

Kevin M. Crosby

Department of Physics & Astronomy

Carthage College

2001 Alford Park Drive

Kenosha, WI 53140

(262) 551-5855

kcrosby@carthage.edu

<http://faculty.carthage.edu/kcrosby/>

Professional Preparation

Ph.D. (Physics), Colorado State University, 1997.

Dissertation in Computational Physics of Disordered Materials.

M.S. (Physics), University of California, Davis, 1992.

Thesis in Experimental Non-linear Optics.

B.A. (Physics with concentration in astrophysics), Beloit College, 1990.

Academic Leadership Appointments

2014 – : Director, Wisconsin Space Grant Consortium

2015 – 2017: Dean, Division of Natural and Social Sciences, Carthage College

2005 – 2014: Chair, Division of Natural Sciences, Carthage College

2001 – 2005: Chair, Computer Science Department, Carthage College

1999 – 2001: Chair, Physics Department, Carthage College

Academic Rank Appointments

2011 – : Professor, Carthage College

2004 – 2011: Associate Professor, Carthage College

1998 – 2004: Assistant Professor, Carthage College

1996 – 1997: Visiting Assistant Professor, Univ. Northern Colorado

1993 – 1994: Lecturer in Physics, Miracosta College

1992 – 1993: Lecturer, California State University at Sacramento

1991 – 1992: Adjunct Instructor in Physics, Cosumnes River College

Recent External Service Appointments

2019 – : Executive Board Member, Wisconsin Aerospace Partners

2018 – : Visiting Senior Scientist (Intergovernmental Personnel Agreement),
Engineering Directorate, NASA Johnson Space Center

2018 – : Visiting Senior Scientist (Intergovernmental Personnel Agreement),
Advanced Exploration Systems Division, NASA Kennedy Space Center

2018 – : External Member, Dissertation Committee, Aerospace Engineering,
Purdue University, Lafayette, IN

2017 – : External Member, Dissertation Committee, Embry Riddle Aeronautical
University, Daytona Beach, FL

2015 – : Executive Board, National Space Grant Foundation. Service as Secretary
and Treasurer to a Foundation with over \$2M in managed assets

2016 – : Member, Elections Committee, National Space Grant Alliance

- 2015 – : Member, Appointments, Promotion, and Tenure Committee, Rosalind Franklin University of Medicine and Science College of Pharmacy
- 2009 – 2017: Member, Advisory Board, Rosalind Franklin University of Medicine and Science College of Pharmacy. Helped develop new college's strategic plan; assisted with accreditation; wrote articulation agreement for dual-degree program

Awards and Grants

\$8M+ in external grants and contracts

- NASA Flight Opportunities Program: *Propellant Mass Gauging in Gateway Architecture Vehicles*, 2019-2021. \$500,000. **P.I.**
- NASA Flight Opportunities Program: *Magneto-Active Slosh Control System for Spacecraft and Launch Vehicles*, 2019-2020. \$271,749. **P.I.**
- NASA National Space Grant College and Fellowship Program: *Lead Institution/Director, Wisconsin Space Grant Consortium*, 2014-2019. \$2,855,000.
- NASA Undergraduate Student Instrument Project: *CaNOP CubeSat*, 2016-2018. \$210,000. **P.I.**
- NASA Flight Opportunities Program: *Modal Propellant Gauging in Microgravity Phase III*. \$285,000. **P.I.**
- NASA Flight Opportunities Program: *Modal Propellant Gauging in Microgravity Phase II*. \$163,000. **P.I.**
- NASA Flight Opportunities Program: *Modal Propellant Gauging in Microgravity*, 2015-17. \$126,000. **P.I.**
- Midstates Math and Science Consortium: *Janet Anderson Lecture Award*, 2014.
- National Space Grant Foundation Contract: *First Nations Launch Rocket Competition*, 2014-2018. \$500,000+.
- NASA Cooperative Agreement *STEM Persistence through Early Engagement with Balloon-Platform Research*, 2014-2017. \$485,844. **P.I.**
- NSF Noyce STEM Teacher Training Grant: *Community Alliance for STEM Teaching (CAST)*, 2014-2016. \$299,131. **P.I.**
- Wisconsin Space Grant Consortium Research Seed Grant: *Normal Field Instability in Ferrofluids in Microgravity*, 2014. \$15,587. **P.I.**
- NASA Science Mission Directorate: *Microgravity Propellant Gauging Using Modal Analysis*, 2013. \$68,000 (inc. match). **P.I.**
- Wisconsin Space Grant Consortium: *Parabolic Flight Campaign: De-gassing FC-72 Using Radial Membrane Filtration*, 2013. \$2,000. Student Authors.
- Wisconsin Space Grant Consortium Research Seed Grant: *Fluid Mass Gauging in Spacecraft Propellant Tanks Using Modal Analysis*, 2012. \$41,550. **P.I.**
- Wisconsin space Grant Consortium: *Using Real-time Modal Analysis to Determine Spacecraft Propellant Tank Volume*, 2011. \$3,000. Student Authors.
- Wisconsin space Grant Consortium: *Modeling Propellant Slosh in the Orion Crew Module Downstream Propellant Tanks*, 2010. \$2,000. Student Authors.
- Wisconsin Space Grant Consortium: *Space Sciences Capstone Curriculum – Higher Education Initiatives Program*, 2009. \$16,000. **P.I.**

