**PETER B. ARMENTROUT**

Curriculum Vitae

**EDUCATION**

B.S., Chemistry, Case Western Reserve University, Cleveland, Ohio, 1975 (Highest Honors)

Ph.D., Chemistry, California Institute of Technology, Pasadena, CA, 1980 (Blanche A. Mowrer Memorial Fellowship)

Postdoctoral Member of Technical Staff, Bell Laboratories, Murray Hill, NJ, 1/80 to 7/81

**AWARDS AND HONORS**

Camille and Henry Dreyfus Grant for Newly Appointed Faculty in Chemistry, 1981

University of California Regents' Junior Faculty Fellow, 1982

Presidential Young Investigator Award, National Science Foundation, 1984-1989

Alfred P. Sloan Research Fellow, 1986-1990

Camille and Henry Dreyfus Teacher-Scholar, 1987-1992

Outstanding Undergraduate Teaching Award, Chemistry Department, University of Utah, 1988-1989

Fellow of the American Association for the Advancement of Science, elected 1992

Buck-Whitney Award, American Chemical Society Eastern New York Section, 1993

Distinguished Research Award, University of Utah, 1994

Fellow of the American Physical Society, elected 1994

Mack Memorial Award Lecturer, The Ohio State University Department of Chemistry, 1997

Japan Society for the Promotion of Science (JSPS) Fellow, 1999

ISI Highly Cited Researcher in Chemistry (world's top 250 most highly cited researchers), 2000-present

Biemann Medal, American Society of Mass Spectrometry, 2001

Honoree of Special Issue of Journal of American Society of Mass Spectrometry, Vol. 13, 2002

Utah Award of Chemistry, American Chemical Society, 2002

Cannon Fellow, Chemistry Department, University of Utah, 2003-2018

Phi Kappa Phi Honor Society, 2004

Outstanding Alumnus of the Year, Department of Chemistry, Case Western Reserve University, 2004

Freiser Memorial Lecture, Purdue University, 2007

Field and Franklin Award for Outstanding Achievement in Mass Spectrometry, American Chemical Society, 2009

Governor's Medal for Science and Technology Award, Utah, 2010

R. W. Parry Teaching Award, Department of Chemistry, University of Utah, 2011

Rosenblatt Prize for Excellence, University of Utah, 2011

Morino Lectureship, Morino Foundation of Japan and Kobe University, Japan, 2011

Honoree of Special Issue of International Journal of Mass Spectrometry, Vol. 330-332, 2012

Honoree of Special Issue of Journal of Physical Chemistry A, Vol. 117, 2013

Ron Hites Award, American Society of Mass Spectrometry, 2018

Henry Eyring Presidential Endowed Chair in Chemistry, University of Utah, 2018-present

John B. Fenn Award for a Distinguished Contribution in Mass Spectrometry, American Society of Mass Spectrometry, 2021

Honoree of Special Issue of Journal of American Society of Mass Spectrometry, Vol. 33, 2022

Environmental Health & Safety Partnership Award (inaugural), University of Utah, 2023

**PROFESSIONAL ACTIVITIES**

Editorial Boards: International Journal of Mass Spectrometry, 1987-2020, emeritus member present; Journal of Physical Chemistry, 2005-2007; Journal of Chemical Physics, 2004-2006; Journal of the American Society of Mass Spectrometry, 1999-2004, 2013-2018; Journal of the American Chemical Society, 1996-2001; Organometallics, 1999-2001; Journal of Cluster Science, 1989-1995

Air Force Office of Scientific Research Review Panel, 1988-1992

National Science Foundation Review Panels: Postdoctoral Fellowship, 1990; Collaborative Research in Chemistry, 2008; CSDM-A Chemistry Panel, 2019, 2022; NHMFL Panel, 2019; CMI Mass Spectrometry Panel, 2021.

Department of Energy, Energy Frontiers Research Center Review Panel, 2009

Pacifichem symposia reviewer *Phys., Theor., & Comput. Chem*., 2010, 2015, 2020.

Scientific Committee: Conference on Isolated Biomolecules and Biomolecular Interactions, 2014 – present; Conference on Advancing Mass Spectrometry, 2015 – present

National Award Selection Committees: American Chemical Society (1994-2000, 2019-2021 award cycles), American Society for Mass Spectrometry (1998-2004, 2024 award cycles)

AAAS: Electorate Nominating Committee, 2000-2003

Alternate Councilor, Physical Chemistry Division, American Chemical Society, 2004-2007

AAAS Member-at-Large, Section Committee, Chemistry, 2008 – 2012

Member: American Chemical Society, American Society for Mass Spectrometry

Fellow: American Physical Society, American Association for the Advancement of Science

Editor, *The Encyclopedia of Mass Spectrometry. Volume 1: Theory and Ion Chemistry*, Elsevier: Amsterdam, 2003

Guest Editor: J. Phys. Chem. A, 2002; Int. J. Mass Spectrom*.*, 2001, 2003 (2), 2009, 2014

**PROFESSIONAL EXPERIENCE**

Assistant Professor of Chemistry, University of California, Berkeley, 1981-1987

Associate Professor of Chemistry, University of Utah, 1987-1989

Professor of Chemistry, University of Utah, 1989-1998

Distinguished Professor of Chemistry, University of Utah, 1998-present

Chair, Department of Chemistry, University of Utah, 2001-2007, 2024

Cannon Fellow, Department of Chemistry, University of Utah, 2003-2018

Henry Eyring Presidential Endowed Chair of Chemistry, 2018-present

Visiting Scientist, Fakultät für Physik der Universität Freiburg, Germany, 1992

Professeur d'Invité, Université de Paris-Sud, France, 1994; Université de Pierre et Marie Curie, 2008

Japan Society for the Promotion of Science (JSPS) Fellow, 1999

**PUBLICATIONS** ‑ P. B. Armentrout

1. "Laser Photodissociation of Ions in a Bendix Time‑of‑Flight Mass Spectrometer" Dunbar, R. C.; Armentrout, P. B. *Int. J. Mass Spectrom. Ion Phys.* **1977**, *24*, 465‑468. doi: 10.1016/0020-7381(77)80084-3

2. "Endothermic Reactions of Uranium Ions with N2, D2 and CD4" Armentrout, P. B.; Hodges, R. V.; Beauchamp, J. L. *J. Chem. Phys.* **1977**, *66*, 4683‑4688. doi: 10.1063/1.433678

