008, BAAS 212, 44.01
- *The NASA Star and Exoplanet Database: The ExoPlanet Transit Survey Service*: Ciardi, D.R., et al. 2008, BAAS 212, 10.06
- *The NASA Star and Exoplanet Database: The Stellar Archive*: Stauffer, J. R., et al. 2008, BAAS 212, 10.07
- *Observational Window Functions in Planet Transit Searches* -- **von Braun, K.** and Ciardi, D. R. 2007, BAAS 211, 134.06
- *Burrell-Optical-Kepler Survey (BOKS): Exo-planet Search In Cygnus* -- Proctor, A., et al. 2007, BAAS 211, 134.12
- *Observational Window Functions in Planet Transit Searches* -- **von Braun, K.** and Ciardi, D. R. 2007, “Exoplanets: Detection, Formation and Dynamics”, Proceedings of the International Astronomical Union, IAU Symposium, Volume 249, p. 93-100 (astro-ph/0711.4256)
- *The Spitzer 24-micron Photometric Light Curve of the Eclipsing M-dwarf Binary GU Bootis* -- **von Braun, K.**, et al. S. 2007, 14th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun; ASP Conference Series, Vol. 384, editor G. T. van Belle., p.233 (astro-ph/0708.0699)
- *Constraints on the Fundamental Stellar Parameters of an Eclipsing Binary Blue Straggler in the Globular Cluster NGC 3201* – **von Braun, K.**, López-Morales, M., and Mateo, M. L. 2007, BAAS 210, 03.03
- *Analysis of the Spitzer/MIPS24 Light Curve of the M-dwarf Eclipsing Binary GU Boo* – **von Braun, K.**, et al. 2007, BAAS 209, 151.03
- *Burrell-Optical-Kepler Survey (BOKS) I: Survey Description* – Feldmeier, J. J., et al. 2007, BAAS 209, 162.15
- *Burrell-Optical-Kepler Survey (BOKS) II: Early Variability Results* – Howell, S., et al. 2007, BAAS 209, 162.16
- *The Spitzer 24-micron Photometric Light Curve of the Eclipsing M-dwarf Binary GU Bootis* – **von Braun, K.**, et al. 2006, Cool Stars 14, #297

- *Spitzer Observations of the Eclipsing Binary GU Bootes* – van Belle, G., **von Braun, K.**, Ciardi, D., Hoard, D., Wachter, S. 2006, IAUS, 240, 54
- *EXPLORE/OC: Photometry Results for the Open Cluster NGC 2660* – **von Braun, K.**, et al. 2005, Aspen Astrophysics Conference
- *First Results from the EXPLORE/OC Survey* – **von Braun, K.**, Lee, B. L., Seager, S., Yee, H. K. C., Mallén-Ornelas, G., and Gladders, M. D. 2004, Astrobiology, 4, 302
- *Himmelszyklen und Zivilisation* – von Braun, C.-F. & **von Braun, K.** 2004, Technik in Bayern, 6/2004, pp 8-9
- *EXPLORE/OC: A Search for Planetary Transits in the Field of the Southern Open Cluster NGC 2660* – **von Braun, K.**, et al. 2004 AIP Conf Proceedings "The Search for Other Worlds", 713, 181 (astro-ph/0312217)
- *EXPLORE/OC: A Search for Planetary Transits in the Field of the Southern Open Cluster NGC 6208* – Lee, B. L., et al. 2004; AIP Conf Proceedings "The Search for Other Worlds", 713, 177 (astro-ph/0312397)
- *Possible Transiting Planet Candidates from the EXPLORE Project* – Mallén-Ornelas, G., et al. 2003, BAAS, 201, 96.04
- *The EXPLORE Project: A Deep Search for Transiting Extrasolar Planets at the KPNO and CTIO 4m Telescopes* – Mallén-Ornelas, G., et al. 2003, BAAS, 201, 104.10
- *Variable Stars in the Fields of the Globular Clusters M10 and M12* – **von Braun, K.**, Mateo, M., Chiboucas, K., Athey, A., and Hurley-Keller, D. 2002, BAAS, 199, 56.14
- *NGC 3201 Photometry Results: Differential Extinction Map, Color-Magnitude Diagram, and Variable Star Candidates* – **von Braun, K.**, and Mateo, M. 2001, BAAS, 198, 42.07
- *Observational Mishaps: a Database* – **von Braun, K.**, Chiboucas, K., and Hurley-Keller, D. 1999, BAAS, 194, 44.03
- *Observational Mishaps: a Database* – **von Braun, K.**, Chiboucas, K., and Hurley-Keller, D. 1999, I.A.P.P.P Communications No 75, 62 (astro-ph/9906195)
- *Eclipsing Binary Stars in Globular Clusters* – **von Braun, K.**, Mateo, M., and Yan, L. 1996, BAAS, 189, 71.12