

# Erika R. Nesvold

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Department of Terrestrial Magnetism  
Carnegie Institution for Science  
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- RESEARCH INTERESTS** Debris disk morphology, planet-disk interactions, planetary system dynamics, submillimeter imaging
- EDUCATION**
- Ph.D., Physics**  
August 2015, University of Maryland, Baltimore County (UMBC)  
Advisor: Dr. Marc Kuchner, NASA Goddard Space Flight Center
- M.S., Applied Physics**  
May 2011, UMBC
- B.S., Mathematics**  
May 2009, UMBC  
Magna Cum Laude
- RESEARCH EXPERIENCE**
- Postdoctoral Fellow** 2015-Present  
Carnegie Department of Terrestrial Magnetism (DTM)
- Graduate Researcher** 2010-2015  
NASA Goddard Space Flight Center (GSFC)  
*Developed a new collisional model of debris disks using parallelized C code. Applied model to observations of debris disks to analyze effects of collisions on planet-disk interactions.*  
Advisor: Dr. Marc Kuchner
- Graduate Summer Researcher** Summer 2013  
NASA/GSFC  
*Updated Python code for generating spectral image cubes of Solar System planets and dust for use with instrument simulators. Integrated simulated and observed planet spectra with empirical and model dust distributions.*  
Advisor: Dr. Aki Roberge
- Graduate Summer Researcher** Summer 2010  
NASA/GSFC  
*Developed IDL code to reduce optical and infrared data for two circumstellar disks. Analyzed the morphology of both disks to identify indications of the presence of exoplanets and to constrain the mass of any possible planets.*  
Advisor: Dr. Mark Clampin
- Undergraduate Summer Intern** Summer 2008  
NASA/GSFC  
*Reduced submillimeter data for several extragalactic sources using a C-based software package. Performed temperature and spectral analysis on the reduced data using IDL routines.*

Advisors: Dr. Dominic Benford & Dr. Johannes Staughan

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|-----------------------------------|--|------------|
| <b>TEACHING EXPERIENCE</b>        | <b>Teaching Assistant</b><br>UMBC Physics Department   | 2009-2011  |
|                                   | <ul style="list-style-type: none"><li>• Algebra-Based Introductory Physics <span style="float: right;">Spring 2011</span><br/><i>Supervised 15 students in an introductory physics lab involving experiments and demonstrations in electricity, magnetism, optics, and modern physics</i></li><li>• Upper-Level Undergraduate Optics <span style="float: right;">Fall 2009, Fall 2010</span><br/><i>Supervised 12 students in a 300-level optics lab and graded weekly lab reports</i></li><li>• Calculus-Based Introductory Physics <span style="float: right;">Spring 2010</span><br/><i>Led a discussion section of 50 students and wrote and graded weekly quizzes</i></li></ul> |            |
| <b>INSTITUTIONAL SERVICE</b>      | <b>Organizer</b> , NASA/GSFC Disks/Planet Group Meetings   | 2011-2015  |
|                                   | <b>Referee</b> , Astronomy & Astrophysics Journal  | 2014       |
|                                   | <b>Executive Secretary</b> , NASA PATM Review Panel  | 2012       |
|                                   | <b>President</b> , Physics Graduate Student Association  | 2010-2011  |
| <b>TECHNICAL SKILLS</b>           | <b>Software:</b> Mathematica, Microsoft Office, Linux/Unix, Mac OS X, Windows<br><b>Programming/Scripting:</b> C, IDL, Python, Matlab, HTML, CSS, LaTeX, OpenMP, MPI   |            |
| <b>GRANTS, AWARDS, AND HONORS</b> | <b>ALMA Student Observing Support Grant</b><br>National Radio Astronomy Observatory<br><i>Student funding associated with ALMA observations (\$27 K)</i>   | 2014       |
|                                   | <b>ALMA Observing Proposal</b><br>Co-I, <i>Confirming the recent collisional destruction of an extra-solar Pluto</i>   | 2014       |
|                                   | <b>HST Theory Grant</b><br>Co-I, <i>SMACK: A New Tool for Modeling Images of Debris Disks (\$110 K)</i>  | 2013       |
|                                   | <b>Graduate Research Conference (GRC) Award</b><br>UMBC Graduate School<br><i>Financial award for the best oral presentation in Physics at the annual GRC</i>  | 2012, 2013 |
|                                   | <b>Mulligan Award</b><br>UMBC Department of Physics<br><i>Financial award for researching and presenting on a topic in the history of physics</i>  | 2012       |
|                                   | <b>Student Stipend Award</b><br>Division of Dynamical Astronomy (DDA)<br><i>Travel grant to present at the 2012 DDA Meeting</i>  | 2012       |
|                                   | <b>Graduate Assistantships in Areas of National Need</b><br>Department of Education  | 2009-2011  |

