

June 30, 2005

Curriculum Vitae
JAMES V. COE
Associate Professor
Department of Chemistry
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Education

B.A. in Chemistry, Swarthmore College, 1980.
M.S. in Chemistry, The Johns Hopkins University, 1982.
Ph.D. in Chemistry, The Johns Hopkins University, 1986.

Professional Experience

Postdoctoral Research Associate, U. of California at Berkeley, 1986-88.
Assistant Professor, The Ohio State University, 1989-1995.
Associate Professor, The Ohio State University, 1995-present
Program Chair, 31st ACS Central Regional Meeting

Professional Affiliations

American Chemical Society
American Physical Society
Sigma Xi

Awards and Distinctions

Editorial Board of new journal "Plasmonics", 2005
OSU Mortar Board and Sphinx 2005 Faculty and Staff Recognition
Outstanding Service Award, Nov. 9th 1999, ACS Columbus Section
Roseman Award for excellence in research, The Johns Hopkins U., 1985
Sigma Xi, 1981
NSF-Undergraduate Research Program, U. of Delaware, summer 1979.

Personal:

Birth Date: April 25, 1958
Marital Status: Married, two children
Citizenship: United States of America

Publications

in preparation

63. S.M. Teeters-Kennedy, T.M. Rogers, K.A. Zomcheck, S.M. Williams, K.R. Rodriguez, V. Cherezo, M. Caffrey, and J.V. Coe, "Enhanced IR Absorption and Control of the Passage of Light through Metallic Microarrays by Phospholipid Bilayers", manuscript under revision.
62. K.R. Rodriguez, S.M. Teeters-Kennedy, S.M. Williams, and J.V. Coe, "IR Absorption Spectra of Adsorbed 2-Hydroxyethyl Radical using Surface-Plasmon-Mediated Transmission of Metallic Mesh Arrays", manuscript under revision.
61. K.R. Rodriguez, S.M. Williams, M.A. Young, A.D. Stafford, S.R. Bishop, U.K. Lincoln, and J.V. Coe, "Calculating Reliable Thermochemistry of Infinite One and Two Dimensional Carbon Structures using Clusters: Cumulenenic Chains, Acetylenic Chains, Graphene Sheet, and the (5,5) Single-Walled Nanotube", in preparation.

submitted

60. J.V. Coe, S.M. Williams, and K.H. Bowen, "Photoelectron spectra of hydrated electron clusters vs cluster size: Connecting to bulk", J. Chem. Phys., 2005, submitted.
59. J.V. Coe, S.T. Arnold, J.G. Eaton, G.H. Lee, and K.H. Bowen, "Photoelectron spectra of hydrated electron clusters: Fitting lineshapes and grouping isomers", J. Chem. Phys., 2005 submitted.

published

58. S.M. Williams, and J.V. Coe, "Dispersion Study of the Infrared Transmission Resonances of Freestanding Ni Microarrays", Plasmonics, in press (2006).
57. "Coated Biperiodic Metallic Mesh Arrays with Molecular Monolayers and Lipid Bilayers Thereon", James V. Coe, Shaun M. Williams, and Kenneth R. Rodriguez, U.S. Patent No. 6,863,991 B1, 3/15/05, filing date 5/1/03, Atty. Docket No. OSU 1159-168C.
56. B. C. Garrett, D. A. Dixon, D. M. Camaioni, D. M. Chipman, M. A. Johnson, C., D. Jonah, G. A. Kimmel, J. H. Miller, T. N. Rescigno, P. J. Rossky, S. S. Xantheas, S. D. Colson, A. H. Laufer, D. Ray, P. F. Barbara, D. M. Bartels, K. H. Becker, K. H. Bowen, S. E. Bradforth, I. Carmichael, J. V. Coe, L. R. Corrales, J. P. Cowin, M. Dupuis, K. B. Eisenthal, J. A. Franz, M. S. Gutowski, K. D. Jordan, B. D. Kay, J. A. LaVerne, S. V. Lymar, T. E. Madey, C. W. McCurdy, D. Meisel, S. Mukamel, A. R. Nilsson, T. M. Orlando, N. G. Petrik, S. M. Pimblott, J. R. Rustad, G. K. Schenter, S. J. Singer, A., Tokmakoff, L.-W. Wang, C. Wittig, and T. S. Zwieter, "The Role of Water on Electron-Initiated Processes and Radical Chemistry: Issues and Scientific Advances", Chemical Reviews **105**, 355-389 (2005).