3. "Metal Atoms as Super Bases: The Gas Phase Proton Affinity of Uranium" Armentrout, P. B.; Hodges, R. V.; Beauchamp, J. L. *J. Am. Chem. Soc.* **1977**, *99*, 3162‑3163. doi: 10.1021/ja00451a051

4. "Rare Gas Molecular Ions: Formation of XeF+ by Ion‑Molecule Reactions in Xe and NF3 and Evidence for Radiative Deactivation of Xe+(2P1/2)" Armentrout, P. B.; Berman, D. W.; Beauchamp, J. L. *Chem. Phys. Lett.* **1978**, *53*, 255‑259. doi: 10.1016/0009‑2614(78)85391‑3

5. "Gas Phase Organometallic Chemistry. Reactions of Al+ with Alkyl Halides" Hodges, R. V.; Armentrout, P. B.; Beauchamp, J. L. *Int. J. Mass Spectrom. Ion Phys.* **1979**, *29*, 375‑390. doi: 10.1016/0020-7381(79)80007-8

6. "Properties and Reactions of Uranium (IV) Tetrahydroborate by Ion Cyclotron Mass Spectrometry" Armentrout, P. B.; Beauchamp, J. L. *Inorg. Chem.* **1979**, *18*, 1349‑1353. doi: 10.1021/ic50195a039

7. "Ion Beam Studies of Organometallic Chemistry. High Energy "Sampling" of Reaction Intermediates Involved in Carbon‑Carbon Bond Cleavage by Transition Metals" Armentrout, P. B.; Beauchamp, J. L. *J. Am. Chem. Soc.* **1980**, *102*, 1736‑1738. doi: 10.1021/ja00525a052

8. "Experimental and Theoretical Studies of the Reaction Ba+ (D2, D) BaD+: Sequential Impulse Model for Endothermic Reactions" Armentrout, P. B.; Beauchamp, J. L. *Chem. Phys.* **1980**, *48*, 315‑320. doi: 10.1016/0301-0104(80)80062-0

9. "Collision Induced Dissociation of UO+ and UO2+" Armentrout, P. B.; Beauchamp, J. L. *Chem. Phys.* **1980**, *50*, 21‑25. doi: 10.1016/0301-0104(80)87021-2

10. "Reactions of U+ and UO+ with O2, CO, CO2, COS, CS2 and D2O" Armentrout, P. B.; Beauchamp, J. L. *Chem. Phys.* **1980**, *50*, 27‑36. doi: 10.1016/0301-0104(80)87022-4

11. "Endothermic Reactions of Ni+ with H2, HD and D2" Armentrout, P. B.; Beauchamp, J. L. *Chem. Phys.* **1980**, *50*, 37‑43. doi: 10.1016/0301-0104(80)87023-6

12. "Cobalt Carbene Ion: Reactions of Co+ with C2H4, cyclo‑C3H6 and cyclo‑C2H4O" Armentrout, P. B.; Beauchamp, J. L. *J. Chem. Phys.* **1981**, *74*, 2819‑2826. doi: 10.1063/1.441453

13. "Ion Beam Studies of the Reactions of Atomic Cobalt Ions with Alkanes: Determination of Metal‑Hydrogen and Metal‑Carbon Bond Energies and an Examination of the Mechanism by which Transition Metals Cleave Carbon‑Carbon Bonds" Armentrout, P. B.; Beauchamp, J. L. *J. Am. Chem. Soc.* **1981**, *103*, 784‑791. doi: 10.1021/ja00394a010

14. "Formation of Chromium Carbene Ions by Reaction of Electronically Excited Chromium Ions with Methane in the Gas Phase" Halle, L. F.; Armentrout, P. B.; Beauchamp, J. L. *J. Am. Chem. Soc.* **1981**, *103*, 962‑963. doi: 10.1021/ja00394a051

15. "Electron Impact Ionization Cross Section of Metastable N2(A3u+)" Armentrout, P. B.; Tarr, S. M.; Dori, A.; Freund, R. S. *J. Chem. Phys.* **1981**, *75*, 2786‑2794. doi: 10.1063/1.442350

16. "Ion Beam Studies of the Reactions of Atomic Cobalt Ions with Alkenes" Armentrout, P. B.; Halle, L. F.; Beauchamp, J. L. *J. Am. Chem. Soc.* **1981**, *103*, 6624‑6628. doi: 10.1021/ja00412a016

17. "Ion Beam Studies of the Reactions of Atomic Cobalt Ions with Cycloalkanes in the Gas Phase: Formation and Decomposition of Chemically Activated Metallacycles" Armentrout, P. B.; Beauchamp, J. L. *J. Am. Chem. Soc.* **1981**, *103*, 6628‑6632. doi: 10.1021/ja00412a017

18. "Periodic Trends in Transition Metal‑Hydrogen, Metal‑Carbon, and Metal‑Oxygen Bond Dissociation Energies. Correlation with Reactivity and Electronic Structure" Armentrout, P. B.; Halle, L. F.; Beauchamp, J. L. *J. Am. Chem. Soc.* **1981**, *103*, 6501‑6502. doi: 10.1021/ja00411a043

19. "Thermochemistry of Uranium Halide Ions: Reactions of U+ with CH3F, SiF4, CH3Cl and CCl4" Armentrout, P. B.; Beauchamp, J. L. *J. Phys. Chem.* **1981**, *85*, 4103‑4105. doi: 10.1021/j150626a030

20. "Reactions of Cr+, Mn+, Fe+, Co+ and Ni+ with O2 and N2O. Examination of the Translational Energy Dependence of the Cross Sections of Endothermic Reactions" Armentrout, P. B.; Halle, L. F.; Beauchamp, J. L. *J. Chem. Phys.* **1982**, *76*, 2449‑2457. doi: 10.1063/1.443274

21. "Ion Beam Studies of the Reactions of Group 8 Metal Ions with Alkanes: Correlation of Thermochemical Properties and Reactivity" Halle, L. F.; Armentrout, P. B.; Beauchamp, J. L. *Organometallics* **1982**, *1*, 963‑968. doi: 10.1021/om00067a012

22. "Metal Cluster Ions: The Bond Energy of Mn2+" Ervin, K.; Loh, S. K.; Aristov, N.; Armentrout, P. B. *J. Phys. Chem.* **1983**, *87*, 3593‑3596. doi: 10.1021/j100242a006

23. "Fluorine Substituent Effects on Metal‑Carbene Bond Dissociation Energies. Implications for Metathesis Reactions of Fluorinated Olefins" Halle, L. F.; Armentrout, P. B.; Beauchamp, J. L. *Organometallics* **1983**, *2*, 1829‑1833. doi: 10.1021/om50006a021

24. "Carbon and Oxygen Isotope Fractionation in Dense Interstellar Clouds" Langer, W. D.; Graedel, T. E.; Frerking, M. A.; Armentrout, P. B. *Astrophys. J.* **1984**, *277*, 581‑604.