- NASA Regional Space Grant: *Repose Angles of Lunar Regolith in Reduced Gravity – NASA Reduced Gravity Flight Program, 2009*. \$2,500. Student Authors.
- NASA Regional Space Grant: *Team Participation in Rock-On Suborbital Payload Development and Launch, 2009*. \$8,000. **P.I.**
- Wisconsin Space Grant Consortium: *Inertial Filtration of Lunar Dust – NASA Reduced Gravity Flight Program, 2008*. \$2,500. Student Authors.
- Wisconsin Dept. of Public Instruction: *Advancing Science Knowledge (Middle School Science Education, co-P.I.) 2007*. \$100,000.
- NSF-STC Grant: *Education and Outreach under the Center for Adaptive Optics (partner with co-P.I.), 2000*.
- NSF-DUE (CCLI) Grant: *A Computation and Visualization Laboratory at Carthage College (co-P.I.), 2000*. \$150,000.
- NSF Travel Grant: Travel Grant to Bring Speakers to Carthage College, 1999. \$1000.
- Carthage College Faculty Research Grant: *Seeing Science: Visualizing Complex Data, 1999*. \$2000.
- NSF-DUE Grant: *Case Studies in the Introductory Physics Laboratory, 1998*. \$150,000. **P.I.**
- Phi-Kappa-Phi Honor Society, 1997.
- Colorado State University Dissertation Fellowship, 1996.
- NSF-DMR Grant: *Mesoscopic Modeling of Mechanical and Electrical Failure of Diamond-like Carbon-Thin Films (recipient of Graduate Research Fellowship resulting from this grant), 1995*.
- Palmer Undergraduate Teaching Fellowship, 1988-90.
- Bullock Science Scholarship, 1986-90.

Selected Publications and Proceedings

Modal Propellant Gauging: High-resolution and non-invasive gauging of both settled and unsettled liquids in reduced gravity, Crosby, K.M., Williams, N.J., Werlink, R.J., Hurlbert, E.A. *Acta Astronautica* (2019). ISSN 0094-5765.
<https://doi.org/10.1016/j.actaastro.2019.01.050>.

Modal Propellant Gauging: High-resolution and non-invasive gauging of both settled and unsettled liquids in reduced gravity, Crosby, K.M., Werlink, R., Williams, N., Hurlbert, E. (2018). Proceedings of the 69th International Astronautical Congress (IAC), Bremen, Germany, 1-5 October 2018.

Non-Intrusive Zero-G and Settled Mass Gauging System using Piezoelectric Actuation and Sensing of Modal Response for Spacecraft Cryogenic or Earth Storable Propellants, Crosby, K.M., Werlink, R., Williams, N., Hurlbert, E. (2018). Joint Army-Navy-NASA-Air Force Interagency Propulsion Committee, In-Space Chemical Propulsion Technical Interchange Meeting (TIM), Huntsville, AL, 29-30, August 2018.

Modal Propellant Gauging in Low Gravity, Crosby, K.M., Rundle, T., LeCaptain, K., & Werlink, R. (2016). *AIAA SPACE 2016*. American Institute of Aeronautics and Astronautics.

Modal Propellant Gauging. Rundle T., LeCaptain, K., Crosby, K.M. (2017). Next-Generation Suborbital Researchers Conference, 18-20, December 2017, Broomfield, CO. <http://www.boulder.swri.edu/NSRC2017/Site4/PDF/Crosby.pdf>

The Canopy Near-Infrared Observing Project: NanoSatellites and Forestry. (SP-64) Crosby, K.M., Hammock, L., Munson, J., Wonsil, J (2017). 33rd Annual Meeting American Society for Gravitational and Space Research, 25-28 October 2017, Seattle, WA.

Microgravity Propellant Gauging Using Experimental Modal Analysis. Rundle, T., LeCaptain, K., Werlink, R., Crosby, K.M. (2016). Next-Generation Suborbital Researchers Conference, 2-4, June 2016, Broomfield, CO.

