

Massimo Francesco Bertino

Associate Professor
Department of Physics
Virginia Commonwealth University
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Education & Employment:

- 2007- **Virginia Commonwealth University, Richmond, VA.**
Associate Professor, Department of Physics.
- 2006-2007 **University of Missouri-Rolla, Rolla, MO.**
Associate Professor, Department of Physics.
- 2000-2006 **University of Missouri-Rolla, Rolla, MO.**
Assistant Professor, Department of Physics.
- 1999 **Pacific Northwest National Laboratory, Richland, WA.**
Postdoctoral Associate. Advisors: J. P. Cowin, S. A. Joyce.
- 1997-99 **Massachusetts Institute of Technology, Cambridge, MA.**
Postdoctoral Associate in the Department of Chemistry.
Advisor: Prof. S. T. Ceyer.
- 1992-96 **Max-Planck-Institut für Strömungsforschung (MPI), Goettingen, Germany.**
Ph. D. Advisor: Prof. J. P. Toennies.
- 1986-91 **University of Milan, Milan, Italy.** Degree *cum laude* in Physics.

Current Research interests:

- Synthesis of metal and polymer nanostructures with high aspect ratio.
- Synthesis of silica (aero)gel/nanoparticle composites for catalytic and electronic applications.
- Cluster-biomolecule composites

Publications:

- 76 manuscripts published or accepted for publication; 1 book chapter.
- Invited talks at University of Bochum (Germany), Clemson University (SC), University of Arizona, Boston University, University of Missouri-Columbia, University of Missouri-Saint Louis, University of Louisville (KY), Texas A&M University, Washington State University, University of Idaho, Pacific Northwest National Laboratory, University of Nevada-Reno, Kansas State University, The Pennsylvania State University, University of York (England), Max-Planck-Institut for Colloid Research, Potsdam (Germany), Virginia Commonwealth University, SUNY Albany.

Honors and Outreach Activities:

- “Marie Curie” doctoral fellow (European Union fellowship, approximately equivalent to a NSF doctoral fellowship).
- Organizer, “11th Workshop on Surface Dynamics”, Sullivan, MO, Oct. 2-5, 2003.
- Organizer, “US-Pakistan workshop on Applications of Nanotechnology”, Islamabad, Pakistan, May 31-June 4, 2010.
- Organizer, “US-Pakistan workshop on Applications of Nanotechnology”, Karachi, Pakistan, May 30-June 3, 2012.
- Guest Editor, *Journal of Physics: Condensed Matter* (proceedings of the workshop on surface dynamics).
- Faculty Excellence Award, University of Missouri-Rolla, 2003 and 2005.
- Publications reviewed by *Bulletin of the Materials Research Society* (Feb. and Mar. 2005), *Chemical and Engineering News* (April 24, 2006 issue), *Micro-Nano* (part of

- R&D magazine, Jan. 2005), *Nanotechwire.com* (Dec. 2004), and by *CSA Aerospace & High Technology Database* (Sep. 2006), and by *Institute of Physics (IOP)*, date tba).
- Reviewer for: *National Science Foundation, Petroleum Research Fund, Research Corporation, The United States Civilian Research and Development Foundation, Langmuir, Journal of Physical Chemistry B, Chemical Physics Letters, The Materials Research Society, Journal of Physics: Condensed Matter, Microelectronics Reliability, Journal of Sol-Gel Science and Technology, Journal of non-crystalline Solids, Journal of Materials Research, Macromolecular Rapid Communications, Journal of Biological Physics, Materials Science and Engineering, Optics Materials, Angewandte Chemie, Journal of the American Chemical Society, Advanced Materials, European Polymer Journal.*
 - Visiting Scientist, Pacific Northwest National Laboratory, 2006.
 - Visiting Scientist, Max-Planck-Institut for Colloid Research, 2007.
 - Visiting Scientist, University of Giessen, 2009, 2010 and 2011.

Teaching & Student Supervision

- Courses taught: introductory mechanics for scientists and engineers, nanotechnology . The average teaching evaluations are 3.4/4.0.
- Three M.S. students graduated with thesis.
- Two Ph.D. students graduated, 2004 and 2007.
- Involved more than 20 undergraduates in research activities. Undergraduates are co-authors of four publications. Four additional publications featuring undergraduates as co-authors are submitted/being prepared.