25. "Transition Metal Cluster Chemistry: Reactions of Mn2+ with O2" Armentrout, P. B.; Loh, S. K.; Ervin, K. M. *J. Am. Chem. Soc.* **1984**, *106*, 1161‑1163. doi: 10.1021/ja00316a082

26. "Threshold Behavior of Endothermic Reactions: C+(2P) + H2 → CH+ + H" Ervin, K. M.; Armentrout, P. B. *J. Chem. Phys.* **1984**, *80*, 2978‑2980. doi: 10.1063/1.447010

27. "Bond Energy ‑ Bond Order Relations in Transition Metal Bonds: Vanadium" Aristov, N.; Armentrout, P. B. *J. Am. Chem. Soc.* **1984**, *106*, 4065‑4066. doi: 10.1021/ja00326a049

28. "Threshold Behavior for Chemical Reactions: Line‑of‑Centers Cross Section for Si+(2P) + H2 → SiH+ + H" Elkind, J. L.; Armentrout, P. B. *J. Phys. Chem.* **1984**, *88*, 5454‑5456. doi: 10.1021/j150667a002

29. "Reactions of Atomic Cobalt Ions with Aldehydes and Ketones. Observation of Decarbonylation Processes Leading to Formation of Metal Alkyls and Metallacycles in the Gas Phase" Halle, L. F.; Crowe, W. E.; Armentrout, P. B.; Beauchamp, J. L. *Organometallics* **1984**, *3*, 1694‑1706. doi: 10.1021/om00089a017

30. "Translational Energy Dependence of Ar+ + XY → ArX+ + Y (XY = H2, D2, HD) from Thermal to 30 eV c.m." Ervin, K. M.; Armentrout, P. B. *J. Chem. Phys.* **1985**, *83*, 166‑189. doi: 10.1063/1.449799

31. "Effect of Kinetic and Electronic Energy on the Reaction of V+ with H2, HD and D2" Elkind, J. L.; Armentrout, P. B. *J. Phys. Chem.* **1985**, *89*, 5626‑5636. doi: 10.1021/j100272a012

32. "Kinetic Energy Dependence of Al+ + O2 → AlO+ + O" Weber, M. E.; Elkind, J. L.; Armentrout, P. B. *J. Chem. Phys.* **1986**, *84*, 1521‑1529. doi: 10.1063/1.450497

33. "Reaction Mechanisms and Thermochemistry of V+ + C2H2p (p = 1,2,3)" Aristov, N.; Armentrout, P. B. *J. Am. Chem. Soc.* **1986**, *108*, 1806‑1819. doi: 10.1021/ja00268a017

34. "Effect of Kinetic and Electronic Energy on the Reactions of Mn+ with H2, HD and D2" Elkind, J. L.; Armentrout, P. B. *J. Chem. Phys.* **1986**, *84*, 4862‑4871. doi: 10.1063/1.449975

35. "Neutral and Ionic Metal Methyl Bond Energies: Zn" Georgiadis, R.; Armentrout, P. B. *J. Am. Chem. Soc.* **1986**, *108*, 2119‑2126. doi: 10.1021/ja00269a001

36. "Transition Metal Hydride Bond Energies: First and Second Row" Elkind, J. L.; Armentrout, P. B. *Inorg. Chem.* **1986**, *25*, 1078‑1080. doi: 10.1021/ic00228a004

37. "Does Ground State Fe+ React with H2?" Elkind, J. L.; Armentrout, P. B. *J. Am. Chem. Soc.* **1986**, *108*, 2765‑2767. doi: 10.1021/ja00270a052

38. "C+(2P) + H2(D2,HD) → CH+(CD+) + H(D): I. Reaction Cross Sections and Kinetic Isotope Effects from Threshold to 15 eV c.m." Ervin, K. M.; Armentrout, P. B. *J. Chem. Phys.* **1986**, *84*, 6738‑6749. doi: 10.1063/1.450677

39. "C+(2P) + H2(D2,HD) → CH+(CD+) + H(D): II. Statistical Phase Space Theory" Ervin, K. M.; Armentrout, P. B. *J. Chem. Phys.* **1986**, *84*, 6750‑6760. doi: 10.1063/1.450678

40. "Transition Metal Cluster Ion Chemistry" Armentrout, P. B. In *Laser Applications in Chemistry and Biophysics*, El‑Sayed, M., Ed.; Proc. SPIE **1986**, *620*, 38‑45.

41. "A Continuous Source for Production of Cold, Mass‑Selected Transition Metal Cluster Ions" Loh, S. K.; Hales, D. A.; Armentrout, P. B. *Chem. Phys. Lett.* **1986**, *129*, 527‑532. doi: 10.1016/0009-2614(86)80394-3

42. "Collision-Induced Dissociation of Vanadium Monoxide Ion" Aristov, N.; Armentrout, P. B. *J. Phys. Chem.* **1986**, *90*, 5135‑5140. doi: 10.1021/j100412a049

43. "Effect of Kinetic and Electronic Energy on the Reactions of Fe+ with H2, HD and D2: State‑Specific Cross Sections for Fe+(6D) and Fe+(4F)" Elkind, J. L.; Armentrout, P. B. *J. Phys. Chem.* **1986**, *90*, 5736‑5745. doi: 10.1021/j100280a054

44. "Effect of Kinetic and Electronic Energy on the Reactions of Co+, Ni+ and Cu+ with H2, HD and D2" Elkind, J. L.; Armentrout, P. B. *J. Phys. Chem.* **1986**, *90*, 6576‑6586. doi: 10.1021/j100282a031

45. "Spin‑orbit State‑selected Reactions of Kr+(2P3/2 and 2P1/2) with H2, D2, and HD from Thermal Energies to 20 eV c.m." Ervin, K. M.; Armentrout, P. B. *J. Chem. Phys.* **1986**, *85*, 6380‑6395. doi: 10.1063/1.451469