55. J.V. Coe and S.M. Williams, "Method for Uniform Reduction of Apertures to Micron and Submicron Dimensions Using Commercial Bipерiodic Metallic Mesh Arrays and Devices Derived Therefrom", U.S. Patent #6,797,405 B1, Sept. 28, 2004.
54. K.R. Rodriguez, S. Shah, S.M. Williams, S. Teeters-Kennedy, and J.V. Coe, "Enhanced IR Absorption Spectra of Self-Assembled Alkanethiol Monolayers using the Extraordinary IR Transmission of Metallic Arrays of Subwavelength Apertures", *J. Chem. Phys.* **121**(18), 8671-8675 (2004). This article was also chosen for distribution in the Virtual Journal of Nanoscale Science and Technology.
53. S.M. Williams, K.R. Rodriguez, S. Teeters-Kennedy, A.D. Stafford, S.R. Bishop, U.K. Lincoln, and J.V. Coe, "Using the extraordinary infrared transmission of metallic subwavelength arrays to study the catalyzed reaction of methanol to formaldehyde on copper oxide", *J. Phys. Chem. B*, **108** 11833-11837 (2004).
52. J.V. Coe, S.M. Williams, S.M. Teeters-Kennedy, K.R. Rodriguez, and S. Shah, "Scaffolding for Nanotechnology: Extraordinary IR Transmission of Metal Microarrays for Stacked Sensors and Surface Spectroscopy", *Nanotechnology*, **15** S495-S503 (2004) (International Conference on Nanoscale Devices and System Integration). This article was among the most highly downloaded articles of this journal during 2004 (downloaded 941 times since online publication).
51. S.M. Williams, A.D. Stafford, T.M. Rogers, Sarah R. Bishop, and J.V. Coe, "Extraordinary Infrared Transmission of Cu-Coated Arrays with Subwavelength Apertures: Hole Size and the Transition from Surface Plasmon to Waveguide Transmission", *Appl. Phys. Lett.* **85**(9), 1472-1474 (2004).
50. D.M. Bartels, and J.V. Coe, "Absolute Electron and Proton Hydration Enthalpy vs. Temperature", *Proceeding of the Trombay Symposium on Radiation and Photochemistry*, 2004, in press.
49. M. D. Tissandier and J. V. Coe, "Transmission Characteristics of an Ion Spirograph Electrostatic Particle Guide with Fast Ion Beams", manuscript available but not submitted.
48. S.M. Williams, A.D. Stafford, K.R. Rodriguez, T.M. Rogers, and J.V. Coe, "Accessing Surface Plasmons with Ni Microarrays for Enhanced IR Absorption by Monolayers", *J. Phys. Chem. B*, **107** 11871-11879 (2003).
47. T. R. Tuttle, S. Malaxos, and J. V. Coe, "A New Cluster Pair Method of Determining Absolute Single Ion Solvation Energies Demonstrated in Water and Applied to Ammonia", *J. Phys. Chem. A*, **106** 925-932 (2002).
46. J. V. Coe, "Fundamental Properties of Bulk Water from Cluster Ion Data", *Int. Rev. Phys. Chem.*, **20**(1) 33-58 (2001).
45. J.-L. Kuo, J. V. Coe, S. J. Singer, Y.B. Band, and L. Ojamae, "On the use of graph

- invariants for efficiently generating hydrogen bond topologies and predicting physical properties of water clusters and ice", *J. Chem. Phys.* **114**(6), 2527-2540 (2001).
44. M.D. Tissandier, S. Singer, and J.V. Coe, "Enumeration and Evaluation of the Water Hexamer Cage Structure", *J Phys. Chem. A*, **104**, 752-757 (2000).
 43. M.H. Cohen, M.D. Tissandier, J. Seitzinger and J.V. Coe, "Dissociation of Electronically Excited D_3O to $O+D_2+D$ from the Glancing Charge Transfer Reaction of D_3O^+ with H_2O ", *J. Chem. Phys.* **110**, 11113-6 (1999).
 42. M. D. Tissandier, K. A. Cowen, W. Y. Feng, E. Gundlach, M. H. Cohen, A. D. Earhart, T. R. Tuttle, and J. V. Coe, **Erratum** -"The proton's absolute aqueous enthalpy and Gibbs free energy of solvation from cluster ion solvation data, *J. Phys. Chem. A* **102**, (vol 102A, pg 7791, 1998)", *J. Phys. Chem. A* **102**, 9308 (1998).
 41. M.D. Tissandier, K.A. Cowen, W.Y. Feng, E. Gundlach, M.H. Cohen, A.D. Earhart, James V. Coe, and T.R. Tuttle, Jr. "The Proton's Absolute Aqueous Enthalpy and Gibbs Free Energy of Solvation from Cluster Ion Solvation Data", *J. Phys. Chem. A* **102**, 7787-7794 (1998).
 40. M.D. Tissandier, M.H. Cohen, A.D. Earhart, E. Gunlach, W.Y. Feng, and J.V. Coe, "Approaching Water Through Clusters", in *Progress in the Physics of Clusters* (World Scientific, Singapore, 1998), proceedings of the international conference "Physics of Clusters: Clusters in Plasmas and Gases", Puchino, Russia.
 39. J.V. Coe, A.D. Earhart, M.H. Cohen, G.J. Hoffman, H.W. Sarkas, and K.H. Bowen, "Using Cluster Studies to Approach the Electronic Structure of Bulk Water: Reassessing the Vacuum Level, Conduction Band Edge, and Band Gap of Water", *J. Chem. Phys.* **107**, 6023-6031 (1997).
 38. J.V. Coe, "Connecting Cluster Anion Properties to Bulk: Ion Solvation Free Energy Trends with Cluster Size and the Surface vs. Internal Nature of Iodide in Water Clusters", *J. Phys. Chem. A*, **101**, 2055-2063 (1997).
 37. M.H. Cohen, T. Schwöpe, M.D. Tissandier, and J.V. Coe, "The Effect of Clustering Water Molecules on the Rate and Mechanism of the $H_3O^+(H_2O)_n+OH^-(H_2O)_m$ Reaction", p. 216 in **Dissociative Recombination: Theory, Experiment, and Applications III**, D. Zajfman, J.B.A. Mitchell, D. Schwalm, and B.R. Rowe, Eds. (World Scientific, Singapore, 1996).
 36. B. Plastringe, K.A. Cowen, D.A. Wood, M.H. Cohen, and J.V. Coe, "Recombination of Oppositely Charged Aqueous Cluster Ions Using Electrostatically Merged Ion Beams", *Surface Review and Letters*, **3**, 655-660 (1996).
 35. B. Plastringe, K.A. Cowen, D.A. Wood, and J.V. Coe, "The Effect of Clustering on Mutual Neutralization Rates Using Electrostatically Merged Ion Beams:

- $\text{OH}^-(\text{H}_2\text{O})_{n=0-3} + \text{H}_3\text{O}^+(\text{H}_2\text{O})_{m=0-3}$ ", J. Phys. Chem. **99**, 118 (1995).
34. D.A. Wood, K.A. Cowen, B. Plastringe, and J.V. Coe, "Collisional Activation Dynamics of $\text{OH}^-(\text{H}_2\text{O})_n$ Clusters Ions: Comparison to $\text{H}_3\text{O}^+(\text{H}_2\text{O})_n$ ", J. Phys. Chem. **98**, 13138 (1994).
 33. K.A. Cowen, B. Plastringe, D.A. Wood, and J.V. Coe, "Optimizing Internal Excitation of H_5O_2^+ in a Fast Ion Beam by Glancing Collisions with Argon: A Multiple Collision Analysis", Chem. Phys. Lett. **229**, 628 (1994).
 32. C. Capp, T.D. Wood, A.G. Marshall, and J.V. Coe, "Spectroscopic Signatures of Metal Ion Motions in Fullerenes", **Recent Advances in the Physics and Chemistry of Fullerenes** (The Electrochemical Society, Pennington, 1994).
 31. J.V. Coe, "Connecting Cluster Ions and Bulk Aqueous Solvation: A Determination of Bulk Single Ion Solvation Enthalpies", Chem. Phys. Lett. **229**, 161 (1994).
 30. C. Capp, T.D. Wood, A.G. Marshall, J.V. Coe, "High Pressure Toluene Extraction of $\text{La}@\text{C}_n$ for Even n from 74 to 90", J. Am. Chem. Soc. **116**, 4987 (1994). This paper was featured in the Science/Technology Concentrates of the June 20, 1994 issue of Chemistry & Engineering News.
 29. B.K. Gupta, B. Bhushan, C. Capp, and J.V. Coe, "Materials Characterization and Effect of Purity and Ion Implantation on the Friction and Wear Sublimed Fullerene Films", J. Mat. Res. **9**, 2823 (1994).
 28. K.A. Cowen, B. Plastringe, D.A. Wood, and J.V. Coe, "The Importance of High Impact Parameter Interactions in the Collision Induced Dissociation of Protonated Water Clusters by Argon Using a Wien Velocity Filter", J. Chem. Phys. **99**, 3480 (1993).
 27. G.W. Van Cleef, G.D. Renkes, and J.V. Coe, "Prediction of the Intensity and Structure of Spectra Associated with the Endohedral Motions of Metal-Containing Buckyballs", J. Chem. Phys. **98**, 860 (1993).
 26. T.D. Wood, G.W. Van Cleef, M.A. Mearini, J.V. Coe, A.G. Marshall, "Formation of Giant Fullerene Gas-Phase Ions (C_{2n}^+ , $60 \leq 2n \leq 500$): Laser Desorption/Electron Ionization Fourier Transform Ion Cyclotron Resonance Mass Spectrometric Evidence", Rap. Comm. Mass Spectrom. **7**, 304 (1993).
 25. B. Bhushan, B.K. Gupta, G.W. Van Cleef, C. Capp, J.V. Coe, "Fullerene (C_{60}) Films for Solid Lubrication", Tribology Transactions, **36**, 573 (1993).
 24. B. Bhushan, B.K. Gupta, G.W. Van Cleef, C. Capp, J.V. Coe, "Sublimed C_{60} Films for Tribology", App. Phys. Lett., **62**, 3253 (1993).
 23. P.A. Limbach, L.C. Schweikhard, K.A. Cowen, M.T. McDermott, A.G. Marshall, and