List of Publications

1. M. Bertino, A. Corazza, M. Martini, A. Mervic and G. Spinolo, "The 2.7 eV Photoluminescence Band in High-Purity Synthetic Silica", *J. Phys. C: Condensed Matter* **6**, 6345 (1994).
2. M. F. Bertino, J. Ellis, F. Hofmann, J. R. Manson and J. P. Toennies, "High Resolution He Scattering Studies of Inelastic Interference Structures of the Frustrated Translational Mode of CO on Cu(001)", *Phys. Rev. Lett.* **73**, 605 (1994).
3. M. F. Bertino, F. Hofmann, E. Hulpke, W. Steinhögl, G. Witte and Ch. Wöll, "The Low-Energy Thermal Excitation Spectrum of Nitrogen Molecules adsorbed on Ni(110): Implications for Molecular Adsorption Sites", *Appl. Phys. A* **62**, 95 (1996).
4. A. P. Graham, M.F. Bertino, F. Hofmann and J. P. Toennies, "Structure and Dynamics of C₂H₄ at Submonolayer Coverages on a Copper(001) Surface Studied by He Atom Scattering", *J. Phys. Chem.* **100**, 19136 (1996).
5. A. P. Graham, M.F. Bertino, F. Hofmann and J. P. Toennies, "Adsorption, Desorption, monolayer structure and dynamics of C₂H₄ on Cu(001)", *J. Chem. Soc., Faraday Trans.*, **92**, 4749 (1996).
6. M. F. Bertino, F. Hofmann, W. Steinhögl and J. P. Toennies, "Quasielastic Helium Atom Scattering Measurements of Microscopic Diffusion of CO on the Ni(110) Surface", *J. Chem. Phys.* **105**, 11297 (1996).
7. A. P. Graham, M. F. Bertino, F. Hofmann, W. Silvestri and J. P. Toennies, "A Helium Atom Scattering Study of the Growth and Dynamics of CH₄ and C₂H₆ on Cu(001)", *J. Chem. Phys.* **106**, 2502 (1997).
8. M. F. Bertino, F. Hofmann and J. P. Toennies, "The Effect of Dissociative Chemisorption on the Diffraction of D₂ from Ni(110)", *J. Chem. Phys.* **106**, 4327 (1997).
9. A. P. Graham, M. F. Bertino, F. Hofmann, J. P. Toennies and Ch. Wöll, "Experimental Determination of a Two-Dimensional Longitudinal Dispersion Curve", *J. Chem. Phys.* **106**, 6194 (1997).
10. J. Braun, D. Fuhrmann, M. F. Bertino, A. P. Graham, A. Bilic, B. Gumhalter, J. P. Toennies and Ch. Wöll, "Multiphonon He atom scattering from Xe overlayers on Cu(111) and Cu(001) surfaces", *J. Chem. Phys.* **106**, 9922 (1997).
11. G. Benedek, M. F. Bertino, S. Miret-Artes and J. P. Toennies, "Rotationally Mediated Focussed Inelastic Resonances in D₂ scattering from Cu(001)", *Surf. Sci.* **377-379**, 714 (1997).
12. M. F. Bertino, G. Benedek, S. Miret-Artes and J. P. Toennies, "Observation of Rotationally Focussed Inelastic Resonances in D₂ scattering from Cu(001)", *Phys. Rev. B* **56**, 9964 (1997).
13. M. F. Bertino and G. Witte, "A High Resolution He Scattering Study of the External Vibrations of CO molecules adsorbed on Ni(110)", *Surf. Sci.* **385**, L984 (1997).
14. A. P. Graham, M. F. Bertino, F. Hofmann, J. P. Toennies and Ch. Wöll, Response to "Comment on Experimental determination of a longitudinal phonon dispersion curve in a quasi-two-dimensional system" [*J. Chem. Phys.* 107, 4443 (1997)], *J. Chem. Phys.* **107**, 4445 (1997).
15. M. F. Bertino, S. Miret-Artes and J. P. Toennies, "Observation of Elastic Rotationally Mediated Critical Kinematic Effect in D₂ Scattering from Cu(001)", *Chem. Phys. Lett.* **287**, 663 (1998).
16. M. F. Bertino, J. R. Manson and W. Silvestri, "A Comparative Experimental Study of the Scattering of Highly energetic Atomic and Molecular Beams from Metallic Surfaces", *J. Chem. Phys.* **108**, 10239 (1998).
17. M. F. Bertino, P. Hahn, M. Ritter, J. P. Toennies and W. Weiss, "Determination of the Structural and Catalytic Properties of thin Al films on Ni(110)", *Surf. Sci.* **413**, 82 (1998).
18. M. F. Bertino, A. P. Graham, L. Yu Rusin and J. P. Toennies, "Diffraction and Rotational Transitions in the Scattering of D₂ from Cu(001) at Energies up to 250 meV", *J. Chem. Phys.* **109**, 8036 (1998).
19. M. F. Bertino, A. Glebov, F. Traeger, G.-J. Kroes, E. Pijper, R. C. Mowrey and J. P. Toennies, "Observation of large Differences in the Diffraction of Normal and para-H₂ from LiF(001)", *Phys. Rev. Lett.* **81**, 5608 (1998).
20. A. Siber, B. Gumhalter, J. Braun, A. P. Graham, M. F. Bertino, J. P. Toennies, D. Fuhrmann, and C. Wöll, "Combined He-atom scattering and theoretical study of the low-energy vibrations of physisorbed monolayers of Xe on Cu(111) and Cu(001)", *Phys. Rev. B* **59**, 5898 (1999).
21. M. F. Bertino and J. P. Toennies, "Determination of the Reaction Time of the H₂ + D₂ = 2HD Reaction on Ni(110)", *J. Chem. Phys.* **110**, 9186 (1999).
22. M. R. Tate, D. Gosalvez, D. P. Pullman, A. A. Tsekouras, Y. L. Li, J. J. Yang, K. B. Laughlin, S. C. Eckman, M.F. Bertino and S.T. Ceyer, "Fluorine atom abstraction by Si(100). I. Experimental", *J. Chem. Phys.* **111**, 3679 (1999).