46. "Reaction of Scandium Ions with Ethane. First and Second Hydride‑Scandium Ion Bond Energies" Sunderlin, L.; Aristov, N.; Armentrout, P. B. *J. Am. Chem. Soc.* **1987**, *109*, 78‑89. doi: 10.1021/ja00235a013

47. "Kinetic Energy Dependence of Ion‑Molecule Reactions: From Triatomics to Transition Metals" Armentrout, P. B. In *Structure/Reactivity and Thermochemistry of Ions*, Ausloos, P.; Lias, S. G., Eds.; D. Reidel: Dordrecht, 1987; pp. 97‑164. ISBN: 90-277-2422-9

48. "Effect of Kinetic and Electronic Energy on the Reactions of Cr+ with H2, HD and D2" Elkind, J. L.; Armentrout, P. B. *J. Chem. Phys.* **1987**, *86*, 1868‑1877. doi: 10.1063/1.452138

49. "Translational Energy Dependence of O+(4S) + N2 → NO+ + N from Thermal to 30 eV c.m." Burley, J. D.; Ervin, K. M.; Armentrout, P. B. *J. Chem. Phys.* **1987**, *86*, 1944‑1953. doi: 10.1063/1.452144

50. "Energy Dependence, Kinetic Isotope Effects, and Thermochemistry of the Nearly Thermoneutral Reactions N+(3P) + H2(HD, D2) → NH+(ND+) + H(D)" Ervin, K. M.; Armentrout, P. B. *J. Chem. Phys.* **1987**, *86*, 2659‑2673. doi: 10.1063/1.452068

51. "State‑specific Reactions of Atomic Transition Metal Ions with H2, HD and D2: Effects of d Orbitals on Chemistry" Elkind, J. L.; Armentrout, P. B. *J. Phys. Chem.* **1987**, *91*, 2037‑2045. doi: 10.1021/j100292a012

52. "Hydrogen Atom Transfer Reactions of He+ and Ne+ with H2, D2, and HD" Ervin, K. M.; Armentrout, P. B. *J. Chem. Phys.* **1987**, *86*, 6240‑6250. doi: 10.1063/1.452461

53. "Reaction of Silicon Ion (2P) with Silane (SiH4, SiD4). Heats of Formation of SiHn, SiHn+ (n = 1, 2, 3) and Si2Hn+ (n = 0, 1, 2, 3). Remarkable Isotope Exchange Reaction Involving Four Hydrogen Shifts." Boo, B. H.; Armentrout, P. B. *J. Am. Chem. Soc.* **1987**, *109*, 3549‑3559. doi: 10.1021/ja00246a010

54. "Multiphoton Ionization of VOCl3" Georgiadis, R.; Armentrout, P. B. *Chem. Phys. Lett.* **1987**, *137*, 144‑148. doi: 10.1016/0009-2614(87)80320-2

55. "Non‑Adiabatic Behavior of a Transition Metal System: Exothermic Reactions of Fe+(6D, 4F) and Propane" Schultz, R. H.; Armentrout, P. B. *J. Phys. Chem.* **1987**, *91*, 4433‑4435. doi: 10.1021/j100301a001

56. "Energetics and Reaction Mechanisms of Reactions of SiH+ + D2, SiD+ + H2, and Collision Induced Dissociation of SiD3+" Boo, B. H.; Armentrout, P. B. *J. Phys. Chem.* **1987**, *91*, 5777‑5781. doi: 10.1021/j100306a051

57. "Methane Activation by V+: Electronic and Translational Energy Dependence" Aristov, N.; Armentrout, P. B. *J. Phys. Chem.* **1987**, *91*, 6178‑6188. doi: 10.1021/j100308a024

58. "Translational Energy Dependence of O+(4S) + H2(D2, HD) → OH+(OD+) + H(D) from Thermal to 30 eV c.m." Burley, J. D.; Ervin, K. M.; Armentrout, P. B. *Int. J. Mass Spectrom. Ion Processes* **1987**, *80*, 153‑175. doi: 10.1016/0168-1176(87)87027-1

59. "Electronic Effects in C‑H and C‑C Bond Activation: State‑specific Reactions of Fe+(6D, 4F) with Methane, Ethane and Propane" Schultz, R. H.; Elkind, J. L.; Armentrout, P. B. *J. Am. Chem. Soc.* **1988**, *110*, 411‑423. doi: 10.1021/ja00210a017

60. "Methane Activation by Ti+: Electronic and Translational Energy Dependence" Sunderlin, L. S.; Armentrout, P. B. *J. Phys. Chem.* **1988**, *92*, 1209‑1219. doi: 10.1021/j100316a040

61. "Effect of Kinetic and Electronic Energy on the Reactions of Ti+ with H2, HD and D2" Elkind, J. L.; Armentrout, P. B. *Int. J. Mass Spectrom. Ion Processes* **1988**, *83*, 259‑284. doi: 10.1016/0168-1176(88)80032-6

62. "Energetics and Dynamics in the Reaction of Si+ with SiF4. Thermochemistry of SiFx and SiFx+ (x = 1, 2, 3)" Weber, M. E.; Armentrout, P. B. *J. Chem. Phys.* **1988**, *88*, 6898‑6910. doi: 10.1063/1.454387

63. "Kinetic Energy Dependence of C+(2P) + O2 from Thermal Energies to 35 eV c.m." Burley, J. D.; Armentrout, P. B. *Int. J. Mass Spectrom. Ion Processes* **1988**, *84*, 157‑184. doi: 10.1016/0168-1176(88)83033-7

64. "Collision‑Induced Dissociation Processes of Nb4+ and Fe4+: Fission vs. Evaporation" Loh, S. K.; Lian, L.; Hales, D. A.; Armentrout, P. B. *J. Chem. Phys.* **1988**, *89*, 610‑611, 3378‑3379. doi: 10.1063/1.455455

65. "Collision‑Induced Dissociation of Fe2+" Loh, S. K.; Lian, L.; Hales, D. A.; Armentrout, P. B. *J. Phys. Chem.* **1988**, *92*, 4009‑4012. doi: 10.1021/j100325a001

66. "Periodic Trends in Gas Phase M‑H and M‑C Bond Energies" Armentrout, P. B.; Georgiadis, R. *Polyhedron* **1988**, *7*, 1573‑1581. doi: 10.1016/S0277-5387(00)81783-0

67. "Energy Dependences of Ion‑Molecule Reactions" Armentrout, P. B. *Comments Atomic Molec. Phys.* **1988**, *22*, 133‑144.

