

JOSHUA E. COLWELL
Pegasus Professor and Chair
Department of Physics
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EDUCATION

Ph.D. December 1989. University of Colorado at Boulder, Dept. of Astrophysical, Planetary, and Atmospheric Sciences. *The Origin and Evolution of the Uranian Dust Rings.*

B.S. May 1985. Stetson University, Major in Physics, Minor in Applied Mathematics. (Honors Program, summa cum laude).

PROFESSIONAL CAREER

University of Central Florida

Department Chair: 2021 – present.

Pegasus Professor: 2019 – present.

Director, Stephen W. Hawking Center for Microgravity Research and Education:
2021 – present.

Professor: Department of Physics, August 2012 – present.

Associate Professor: Department of Physics, August 2009 – August 2012.

Associate Chair: Department of Physics, January 2011 – May 2021.

Assistant Director: Florida Space Institute, October 2011 – May 2021.

Assistant Professor: Department of Physics, December 2006 – August 2009.

University of Colorado

Research Scientist III: Laboratory for Atmospheric and Space Physics, July 2002 – December 2006.

Research Scientist II: Laboratory for Atmospheric and Space Physics, July 1993 – June 2002.

Post-Doctoral Research Associate: Laboratory for Atmospheric and Space Physics, November 1989 - June 1993.

Fulbright Senior Research Scholar: Observatoire Midi-Pyrénées, Toulouse, France. (September 1995 - May 1996).

TEACHING, SERVICE, AND OUTREACH ACTIVITIES

Taught introductory physics and astronomy, advanced undergraduate astronomy courses, created general education course on The Physics of Energy and Climate Change, created graduate course on The Origin and Evolution of Planetary Systems. Creator, Producer and Host of “Walkabout the Galaxy” an astronomy podcast for the general public, published 2-3 times per month, 40-minute episodes. More than 290,000 downloads as of March 2023. Science advisor to “Deep Impact” (Dreamworks). Multiple public speaking engagements. Scientific and local organizing committees for multiple international workshops and conferences.

RESEARCH ACTIVITIES

Principal Investigator of over \$7.4M in external research grants. Co-Investigator on Cassini Ultraviolet Imaging Spectrograph. Principal Investigator of multiple flight experiments on the Space Shuttle, International Space Station, commercial suborbital vehicles New Shepard and SpaceShipTwo, Q-PACE CubeSat, and parabolic airplane flights. Numerical modeling of planetary rings, asteroid regolith, lunar, cometary, and asteroid thermal evolution, and circumplanetary dust. Microgravity experiments on planetesimal accretion, planetary ring collisions, and planetary regolith evolution.

HONORS AND AWARDS

- Asteroid 29605 joshuacolwell
- Pegasus Professor, 2019.
- UCF Excellence in Mentoring Doctoral Students, 2019
- NASA Group Achievement Award, Cassini Solstice & Grand Finale, UVIS Team 2018
- UCF Luminary Award, 2018
- UCF Teaching Incentive Program Award (TIP), 2018
- NASA Group Achievement Award, Rosetta Alice Team, 2017
- UCF Research Incentive Award (RIA), 2017
- UCF Excellence in Undergraduate Teaching Award, 2017
- UCF SGA Lifesaver Award, 2014
- UCF Teaching Incentive Program Award (TIP), 2013
- UCF Mentor of the Year, 2012-2013, Office of Undergraduate Research
- UCF Research Incentive Award (RIA), 2012
- NASA Group Achievement Award, Cassini UVIS Team, 2009
- NASA Group Achievement Award, Cassini Rings Target Working Team, 2009
- NASA Space Act Board Award, SOA, 2005.
- NASA JPL Interplanetary Network Directorate Team Award, SOA, 2004.
- University of Colorado Academic Life Teaching Excellence Award 2003.
- NASA Group Achievement Award, Cassini, 1998.
- NASA Group Achievement Award, Voyager PPS Investigation, 1989.
- University of Colorado Graduate Fellowship: 1985/86, 1986/87, 1987/88, 1988/89.

GRADUATE STUDENTS SUPERVISED AT UCF

Current:

Melody Raechel Green, University of Central Florida, Modeling and Simulation, working toward Ph.D.

Previous:

Stephanie Eckert, Ph.D., University of Central Florida, Physics Department (Planetary Sciences Track), "Characterizing the Particle Size Distribution in Saturn's Rings Using Cassini UVIS Stellar Occultation Data", May 2022.

Isabel Rivera, M.S., University of Central Florida, Physics Department (Planetary Sciences Track), “Simulating Ejecta Blown Off the Lunar Surface Due to Landing Spacecraft Using the Mercury N-Body Integrator”, August 2021.

Stephanie Gibson Jarmak, Ph.D., University of Central Florida, Physics Department (Planetary Sciences Track), “Experimental and Numerical Investigations of Granular Dynamics in Microgravity”, May 2020. Recipient of Order of Pegasus.

Richard Jerousek, Ph.D., University of Central Florida, Physics Department (Planetary Sciences Track), “Determining the Small-Scale Structure and Particle Properties in Saturn’s Rings from Stellar and Radio Occultations”, May 2018.

Tracy Becker, Ph.D., University of Central Florida, Physics Department (Planetary Sciences Track), “Saturn’s Rings: Measuring Particle Size Distributions Using Cassini UVIS Occultation Data”, May 2016. Recipient of Order of Pegasus. Recipient of College of Sciences Outstanding Dissertation Award.

Akbar Whizin, Ph.D., University of Central Florida, Physics Department (Planetary Sciences Track), “Dynamical Formation of Planetesimals”, May 2016.