- J.V. Coe, "Observation of the Doubly Charged, Gas Phase Fullerene Anions, C_{60}^{2-} and C_{70}^{2-} ", *J. Am. Chem. Soc.* **113**, 6795 (1991).
22. K.A. Cowen, C. Frank, and J.V. Coe, "Beam Voltage Manipulation for Time-of-Flight Mass Analysis of Continuous Ion Beams", *Anal. Chem.* **63**, 990 (1991).
21. K.A. Cowen and J.V. Coe, "A New and Simple Time-of-Flight Mass Filter for CW Ion Sources", *Rev. Sci. Instrum.* **61**, 2601 (1990).
20. E.R. Keim, M.L. Polak, J.C. Owrutsky, J.V. Coe, and R.J. Saykally, "Absolute Infrared Vibrational Band Intensities of Molecular Ions Determined by Direct Laser Absorption Spectroscopy in Fast Ion Beams" *J. Chem. Phys.* **93**, 3111 (1990).
19. J.C. Owrutsky, E.R. Keim, J.V. Coe, and R.J. Saykally, "Absolute IR Intensities of the $<_1$ Bands of HN_2^+ and HCO^+ Determined by Direct Laser Absorption Spectroscopy in Fast Ion Beams", *J. Phys. Chem.*, **93**, 5960 (1989).
18. J.V. Coe, J.C. Owrutsky, E.R. Keim, N.V. Agman, and R.J. Saykally, "Sub-Doppler Direct IR Laser Absorption Spectroscopy in Fast Ion Beams: The Fluorine Hyperfine Structure of HF^+ ", *J. Chem. Phys.* **90**, 3893 (1989).
17. J.V. Coe and R.J. Saykally, "Infrared Laser Spectroscopy of Molecular Ions", in **Ion and Cluster Ion Spectroscopy and Structure**, ed. J.P. Maier, (Elsevier, Amsterdam, 1989).
16. J.T. Snodgrass, J.V. Coe, C.B. Freidhoff, K.M. McHugh, and K.H. Bowen, "Negative Ion Photoelectron Spectroscopy of $NH_2^-(NH_3)_1$ and $NH_2^-(NH_3)_2$: Gas Phase Basicities of Partially Solvated Anions", *J. Phys. Chem.* **99**, 9675 (1995).
15. L.H. Kidder, C.A. Fancher, T.P. Lippa, H.W. Sarkas, J.V. Coe, and K.H. Bowen, "The Generation and Optical Response of Nanoclusters", *Proceedings of the 1994 Scientific Conference on Obscuration and Aerosol Research*, ed. J. Rhodes (US Army Chemical Development and Engineering Center, June, 1994).
14. S.T. Arnold, J.V. Coe, J.G. Eaton, C.B. Freidhoff, L. Kidder, G.H. Lee, M.R. Manaa, K.M. McHugh, D. Patel-Misra, H.W. Sarkas, J.T. Snodgrass, and K.H. Bowen, "Photodetachment Spectroscopy of Negative Cluster Ions", **The Chemical Physics of Atomic and Molecular Physics**, *Proceedings of the International School of Physics 'Enrico Fermi'*, G.S. Scoles, ed. (Elsevier, north-Holland, 1990).
13. J.V. Coe, G.H. Lee, J.G. Eaton, S. Arnold, H.W. Sarkas, K.H. Bowen, C. Ludewigt, H. Haberland, and D. Worsnop, "Photoelectron Spectroscopy of Hydrated Electron Cluster Anions, $(H_2O)_{n=2-69}^-$ ", *J. Chem. Phys.* **92**, 3980 (1990).
12. J.T. Snodgrass, J.V. Coe, C.B. Freidhoff, K.M. McHugh, and K.H. Bowen, "Photodetachment Spectroscopy of Cluster Anions: Photoelectron Spectroscopy of $H^-(NH_3)_1$, $H^-(NH_3)_2$, and the Tetrahedral Isomer of NH_4^- ", *Far. Dis. Chem. Soc.* **86**, 241 (1988).