68. "Kinetic Energy Dependence of the Reactions of Ca+ and Zn+ with H2, D2, and HD. Effect of Empty versus Full d Orbitals" Georgiadis, R.; Armentrout, P. B. *J. Phys. Chem.* **1988**, *92*, 7060‑7067. doi: 10.1021/j100336a008

69. "Translational and Electronic Energy Dependence of Chromium Ion Reactions with Methane" Georgiadis, R.; Armentrout, P. B. *J. Phys. Chem.* **1988**, *92*, 7067‑7074. doi: 10.1021/j100336a009

70. "Spin‑Orbit State‑selected Reactions of Xe+(2P3/2 and 2P1/2) with H2, D2, and HD" Ervin, K. M.; Armentrout; P. B. *J. Chem. Phys.* **1989**, *90*, 118‑126. doi: 10.1063/1.456516

71. "Reactions of Ar+, Ne+, and He+ with SiF4 from Thermal Energy to 50 eV c.m." Weber, M. E.; Armentrout, P. B. *J. Chem. Phys.* **1989**, *90*, 2213‑2224. doi: 10.1063/1.456016

72. "Energetics and Mechanisms in the Reaction of Si+ with SiCl4. Thermochemistry of SiCl, SiCl+, and SiCl2+" Weber, M. E.; Armentrout, P. B. *J. Phys. Chem.* **1989**, *93*, 1596‑1604. doi: 10.1021/j100341a082

73. "Reactions of Atomic Metal Ions with H2, CH4, and C2H6: Electronic Requirements for H‑H, C‑H, and C‑C Bond Activation" Armentrout, P. B. In *Gas Phase Inorganic Chemistry*, Russell, D. H., Ed.; Plenum: New York, 1989; pp. 1‑42. ISBN: 0-306-42972-1

74. "Periodic Trends in Chemical Reactivity: Reactions of Sc+, Y+, La+, and Lu+ with H2, D2, and HD" Elkind, J. L.; Sunderlin, L. S.; Armentrout, P. B. *J. Phys. Chem.* **1989**, *93*, 3151‑3158. doi: 10.1021/j100345a054

75. "State‑Specific Reactions of Fe+(6D, 4F) with O2 and cyclo‑C2H4O: Do0(Fe+‑O) and Effects of Collisional Relaxation" Loh, S. K.; Fisher, E. R.; Lian, L.; Schultz, R. H.; Armentrout, P. B. *J. Phys. Chem.* **1989**, *93*, 3159‑3167. doi: 10.1021/j100345a055

76. "Collision‑Induced Dissociation of Niobium Cluster Ions: Transition Metal Cluster Binding Energies" Loh, S. K.; Lian, L.; Armentrout, P. B. *J. Am. Chem. Soc.* **1989**, *111*, 3167‑3176. doi: 10.1021/ja00191a010

77. "Collision‑Induced Dissociation of Fen+ (n = 2 ‑ 10) with Xe: Ionic and Neutral Iron Cluster Binding Energies" Loh, S. K.; Hales, D. A.; Lian, L.; Armentrout, P. B. *J. Chem. Phys.* **1989**, *90*, 5466‑5485. doi: 10.1063/1.456452

78. "Periodic Trends in Chemical Reactivity: Reactions of Sc+, Y+, La+, and Lu+ with Methane and Ethane" Sunderlin, L. S.; Armentrout, P. B. *J. Am. Chem. Soc.* **1989**, *111*, 3845‑3855. doi: 10.1021/ja00193a015

79. "Reactions of Ground State Cr+ with C2H6, C2H4, cyclo‑C3H6, and cyclo‑C2H4O: Bond Energies for CrCHn+ (n = 1‑3)" Georgiadis, R.; Armentrout, P. B. *Int. J. Mass Spectrom. Ion Processes* **1989**, *89*, 227‑247. doi: 10.1016/0168-1176(89)83062-9

80. "Neutral and Ionic Metal‑Hydrogen and Metal‑Carbon Bond Energies: Reactions of Co+, Ni+, and Cu+ with Ethane, Propane, Methylpropane, and Dimethylpropane" Georgiadis, R.; Fisher, E. R.; Armentrout, P. B. *J. Am. Chem. Soc.* **1989**, *111*, 4251‑4262. doi: 10.1021/ja00194a016

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558. “Comment on ‘Gas-phase ion-molecule interactions in a collision reaction cell with triple quadrupole-inductively coupled plasma mass spectrometry: Investigations with N2O as the reaction gas’ by Khadouja Harouaka, Caleb Allen, Eric Bylaska, Richard M Cox, Gregory C. Eiden, Maria Laura di Vacri, Eric W. Hoppe, Isaac J. Arnquist” Armentrout, P. B. *Spectrochim. Acta B* **2023**, *207*, 106345. DOI: 10.1016/j.sab.2021.106345

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570. “Quantitative Aspects of Gas-phase Metal Ion Chemistry: Conservation of Spin, Participation of f Orbitals, and C-H Activation and C-C Coupling” Armentrout, P. B. *J. Phys. Chem. B (Invited Feature Article)* **2023**, *127*, 9641-9653. DOI: 10.1021/acs.jpca.3c06023

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573. “Infrared Multiple Photon Dissociation Spectra of Cesiated Complexes of the Aliphatic Amino Acids: Challenges for Conformational-Space Calculations by Density Functional Theory” Armentrout, P. B.; Steele, R. P.; Stevenson, B. C.; Jones, R. M.; Martens, J.; Berden, G.; Oomens, J. *Int. J. Mass Spectrom. (Computations in Mass Spectrometry*) **2024**, *498*, 117201. DOI: 10.1016/j.ijms.2024.117201

574. “IR spectroscopic characterization of [M,C,2H]+ (M = Ru and Rh) products formed by reacting 4d transition metal cations with oxirane: Spectroscopic evidence for multireference character in RhCH2+” Wensink, F. J.; Smink, C. E.; Stevenson, B. C.; Steele, R. P.; Bakker, J. M.; Armentrout, P. B. *Phys. Chem. Chem. Phys. (Size effects in the chemistry and physics of atomic and molecular clusters, nanoparticles and nanostructures)*, submitted for publication.