23. C. M. Doudna, J. H. Hund and M. F. Bertino, "Synthesis of (bi) metallic clusters in a nuclear reactor", *Int. Jou. of Mod. Phys. B*, **15**, 3302 (2001).
24. C. M. Doudna, M. F. Bertino, "Synthesis and characterization of homogeneous alloy Ag-Pd nanoparticles", *Langmuir*, **18**, 2434 (2002).
25. M. F. Bertino, and D. Farias, "Probing gas-surface potential energy surfaces with diffraction of hydrogen molecules", Topical Review Article, *J. Phys.: Condensed Matter* **14**, R21-28 (2002).
26. A. Tokuhiko and M. F. Bertino, "Radiation resistance testing of MOSFET and CMOS as a means of risk management", *IEEE Trans. on Components and Packaging Technologies*, **25**, 518 (2002).
27. J. F. Hund, M. F. Bertino, G. Zhang, C. Sotiriou-Leventis, N. Leventis, A. Tokuhiko, and J. Farmer, "Formation and Entrapment of Noble Metal Clusters in Silica Aerogel Monoliths by γ -Radiolysis", *J. Phys. Chem. B* **107**, 465 (2003).
28. J. F. Hund, M. F. Bertino, G. Zhang, C. Sotiriou-Leventis, N. Leventis, A. Tokuhiko, and J. Farmer, "Synthesis of aerogel-metal cluster composites by gamma radiolysis", *Mater. Res. Soc. Symp. Proc.* **740**, I11.2 (2003).
29. C. M. Doudna, M. F. Bertino, F. D. Blum, A. T. Tokuhiko, D. Lahiri-Dey, S. Chattopadhyay, and J. Terry, "Synthesis of bimetallic nanoparticles with high aspect ratio", *Mater. Res. Soc. Symp. Proc.* **740**, I7.15 (2003).
30. C. M. Doudna, M. F. Bertino, F. D. Blum, A. T. Tokuhiko, D. Lahiri-Dey, S. Chattopadhyay, and J. Terry, "Radiolytic synthesis of bimetallic Ag-Pt nanoparticles with high aspect ratio", *J. Phys. Chem. B* **107**, 2966 (2003).
31. M. F. Bertino, J. F. Hund, J. Sosa, G. Zhang, C. Sotiriou-Leventis, N. Leventis, A. T. Tokuhiko, and J. Terry, "High resolution patterning of silica aerogels", published as a letter in *J. Non-Cryst. Solids* **333**, 108 (2004).
32. M. F. Bertino, J. F. Hund, G. Zhang, C. Sotiriou-Leventis, A. T. Tokuhiko, and N. Leventis, "Room Temperature Synthesis of Noble Metal Clusters in the Mesopores of Mechanically Strong Silica-Polymer Aerogel Composites", *J. Sol-Gel Sci. Techn.* **30**, 43 (2004).
33. R. C. Hefty, J. R. Holt, M. R. Tate, D. B. Gosalvez, M. F. Bertino, S. T. Ceyer, "Dissociation of a Product of a Surface Reaction in the Gas Phase: XEF₂ Reaction with Si", *Phys. Rev. Lett.* **92**, 188302 (2004).