11. S.T. Arnold, J.V. Coe, J.G. Eaton, C.B. Freidhoff, L. Kidder, G.H. Lee, M.R. Manaa, K.M. McHugh, D. Patel-Misra, H. W. Sarkas, J.T. Snodgrass, and K.H. Bowen, "Photodetachment Spectroscopy of Negative Cluster Ions", in **Proceedings of Enrico Fermi School of Physics**, Varenna, Italy (1988), in press.
10. J.T. Snodgrass, J.V. Coe, K.M. McHugh, C.B. Freidhoff, and K.H. Bowen, "Photoelectron Spectroscopy of Selenium and Tellurium Containing Negative Ions: SeO_2^- , Se_2^- , and Te_2^- ", *J. Phys. Chem.* **93**, 1249 (1989).
9. J.T. Snodgrass, J.V. Coe, C.B. Freidhoff, K.M. McHugh, and K.H. Bowen, "On the Photodetachment of $(\text{SO}_2)_2^-$ ", *J. Chem. Phys.* **88**, 8014 (1988).
8. J.V. Coe, J.T. Snodgrass, C.B. Freidhoff, K.M. McHugh, and K.H. Bowen, "Negative Ion Photoelectron Spectroscopy of the Negative Cluster Ions, $\text{NO}(\text{N}_2\text{O})_{n=1,2}$ ", *J. Chem. Phys.* **87**, 4302 (1987).
7. J.V. Coe, J.T. Snodgrass, C.B. Freidhoff, K.M. McHugh, and K.H. Bowen, "Negative Ion Photoelectron Spectroscopy of N_2O^- and $(\text{N}_2\text{O})_2^-$ ", *Chem. Phys. Lett.* **124**, 274 (1986).
6. C.B. Freidhoff, J.V. Coe, J.T. Snodgrass, K.M. McHugh, and K.H. Bowen, "Negative Ion Photoelectron Spectroscopy of TeO^- ", *Chem. Phys. Lett.* **124**, 268 (1986).
5. C.B. Freidhoff, J.T. Snodgrass, J.V. Coe, K.M. McHugh, and K.H. Bowen, "Negative Ion Photoelectron Spectroscopy of TeH^- ", *J. Chem. Phys.* **84**, 1051 (1986).
4. J.V. Coe, J.T. Snodgrass, C.B. Freidhoff, K.M. McHugh, and K.H. Bowen, "Negative Ion Photoelectron Spectroscopy of the Negative Ion, SeO^- ", *J. Chem. Phys.* **84**, 618 (1986).
3. J.T. Snodgrass, J.V. Coe, C.B. Freidhoff, K.M. McHugh, and K.H. Bowen, "Negative Ion Photoelectron Spectroscopy of P_2^- ", *Chem. Phys. Lett.* **122**, 352 (1985).
2. J.V. Coe, J.T. Snodgrass, C.B. Freidhoff, K.M. McHugh, and K.H. Bowen, "Negative Ion Photoelectron Spectroscopy of the Negative Cluster Ion, $\text{H}^-(\text{NH}_3)_1$ ", *J. Chem. Phys.* **83**, 3169 (1985).
1. J.G. Voet, J.V. Coe, J. Epstein, V. Matossian, and T. Shipley, "Electrostatic Control of Enzyme Reactions: Effect of Ionic Strength on the pK_a of an Essential Acidic Group on Glucose Oxidase", *Biochemistry* **20**, 7182 (1981).

Presentations

72. "The Extraordinary Transmission of Metallic Arrays of Subwavelength Apertures for the Molecules of the Cell Membrane", The Ohio State University International Symposium on Molecular Spectroscopy, June 21, 2005.

71. "The Extraordinary Transmission of Metallic Arrays of Subwavelength Apertures for Enhanced IR Absorption Spectra of Complex Molecular Assemblies", International Symposium on Molecular Plasmonics, Jena Germany, May 20, 2005, invited.
70. "Scaffolding for Nanotechnology: Extraordinary IR Transmission of Metal Microarrays", Key-note speaker at the ACS Cleveland Section's Meeting in Miniature of Northeastern Ohio Schools, invited, March 23, 2005.
69. "Scaffolding for Nanotechnology: Extraordinary IR Transmission of Metal Microarrays", Ohio Northern University, Dec. 2, 2004, invited.
68. "Rotationally-Resolved IR Absorption and Emission Spectra of the Forbidden $02^2_0-00^0_0$ Band of $\text{CO}_2(\text{g})$ in the Surface Plasmon Field of Metal Mesh with Subwavelength Holes", The Ohio State University International Symposium on Molecular Spectroscopy, Jun. 23, 2004.
67. "Scaffolding for Nanotechnology: Extraordinary IR Transmission of Metal Microarrays", The Ohio State University Physical Chemistry Lecture Series, May 17, 2004.
66. "Scaffolding for Nanotechnology: Extraordinary IR Transmission of Metal Microarrays for Sensors, Control of Light, and Enhanced Surface Spectroscopy", IEEE conference on Nanoscale Devices and System Integration (NDSI), Miami, Feb. 15-19, 2004, invited.
65. "Using Photoelectron Spectra of Hydrated Electron Clusters to Characterize the Conduction Band of Bulk Water", National ACS Meeting, New York City, September 9, 2003, invited.
64. "Nanoscale Clusters and Holes: i. Carbon Clusters, ii. Metal Microarrays", XII International Materials Research Congress, Cancun, Mexico, August 18, 2003, invited.
63. "Nanoscale Clusters and Holes", California State University Dominguez Hills, June 15, 2003, invited.
62. "Accessing Surface Plasmons on Metallic Microarrays: Enhanced IR Absorption Spectroscopy of Monolayers and Bilayers", The Johns Hopkins University, March 24, 2003, invited
61. "Hydrated Electron Cluster Spectra and their Connection to Bulk", DOE Workshop "Understanding the Role of Water on Electron-Initiated Processes and Radical Chemistry", held at Environmental Molecular Science Laboratory at PNNL, 9/26/02.
60. "Connecting Water Clusters to Ice", OSU International Symposium on Molecular Spectroscopy", June, 2001.