Modal Propellant Gauging Using Experimental Modal Analysis. (SP-54). Rundle, T., Crosby, K.M. (2015). 31st Annual Meeting American Society for Gravitational and Space Research, 11-15 November 2015, Alexandria, VA.

Book Review: The Physics of War, Physics Today **67**(9), September (2014).

Degassing of FC-72 in Microgravity, Weiland, D., Crosby, K.M., Hall, N., Proceedings of the 23rd Annual Wisconsin Space Grant Consortium (2013).

Experimental modal analysis of fluid volume in spacecraft propellant tanks in microgravity, Mathe, S., Lubick, K., Crosby, K.M., Werlink, R., Proceedings of the 23rd Annual Wisconsin Space Grant Consortium (2013).

Zero Gravity Fuel Gauging Using Modal Analysis (Proceedings Abstract), Crosby, K.M., Werlink, R., Mathe, S., Lubick, L., Next-generation Suborbital Researchers Conference, June 3-5, Broomfield, CO (2013).

Modal Evaluation of Fluid Volume in Spacecraft Propellant Tanks (Proceeding Abstract), Crosby, K.M., Werlink, R., Mathe, S., Lubick, K., Annual Meeting of the Lunar Exploration Analysis Group, held October 22-24, 2012 in Greenbelt, MD.

Modal Evaluation of Fluid Volume in Spacecraft Propellant Tanks: Part I, II, Finnvik, S., Metallo, S., Robinson, J., Crosby, K.M., Werlink, R., Proceedings of the 21th Annual Wisconsin Space Grant Consortium (2011).

Investigation of Propellant Sloshing and Zero Gravity Equilibrium for the Orion Service Module Propellant Tanks, Bakkum, A., Shultz, K., Finnvik, S., Fritz, I., Frye, B., Grove, C., Hartstern, K., Kreppel, S., Schiavone, E., Crosby, K. M., Proceedings of the 20th Annual Wisconsin Space Conference (2010).

Slosh Dynamics in the Orion Downstream Propellant Tank (Proceedings Abstract), Crosby, K.M., Bakkum, A., Finnvik, S., Fritz, I., Frye, B., Grove, C., Hartstern, K., Kreppel, S., Schultz, K., Braun, J.P., Annual Meeting of the Lunar Exploration Analysis Group, held September 14-17, 2010 in Washington, D.C.

Reduced Pressure Cyclone Separation Studies using Synthetic Lunar Regolith, Mackey, J. R., Agui, J. H., Crosby, K. M., Frye, B., Sietz, T., Symposium Report of the 40th International Conference on Environmental Systems, Barcelona, Spain, July, 2010.
Repose Angles of Lunar Mare Simulants in Microgravity, Fritz, I., Kreppel, S., Crosby, K., Martin, E., Pennington, C., Frye, B., Monegato, J., and Agui, J, Proceedings of the 19th Annual Wisconsin Space Grant (2009).

Scaling Relations for Repose Angles of Lunar Mare Simulants (Proceedings Abstract), Crosby K. M., Fritz I., Kreppel S., Martin E., Pennington C., Frye B., and Agui J., Report of the Lunar Exploration Analysis Group (2009).

Measurements of the Collection Efficiency of an Air Cyclone in Lunar Gravity, Crosby, K. M., Agui, J., Pennington, C., Sorensen, E., Martin, E., Fritz, I., and Frye, B., Proceedings of the Wisconsin Space Grant (2008).

Dust in the Wind: Inertial Filtration of Lunar Dust in Reduced Gravity, Crosby, K. M., Report of the Joint Annual Meeting of Lunar Exploration Analysis Group, International Lunar Exploration Working Group, and Space Resources Roundtable (2008).

Computational Fluid Dynamical Model of a Cyclone Separator in Microgravity, Crosby, K. M. and Frye, B., Proceedings of the Wisconsin Space Grant (2008).

Professional Affiliations

American Institute of Aeronautics and Astronautics (2012-present)

Sigma Pi Sigma Honorary Society (2007-present)

Wisconsin Space Grant Consortium (2005-present)

Sixth Star Entertainment (2003-present)

Association for Computing Machinery (2001-present)

Special Interest Group in Computer Science Education (2001-present)

Material Research Society (1999-present)

Council on Undergraduate Research (1998-2001)

American Physical Society (1992-present)

Division of Computational Physics, APS Regional Committee Member (1998-present)

Liaison to Careers and Professional Development Program Unit (American Physical Society, 1999-2003)

American Association of Physics Teachers (1998-present)