*Graduate fellowship providing full tuition and student stipend*

**Loughran Regents Scholarship** 2005-2009

UMBC

*Merit scholarship providing full undergraduate tuition, fees, and stipend*

**OTHER  
SUBMITTED  
PROPOSALS**

**ALMA Observing Proposal** 2014

Co-I, *Measuring the gap width in a bright, planet-sculpted debris disk*

**ALMA Observing Proposal** 2014

Co-I, *Resolving Millimeter Emission in the HD 10647 Debris Disk*

**NASA Internal Research and Development Grant** 2014

Co-I, *ECHELLE: Exoplanet Habitability and stELLar Evolution – A systematic interdisciplinary study of the impact of stellar evolution on the habitability of other worlds*

**NASA Astrobiology Institute Program** 2014

Co-I, *ECHELLE: Exoplanet Habitability and stELLar Evolution – A systematic interdisciplinary study of the impact of stellar evolution on the habitability of other worlds*

**NASA Astrophysics Theory Program** 2012

Co-I, *SMACK: Superparticle Model/Algorithm for Collisions in Kuiper belts and debris disks*

**SCHOOLS AND  
WORKSHOPS**

**International Max Planck Research School** August 2011

University of Heidelberg

Characterizing Exoplanets – From Formation to Atmospheres

**PUBLICATIONS**

**Nesvold, E. R.**, Kuchner, M. J., *A SMACK Model of Planetesimals and Dust in the  $\beta$  Pictoris Debris Disk: Thermal Radiation and Scattered Light*, ApJ, submitted

Jang-Condell, H., Chen, C. H., Manoj, P., Watson, D., Lisse, C., **Nesvold, E.**, Kuchner, M., 2015, *Spitzer IRS Spectra of Debris Disks in the Scorpius-Centaurus OB Association III*, ApJ, accepted

**Nesvold, E. R.**, Kuchner, M. J., Rein, H., Pan, M., 2013, *SMACK: A New Algorithm for Modeling Collisions and Dynamics of Planetesimals in Debris Disks*, ApJ, 777, 144

**Nesvold, E. R.**, Kuchner, M. J., 2015, *Gap Clearing by Planets in a Collisional Debris Disk*, ApJ, 798, 83

Roberge, A., Wilkins, A. N., Rizzo, M. J., **Nesvold, E. R.**, Stark, C. C., Lincowski, A. P., McElwain, M. W., Kuchner, M. J., Robinson, T., Meadows, V. S., Straughn, A. N., Wikland, T., Turnbull, M. C., 2015, *Finding the Needle in the Haystack: A High-Fidelity Model of the Solar System for Simulating Exoplanet Observations*, in prep

**INVITED TALKS  
AND SEMINARS**

**Center for Exoplanets & Habitable Worlds Seminar** December 2014

Penn State University

|   |   |                |
|---|---|----------------|
|   | <b>Planet and Star Formation Seminar</b><br>University of California Berkeley   | October 2014   |
|   | <b>Astrophysics Colloquium</b><br>NASA Jet Propulsion Laboratory  | October 2014   |
|   | <b>Infrared Processing and Analysis Center Seminar</b><br>California Institute of Technology  | October 2014   |
|   | <b>Journal Club Talk</b><br>University of California Los Angeles  | October 2014   |
|   | <b>Astro Seminar</b><br>Carnegie Department of Terrestrial Magnetism  | October 2014   |
|   | <b>Planetary Astronomy Seminar</b><br>University of Maryland College Park   | October 2014   |
|   | <b>Radio and Geoastronomy Lunch Talk</b><br>Harvard-Smithsonian Center for Astrophysics   | September 2014 |
|   | <b>Exoplanet Seminar Series</b><br>NASA/GSFC  | November 2013  |
|   | <b>STScI Star and Planet Formation Seminar Series</b><br>Space Telescope Science Institute  | October 2013   |
|   | <b>Astrophysics and Supercomputing Colloquium</b><br>Swinburne University   | March 2013     |
|   | <b>ICRAR/UWA Seminar</b><br>International Centre for Radio Astronomy Research,<br>University of Western Australia   | March 2013     |
| <b>SCIENTIFIC<br/>POSTERS AND<br/>PRESENTA-<br/>TIONS</b> | <b>In the Spirit of Bernard Lyot</b><br>Presentation, Montreal<br>“A SMACK Model of Colliding Planetsimals and Dust in the $\beta$ Pictoris Debris<br>Disk” | June 2015      |
|   | <b>225th American Astronomical Society (AAS)</b><br>Thesis Presentation · Seattle<br>“Modeling Collisions in Circumstellar Disks with SMACK”                | January 2015   |
|   | <b>30 Years of beta Pic Conference</b><br>Poster · Institut d’Astrophysique de Paris<br>“Gap Clearing by Planets in a Collisional Debris Disk”              | September 2014 |
|   | <b>5th National Capital Area Disks (NCAD) Meeting</b><br>Presentation · Carnegie DTM<br>“Gap-Opening by Planets in Debris Disks”                            | July 2014      |
|   | <b>223rd AAS Meeting</b><br>Presentation · National Harbor, Maryland<br>“Modeling Eccentric Debris Rings with SMACK: Collisions Change Everything”          | January 2014   |

