

# Dawn E. Peterson, PhD

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## Employment

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- Research Scientist: Space Science Institute, 04/2012 - present.
- Astrophysicist: Smithsonian Astrophysical Observatory, 09/2011 - 07/2012.
- Lecturer: Boston University, AST 101 *The Solar System*, 01/2011 - 12/2011.
- Postdoctoral Fellow: Harvard-Smithsonian Center for Astrophysics, 08/2007 - 07/2011.
- Postdoctoral Fellow: Dept. of Astronomy, University of Virginia, 10/2004 - 07/2007.
- Graduate Research Assistant: Near-Infrared Astrophysics Lab, Dept. of Physics & Astronomy, University of Rochester, 07/1998 - 09/2004.
- Teaching Assistant: Introductory astronomy classes, University of Rochester, 09/1998 - 05/1999.
- Undergraduate Research Assistant: Dept. of Astronomy, Boston University, 09/1995 - 05/1998.

## Skills and Experience

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- **Project Management** Principal Investigator for a NASA funded grant: directed a small team, managed the budget, organized and analyzed data, prepared presentations — Proposed, planned, obtained visible/infrared wavelength astronomical observations: operated 0.5-2-m class telescopes and their instruments (CCD detectors, spectrographs), pinpointed and solved problems in real-time
- **Teaching/Mentoring** Developed and instructed a large (~60 students), undergraduate astronomy course for non-science majors — Supervised 4 undergraduate astronomy majors: explained data analysis techniques, trained in IDL, guided research programs to publication
- **Data Analysis/Software** Processed, analyzed, interpreted large data sets — Extracted, classified, cataloged information from raw images and spectra — Investigated and implemented models and statistical tools to interpret results — Designed and implemented astronomical image analysis and visualization software using IDL — Tested, debugged, maintained spectral analysis software — Stream-lined, documented, maintained data analysis software for a large team of scientists
- **Computer** Operating systems: UNIX-like systems, particularly Linux and Mac OS X; Windows — Languages: IDL, some Fortran, Python, HTML — Document preparation systems: LaTeX, TeX — Other software: IRAF, Keynote, PowerPoint, OpenOffice, Gimp
- **Publishing/Proposal Writing** Authored/co-authored 21 publications in scientific, peer-reviewed journals — Authored/co-authored dozens of successful proposals to obtain astronomical observations (ground- and space-based), including the Hubble, Spitzer, and Herschel Space Telescopes — PI/co-PI for several NSF, NASA, K2, and AAS grant proposals; PI for successful NASA and AAS grants
- **Presentation** Prepared and publicized results, both oral and poster contributions, at 20 conferences
- **Service/Outreach** Served twice as NASA grant panel review member — Acted as peer-reviewer for scientific journals — Served as expert for telescope time allocation committees — Volunteered to give public talks — Served as expert at Cambridge Science Festival

## Education

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- **Ph.D.**, 2005, *Physics & Astronomy*, Department of Physics & Astronomy, University of Rochester. Title: *The Pre-Main Sequence & Brown Dwarf Populations of OMC 2/3: A Multiwavelength Study* Advisers: Judith L. Pipher & S. Thomas Megeath
- **M.A.**, 2000, *Physics*, Department of Physics & Astronomy, University of Rochester.
- **B.A.**, 1998, *Astronomy & Physics with distinction*, College of Arts and Sciences, Boston University.

