

Timothy K. Minton, Professor

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Professional Preparation

University of Illinois, Urbana-Champaign, Chemistry, B.S., 1980

University of California, Berkeley, Physical Chemistry, Ph.D., 1986

University of Illinois, Urbana-Champaign, Reaction Dynamics, Post-Doc, 1986-1988

University of Zürich, Switzerland, Reaction Dynamics, Post-Doc, 1988-1989

Appointments

University of Colorado, Smead Department of Aerospace Engineering Sciences, Professor, 2020–Present. Montana State University, Department of Chemistry and Biochemistry, Professor, 2005–2020, Associate Professor, 2001–2005, Assistant Professor, 1995–2001. Jet Propulsion Laboratory, Pasadena, CA: Member of Technical Staff, 1989–1995.

Ten Most Recent Refereed Publications

1. Xu, C.; Treadway, C. M.; Murray, V. J.; Minton, T. K.; Malaska, M. J.; Cable, M. L.; Hofmann, A. E. Inelastic Scattering Dynamics of Naphthalene and 2-Octanone on Highly-Oriented Pyrolytic Graphite. *J. Chem. Phys.* **2020**, *152*, 244709. DOI: 10.1063/5.0011958

2. Murray, J. J.; Recio, P.; Caracciolo, A.; Miossec, C.; Balucani, N.; Casavecchia, P.; Minton, T. K. Oxidation and Nitridation of Vitreous Carbon at High Temperatures. *Carbon* **2020**, *167*, 388-402. DOI: 10.1016/j.carbon.2020.05.076.

3. Verker, R.; Bolker, A.; Carmiel, Y.; Gouzman, I.; Grossman, E.; Minton, T. K.; Remaury, S. Ground Testing of an On-orbit Atomic Oxygen Flux and Ionizing Radiation Dose Sensor Based on Material Degradation by the Space Environment. *Acta Astronautica* **2020**, *173*, 333-343. DOI: 10.1016/j.actaastro.2020.04.065

4. Shivakumar, R.; Bolker, A.; Tsang, S. H.; Atar, N.; Verker, R.; Gouzman, I.; Hala, M.; Moshe, N.; Grossman, E.; Minton, T. K.; Teo, E. T. POSS Enhanced 3D Graphene - Polyimide Film for Atomic Oxygen Endurance in Low Earth Orbit space environment. *Polymer* **2020**, *191*, 122270. DOI: 10.1016/j.polymer.2020.122270

5. Smoll, Jr. E. J.; Chen, X.; Hall, L. M.; D'Andrea, L.; Slattery, J. M.; Minton, T. K. Probing a Ruthenium Coordination Complex at the Ionic Liquid-Vacuum Interface with Reactive-Atom Scattering, X-Ray Photoelectron Spectroscopy, and Time-of Flight Secondary Ion Mass Spectrometry. *J. Phys. Chem. C* **2020**, *124*, 382-397. DOI: 10.1021/acs.jpcc.9b07662.

6. Smoll, Jr., E. J.; Minton, T. K. Scattering-Angle Randomization in Nonthermal Gas-Liquid Collisions. *J. Phys. Chem. C* **2019**, *123*, 22887-22896. DOI: 10.1021/acs.jpcc.9b03467.

7. Murray, V. J.; Minton, T. K. Gas-Surface Interactions of Atomic Nitrogen on Carbon. *Carbon* **2019**, *150*, 85-92. DOI: 10.1016/j.carbon.2019.04.117.

8. Murray, V. J.; Zhou, L.; Xu, C.; Wang, Y.; Guo, H.; Minton, T. K. Scattering Dynamics of Glycine, H₂O, and CO₂ on Highly Oriented Pyrolytic Graphite. *J. Phys. Chem. C* **2019**, *123*, 3605–3621. DOI: 10.1021/acs.jpcc.8b11293.

9. Poovathingal, S. J.; Minton, T. K.; Szilagy, R. K. Evaluating Density Functionals by Examining Molecular Structures, Chemical Bonding, and Relative Energies of Mononuclear Ru–Cl–H–PR₃ Isomers. *J. Phys. Chem. A* **2019**, *123*, 343-358. DOI: 10.1021/acs.jpca.8b03216.