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|--------------------------------------|---|----------------------|
|                                      | <b>5th Subaru International Conference</b>  | December 2013        |
|                                      | Presentation · Kona, Hawaii   |                      |
|                                      | “SMACK: A New Algorithm for Modeling Collisions and Dynamics of Debris Disks”   |                      |
|                                      | <b>45th Division for Planetary Sciences (DPS) Meeting</b>   | October 2013         |
|                                      | Presentation · Denver, Colorado   |                      |
|                                      | “SMACK: A New Collisional Algorithm for Modeling Collisions and Dynamics in Debris Disks”                                   |                      |
|                                      | <b>DC/MD/VA Astrophysics Summer Meeting for Grad Students</b>   | July 2013            |
|                                      | Presentation · University of Maryland, College Park   |                      |
|                                      | “A New Collisional Algorithm for Modeling Collisions and Dynamics in Debris Disks”  |                      |
|                                      | <b>2013 Rocks! ALMA Conference</b>  | April 2013           |
|                                      | Poster · Kona, Hawaii   |                      |
|                                      | “SMACK – A New Method for Modeling How Collisions and Planets Affect Debris Disks”  |                      |
|                                      | <b>4th NCAD Meeting</b>   | July 2012            |
|                                      | Presentation · STScI  |                      |
|                                      | “Debris Disks: Modeling Collisions and Dynamics Together”   |                      |
|                                      | <b>Division of Dynamical Astronomy (DDA) Meeting</b>  | May 2012             |
|                                      | Presentation · Mt. Hood, Oregon   |                      |
|                                      | “A New Algorithm for Modeling Collisions in Debris Disks”   |                      |
|                                      | <b>Signposts of Planet Conference</b>   | October 2011         |
|                                      | Poster · NASA/GSFC  |                      |
|                                      | “A New Algorithm for Modeling Collisional Evolution of Debris Disks in 3-D”   |                      |
| <b>PUBLIC TALKS AND PANELS</b>       | <b>Women in Public Service Project Conference</b>   | June 2013            |
|                                      | University of Massachusetts Lowell  |                      |
|                                      | Sharing STEM: Innovation, Entrepreneurship, and Community Engagement Panel  |                      |
|                                      | <b>Mulligan Memorial Lecture</b>  | May 2012             |
|                                      | UMBC  |                      |
|                                      | “The Life and Work of Nikola Tesla”   |                      |
|                                      | <b>Maryland Space Sciences Interaction Day</b>  | May 2012             |
|                                      | NASA/GSFC   |                      |
|                                      | “Modeling Collisions in Debris Disks: A Path to Finding Exoplanets”   |                      |
|                                      | <b>Various Classroom Visits</b>   | 2012-present         |
|                                      | Seton Keough High School, Monsignor Slade Catholic School   |                      |
| <b>EDUCATION AND PUBLIC OUTREACH</b> | Member of <b>Disk Detective</b> science team  | January 2014-present |
|                                      | <i>Participated in social media outreach program for the NASA-funded Zooniverse Disk Detective citizen science program.</i> |                      |
|                                      | <a href="http://www.diskdetective.org">www.diskdetective.org</a>  |                      |

Writer for **Astrobites** blog

December 2012-present

*Contributed monthly posts to the Astrobites blog, summarizing recent astrophysics publications. Edited other contributors' posts. Represented Astrobites at the 2014 Winter AAS meeting.*

[www.astrobites.org](http://www.astrobites.org)