59. "Looking for Photons from Ion-Ion Recombinations", OSU International Symposium on Molecular Spectroscopy", June, 2001.
58. "Fundamental Properties of Water from Cluster Data", Fall 2001 ACS Meeting, symposium entitled "What Can We Really Learn about Condensed Phases from Clusters", Aug. 26, 2001, invited
57. "Fundamental Properties of Water from Cluster Data", Baylor University, Apr. 6, 2001, invited.
56. "Approaching Bulk Water Through Clusters", Telluride Summer Research Center Workshop on Water in Confined Geometries, July 31-Aug. 5, 2000, invited.
55. "Fundamental Properties of Water from Cluster Data", Pacific Northwest National Lab, July 10, 2000, invited.
54. "Using Photoelectron and Absorption Spectra of Hydrated Electron Clusters Together to Better Understand the Electronic Properties of Bulk Water", OSU International Symposium on Molecular Spectroscopy", June 12, 2000.
53. "Approaching Bulk Water Through Clusters", University of Notre Dame, Feb. 3, 2000, invited.
52. "Approaching Bulk Water Through Clusters", Youngstown State University, Oct. 29, 1999, invited.
51. "Approaching Bulk Water Through Clusters", Mount Vernon Nazarene College, Sept. 23, 1999, invited.
50. "Approaching Water Through Clusters", 50th Anniversary of the South East Regional Meeting of the American Chemical Society, Symposium on "The Structure of Water, Hydrophobic and Hydrophilic Interactions", Knoxville TN, October 19, 1999, invited.
49. "Approaching Water Through Clusters: Reassessing Bulk Properties of Water and Charge Transfer Dynamics", ACS National Meeting, Symposium on "Water in Chemistry and Biology", New Orleans, August 22-26, 1999, invited.
48. "Approaching Bulk Water Through Clusters", 31st Central Regional Meeting of the ACS, June 23, 1999, invited.
47. "Approaching Bulk Water Through Clusters: The Roles of $\text{H}_3\text{O}^+(\text{aq})$, $\text{H}_3\text{O}^*(\text{aq})$, $\text{OH}(\text{aq})$, and $\text{e}^-(\text{aq})$ in the Electronically Excited Properties of Water", Joint APS Centennial and March Meeting Symposium on "Cluster Spectroscopy and Dynamics", Atlanta, March 25, 1999, invited.
46. "Approaching Water Through Clusters", Bowling Green State University, Sept. 30, 1998,

invited.

45. "Using Cluster Studies to Approach the Electronic Structure of Bulk Water: Reassessing the Vacuum Level, Conduction Band Edge, and Band Gap of Water", American Physical Society, BAPSAPR98, Columbus OH, April 21, 1998, contributed.
44. "Approaching Water Through Clusters: Reassessing Bulk Properties of Water and Charge Transfer Dynamics", Technical University of Munich, June 25, 1998, invited.
43. "Charge Transfer Dynamics in Aqueous Cluster Systems and the Reassessment of Fundamental Properties of Water through Cluster Studies", International Conference "Water in the Gas Phase", University of Marne la Valey, Paris, France, June 23, 1998, invited.
42. "Approaching Bulk Water Through Clusters: Building Up to Bulk One Molecule at a Time", Swarthmore College, Nov. 17, 1997, invited.
41. "Approaching Water Through Clusters: the Payoff when Cluster Work Connects to Bulk", Brandeis, Oct. 21, 1997, invited.
40. "Approaching Water Through Clusters", Physics of Clusters International Conference of the Russian Academy of Sciences Institute of Mathematical Problems of Biology, Pushchino, Russia, August 17, 1997, invited.
39. "Approaching Water Through Clusters: A New Determination of the Band Gap, Conduction Band Edge, and Vacuum Level of Water from Cluster Studies", American Physical Society 1997 March Meeting, Kansas City, March 21, 1997.
38. "Approaching Water Through Clusters", University of Kentucky, October 4, 1996, invited.
37. "The Effect of Solvating Water Molecules on the Reaction of H_3O^+ and OH^- : A Change from Electron Transfer to Proton Transfer with Clustering", Local American Chemical Society Meeting, Dayton, June 10, 1996.
36. "Infrared Emission Spectra of Molecular Ions in Fast Ion Beams", The 51st Ohio State University International Symposium on Molecular Spectroscopy, June 14, 1996.
35. "Surface Vs. Internal Controversies for Iodide and the Electron Solvated in Water Clusters", The Ohio State University Theoretical Chemistry Seminar, April 12, 1996.
34. "The Nature of Metal Atoms Trapped in Big Bags of Carbon", The Ohio State University Center for Materials Research presentation, Nov. 16, 1995.
33. "The Effect of Clustering on Recombination Reactions of Aqueous Cluster Ions", The 3rd International Symposium on Dissociative Recombination, Ein Gedi, Israel, May 28,