## Grants Awarded

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- Peterson, D. E., Allen, L. E., & Gutermuth, R. A., *Assessing the Role of Environment in Star Formation: Isolated Bok Globules Versus Bright-Rimmed Clouds*, NASA Astrophysics Data Analysis grant, awarded September 2009 (\$67K)
- Peterson, D. E., Allen, L. E., Gutermuth, R. A., & Bourke, T., 2009 *Small Clusters Forming in Isolation? CB 34 and CB 58*, using Spitzer Space Telescope GO time with IRAC (Warm Mission), 1.8 hours allocated during Cycle 6 (\$5K)
- Harvey, P., Matthews, B., Bourke, T., Tothill, N., Terebey, S., Reid, M., Andre, P., Allen, L., & Peterson, D. 2011 *The Auriga-California Molecular Cloud: A Massive Nearby Cloud with Powerful Diagnostics for Early Stages of Star Formation*, using the Herschel Space Telescope time with PACS and SPIRE; 19 hours allocated during OT1 (\$23K to Peterson)
- Peterson, D. E., *Measuring the Bottom of the Initial Mass Function in Upper Scorpius*, American Astronomical Society (AAS) Small Research Grant, awarded January 2012 (\$4K)
- Megeath, S. T., Peterson, D. E., Mazur, B., Fischer, W., Hartmann, L., Stutz, A., Muzerolle, J. 2014 *WFC3 Spectroscopy of Faint Young Companions to Orion Young Stellar Objects*, using the Hubble Space Telescope with WFC3; 10 orbits allocated during Cycle 22 (\$5K to Peterson)
- Scholz, A., Eislöffel, J., Melnikov, S., Peterson, D. 2015 *Rotation periods of very low mass stars and brown dwarfs in open clusters*, Kepler K2, campaigns 4 and 5 (\$30K to Peterson)
- Stelzer, B., Scholz, A., Matt, S. 2016 *The rotation/activity relation of M dwarfs*, Chandra Cycle 17 (\$33K to Peterson)
- Scholz, A., Stelzer, B., Matt, S., Peterson, D. 2016 *Rotation of M Dwarfs: Spindown, Activity and Gyrochronology*, Kepler K2 GO-4, campaigns 11-13, (\$40K to Peterson)

## Honors and Awards

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- Department of Education Graduate GAANN Fellowship in Physics and Astronomy at the University of Rochester, September 1998 - May 2001.
- Graduated with distinction from the Department of Astronomy: Boston University, May 1998.
- University Merit Scholarship: Boston University, September 1994 - May 1998.

## Invited Talks

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- The Role of Environment in Star Formation*, Seminar for the Stratospheric Observatory for Infrared Astronomy (SOFIA) Science Center, NASA Ames Research Center, July 10, 2012.
- Star Formation in the Milky Way Galaxy*, Colloquium for the Department of Physics and Space Sciences, Florida Institute of Technology, August 28, 2009.
- Star Formation in the Milky Way Galaxy*, Colloquium for the Department of Physics and Astronomy, James Madison University, February 17, 2009.
- The Pre-Main Sequence and Brown Dwarf Populations of OMC 2/3: A Multiwavelength Study*, Colloquium for the Institute for Astrophysical Research, Boston University, November 16, 2004.

## Observing Awards and Experience

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- Megeath, S. T., Pipher, J. L., Allen, L. E., Luhman, K. L., Peterson, D. E., 2003, *How do Brown Dwarfs Form?*, Hubble Space Telescope time with NICMOS, 6 orbits allocated during Cycle 12.
- Peterson, D. E., Megeath, S. T., Luhman, K. L., Pipher, J. L., Allen, L. E., Rayner, J., Cushing, M. C., 2005, *Near-Infrared Selected Brown Dwarf Candidates in the Orion Molecular Clouds 2 and 3 Region*, using the SpeX spectrograph at the NASA Infrared Telescope Facility, Mauna Kea, 3 nights allocated, January 2-4, 2006 (time allocated for the same project in 2003 and 2004 as well).
- Megeath, S. T., Pipher, J. L., Peterson, D. E., Myers, P. C., Li, D., Allen, L., 2005, *Mapping the Structure of Dark Filaments in OMC 3 with the IRS*, Spitzer Space Telescope GO time with IRS, 12 hours allocated during Cycle 2.