10. Smoll, Jr., E. J.; Purcell, S. M.; D'Andrea, L.; Slattery, J. M.; Bruce, D. W.; Costen, M. L.; McKendrick, K. G.; Minton, T. K. Probing Conformational Heterogeneity at the Ionic Liquid–Vacuum Interface by Reactive-Atom Scattering. *J. Phys. Chem. Lett.* **2019**, *10*, 156-163. DOI: 10.1021/acs.jpcllett.8b02920.

Synergistic Activities

1. Associate Editor for the *J. Spacecr. Rockets*, 2010–present.
2. Senior Editor for the *J. Phys. Chem. A/B/C*, 2005–2019.
3. Participated in several low-Earth orbital space-flight experiments: EOIM-3, MISSE-1&2, MISSE-5, MISSE-6, MISSE-7; currently involved with MISSE-FF.
4. Member of the Organizing Committee for nine space materials conferences: *14th International Symposium on Materials in a Space Environment (ISMSE-14)*, held in Biarritz, France, October 2018; *ISMSE-13*, held in Pau, France, June 2015; *11th International Conference on the Protection of Materials and Structures from the Space Environment (ICPMSE-11)*, held in Lijiang, Yunnan, China, May 2014; *ISMSE-12*, held in Noordwijk, The Netherlands, September 2012; *ICPMSE-10*, held in Okinawa, Japan, June 2011; *ISMSE-11*, held in Aix en Provence, France, September 2009; *ICPMSE-9*, held in Toronto, Canada, May 2008; *ICPMSE-7*, held in Toronto, Canada, May 2004; *ICPMSE-6*, held in Toronto, Canada, May 2002.
5. Organizer or co-organizer of several scientific symposia: *Dynamics of Molecular Collisions*, Co-Chair in 2017 (Tahoe City, CA) and Chair in 2019 (Big Sky, MT). *9th Ablation Workshop*, Chair, held in Bozeman, MT, August 2017. *Chemical Dynamics in Extreme Environments*, Symposium Chair, held at the ACS National Meeting, San Francisco, September 2006; *International Symposium on Free Radicals*, Co-Chair, held at Big Sky, MT, August 2007. *In Situ Studies of Gas-Solid Surface Reactions*, Co-Chair, held at the Materials Research Society National Meeting in San Francisco, CA, March 2005
6. Member or Chair of five prize committees for the American Chemical Society and the American Physical Society.

Honors and Awards

MSU Alumni/Bozeman Chamber of Commerce Excellence Award (1996); Charles & Nora Wiley Award for Meritorious Research (2002); Air Force Research Laboratory, In-House Project of the Quarter (2002); Fellow of the American Chemical Society (2010); Fellow of the American Association for the Advancement of Science (2012); Chinese Academy of Sciences: Senior International Scholar (2012, 2014); Fellow of the American Physical Society (2015); Lloyd Thomas Lecturer at the 30th International Symposium on Rarefied Gas Dynamics (2016); Visiting Foreign Scholar, University of Perugia, Italy (2017).

Undergraduate and Graduate Advisors, and Postdoctoral Sponsors

Undergraduate research advisor: Willis H. Flygare (University of Illinois, deceased). Ph.D. advisor: Yuan T. Lee (Nobel Prize 1986, currently at Academia Sinica, Taiwan); Post-doc advisor: J. Douglas McDonald (University of Illinois, retired); Post-doc advisor: J. Robert Huber (University of Zürich, Switzerland, retired).

Management/Career Performance

- (1) Task Manager of 6 projects at the Jet Propulsion Laboratory, totaling \$611k.
- (2) Co-Manager of 3 projects at the Jet Propulsion Laboratory, totaling \$313k.
- (3) Principal Investigator of 67 projects at Montana State University, totaling \$14,608k.
- (4) Outputs: 119 refereed articles; 2 book chapters; 2 patents; 52 conference proceedings (13 refereed); 6 technical reports; 128 invited talks; 42 contributed talks.
- (5) Supervision: 8 staff, 22 graduate students; 18 post-doctoral associates; 15 undergraduates.
- (6) Courses taught (one semester duration): 59.
- (7) Current funding: NASA (multiple grants), AFOSR, AFRL, Sandia, Israeli Defense Ministry, University of Colorado (startup)