34. J. F. Hund, M. F. Bertino, G. Zhang, C. Sotiriou-Leventis, N. Leventis, "Synthesis of homogeneous alloy metal clusters in silica aerogels", *J. Non-Cryst. Solids* **350**, 9 (2004).
35. M. F. Bertino, R. R. Gadipalli, J. G. Story, C. G. Williams, G. Zhang, C. Sotiriou-Leventis, A. T. Tokuhiko, S. Guha, and N. Leventis, "Laser Writing of Semiconductor Nanoparticles and Quantum Dots", *Appl. Phys. Lett.* **85**, 6007 (2004). The article was also published on "Virtual Journal of Nanoscale Science & Technology" (Dec. 20, 2004 issue), and was reviewed by "Micro/Nano Newsletter" (January 2005 issue), by "MRS Bulletin" (Feb. 2005 issue), and by "Nanotechwire.com" (<http://nanotechwire.com/news.asp?nid=1385>).
36. S. Pillalamarri, F. D. Blum, A. T. Tokuhiko, and M. F. Bertino, "Templateless Synthesis of Polyaniline Nanofibers", *Chem. Mater.* (communication) **17**, 227 (2005). The article was reviewed by "MRS Bulletin" (Mar. 2005 issue).
37. D. Lahiri, S. Chattopadhyay, B.A. Bunker, C.M. Doudna, M.F. Bertino, F. D. Blum, A. T. Tokuhiko and J. Terry, "EXAFS studies of bimetallic Ag-Pt and Ag-Pd nanofibers", *Physica Scripta*, **T115**, 776 (2005).
38. D. Lahiri, Z. Zhang, S. Chattopadhyay, C. M. Doudna, T. Shibata, B. Mishra. A. T. Tokuhiko, J. Terry, D. Meisel, and B. A. Bunker, "XAFS investigation of core-shell and alloyed Pt/Ag and Pd/Ag nanoparticles", *J. Appl. Phys.* **97**, 094304 (2005).
39. S. Pillalamarri, F. D. Blum, and M. F. Bertino, "Synthesis of polyaniline-gold nanocomposites using "grafting from" approach", *Chem. Commun* **2005**, 4584.
40. L. K. Werake, J. G. Story, M. F. Bertino, S. K. Pillalamarri, and F. D. Blum, "Photolithographic Synthesis of Polyaniline Nanofibers", *Nanotechnology*, **16**, 2833-2837, (2005). This publication was included in the *CSA Aerospace & High Technology Database*, Sept. 2006.
41. S. Pillalamarri, F. D. Blum, A. T. Tokuhiko, and M. F. Bertino, "One-pot synthesis of polyaniline-metal nanocomposites", *Chem. Mater.* **17**, 5941-44 (2005).
42. R.R.Gadipalli, L.A.Martin, B. Heckman, J.G.Story, M.F.Bertino, N.Leventis, P. Fraundorf, and S.Guha, "Patterning porous matrices and planar substrates with quantum dots", *J Sol-Gel Sci Techn.* **39**, 299-306 (2006).
43. R.R.Gadipalli, L.A.Martin, B. Heckman, J.G.Story, M.F.Bertino, N.Leventis, P. Fraundorf, and S.Guha, "Infra Red Quantum Dot Photolithography", *J Sol-Gel Sci Techn.* **40**, 101-107 (2006).

