

Kathryn M. G. Peek

601 Campbell Hall
University of California, Berkeley
Berkeley, CA 94720-3411
+1.510.847.2513
kpeek@astron.berkeley.edu

Astrophysicist specializing in stellar populations and exoplanet detection
with expertise in high-resolution spectroscopy and adaptive optics.

Education

University of California, Berkeley, CA

Astronomy Department

Ph.D. anticipated May 2009; MA awarded May 2005

Honors and Awards:

Teaching Effectiveness Award, 2005

Outstanding Graduate Student Instructor, 2005

Clare Boothe Luce Fellow, 2003

Mount Holyoke College, South Hadley, MA

Summa Cum Laude Bachelor of Arts, May 2002

Majors: Physics and Astronomy

Cumulative GPA: 3.96

Honors and Awards:

Phi Beta Kappa, 2001

Sigma Xi, 2002

Barry M. Goldwater Scholar, 2000

Sigma Pi Sigma (Physics honor society), 2001

Sarah Williston Scholar (top 15% of class), 2001

Society of Physics Students Leadership Award, 2001

Rogers D. Rusk Prize, 2002 (outstanding physics major at Mount Holyoke College)

Mary Dailey Irvine Prize, 2002 (outstanding Five College Astronomy thesis)

Phi Beta Kappa Prize, 2002 (outstanding Mount Holyoke College thesis)

NSF REU Internship, Cornell University, summer 2000

Lunar and Planetary Science Institute Internship, summer 2001

Society of Physics Students Internship, summer 2002

Research Interests

r-Process Elements in Solar-Type Stars

Ph.D. Thesis Project, under investigation since summer 2005

Using europium ($Z=63$) as an *r*-process marker, I am determining the abundance of the *r*-process in approximately one thousand nearby F8–K0 stars, to investigate the history of Galactic heavy element nucleosynthesis. To that end, I am also measuring europium in cluster stars of known ages, to see how that abundance changes as a function of time in the Galaxy. Advised by Geoffrey Marcy. I anticipate completing my dissertation in mid 2009.

Binary Companions to Retired A Stars

Under investigation since summer 2006

Using a combination of adaptive optics and radial velocity measurements, I am determining the binary occurrence rate for intermediate-mass stars. Project ongoing.

California Planet Search (CPS) Team Member

Since 2005

As a primary observer for the Berkeley contingent of the CPS, the world's most successful radial velocity extrasolar planet search, I have logged 85 nights on the Keck telescope since March 2006. I have also been the primary operator of the data reduction pipeline.

Epoch of Reionization Low-Frequency Interferometry

Academic Year 2004–2005

As a second-year graduate project, I worked with Don Backer on the prototype dipole stage of PAPER, an array to detect low-frequency radiation from the epoch of reionization. I created a computer model of the beam response as a function of position angle and helped set up the prototypes at Green Bank, West Virginia.

Thesis with High Honor, Mount Holyoke College

Academic Year 2001–2002

To pursue possible formation scenarios for Saturn's rings, I simulated the dynamics of a dense, narrow ring (the hypothetical result of a moon destruction) using an n-body symplectic integrator code. The thesis won the high honor designation by the astronomy department. The work was a continuation of a summer internship at the Lunar and Planetary Institute in Houston, Texas, advised by Joseph Hahn.

Conference Contributions

American Astronomical Society (AAS) 211th General Meeting

Austin, Texas, January 2008

Poster Title: "*r*-Process Elements in the Milky Way."

Formation and Evolution of Galaxy Disks

Rome, Italy, October 2007

Poster Title: "*r*-Process Elements in the Galaxy."

American Astronomical Society (AAS) 210th General Meeting

Honolulu, Hawai'i, May 2007

Poster Title: "The Heaviest Elements: *r*-Process Abundances in the Galaxy."

American Physical Society (APS) General Meeting

Philadelphia, Pennsylvania, April 2003

Invited Speaker at Society of Physics Students session. Presented research results about dust in the solar corona, work done during a summer internship at Goddard Space Flight Center.

Lunar and Planetary Science Conference (LPSC)

Houston, Texas, March 2002

Poster title: "A Formation Scenario for Saturn's rings."

Observing Experience

Keck 1 / HIRES: 85 nights, March 2006–January 2009

Shane 3-m / Hamilton Spectrograph: 16 nights, October 2006–January 2009

Coudé Auxiliary Telescope / Hamilton Spectrograph: 24 nights, June 2006–April 2009

Shane 3-m / NGS-AO: 5 nights, March & October 2007

Green Bank: Six days setting up prototype dipole array, August 2004

Teaching Experience

Guest Lecturer, Mills College

October 2008

Gave guest lecture on exoplanets for a "Search for Life" sophomore seminar at Mills. I instructed students on all methods of exoplanet detection.

Graduate Student Instructor (GSI), UC Berkeley

Fall 2005

Astronomy 160: Junior-level stars. Led weekly discussion and homework help sessions and lectured in the professor's absence.