4. Bary, J. S., Skrutskie, M. F., Peterson, D. E., 2006 (and 2005) *A Multi-Epoch IRS Accretion Variability Study of Actively Accreting T Tauri Stars*, Spitzer Space Telescope GO time with IRS, 7.7 hours allocated during Cycle 3 (8.4 hours allocated during Cycle 2).
5. Peterson, D. E., Megeath, S. T., Cushing, M. C., & Pipher, J. L., 2007 & 2008, *Probing the Initial Mass Function in the Orion Molecular Cloud 2/3 Region*, using the SpeX spectrograph at NASA IRTF, 3 nights allocated, 2007; 5 half-nights allocated, 2008.
6. Peterson, D. E. (Technical Contact), Allen, L. E., Gutermuth, R. A., & Bourke, T., 2008, *A Survey for Isolated Clusters in Bok Globules*, using the Spitzer Space Telescope GTO time with IRAC and MIPS; 14 hours allocated during Cycle 5 (PID: 50452).
7. Peterson, D. E., Bourke, T., Jørgenson, J., Allen, L., Gutermuth, R., & Covey, K., 2008, *Deconstructing YSO Disks in Corona Australis with SMA*, 1 “A” track, 1 “B” track allocated, June 2008.
8. Peterson, D. E., Bourke, T., Jørgenson, J., Allen, L., Matthews, B., & Kirk, J. 2008, *Deconstructing YSO Disks in Auriga with SMA*, 2 “B” tracks allocated, November 2008.
9. Peterson, D. E., Allen, L. E., Gutermuth, R. A., & Bourke, T., 2009, *Small Clusters Forming in Isolation? CB 34 and CB 58*, Spitzer Space Telescope GO time with IRAC (Warm Mission), 1.8 hours allocated during Cycle 6 (PID: 60181).
10. Peterson, D. E., Bourke, T., Jørgenson, J., Allen, L., Matthews, B., & Caratti o Garatti, A. 2009, *First Census of Star Formation in Auriga*, 2 “B” tracks allocated, November 2009, also May 2010.
11. Peterson, D. E., Bourke, T., Allen, L. E., & Matthews, B. 2010 *First Census of Young Brown Dwarfs in Auriga*, using the SpeX spectrograph at NASA IRTF, 3 half-nights allocated, 2010.
12. Harvey, P., Matthews, B., Bourke, T., Tothill, N., Terebey, S., Reid, M., Andre, P., Allen, L., & Peterson, D. 2011 *The Auriga-California Molecular Cloud: A Massive Nearby Cloud with Powerful Diagnostics for Early Stages of Star Formation*, using the Herschel Space Telescope time with PACS and SPIRE; 19 hours allocated during OT1.
13. Scholz, A., Peterson, D., Dawson, P., Muzic, K., & Ray, T. 2012 *Spectroscopy for New Brown Dwarf Candidates in Upper Scorpius*, using SpeX at NASA IRTF, 3 half-nights allocated, June 2012.
14. Megeath, S.T., Peterson, D., Mazur, B., Fischer, W., Hartmann, L., Stutz, A., Muzerolle, J. 2014 *WFC3 Spectroscopy of Faint Young Companions to Orion Young Stellar Objects*, Hubble Space Telescope time with WFC3, 10 orbits allocated during Cycle 22.

I have extensive near-infrared and visible wavelength imaging and spectroscopic experience at various telescopes using several instruments. This includes the CorMASS spectrograph at the Vatican Advanced Technology Telescope, Apache Point Observatory 3.5-m, and the Magellan telescopes as well as SpeX at the IRTF. For imaging, I have used the Stelircam, 4-Shooter, and Keplercam cameras on the 1.2-m telescope at Fred Lawrence Whipple Observatory, the Simultaneous Quad Infrared Imaging Device (SQIID) on the KPNO 2-m telescope, and NEWFIRM at the KPNO 4-m. In addition, I have several nights experience using the Red Channel Spectrograph, Hectospec and FLAMINGOS (imaging) at the MMT Observatory.

## Refereed Publications

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1. *Young Stellar Objects in the Gould Belt*, Dunham, M., Allen, L., Evans, N. J., II, Broekhoven-Fiene, H., Cieza, L., DiFrancesco, J., Gutermuth, R., Harvey, P., Hatchell, J., Heiderman, A., Huard, T., Johnstone, D., Kirk, J., Matthews, B., Miller, J., **Peterson, D.**, Young, K., 2015, *Astrophysical Journal Supplements*, 220, 11.
2. *Near Infrared Spectroscopy of Young Brown Dwarfs in Upper Scorpius*, Dawson, P., Scholz, A., Ray, T. P., **Peterson, D. E.**, Rodgers-Lee, D., & Geers, V., 2014, *Monthly Notices of the Royal Astronomical Society*, 442, 1586.
3. *The Spitzer Survey of Interstellar Clouds in the Gould Belt. VI. The Auriga-California Molecular Cloud observed with IRAC and MIPS*, Broekhoven-Fiene, H., Matthews, B. C., Harvey, P. M., Gutermuth, R. A., Huard, T. L., Tothill, N. F. H., Nutter, D., Bourke, T., DiFrancesco, J., Jørgensen, J. K., Allen, L. E., Chapman, N. L., Dunham, M. M., Merín, B., Miller, J. F., **Peterson, D. E.**, Terebey, S., & Stapelfeldt, K., 2014, *Astrophysical Journal*, 786, 37.

