

# Joleen K. Carlberg

PO Box 400325  
University of Virginia  
Charlottesville, VA 22904

Office phone: (434)924-7935  
Fax: (434)924-3104  
jkm9n@virginia.edu

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## Education

- **University of Virginia, Charlottesville, VA**  
Ph.D. in Astronomy expected 2011  
M.S. in Astronomy 2006
- **Villanova University, Villanova, PA**  
B.S. in Astronomy & Astrophysics 2004  
Minor in Physics  
Summa Cum Laude

## Research

- **Graduate Research Assistant** 2004–2011  
*University of Virginia, Advisor: Dr. Steven Majewski*  
Studying detailed chemical composition of rapidly rotating red giant stars to determine whether planets ingested during the stars' evolution causes their rapid rotation.  
Simulating the effects of binary companions on the radial velocity measurements of giant stars for the APOGEE project.  
Looking for structures, i.e., star streams or dwarf galaxies, associated with the Milky Way using M giant stars from the 2MASS database as tracers.
- **NASA Academy Summer Intern** 2004  
*Goddard Space Flight Center, Advisor: Dr. James Thieman*  
Wrote software to import Radio Jove (an amateur radio telescope kit) data into IDL for scientific analysis, allowing the study of radio outbursts from Jupiter.  
Science team member and educational outreach leader for the academy group project, *Design the Next Mars Scout Mission: Mars Subsurface Chemical Life Explorer*. Designed the project's web page.
- **Research Experience for Undergraduates (REU) Summer Intern** 2003  
*Smithsonian Astrophysical Observatory, Advisor: Dr. Peter Nisenson*  
Precisely measured the radial velocity offsets between the stellar "reference spectra" of exoplanet candidate host stars taken before and after a physical upgrade of the AFOE spectrograph so that the pre- and post-upgrade data could be shifted to the same velocity zero-point.
- **Undergraduate Research Assistant** 2002–2004  
*Villanova University, Advisor: Dr. Edward Sion*  
Modeled the ultraviolet spectra of symbiotic variable star systems to study their physical properties, specifically to look for the presence and nature of associated accretion disks.

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**Refereed Publications**

- **Carlberg, J. K.**, Smith, V. V., Cunha, K., Majewski, S. R., & Rood, R. T., 2010, *ApJL*, **723**, 103 “The Super Lithium-Rich Red Giant Rapid Rotator G0928+73.2600: A Case for Planet Accretion?”
- **Carlberg, J. K.**, Majewski, S. R., Patterson, R. J., Bizyaev, D., Smith, V. V., & Cunha, K., “The Frequency of Rapid Rotation Among K Giant Stars,” submitted to *ApJ*
- Sharma, S., Johnston, K. V., Majewski, S. R., Muñoz, R. R., **Carlberg, J. K.**, & Bullock, J., 2010, *ApJ*, **722**, 750 “Group Finding in the Stellar Halo Using M-giants in the Two Micron All Sky Survey: An Extended View of the Pisces Overdensity?”
- **Carlberg, J. K.**, Majewski, S. R., & Arras, P., 2009, *ApJ*, **700**, 832, “The Role of Planet Accretion in Creating the Next Generation of Red Giant Rapid Rotators”
- Kolb, K., **Miller, J. K.**, Sion, E. M., & Mikołajewska, J., 2004, *AJ*, **128**, 1790 “Synthetic Spectral Analysis of the Hot Component in the S-Type Symbiotic Variable EG Andromedae”

**Presentations**

- **Carlberg, J. K.**, Majewski, S. R., Smith, V. V., Cunha, K., & Bizyaev, D., “The Fate of Exoplanets and the Red Giant Rapid Rotator Connection,” oral presentation for Planetary Systems Beyond the Main Sequence conference, Bamberg, Germany, Aug. 11-14, 2010
- Zasowski, G., Johnson, K., Beaton, R., **Carlberg, J.**, Czekala, I., de Messieres, G., Drosback, M., Filipetti, C., Gugliucci, N., Hoeft, A., Jackson, L., Lynch, R., Romero, C., Sivakoff, G., Whelan, D., & Wong, A., “Dark Skies, Bright Kids – Astronomy Education and Outreach in Rural Virginia,” poster at AAS Meeting 215, #445.01
- **Carlberg, J. K.**, Majewski, S. R., Smith, V. V., Cunha, K., Patterson, R. J., Bizyaev, D., Arras, P., & Rood, R. T., 2009, “A New Spin on Red Giant Branch Rapid Rotators: Evidence for Chemical Exchange Between Planets and Evolved Stars,” in IAU Symposium Vol. 265, Chemical Abundances in the Universe: Connecting First Stars to Planets, ed. K. Cunha, M. Spite, & B. Barbuy, 408
- **Miller, J. K.**, Majewski, S. R., Smith, V. V., Rood, R. T., Cunha, K., Patterson, R. J., & Bizyaev, D., 2007, “Looking for Chemical Evidence for the Accretion of Planets onto Red Giant Stars,” poster at Extreme Solar Systems conference, Santorini, Greece, Jun. 25-29, 2007
- **Miller, J. K.**, Korzennik, S. G., & Nisenson, P., 2003, “Calculating Velocity Shifts Between the Pre- and Post-Upgrade AFOE Data Sets,” poster at AAS Meeting 203, #17.10
- Kolb, K. J., **Miller, J. K.**, & Sion, E. M., 2003, “Modelling the Hot Components of the Symbiotic Variables EG Andromeda and SY Muscae,” poster at AAS Meeting 202, #39.08