44. M. F. Bertino, Z. M. Sun, R. Zhang, and L. S. Wang, "Facile Synthesis of monodisperse ultra-small Au clusters", *J. Phys. Chem. B. (letters)* **110**, 21416-21418 (2006).
45. A. Yamilov, M. Herrera, and M. F. Bertino, "Disorder-immune coupled resonator optical waveguide", *Opt. Lett.* **32**, 283-285 (2007). This article was also published on the January 29, 2007 issue of *Virtual Journal of Nanoscale Science & Technology*.
46. M. F. Bertino, R.R. Gadipalli, L. A. Martin, L. E. Rich, A. Yamilov, B. R. Heckman, N. Leventis, S. Guha, J. Katsoudas, R. Divan and D. C. Mancini, "Quantum dots by ultraviolet and X-ray lithography", *Nanotechnology* **18**, 315603 (2007).
47. A. Mumtaz, K. Maaz, B. Janjua, S.K. Hasanain, and M. F. Bertino, "Exchange Bias and Vertical Shift in CoFe₂O₄ Nanoparticles", *Journal of Magnetism and Magnetic Materials*, **313**, 266 (2007).
48. I. D'Amico, T. Hodgson, M. F. Bertino, and N. Leventis, "Mesoporous matrices for quantum computation with improved response through redundancy", *J. Appl. Phys.* **101**, 114319 (2007) This article was reviewed by IOP on May 22, 2007: http://www.iop.org/Media/Press%20Releases/press_22278.html
49. B. Heckman, L. Martin, M.F.Bertino, N.Leventis, A. T. Tokuhito, "Sol-gel materials for high capacity, rapid removal of metal contaminants", *Sep. Sci. and Technol.* **43**, 1474-1487 (2008).
50. M. Herrera, M. F. Bertino, and A. Yamilov, "Slow-light effect in dual-periodic photonic lattice", *J. Opt. Soc. of America B*, **25**, 599-608 (2008).
51. I. D'Amico, T. Hodgson, M. F. Bertino, and N. Leventis, "Effect of matrix parameters on mesoporous matrix based quantum computation", *physica status solidi (c)*, **5**, 2511-2515 (2008).
52. Z. Li, F. D. Blum, M. F. Bertino, C.-Soo Kim, and S. K. Pillalamarri, "One-step fabrication of a polyaniline nanofiber vapor sensor" *Sensors and Actuators B* **134** (2008) 31-35
53. M.F. Bertino, B. Smarsly, A. Stocco, and A. Stark, "Densification of nanoparticles with visible light", *Adv. Funct. Mater.*, **19**, 1-6 (2009).
54. C. Wingfield, A. Baski, M. F. Bertino, N. Leventis, D. P. Mohite, and H. Lu, "Fabrication of sol-gel materials with anisotropic physical properties", *Chem. Mater.* **21**, 2108-2114 (2009).
55. G. Shafai, S. Hong, M. F. Bertino, and T. S. Rahman, "Effect of ligands on the geometric and electronic structure of Au₁₃ clusters", *J. Phys. Chem. C*, **113**, 12072-12078 (2009).
56. K. Maaz, M. Usman, S. Karim, A. Mumtaz, S. K. Hasanain, M. F. Bertino, "Magnetic response of core-shell cobalt ferrite nanoparticles at low temperature", *J. Appl. Phys.* **105**, 113917 (2009).
57. J. J. Zhao, S. Sallard, B. Smarsly, S. Gross, M. Bertino, C. Boissiere, H. R. Chen, J. L. Shi, "Photocatalytic performances of mesoporous TiO₂ films doped with gold clusters", *J. Mater. Chem.* **20**, 2831-2839 (2010).
58. K. Maaz, A.Mumtaz, S.K.Hasanain, M.F.Bertino, "Temperature dependent coercivity and magnetization of nickel ferrite nanoparticles" *Journal of Magnetism and Magnetic Materials* **322**, 2199-2202 (2010).
59. M. F. Bertino, S. Seashols, S. Boyd, "Raman Spectroscopy of Blood Samples for Forensic Applications", *Forensic Science International*, **208**, 124-128 (2011).
60. C. Wingfield, L. Franzel, M. F. Bertino, and N. Leventis, "Fabrication of functionally graded aerogels, cellular aerogels and anisotropic ceramics", *J. Mater. Chem.* **21**, 11737-11741 (2011).
61. S. Hong, G. Shafai, M. F. Bertino, and T. Rahman, "Towards an Understanding of Ligand Selectivity in Nanocluster Synthesis", *J. Phys. Chem.*, **115**, 14478-14487 (2011).
62. D. Ye, S. Mutisya, and M. F. Bertino, "Enhancement of Electric Field and Raman Scattering by Ag Coated Ni Nanotips", *Appl. Phys. Lett.* **99**, 081909 (2011).
63. M. F. Bertino, L. Franzel, "Inhomogeneous Aerogels", *Review of Nanoscience and Nanotechnology*, **1**, 52-65 (2012).
64. Z. Li, C.-S. Kim, F. D. Blum, M. F. Bertino, "Fabrication of polyaniline fiber sensors", *Sensors and Actuators:B. Chemical*, **161**, 390-395 (2012).
65. A. Sadekar, S. Mahadik, A. Bang; Z. Larimore, C. Wisner, M. Bertino, J. Mang, C. Sotiriou-Leventis, N. Leventis, A. Kalkan, "From 'Green' Aerogels to Porous Graphite by Emulsion Gelation of Acrylonitrile", *Chem. Mater.*, **24**, 26-47 (2012).
66. M. F. Bertino, E. E. Carpenter, Z. Huba, and L. Franzel, "Synthesis of magnetic nanoparticles by laser ablation", *Applied surface Science*, **261** (2012) 332- 336.
67. S. Ullah Awan, S. K. Hasanain, Massimo F. Bertino, G. Hassnain Jaffari, "Ferromagnetism in Li doped ZnO nanoparticles: the role of interstitial Li", *J. Appl. Phys.*, **112**, 103924 (2012).
68. A. Manzoor, S. K.Hasanain, A Mumtaz, M. F Bertino, L. Franzel, "Effects of size and oxygen annealing on the Multiferroic behavior of Bismuth", *Journal of Nanoparticle Research*, **14**, article number 1310, DOI: 10.1007/s11051-012-1310-x (2012).