575. “IR spectroscopic characterization of 3d transition metal carbene cations, FeCH2+ and CoCH2+: Periodic Trends and A Challenge for DFT approaches” Wensink, F. J.; Smink, C. E.; Armentrout, P. B.; Bakker, J. M. *Phys. Chem. Chem. Phys. (PCCP 25th Anniversary)*, in press. DOI: 10.1039/D4CP00026A

**Invited Talks (2019 - 2024)**

Reactivity of lanthanides and actinides: chemi-ionization, thermochemistry, mechanisms, and spin-orbit effects, Lewis & Clark College, Portland, OR, January 8, 2019.

Reactivity of lanthanides and actinides: chemi-ionization, thermochemistry, mechanisms, and spin-orbit effects, Johns Hopkins University, Baltimore, MD, February 26, 2019.

Chemi-ionization reactions of the lanthanides and their potential as catalysts: Guided ion beam and theoretical studies, AFOSR Molecular Dynamics/Theoretical Chemistry Program Review, Washington DC, May 21-23, 2019.

Reactivity of Lanthanides and Actinides: Chemi-ionization, thermochemistry, mechanisms, and spin-orbit effects, Wilhem Ostwald Colloquium, Leipzig University, Leipzig, Germany, June 24, 2019.

Fundamentals of Mass Spectrometry: Guided Ion Beams and Thermochemistry, Asia-Oceania Mass Spectrometry Conference, University of Macau, Taipa, Macau, China, January 5-7, 2020.

Infrared Action Spectroscopy of Transition Metal Carbene Cations, Asia-Oceania Mass Spectrometry Conference, University of Macau, Taipa, Macau, China, January 5-7, 2020.

Energetics and Mechanisms for the Dissociation of Small Protonated Peptides, Asia-Oceania Mass Spectrometry Post-Conference, University of Hong Kong, Hong Kong, China, January 8-9, 2020.

Guided Ion Beam Tandem Mass Spectrometry, Air Force Research Laboratory, Albuquerque, NM, August 1, 2020 (virtual).

Influence of a Hydroxy Group on the Deamidation and Dehydration Reactions of Protonated Asparagine-Serine Investigated by Spectroscopic, Guided Ion Beam, and Theory, Symposium in Honor of Bill Hase, ACS National Meeting, April 12 - 15, 2021 (virtual).

Lanthanide cation chemistry: Chemi-ionization reactions, spin conservation, and periodic trends, AFOSR Molecular Dynamics/Theoretical Chemistry Program Review, May 25-27, 2021 (virtual).

Thermochemistry and Reactivity of Atomic and Molecular Actinide Cations, Heavy Element Chemistry Program Conference, Department of Energy, June 7 – 11, 2021 (virtual).

Guided ion beam tandem mass spectrometry: Fundamentals and Applications, Pacific Northwest National Laboratory, Richland, WA, August 25, 2021 (virtual).

John B. Fenn Distinguished Contribution Award Lecture, 69th ASMS Conference on Mass Spectrometry and Allied Topics, Philadelphia, PA, Oct 31 – Nov 4, 2021.

Spectroscopic observation of C-C coupling after activating multiple CH4 by Pt+ using the FELICE FTICR, FELIX users meeting, Dec. 9, 2021 (virtual).

Reactivity of Lanthanides and Actinides: Chemi-Ionization, Thermochemistry, Mechanisms, and Spin-Orbit Effects, University of Oklahoma, Normal, OK, Feb. 4, 2022 (virtual).

Energetics and Mechanisms for the Dissociation of Small Protonated Peptides, J. Clarence Karcher Seminar, University of Oklahoma, Normal, OK, May 6, 2022.

Reactivity and Characterization of Gold Dimer Cations, Molecular and Ionic Clusters Gordon Research Conference, Lucca, Italy, Aug. 7 – 11, 2022.

2500 Bond Energies and Counting: From Rob Dunbar to John Fenn – A CWRU Story, Frontiers of Chemistry, Chemistry Alumni Reunion, Case Western Reserve University, Cleveland, OH, Oct. 6, 2022.

Research Update: A synthesis of several reviews, Brown Bag Lunch, University of Utah, Salt Lake City, UT, Oct. 11, 2022.

Periodic Trends in the Hydration Energies and Critical Sizes of Alkaline Earth and Transition Metal Dication Water Complexes, 2023 Mesilla Chemistry Workshop, Mesilla, NM, February 4 – 7, 2023.

2500 Bond Energies (and Counting), **Plenary**, Gordon Research Conference on Gaseous Ions: Structures, Energetics, and Reactions, Ventura, CA, February 19 - 24, 2023.

Measuring the absolute energy differences between conformers of protonated GlyProGlyGly, Frank H. Field and Joe L. Franklin Award for Outstanding Achievement in Mass Spectrometry, ACS Spring Meeting, Indianapolis, IN, March 26, 2023.

C-H bond activation and C-C coupling of methane on a single cationic platinum center, HFML-FELIX/EMFL users meeting, Nijmegen, The Netherlands, June 13-15, 2023.

From Heavy Elements to Peptides: Dynamics, Kinetics, and Thermochemistry, Radboud University, Nijmegen, The Netherlands, July 4, 2023.

From Heavy Elements to Peptides: Dynamics, Kinetics, and Thermochemistry, Fritz Haber Institute, Berlin, Germany, July 10, 2023.

From Heavy Elements to Peptides: Dynamics, Kinetics, and Thermochemistry, Department of Chemistry, University of Wisconsin, Oshkosh, Oshkosh, WI, Oct. 9, 2023 (virtual).

Periodic Trends in the Structure of [M,C,2H]+ for Group 8 and 9 Transition Metals, 2024 Mesilla Chemistry Workshop, Mesilla, NM, February 3 – 6, 2024.

**Contributed Talks and Posters (2019 - 2024)**

Prof. Armentrout and his students have 52 contributed talks and posters at scientific meetings during this time period.