Fall 2004

Astronomy 10: Head GSI for the 840-student introduction to astronomy for non-majors. In charge of a team of 11 GSIs and 8 homework graders, I coordinated star parties and homework help sessions, administered and graded midterm and final exams, confronted student cheating, and lectured to hundreds in the professor's absence. For my work that semester I won the Outstanding GSI and Teaching Effectiveness awards.

Spring 2004

Astronomy 7B: As a GSI for the introductory class for physical science majors, I led weekly discussion and homework help sessions and helped create and grade exams. For the discussion section, my co-GSI and I created thought-provoking worksheets that built on the students' lecture knowledge and prepared them for the homework. Those worksheets are still in use by subsequent GSIs. At the end of the semester, I gave a full lecture of my own design, on absorption features in quasar spectra.

Fall 2003

Astronomy 10: In my first time teaching this course I led two discussion sections, designing activities and fielding student questions.

Physics, Astronomy, and Algebra Teacher, Miss Porter's School

Academic Year 2002–2003

Taught Conceptual Physics, Astronomy, and Algebra I courses at Miss Porter's girls' school in Farmington, Connecticut. Also led a modern physics independent study, advised students academically and extracurricularly, and supervised dormitories.

Astronomy Outreach

Public Lectures, Chabot Space & Science Center

July 2008

Gave two public lectures, one a summary nucleosynthesis focused on a gold atom, the other, a multi-wavelength view of the Galactic center.

Project ASTRO / Girls, Inc.

November 2006, March 2008, February 2009

Led activity sessions on astronomy in girls' after-school program in Oakland, CA.

Expanding Your Horizons

March 2006, 2007, 2008

Co-led "daytime astronomy" session in annual one-day science program for middle school girls, held at Mills College in Oakland, CA.

Science Writing

Editor, Berkeley Science Review

Issue 15, Fall 2008

As a member of the editorial board, chose articles for inclusion in Issue 15. Worked with authors to develop articles on topics as diverse as hummingbird mating practices and research into neglected diseases. Organized fall 2008 BSR seminar on science writing.

Writer, Berkeley Science Review

Issue 15, Fall 2008

Contributed article on argon-argon radiometric dating, highlighting a recent recalibration of the technique by Berkeley geochronologists.

Issue 14, Spring 2008

Reviewed Michael Pollan's *In Defense of Food* for the book review feature.

Copy Editor, Berkeley Science Review

Issue 16, Spring 2009

Issue 14, Spring 2008

Final proofreader for style, grammar, consistency, and accuracy.

Judge, Bay Area STEP White Paper Competition

Spring 2009

Read, scored, and gave feedback for science policy white papers for the first judging phase of the UC Berkeley science, technology, and engineering policy (STEP) group's competition.

Refereed Publications

"A New Technique for Determining Europium Abundances in Solar-Metallicity Stars"

PEEK, KATHRYN M. G.

2009 Pub. of the Astron. Soc. of the Pacific, accepted.

"Old, Rich, and Eccentric: Two Jovian Planets Orbiting Evolved Metal-Rich Stars"

PEEK, KATHRYN M. G., John Asher Johnson, et al.

2009 Pub. of the Astron. Soc. of the Pacific, accepted.

"An Accurate Distance to High-Velocity Cloud Complex C."

Thom, C., J. E. G. Peek, M. E. Putman, C. Heiles, **K. M. G. PEEK**, and R. Wilhelm.

2008 *Astrophys. Journ.*, **684**, 364.

"Five Planets Orbiting 55 Cancri."

Fischer, Debra A., Geoffrey W. Marcy, R. Paul Butler, Steven S. Vogt, Greg Laughlin, Gregory W.

Henry, David Abouav, **KATHRYN M. G. PEEK**, Jason T. Wright, John A. Johnson, Chris McCarthy, and Howard Isaacson.

2008 *Astrophys. Journ.*, **675**, 790–801.

"Retired A Stars and Their Companions. II. Jovian planets orbiting κ CrB and HD 167042."

Johnson, John Asher, Geoffrey W. Marcy, Debra A. Fischer, Jason T. Wright, Sabine Reffert,

Julia M. Kregenow, Peter K. G. Williams, and **KATHRYN M. G. PEEK**.

2008 *Astrophys. Journ.*, **675**, 784–789.

"A New Planet around an M Dwarf: Revealing a Correlation between Exoplanets and Stellar Mass."

Johnson, John Asher, R. Paul Butler, Geoffrey W. Marcy, Debra A. Fischer, Steven S. Vogt,

Jason T. Wright, and **KATHRYN M. G. PEEK**.

2008 *Astrophys. Journ.*, **670**, 833–840.

“Spin-Orbit Alignment for the Eccentric Exoplanet HD 147506b.”

Winn, Joshua N., John Asher Johnson, **KATHRYN M. G. PEEK**, Geoffrey W. Marcy, Gaspar Á. Bakos, Keigo Enya, Norio Narita, Yasushi Suto, Edwin L. Turner, and Steven S. Vogt.
2007 *Astrophys. Journ.*, **665**, L167–L170.

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