- 1995, invited.
32. "Aqueous Cluster Ions", Tulane University, April 10, 1995, invited.
 31. "The Study of Water and Aqueous Solvation Using Cluster Ions", University of Cincinnati, Feb. 23, 1995, invited.
 30. "Aqueous Solvation Effects on Recombination Reactions Using Electrostatically Merged Beams of Oppositely Charged Cluster Ions", University of Minnesota, March 6, 1995, invited.
 29. "The Effect of Clustering on Ion-Ion Mutual Neutralization Using Merged Ion Beams", University of Colorado, Boulder, Jan. 27, 1995, invited.
 28. "The Effect of Clustering on Dissociative Mutual Neutralization Rates Using Merged Ion Beams: $\text{OH}^-(\text{H}_2\text{O})_{n=0-3} + \text{H}_3\text{O}^+(\text{H}_2\text{O})_{m=0-3}$ ", Hot Topic talk at ISSPIC7, Kobe, Japan, Sept. 12, 1994, invited.
 27. "Aqueous Solvation Energetics and Cluster Ions", Swarthmore College, Feb. 21, 1994, invited.
 26. "Aqueous Solvation Energetics Using Merged Beam Recombination of Cluster Ions", March 17, 1994, San Diego, 207th American Chemical Society National Meeting.
 25. "The Importance of High Impact Parameter Interactions in the Collision Induced Dissociation of Cluster Ions Using a Wien Velocity Filter", March 16th, 1994, San Diego, 207th American Chemical Society National Meeting.
 24. "Searching for the Particle-in-a-Box Signatures of Metal Containing Buckyballs", May 27th, 1994, San Francisco, 185th Meeting of the Electrochemical Society, invited.
 23. "The Production, Separation, and Characterization of Endohedral Metallofullerenes: Spectroscopic Signatures of the Motions of Metal Ions in Fullerene Cages", Ann Arbor, June 1-3, 1994, ACS Regional Meeting, invited.
 22. "Metal Containing Buckyballs", Lawrence Technical University, April 28th, 1994, invited.
 21. "Ion Beams and Fullerenes: I. Merged Beam Ion-Ion Recombination Studies of Cluster Ions II. Searching for the Particle-in-a-Box Signatures of Metal Containing Buckyballs", University of Illinois, Dec. 8, 1993, invited.
 20. "Searching for the Particle-in-a-Box Signatures of Metal-Containing Buckyballs", Naval Research Laboratory, May 15, 1993, invited.
 19. "Filling-In on Fullerenes", Local Chapter of the American Chemical Society, Columbus,

- Dec. 9, 1992, invited.
18. "Ion Beams and Fullerenes", Akron University, Nov. 10, 1992, invited.
 17. "Metal-Containing Buckyballs", 1992 Industrial Associates in Chemistry Program, The Ohio State University, Sept. 12, 1992, invited.
 16. "Ion Beams and Fullerenes", Short Lecture related to Evans Award Ceremonies, The Ohio State University, Oct. 9, 1992, invited.
 15. "Use of an ExB Wien Velocity Filter for the Detection of Fragment Ions", International Symposium on Molecular Spectroscopy, The Ohio State University, June 16, 1992.
 14. "Laboratory Measurements of IR Molecular Ion Absorption Intensities", invited talk, International Symposium on Molecular Spectroscopy, The Ohio State University, June 15, 1992, invited.
 13. "Fullerene Derivatives Prepared in an Arc Discharge Apparatus", ACS Regional Meeting, Cincinnati, May 27, 1992, invited.
 12. "Arc Welders and Fullerene Materials", Dennison University, Feb. 19, 1992, invited.
 11. "Buckminsterfullerene (C_{60}), the New Form of Pure, Solid Carbon", the Ohio State University Sigma Xi Chapter, Jan. 15, 1992, invited.
 10. "I. Observation of Doubly Charged, Gas Phase Fullerene Anions, II. Beam Voltage Manipulation Mass Spectrometry", Wright State University, Oct. 11, 1991, invited.
 9. "The New Form of Pure, Solid Carbon, Buckminsterfullerene (C_{60})", the Center for Materials Research at the Ohio State University, Jun. 6, 1991, invited.
 8. "Observation of the Doubly Charged, Gas Phase Anion of Buckminsterfullerene, C_{60}^{2-} ", the 46th International Symposium on Molecular Spectroscopy, the Ohio State University, Jun. 19, 1991.
 7. "Observation of the Double Charged, Gas Phase Fullerene Anions, C_{60}^{2-} and C_{70}^{2-} ", Hot News Session at the March APS Meeting, Cincinnati OH, Mar. 18, 1991, invited.
 6. "Adventures in Molecular Ion Spectroscopy: Direct Absorption in Ion Beams, Excess Electrons in Water Clusters, Beam Voltage Manipulation Mass Spectrometry, and Doubly Charged Gas Phase Fullerenes", The Johns Hopkins University, Feb. 12, 1991, invited.
 5. "Adventures in Molecular Ion Spectroscopy: Direct Absorption in Ion Beams, Excess Electrons in Water Clusters, and Beam Voltage Manipulation Mass Spectrometry", Jan., Kalamazoo College, 1990, invited.