# Teaching (since 2001, not including Chem 7970: Thesis Research, all semesters)

2024: Chem 3070, Thermodynamics and Kinetics; Chem 7070, Graduate Chemical Kinetics

2023: Chem 3070, Thermodynamics and Kinetics

2022: Chem 7040, Graduate Statistical Thermodynamics

2021: Chem 3070, Thermodynamics and Kinetics

2020: Chem 7070, Graduate Chemical Kinetics; Chem 7040, Graduate Statistical Thermodynamics;

Chem 3070, Thermodynamics and Kinetics

2019: Chem 7080, Graduate Chemical Dynamics; Chem 3070, Thermodynamics and Kinetics

2018: Chem 7070, Graduate Chemical Kinetics; Chem 3070, Thermodynamics and Kinetics; Chem 7040,

Graduate Statistical Thermodynamics

2017: Chem 7080, Graduate Chemical Dynamics; Chem 3070, Thermodynamics and Kinetics

2016: Chem 7070, Graduate Chemical Kinetics; Chem 3070, Thermodynamics and Kinetics

2015: Chem 7040, Graduate Statistical Thermodynamics; Chem 7050, Graduate Classical Thermodynamics

2014: Chem 3070 (Spring and Fall) Thermodynamics and Kinetics; Chem 7040, Graduate Statistical

Thermodynamics

2013: Chem 7020, Introduction to Spectroscopy; and Chem 7080, Graduate Chemical Dynamics

2012: Chem 7070, Graduate Chemical Kinetics

2011: Chem 7040, Graduate Statistical Thermodynamics; Chem 7070, Graduate Chemical Kinetics

2010: Chem 7070, Graduate Chemical Kinetics, Chem 7040, Graduate Statistical Thermodynamics;

Chem 7080, Graduate Chemical Dynamics

2009: Chem 1210, General Chemistry; Chem 7040, Graduate Statistical Thermodynamics

2008: Chem 7070 and 7080, Graduate Chemical Kinetics and Dynamics

2007: Chem 7070, Graduate Chemical Kinetics (+ teaching relief as chair)

2001-06: Chem 6040, Graduate Statistical Thermodynamics (+ teaching relief as chair)

**Students**

55 undergraduate students (20 female, 2 Hispanic, 1 black) have worked in my laboratories

9 undergraduate students have participated in my Student Research Initiative project

18 in the past 5 years (3 female)

47 graduate students (18 female) have received Ph.Ds with me and eight (five female) have received a M.S. degree

Natasha Aristov: 1986 Ph.D., Springer Verlag, 1989 (female)

Prof. Kent M. Ervin: 1986 Ph.D., Professor, University of Nevada, Reno, 1990

Jerry L. Elkind: 1986 Ph.D., Texas Instruments, 1988

Prof. Rosina Georgiadis: 1988 Ph.D., Professor, Boston University (female)

Steven K. Loh: 1988 Ph.D., IBM, Fishkill

Mary Ellen Weber: 1988 Ph.D., NASA astronaut; Vice-President, U. Texas, SW Medical Center (female)

Prof. David A. Hales: 1990 Ph.D., Hendrix College, Arkansas

Prof. Lee S. Sunderlin: 1990 Ph.D., Northern Illinois U.

Richard H. Schultz: 1991 Ph.D., Israel

Prof. Ellen R. Fisher: 1991 Ph.D., Colorado State U., U. New Mexico (VP) (female)

Li Lian: 1992 Ph.D. (female)

Prof. David E. Clemmer: 1992 Ph.D., Indiana U.

Greg Stowe: 1989 M.S.

Nathan Dalleska: 1993 Ph.D., staff at Caltech

Chen Xing Su: 1993 Ph.D., DataChem Labs (female)

Yumin Chen: 1994 Ph.D.

Bee Kickel: 1994 Ph.D., Zilog Totally Logical (female)

Christopher Haynes: 1995 Ph.D., Questar Technology Inc.

James B. Griffin: 1997 Ph.D., Micron

Brenda Tjelta: 1996 Ph.D., Ecolab (female)

Prof. Michelle Birke More Paustenbaugh: 1996 Ph.D., Weber State University (female)

Michael Sievers: 1999 Ph.D., IBM; Matheson Tri-Gas

Chad Rue: 2000 Ph.D., IBM; FEI

Felician Muntean: 2000 Ph.D., Varian

Dinesh Vhardan: 2003 M.S.

Hideya Koizumi: 2003 Ph.D., Oak Ridge National Lab.

Robert M. Moision, 2007 Ph.D., Aerojet

Prof. Chris Iceman, 2007 Ph.D., U. Alaska

Sha J. Ye, 2007 Ph.D., Ionics

Fengxia Liu, 2007 Ph.D., Covance Laboratories Inc. (female)

Lin Tan, 2007 M.S. (female)

Amy Heaton, 2009 Ph.D., Bydexbasic Research (female)

Laura Parke, 2009 M.S. (female)

Theresa E. Cooper Hofstetter, 2012 Ph.D., Air Force Technical Applications Center (female)

Damon Carl, 2013 Ph.D., Heritage Environmental Services LLC

Christopher S. Hinton, 2013 Ph.D., Air Force Research Laboratories

Ran Wang, 2013 M.S. (female)

Prof. Jessica Johnston, 2014 Ph.D., Prof. at Westminster U. (female)

Andrew Sweeney, 2015 Ph.D.

Richard M Cox, 2015 Ph.D., PNNL

Christopher P. McNary, 2017 Ph.D.,

Rebecca A. Coates, 2017 Ph.D., Central Washington University (female)

Maria P. Demireva, 2018 Ph.D., postdoc Sandia National Laboratories (female)

Randy Hightower, 2018 M.S.

Oscar Wheeler, 2018 Ph.D.

Juli Sundberg, 2019, M.S. (female)

Georgia C. Boles, 2020, Ph.D. (female)

Abhigya Mookherjee, 2020 Ph.D., postdoc at University of Washington (female)

Maryam Ghiassee, 2021, Ph.D. (female)

JungSoo Kim, 2021, Ph.D.

Sara L. Rockow, 2022, M.S., Eurofins Environmental Testing

Arjun Kafle, 2023, Ph.D.

Roland Jones, 2023, Ph.D.

Brandon Stevenson, 2023, Ph.D.