Kevin Baillé, Ph.D., University of Central Florida, Physics Department (Planetary Sciences Track), “Fine-Scale Structures in Saturn’s Rings: Waves, Wakes, and Ghosts”, August 2011.

REFEREED PUBLICATIONS – JOURNALS

As of December 15, 2023, h-index=38 based on 121 publications and total citations of 4300, from ISI Web of Science, and h-index=44 (25 since 2018) and 6435 total citations based on Google Scholar (<https://scholar.google.com/citations?user=cowArVYAAAAAJ>).

1. Green, M. R., J. E. Colwell, L. W. Esposito, R. G. Jerousek 2023. Particle sizes in Saturn’s rings from UVIS stellar occultations 2. Outlier populations in the C ring and Cassini Division. *Icarus* (submitted).
2. Bradley, E. T., J. E. Colwell, L. W. Esposito 2023. Retrieval of Albedo and Compositional Properties of Saturn’s Rings from Cassini UVIS Spectra. *Icarus* (submitted).
3. French, R. G., P. D. Nicholson, C. A. McGhee-French, P.-Y. Longaretti, M. M. Hedman, J. Colwell, E. A. Marouf, N. Rappaport, S. Flury, J. Fong 2023. The complex shape of the outer edge of Saturn’s B ring, as observed in Cassini occultation data. *Icarus* **405**, 115678, doi:10.1016/j.icarus.2023.115678.
4. Nicholson, P. D., R. G. French, C. A. McGhee-French, P.-Y. Longaretti, M. M. Hedman, M. El Moutamid, J. Colwell, E. A. Marouf, N. Rappaport, S. Flury, J. Fong, R. Maguire, G. Steranka 2022. The Seven-lobed Shape of the Outer Edge of Saturn’s A Ring. *Icarus* **390**, 115287, doi:10.1016/j.icarus.2022.115287.

5. Jarmak, S. G., T. M. Becker, J. E. Colwell, R. G. Jerousek, L. W. Esposito 2022. Solar Occultation Observations of Saturn's Rings with Cassini UVIS. *Icarus* **388**, 115237, doi:10.1016/j.icarus.2022.115237.
6. Brisset, J., C. Cox, J. Metzger, T. Miletich, N. Mohammed, A. Rascon, L. Forczyk, A. Dove, J. Colwell 2022. *Plan. Sci. J.* **3**, 176, doi:10.3847/PSJ/ac779a.
7. Featherstone, J., R. Bullard, T. Emm, A. Jackson, R. Reid, S. Shefferman, A. Dove, J. Colwell, J. E. Kollmer, K. E. Daniels 2021. Stick-slip Dynamics in Penetration Experiments on Simulated Regolith. *Plan. Sci. J.* **2**, id.243, doi:10.3847/PSJ/ac3de2.
8. Jarmak, S., J. Colwell, A. Dove, J. Brisset 2021. The Adhesive Response of Regolith to Low-Energy Disturbances in Microgravity. *Gravitational and Space Research*, **9**, 1-12, doi:10.2478/gsr-2021-0001.
9. Eckert, S., J. E. Colwell, T. M. Becker, L. W. Esposito 2021. Sizes of the Smallest Particles at Saturn's Ring Edges. *Icarus* **357**, 114224, doi:10.1016/j.icarus.2020.114224.
10. Jerousek, R. G., J. E. Colwell, M. Hedman, R. French, E. Marouf, L. W. Esposito, P. D. Nicholson 2019. Saturn's C Ring and Cassini Division: Particle Sizes from Cassini UVIS, VIMS, and RSS Occultations. *Icarus*, **344**, 113565, doi:10.1016/j.icarus.2019.113565.
11. Hansen, C. J., L. W. Esposito, J. E. Colwell, A. R. Hendrix, G. Portyankina, A. I. F. Stewart, R. A. West 2020. The Composition and Structure of Enceladus' Plume from the Complete Set of Cassini UVIS Occultation Observations. *Icarus* **344**, 113461, doi:10.1016/j.icarus.2019.113461.
12. Tiscareno, M. S., J. A. Burns, J. E. Colwell, J. N. Cuzzi, M. M. Hedman, C. D. Murray, P. D. Nicholson, L. J. Spilker, E. J. Baker, S. M. Brooks, R. N. Clark, N. J. Cooper, E. Déau, C. Ferrari, G. Filacchione, R. G. Jerousek, S. Le Mouélic, R. Morishima, S. Pilorz, S. Rodriguez, M. R. Showalter 2019. Close-Range Remote Sensing of Saturn's Rings During Cassini's Ring Grazing Orbits and Grand Finale. *Science*, **364**, eaau1017.
13. Brisset, J., T. Miletich, J. Metzger, A. Rascon, A. Dove, J. Colwell 2019. Multi-Particle Collisions in Microgravity: Coefficient of Restitution and Sticking Threshold for Systems of mm-Sized Particles. *Astron. Astrophys.* **631**, A35, doi:10.1051/0004-6361/201936228.

Books

1. Colwell, J. E. 2019. *The Ringed Planet, Second Edition: Cassini's Voyage of Discovery at Saturn*. Morgan & Claypool/Institute of Physics Concise Physics Series. ISBN: 978-1643277158. Published November 2019.
2. Colwell, J. E. 2017. *The Ringed Planet: Cassini's Voyage of Discovery at Saturn*. Morgan & Claypool/Institute of Physics Concise Physics Series. ISBN: 978-1681744964. Published April 2017.

CONFERENCE ABSTRACTS

Over 330 contributed and invited oral and poster presentations as of 2022