69. S. J. Boyd, L. S. White, S. J. Seashols, D. Ye and M. F. Bertino, "Highly sensitive detection of blood by Surface Enhanced Raman Scattering (SERS)", *Journal of Forensic Sciences* **58**, 753-56 (2013).
70. M. F. Bertino, S. Mutisya, L. Franzel, J. Ryan, B. Barnstein, "Comparison of in situ and ex situ bioconjugation of Au nanoparticles generated by laser ablation", *Applied Surface Science*, **264**, 27-30 (2013).
71. L. Franzel, C. Wingfield, N. Leventis and M. F. Bertino, "Regioselective Cross-Linking of Silica Aerogels with Magnesium Silicate ceramics", *J. Mater. Chem. A*, **2013**, **1** (19), **6021 – 6029**
72. S. S. Naz, N. U. Islam, M. R. Shah, S. S. Alam, Z. Iqbal, M. Bertino, L. Franzel, A. Ahmed, "Enhanced Biocidal activity of Au nanoparticles synthesized in one pot using 2,4-dihydroxybenzene carbodithiotic acid as a reducing and stabilizing agent", *J. Nanobiotechnology* **11**, 13 (2013).
73. S. U. Awan, S. K. Hasanain, M. F. Bertino, G. H. Jaffari, "Effects of substitutional Li on the ferromagnetic response of Li co-doped ZnO:Co nanoparticles", *J. Phys:Condensed Matter* **25**, article number 156005 (2013).
74. Z.-F. Li, F. D. Blum, M. F. Bertino, C.-S. Kim, "Understanding the Response of Nanostructured Polyaniline Gas Sensors", *Sensors and Actuators B:Chemical* **183**, 419-427 (2013).
75. P. Gardner, M. F. Bertino, R. Weimer, E. Hazelrigg, "Analysis of Lipsticks Using Raman Spectroscopy", *Forensic Science International*, manuscript #88/p/7923, accepted for publication.
76. M. Hiruta, G. Johnson, M. Rostamian, G. P. Potirniche, A. M. Ougouagb, M. Bertino, L. Franzel, A. Tokuhiro, "Computational and experimental prediction of dust production in pebble bedreactors, Part II" *Nuclear Engineering and Design* xxx (2013) xxx– xxx <http://dx.doi.org/10.1016/j.nucengdes.2013.04.032>