**Teaching & Professional Development**

- **Dark Skies, Bright Kids** Sep. 2009–present  
*Univ. of Virginia & Southern Albemarle Cty. VA*  
 Volunteer for Astronomy after-school programs at local elementary schools.  
 Aid in lesson-plan development.  
**Lead author of bilingual Astronomy art book for children.**

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- **Teaching Astro 101 Workshop** Jan. 2010  
*Center for Astronomy Education*  
 Attended a workshop on teaching introductory astronomy for non-science majors.
  - **“Astronomy Tutorial” Mentor** Spring 2010  
*University of Virginia*  
 Mentored undergraduate student in an introduction to independent research course.  
 Developed both general and project-specific course materials.
  - **Summer Session Instructor** June 2008  
*University of Virginia*  
 Taught a three-credit undergraduate Astronomy course entitled *Life Beyond Earth*.
  - **Tomorrow’s Professor Today** Sep. 2007–Apr. 2009  
*University of Virginia*  
 Completed two-year professional development program for graduate students.
  - **Teaching Assistant** 2004–2008  
*University of Virginia*  
 ASTR 130: Intro. to Astronomical Observation:  
     Night lab TA, Head ASTR 130 TA, revised & updated Laboratory Manual  
 ASTR 342: Life Beyond Earth  
 ASTR 121/124: Intro. to the Sky and Solar System/Stars, Galaxies and the Universe
  - **Private Tutor with “Math Advantage”** 2004–2007  
*Charlottesville, VA*  
 Worked as a one-on-one tutor in math with two middle school students.

### Awards & Professional Membership

- NASA Earth and Space Science Fellowship 2008–present
- Virginia Space Grant Consortium Graduate Fellowship 2008–present
- First prize oral presentation at Huskey Graduate Research Exhibition 2007
- NSF Graduate Research Fellowship, Honorable Mention 2004
- Barry M. Goldwater Fellow 2003
- American Astronomical Society Junior Member 2003–present

### Talks

#### 2010

- Contributed Talk, Planetary Systems Beyond the Main Sequence, Bamberg, Germany
- Virginia Space Grant Consortium Student Research Conference, Newport News, VA
- UVa Research Symposium, Charlottesville, VA

#### 2009

- Contributed Talk, IAU Symposium 265, Rio de Janeiro, Brazil
- Public Talk, Charlottesville Astronomical Society, Charlottesville, VA
- Virginia Space Grant Consortium Student Research Conference, Hampton, VA
- UVa Research Symposium, Charlottesville, VA

**2008**

- Huskey Graduate Research Exhibition, Charlottesville, VA
- Public Talk, Osher Institute of Lifelong Learning, Charlottesville, VA
- UVa Research Symposium, Charlottesville, VA

**2007**

- Lunch Talk, National Optical Astronomy Observatory, Tucson, AZ
- Public Talk, Osher Institute of Lifelong Learning, Charlottesville, VA
- UVa Research Symposium, Charlottesville, VA

**Outreach and Service**

- Poster Judge for AAS Chambliss Astronomy Achievement Student Award Jan. 2010
- Fan Mountain Public Night 2004–present  
Tour Guide for biannual Fan Mountain Observatory open house.  
Lecturer for the “FOBOS” spectrograph part of tour.
- McCormick Observatory Public Night 2004–present  
Operate the historic 6-in. refractor and 10-in. Meade telescopes for public.
- NASA Academy Scoring Committee 2007  
Evaluated written applications for the 2007 NASA Academy Program.