4. "Adventures in Molecular Ion Spectroscopy: Direct Absorption in Ion Beams and Excess Electrons in Water Clusters", Bowling Green State University, Jan. 25, 1990, invited.
3. "The Distribution of Excess Charge in Water Clusters by Negative Ion Photoelectron Spectroscopy", 44th International Symposium of Molecular Spectroscopy, The Ohio State University, June 15, 1989.
2. "Adventures in Molecular Ion Spectroscopy: Direct Absorption in Ion Beams and Excess Electrons in Water Clusters", University of Cincinnati, Nov. 2, 1989, invited.
1. "Direct Absorption Spectroscopy of Fast Ion Beams", University of Nevada Las Vegas, Oct. 28, 1988, invited.

Patents

5. "Coated Biperiodic Metallic Mesh Arrays with Molecular Monolayers and Lipid Bilayers Thereon", James V. Coe, Shaun M. Williams, and Kenneth R. Rodriguez, U.S. Patent # 6,863,991 B1, filing date 5/1/03, Atty. Docket No. OSU 1159-168C.
4. "Method for Uniform Electrochemical Reduction of Apertures to Micron and Submicron Dimensions using Commercial Biperiodic Metallic Mesh Arrays and Devices Derived Therefrom", James V. Coe and Shaun M. Williams, U.S. Patent #6,797,405 B1, Sept. 28, 2004, filing date 4/30/03, Atty. Docket No. OSU 1159-168B.
3. "Uniform Electrochemical Reduction of Apertures to Submicron Dimensions using Commercial Biperiodic Metallic Mesh Arrays", US Provisional Patent #60/377,170, 5/1/02.
2. "Method for Coating Fullerene Materials for Tribology", B. Bhushan, B.K. Gupta, and J.V. Coe, application number 08/326,345, patent number 5558903, issue date 9/24/96, attorney docket number OSU21801.
1. "Time-of-Flight Mass Spectrometer for Continuous Ion Beams", J.V. Coe, disclosed Nov. 11, 1989, OSU # 90IN17U.11, OSU never pursued.

Funding

pending

"Purchase of a Cyber Enabled Combined Raman and FTIR Micro-Spectroscopy System", PI P. Dutta, Co-PIs H. Allen, J. Coe, R. McCreery, and U. Ozkan, \$451,325, NSF#6490122, 6/27/05.

"Compact Optical Sensor for Biomolecules", PI D. Fourquette, Co-PIs J. V. Coe and W. Lempert, Phase I AFOSR STTR AF05-T025, \$100,000, 4/15/05

"Metallic Microarrays on Silicon Thin Films for Assay of Self-Assembled Nanocoatings with Surface-Plasmon-Enhanced IR Absorption Spectroscopy", User Proposal for Center for Integrated Nanotechnologies, Sandia National Labs, PI J. V. Coe, Co-PI Dale Huber, internal user fees covered, 5/2/05.

current

"Collision-Induced Stimulated-Emission using Surface Plasmons on Metal Microarrays: New Gain Medium for IR Lasers", 1/1/05-8/31/07, \$80,000

"Scaffolding for Nanotechnology: Extraordinary IR Transmission of Metal Microarrays for Sensors, Control of Light, and Surface Spectroscopy", NSF Analytical and Surface Science: Electro, Nano, and Surface Chemistry, CHE-0413077, 7/1/04-6/30/07, \$382,000.

previous

"Silicon Membranes with Arrays of Subwavelength Apertures: Control and Optical Assay of Biomolecules", Ohio MicroMD Micro Grant Program, 7/30/03-7/30/04, \$50,000 operating time.

"Radicals and Intermediates of Catalysis on Metallic Nanochannel Arrays", ACS PRF Type AC, 7/1/02-8/31/04. \$80,000.

"Ion Transport Using Nanopore Membrane", iMEDD, Inc. 4/1/01-4/1/03, \$5,000.

"Studies of Water and Aqueous Solvation by Recombination of Cluster Ions", National Science Foundation, Experimental Physical Chemistry Program, CHE-9528977, 6/1/96-11/30/97, extended for six months to May, 1998, \$169,518.

"Aqueous Solvation Energetics and the Accommodation of Charge in Water Clusters Using Merged Beam Recombination of Cluster Ions", National Science Foundation, Experimental Physical Chemistry Program, CHE-9204204, 5/1/92-5/1/95, \$180,000.

"Materials from the New Form of Carbon, Buckminsterfullerene", The Ohio State University Center for Materials Research, co-investigator S.V. Olesik, 1991, \$61,000.

"Time-of-Flight Mass Spectrometry for Continuous Ion Beams", Department of Chemistry Research Challenge Investigator's Fund, 1990-91, \$7,000.

"Cluster Ion Source Development for High Resolution Infrared Spectroscopy", American Chemical Society Petroleum Research Fund, ACS-PRF # 22159-G6, Ref. # OSURF 29731-55-00, 1989-91, \$18,000.

"High Resolution Spectroscopy of Cluster Ions", OSU Office of Research and Graduate Studies, University Seed Grant, 1989-90, \$10,000.