Conference Presentations

- March 1993:** Oral presentation at the Spring Meeting of the German Physical Society, Muenster.
- July 1993:** Poster at the conference "Scattering from surfaces", Trieste, Italy.
- March 1995:** 3 Oral presentations at the spring meeting of the German Physical Society, Berlin, Germany.
- May 1995:** Poster at the Yearly Conference of the Bunsengesellschaft "Reactivity and Dynamics at Surfaces", Bremen, Germany.
- April 1996:** Oral presentation and poster at the EPS Congress, Stresa, Italy.
- Sept. 1996:** Poster at the 15th ECOSS Meeting, Genoa, Italy.
- March 1997:** Poster at the spring meeting of the German Physical Society, Münster, Germany.
- March 1997:** Poster at the XXX Jahrestreffen Deutscher Katalytiker, Eisenach, Germany.
- July 1997:** Poster at Dynamics of Molecular collisions Conference, Brainerd, MN
- Aug. 1997:** 3 Posters at Gordon Research Conference on Dynamics at Surfaces, Andover, NH.
- Sept. 1997:** Poster at the 16th ECOSS Meeting, Enschede, The Netherlands.
- March 1998:** Oral presentation at the "9th Symposium on Atom-Surface Scattering", Clemson, SC.
- Mar. 1999:** Invited talks at University of Arizona, Boston University, University of Missouri-Rolla.
- Mar. 2000:** Condensed Matter Seminar, University of Missouri-Columbia (*invited*).
- Oct. 2000:** Poster at the 48th Midwest Solid State Conference, Grand Forks, ND.
- June 2001:** Talk at 10th Workshop on Surface Dynamics, Madrid, Spain. (*invited*).
- Jan. 2002:** Condensed Matter Seminar, University of Louisville.
- June 2002:** Oral presentation, Central States Microscopy Society Meeting, St. Louis, MO.
- Dec. 2002:** Poster and oral presentation at Materials Research Society Fall Meeting, Boston.
- Dec. 2002:** Condensed Matter Seminar, Boston University.
- Jan. 2003:** Physical Chemistry Seminar, Texas A& M University.
- Feb. 2003:** Condensed Matter Seminar, University of Missouri-Columbia.
- Sep. 2003:** Colloquium Speaker, Washington State University, Pullman, WA.
- Sep. 2003:** Colloquium Speaker, Idaho State University, Moscow, ID.
- Sep. 2003:** Colloquium Speaker, Washington State University, Richland, WA.
- Nov. 2003:** Colloquium Speaker, University of Nevada-Reno.
- Nov. 2003:** Two oral presentations, "7th International Symposium on Aerogels".
- March 2004:** Poster and oral presentation, National ACS Meeting, Anaheim, CA.
- June 2004:** Oral presentation, "Scientific Conference on obscuration and aerosol research", Aberdeen, MD (*invited*).
- Feb. 2005:** Condensed Matter Seminar, Kansas State University.
- March 2005:** Poster and oral presentation, National ACS Meeting.
- June 2005:** Oral presentation, "Obscurants2005" (*invited-CLOSED SESSION*).
- July 2005:** Lecturer, "30th International Nathiagali Summer College on Physics and Contemporary Needs", Nathiagali, Pakistan.
- Oct. 2005:** Oral presentation, 52nd Midwest Solid State Conference (*invited*).
- Nov. 2005:** Seminar Speaker, *The Pennsylvania State University*, Dept. of Physics.
- Mar. 2006:** Oral presentation, American Chemical Society annual Symposium (*invited* –presenter was F. Blum).
- June 2006:** Lecturer, "Nano-course 2006", Washington State University and Pacific Northwest National Laboratory, Richland, WA.
- Oct. 2006:** Oral Presentation, NSF symposium on Materials Chemistry, St. Louis, MO. (*invited*)
- Nov. 2006:** 2 oral presentations, Materials Research Society Fall Meeting, Boston, MA.
- Feb. 2007:** Colloquium speaker, Virginia Commonwealth University.
- March 2007:** Seminar speaker, Max-Planck-Institut for Colloid Research, Golm, Germany.
- March 2007:** Colloquium speaker, University of York, England.
- May 2007:** Colloquium speaker, SUNY Albany.
- June 2007:** Lecturer, "32^d International Nathiagali Summer College on Physics and Contemporary Needs", Nathiagali, Pakistan.

Oct. 2007: Lecturer, IAEA course on Nanotechnology, Islamabad, Pakistan. (*invited*)