

Erika R. Nesvold

Astrophysicist & Developer, Universe Sandbox
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EXPERIENCE	Astrophysicist & Developer 2017-Present Giant Army <i>Maintained and developed code for the the Universe Sandbox astrophysics simulation game. Added new features related to orbital dynamics and life simulation.</i>
	Postdoctoral Fellow 2015-2017 Carnegie Department of Terrestrial Magnetism (DTM) <i>Conducted and published independent and collaborative theoretical research on the dynamics of exoplanets and debris disks, using my own computational models and tools developed in C, IDL, and Python.</i>
	Researcher Summer 2016 NASA Frontier Development Lab, SETI Institute <i>Participated in a 6-week research accelerator lab, developing machine-learning solutions to problems in planetary defense from asteroid impacts.</i>
	Graduate Researcher 2010-2015 NASA Goddard Space Flight Center (GSFC) <i>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.</i> Advisor: Dr. Marc Kuchner
EDUCATION	Ph.D., Physics August 2015, University of Maryland, Baltimore County (UMBC) “Modeling Collisions in Circumstellar Debris Disks” Advisor: Dr. Marc Kuchner, NASA Goddard Space Flight Center
	M.S., Applied Physics May 2011, UMBC
	B.S., Mathematics May 2009, UMBC <i>magna cum laude</i>
TECHNICAL SKILLS	Software: Unity, Microsoft Office, Linux/Unix, Mac OS X, Windows Programming/Scripting: C, C#, C++, IDL, Python, Matlab, HTML, CSS, LaTeX, OpenMP, MPI
GRANTS, AWARDS, AND HONORS	ALMA Cycle 5 Observing Proposal 2017 Co-I, <i>Disk eccentricity and circumplanetary dust in the HD 106906 system</i> PI: A. Meredith Hughes
	ALMA Cycle 5 Observing Proposal 2017 Co-I, <i>Debris Disk Structure Around Nearby Sun-like Stars with the ACA</i>

PI: Meredith MacGregor

ALMA Cycle 4 Observing Proposal 2016
Co-I, Debris Disk Structure around Nearby Sun-like Stars
 PI: David Wilner

ALMA Cycle 4 Observing Proposal 2016
Co-I, The Debris Disk Surrounding HD 107146: A Possible Super-Earth at 80 AU
 PI: John Carpenter

Magellan Observing Proposal 2015
PI, Imaging the White Dwarfs with the Most Massive Progenitors

ALMA Cycle 3 Observing Proposal 2015
Co-I, Debris Disk Structure around Nearby Sun-like Stars
 PI: David Wilner

Carnegie DTM Postdoctoral Fellowship 2015
 Carnegie DTM
3-year postdoctoral fellowship

ALMA Student Observing Support Grant 2014
 National Radio Astronomy Observatory
Student funding associated with ALMA observations (\$27 K)

ALMA Cycle 2 Observing Proposal 2014
Co-I, Confirming the recent collisional destruction of an extra-solar Pluto
 PI: Chris Stark

HST Theory Grant 2013
Co-I, SMACK: A New Tool for Modeling Images of Debris Disks (\$110 K)
 PI: Marc Kuchner

Student Stipend Award 2012
 Division of Dynamical Astronomy (DDA)
Travel grant to present at the 2012 DDA Meeting

Graduate Assistantships in Areas of National Need 2009-2011
 Department of Education
Graduate fellowship providing full tuition and student stipend

PUBLICATIONS **Nesvold, E. R.**, Greenberg, A., Erasmus, N., van Heerden, E., Galache, J. L., Dahlstrom, E., Marchis, F., 2018, *The Deflector Selector: A Machine Learning Framework for Prioritizing Hazardous Deflection Technology Development*, Acta Astronautica, 146, 33

Nesvold, E. R., Naoz, S., Fitzgerald, M. P., 2017, *HD 106906: A Case Study for External Perturbations of a Debris Disk*, ApJL, 837, L6

Pan, M., **Nesvold, E. R.**, Kuchner, M. J., 2016, *Apocenter Glow in Eccentric Debris Disks: Implications for Fomalhaut and ϵ Eridani*, ApJ, 823, 81

Kuchner, M. J., Silverberg, S. M., Bans, A. S., Bhattacharjee, S., Kenyon, S. J.,

Debes, J. H., Currie, T., Garca, L., Jung, D., Lintott, C., McElwain, M., Padgett, D. L., Rebull, L. M., Wisniewski, J. P., **Nesvold, E. R.**, et al., 2016, *Disk Detective: Discover of New Circumstellar Disk Candidates through Citizen Science*, ApJ, 830, 84

Marino, S., Matra, L., Stark, C., Wyatt, M. C., Casassus, S., Kennedy, G., Rodriguez, D., Zuckerman, B., Perez, S., Dent, W. R. F., Kuchner, M., Hughes, A. M., Schneider, G., Steele, A., Roberge, A., Donaldson, J., and **Nesvold, E. R.**, 2016, *Exocometary gas in the HD 181327 debris ring*, MNRAS, 460, 2933

Nesvold, E. R., Naoz, S., Vican, L., Farr, W. M., 2016, *Circumstellar Debris Disks: Diagnosing the Unseen Perturber*, ApJ, 826, 19

Konishi, M., Grady, C. A., Schneider, G., Shibai, H., McElwain, M. W., **Nesvold, E. R.**, et al., 2016, *Discovery of an Inner Disk Component around HD 141569 A*, ApJL, 818, L23

Nesvold, E. R., Kuchner, M. J., 2015 *A SMACK Model of Colliding Planetesimals in the β Pictoris Debris Disk*, ApJ, 815, 61

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, 808, 167

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

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

**SELECTED
INVITED TALKS
AND SEMINARS**

“Numerical Integration Methods in Planetary Science” August 2017
University of Toronto at Scarborough, Canada

AstroCon DC Conference July 2017
George Washington University

“Impacts in Planetary Systems” Conference May 2017
Lund Observatory, Sweden

Astrophysics Colloquium March 2017
American Museum of Natural History, New York City

iPLEX Lunch Talk October 2016
University of California, Los Angeles

Astrophysics Informal Seminar March 2016
Institute for Advanced Study

Planetary Lunch Colloquium March 2016
Massachusetts Institute of Technology

**SELECTED
POSTERS AND
PRESENTA-
TIONS**

Exoclipse 2017: Exploring New Worlds in the Shade August 2017

Presentation · Boise, Idaho
“Inside-Out Systems: Using Debris Disks to Find Exterior, Wide-Orbit Companions”

Formation and Dynamical Evolution of Exoplanets March 2017
Presentation · Aspen, Colorado
“HD 106906: A Case Study for External Perturbations of a Debris Disk”

Planetary Science Vision 2050 Workshop February 2017
Poster · Washington, DC
“The Deflector Selector: A Machine-Learning Algorithm for Prioritizing Deflection Technology Development”

48th Division for Planetary Sciences (DPS) Meeting October 2016
Presentation · Pasadena, California
“HD 106906: A Case Study for External Perturbations of a Debris Disk”

227th American Astronomical Society (AAS) Meeting January 2016
Presentation · Kissimmee, Florida
“Warm Circumstellar Debris Disks: Dynamical Excitation by Massive External Perturbbers?”

WRITING

Producer and host of the **Making New Worlds** podcast 2017-2018
<http://www.makingnewworlds.com/>

Guest blogger for **The Planetary Society** Various
<http://www.planetary.org/>

Writer for **Damn Interesting** blog 2015-present
<http://www.damninteresting.com>

Writer for **Astrobites** blog 2012-2015
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