4. *The Luminosities of Protostars in the Spitzer c2d and Gould Belt Legacy Clouds*, Dunham, M. M., Arce, H. G., Allen, L. E., Evans, N. J., II, Broekhoven-Fiene, H., Chapman, N. L., Cieza, L. A., Gutermuth, R. A., Harvey, P. M., Hatchell, J., Huard, T. L., Kirk, J. M., Matthews, B. C., Merín, B., Miller, J. F., **Peterson, D. E.**, Spezzi, L., 2013, *Astronomical Journal*, 145, 94.
5. *A First Look at the Auriga-California Giant Molecular Cloud With Herschel and the CSO: Census of the Young Stellar Objects and the Dense Gas*, Harvey, P., Fallscheer, C., Ginsburg, A., Terebey, S., André, P., Bourke, T. L., Di Francesco, J., Könyves, V., Matthews, B. C., **Peterson, D. E.**, 2013, *Astrophysical Journal*, 764, 133.
6. *The Spitzer Survey of Interstellar Clouds in the Gould Belt. V. Ophiuchus North Observed with IRAC and MIPS*, Hatchell, J., Terebey, S., Huard, T., Mamajek, E., Allen, L., Bourke, T., Dunham, M., Gutermuth, R., Harvey, P., Jørgensen, J., Merin, B., Noriega-Crespo, A., & **Peterson, D.**, 2012, *Astrophysical Journal*, 754, 104.
7. *Spitzer Survey of Interstellar Clouds in the Gould Belt. III. A Multi-Wavelength View of Corona Australis*, **Peterson, Dawn E.**, Caratti o Garatti, Alessio, Bourke, Tyler L., Forbrich, Jan, Gutermuth, Robert A., Jørgensen, Jes K., Allen, Lori E., Patten, B. M., Dunham, M. M., Harvey, P. M., Merín, B., Chapman, N. L., Cieza, L. A., Huard, T. L., Knez, C., Prager, B., & Evans, N. J. II., 2011, *Astrophysical Journal Supplements*, 194, 43.
8. *The Spitzer Survey of Interstellar Clouds in the Gould Belt. IV. Lupus V and VI Observed with IRAC and MIPS*, Spezzi, L., Vernazza, P., Merín, B., Allen, L. E., Evans, N. J. II., Jørgensen, J. K., Bourke, T. L., Cieza, L. A., Dunham, M. M., Harvey, P. M., Huard, T. L., **Peterson, D. E.**, Tothill, N. F. H., & the Gould's Belt Team, 2011, *Astrophysical Journal*, 730, 65.
9. *The Spitzer c2d Survey of Nearby Dense Cores: X. Star Formation in L673 and CB188*, Tsitali, A. E., Bourke, T. L., **Peterson, D. E.**, Myers, P. C., Dunham, M. M., Evans, N. J. II, & Huard, T. L., 2010, *Astrophysical Journal*, 725, 2461-2479.
10. *Spitzer Survey of Interstellar Clouds in the Gould Belt. II. The Cepheus Flare Observed with IRAC and MIPS*, Kirk, Jason M., Ward-Thompson, D., Di Francesco, J., Bourke, T. L.,...,**Peterson, Dawn**, Ray, T. P., & Rebull, L. M., 2009, *Astrophysical Journal Supplements*, 185, 198-249.
11. *Spectroscopic Study of Young Stellar Objects in the Serpens Cloud Core and NGC 1333*, Winston, E., Megeath, S. T., Wolk, S. J., Hernandez, J., Gutermuth, R., Muzerolle, J., Hora, J. L., Covey, K., Allen, L. E., Spitzbart, B., **Peterson, D.**, Myers, P., & Fazio, G. G., 2009, *Astronomical Journal*, 137, 4777-4794.
12. *Primordial Circumstellar Disks in Binary Systems: Evidence for Reduced Lifetimes*, Cieza, Lucas A., Padgett, D. L., Allen, L. E., McCabe, Caer E., Brooke, Timothy Y., Carey, Sean J., Chapman, Nicholas L., Fukagawa, Misato, Huard, Tracy L., Noriega-Crespo, Alberto, **Peterson, Dawn E.**, & Rebull, L. M., 2009, *Astrophysical Journal Letters*, 696, L84-L88.
13. *The Orion Molecular Cloud 2/3 and NGC 1977 Regions*, **Peterson, Dawn E.** & Megeath, S. Thomas, chapter in *Handbook of Star Forming Regions*, Bo Reipurth, editor, Astronomical Society of the Pacific Conference Series, San Francisco, 2008.
14. *New Young Brown Dwarfs in the Orion Molecular Cloud 2/3 Region*, **Peterson, Dawn E.**, Megeath, S. T., Luhman, K. L., Pipher, J. L., Stauffer, J. R., Barrado y Navascués, D., Wilson, J. C., Skrutskie, M. F., Nelson, M. J., & Smith, J. D., 2008, *Astrophysical Journal*, 685, 313-332.
15. *Physical Conditions of Accreting Gas in T Tauri Star Systems*, Bary, J. S., Matt, S. P., Skrutskie, M. F., Wilson, J. C., **Peterson, D. E.**, & Nelson, M. J. 2008, *Astrophysical Journal*, 687, 376-388.
16. *Searching for hidden Wolf-Rayet stars in the Galactic Plane – 15 new Wolf-Rayet stars*, Hadfield, L. J., VanDyk, S. D., Morris, P. W., Smith, J. D., Marston, A. P., & **Peterson, D. E.** 2007, *Monthly Notices of the Royal Astronomical Society*, 376, 248-262.
17. *Characterizing Young Brown Dwarfs using Low Resolution Near-IR Spectra*, Allers, K. N., Jaffe, D. T., Luhman, K. L., Liu, M. C., Wilson, J. C., Skrutskie, M. F., Nelson, M., **Peterson, D. E.**, Smith, J. D., & Cushing, M. C. 2007, *Astrophysical Journal*, 657, 511-520.
18. *Discovery of a Young Substellar Companion in Chamaeleon*, Luhman, K. L., Wilson, J. C., Brandner, W., Skrutskie, M. F., Nelson, M. J., Smith, J. D., **Peterson, D. E.**, Cushing, M. C., & Young, E., 2006, *Astrophysical Journal*, 649, 894-899.