Amanda Bubas, 2023, Ph.D. (female)

18 postdoctoral researchers (2 past 5 years)

Prof. B. H. Boo, Chungnam Natl. U., Korea

Dr. Doug Prinslow, Texas Instruments

Dr. Wolfgang Freysinger, Universität HNO‑Klinik, Austria

Prof. Farooq Khan, West Georgia College

Dr. Jose Conceicao

Prof. Franc Meyer, U. of Heidelberg, Germany

Prof. Mary T. Rodgers, Wayne State University (female)

Dr. Rohana Liyanage, staff at U. Arkansas

Dr. X. G. Zhang, Syagen, CA

Dr. Barun Chatterjee, Bose Institute, India

Prof. Jay Amicangelo, U. Penn Erie

Dr. Fuyi Liu, National Synchrotron Radiation Laboratory, China

Dr. Shurong Liu, China (female)

Dr. Ming Li, China

Prof. Murat Citir, Abdullah Gül University, Turkey

Dr. Wenjing Zhang, China (postdoc) (female)

Dr. Evan Perez, present

Dr. Satish Kumar, present

9 visiting student researchers (2 past 5 years)

Ilona Kretschmar, Technical University of Berlin, Germany (female)

Susanne Goebel, Technical University of Berlin, Germany (female)

Michelle Styles, University of Melbourne (female)

Konrad Koszinowski, Technical University of Berlin, Germany

Zsolt Gengeliczki, Eotvos University, Budapest, Hungary

Oxana Upir, Technische Universität Darmstadt, Germany (female)

Stach Kuijpers, Radboud University, The Netherlands

Rene Rahrt, U Gottingen, Germany

Tobias Dijkhuis, Radboud University, The Netherlands

5 visiting faculty associates

Prof. Kenji Honma, Himeji Institute of Technology, Japan

Prof. Detlef Schröder, Technische Universität, Berlin, Germany

Prof. Zhen Gao, Chinese Academy of Sciences, Beijing, China

Prof. Balint Stzaray, University of the Pacific, CA

Prof. Kenji Furura, Kyushu University, Fukuoka, Japan

Prof. Joost Bakker, Radboud University, Nijmegen, Netherlands

6 graduate students (3 female) are presently in my group

Fan Yang (female)

Samantha Walker (female)

David Loertscher

Talley Fenn (female)

Giorgi Jijieshvili

Gonzalo Perez-Maldonado

**Research Support**

National Science Foundation (PI)

$217,964 for 9/83 to 5/86; Thermochemistry of Transition Metal-Ligand Bonds

Renewed at $444,000 for 7/86 to 10/89

Renewed at $504,733 for 11/89 to 4/93

Renewed at $527,400 for 2/93 to 1/96

Renewed at $557,000 for 3/96 to 2/99

Renewed at $594,500 for 5/99 to 4/02

Renewed at $674,225 for 2/02 to 1/05

Renewed at $665,000 for 2/05 to 1/08

Renewed at $663,000 for 2/08 to 1/11

Renewed at $680,000 for 2/11 to 1/14

Renewed at $700,330 for 6/14 to 7/17

Renewed at $648,694 for 7/17 to 7/20;

Renewed at $650,000 for 6/20 to 8/23;

Renewed at $550,000 for 6/23 to 5/26;

Thermochemistry of Metal-Ligand Bonds and Protonated Peptides

Department of Energy (PI)

$478,000 for 7/14 to 7/17

Renewed at $522,420 for 7/17 to 7/20;

Renewed at $533,038 for 7/20 to 7/23;

Renewed at $578,593 for 7/23 to 7/26;

Thermochemistry and Reactivity of Atomic and Molecular Actinides

Air Force Office of Scientific Research (PI)

$65,000 for 9/14 to 9/15;

Renewed at $420,000 for 2/16 to 6/19;

Renewed at $415,808 for 9/20 to 08/23;

Renewed at $494,848 for 9/23 to 8/26;

Thermochemistry and Reactivity of Metals Engaged in Chemiionization

National Science Foundation (co-PI)

$250,000 for 9/14 – 8/18; IRES: U.S. – Dutch Collaborative International Research Experiences for Students in Mass Spectrometry and Ion Spectroscopy

Contract with ENSCO (PI)

$110,535.50 for 11/15 – 5/16;

$73,510 for 2/17 – 9/16.

NSF XSEDE (Computational Resources) (PI)

$90,599 (est.) for 6/17 – 7/18; Thermochemistry of Lanthanides and Actinides

Department of Energy (PI)

$290,096 for 8/91 to 7/94; Thermochemistry and Reactivity of Transition Metal Clusters

Renewed at $296,900 for 9/94 to 7/97

Renewed at $355,000 for 9/97 to 8/00

Renewed at $388,000 for 9/00 to 7/03

Renewed at $430,000 for 6/03 to 5/06

Renewed at $493,000 for 6/06 to 5/09

Renewed at $501,000 for 6/09 to 5/12;

Renewed at $501,307 for 6/12 to 5/13;

Thermochemistry and Reactivity of Transition Metal Clusters and Their Oxides

National Science Foundation Presidential Young Investigator Grant, "Ion Beam Chemistry," $25,000 + $37,500 in industrial matching per year, 1984-1989

Army Research Office Grant, "Transition Metal Cluster Chemistry," $171,781, 8/85 - 7/88

Alfred P. Sloan Fellowship, $25,000, 1986-1990

Camille and Henry Dreyfus Teacher-Scholar Grant, $50,000, 1987-1992

Air Force Systems Command, Aeronautical Systems Division, "Ion-Molecule Chemistry Related to Plasma Deposition and Etching of Silicon," $121,000, 6/88 - 5/91, Renewed at $97,617 for 5/91 to 5/93

Battelle Memorial Institute, Pacific Northwest Laboratories, "Research and Training involving Bond Energies of Crown Ether-Cation Complexes" $42,368 for 3/94 to 2/96

University of Utah Faculty Research Grant, "Energy Dependent Collision-Induced Dissociation of Biomolecules in the Gas Phase", $5,000 for 1/95 to 1/96

American Chemical Society - Petroleum Research Fund, "Energy Dependent Collision-Induced Dissociation of Biomolecules in the Gas Phase", $50,000 for 7/95 to 8/97

National Science Foundation, “Symposium: From reaction dynamics to peptide sequencing”, $6,200 for 8/07

National Science Foundation, “REU Site: Chemistry Undergraduate Research at the University of Utah”, co-PI, $78,984 for 03/07 – 2/08

National Science Foundation, “PIRE: A U.S. – Dutch Mass Spectrometry Consortium for Advanced Modeling and

Biological Structure and Imaging Applications, Senior Personnel, ~$100,000 out of $2,500,000 total for 10/07 – 9/12

National Science Foundation, “MRI: Acquisition of a 9.4 T High Field Fourier Transform Ion Cyclotron Resonance

Mass Spectrometer for Biological and Materials Applications” co-PI, $704,718, 8/10 – 7/11

As chair of the chemistry department, I spearheaded efforts to secure funds from the National Institutes of Health (NIH) for grant support to build the David M. Grant NMR Center ($4 million) and the Thatcher Building for Biological and Biophysical Chemistry ($8 million) on campus.