19. *Near-infrared spectra of the leading and trailing hemispheres of Enceladus*, Verbiscer, A. J., **Peterson, Dawn E.**, Skrutskie, M. F., Cushing, M. C., Helfenstein, P., Nelson, M. J., Smith, J. D., & Wilson, J. C., 2006, *Icarus*, 182, 211-223.
20. *Spectroscopic Confirmation of the Least Massive Known Brown Dwarf in Chamaeleon*, Luhman, K. L., **Peterson, Dawn E.**, and Megeath, S. T., 2004, *Astrophysical Journal*, 617, 565-568.
21. *Photometric Distances to Small Dark Clouds: CB 24*, **Peterson, Dawn E.**, and Clemens, Dan P., 1998, *Astronomical Journal*, 116, 881-889.

## Professional Associations

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- Member of the American Astronomical Society since 1997.

## References

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- **Lori Allen**, NOAO, 950 N. Cherry Avenue, Tucson, AZ 85719, USA, phone: (520) 318-8486, email: lallen@noao.edu.
- **Mike Skrutskie**, Department of Astronomy, University of Virginia, Charlottesville, VA 22903, USA, phone: (434) 924-4328, email: mfs4n@virginia.edu.
- **Judy Pipher**, Department of Physics and Astronomy, University of Rochester, Rochester, NY 14627-0171, USA, phone: (585) 275-4402, email: jlpipher@astro.pas.rochester.edu.