

Diana Berman

CONTACT INFORMATION

Argonne National Laboratory,
Center for Nanoscale Materials
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RESEARCH INTEREST AND EXPERTISE

Nanostructures and Surfaces
Carbon Films
Thin Film Deposition
Friction, Adhesion, and Wear
Radio Frequency Microelectromechanical Systems, Nanodevices
Quartz Crystal Microbalance (QCM)
Ultra High Vacuum (UHV)
Low Temperature/Cryogenics studies
X-ray photoelectron spectroscopy (XPS)
Secondary ion mass spectrometry (TOF-SIMS)
Scanning Electron Microscopy (SEM), Scanning Tunneling Microscopy (STM)
Raman Spectroscopy

EDUCATION

Ph.D. in Physics, North Carolina State University, Raleigh, NC, GPA 4.0 *2007- Feb2012*
M.S. in Physics, North Carolina State University, Raleigh, NC *2005 - 2007*
B.Sc, Applied Physics and Mathematics, Moscow Institute of Physics and Technology, Moscow, Russia *2001 - 2005*

RESEARCH AND PROFESSIONAL EXPERIENCE

PostDoctoral Researcher, Center for Nanoscale Materials, Argonne National Laboratory (Lemont, IL) *Feb2012-present*
Advisor: Dr. Anirudha Sumant
Adjunct Professor in Physics, summer semester *Jul 2012- Aug 2012*
Moraine Valley Community College (Palos Hills, IL)
Research Assistant, Nanotribology Lab, NCSU (Raleigh, NC) *2008 – Feb2012*
Advisor: Dr. Jacqueline Krim, Department of Physics
Lab Assistant, “Engineering Physics Labs”, NCSU (Raleigh, NC) *2006 - 2009*
Teaching Assistant, "Ph.D. Classical Mechanics", NCSU (Raleigh, NC) *Aug2008-Dec2008*
Research Assistant, Astrophysics Group, NCSU (Raleigh, NC) *2005- 2007*

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PUBLICATIONS

D. Berman, A. Erdemir, A.V. Sumant: “*Few layer graphene to reduce wear and friction on sliding steel surfaces*”. Carbon, **54**, 454-459 (2013)

D. Berman, A. Erdemir, A.V. Sumant: “*Reduced Wear and Friction Enabled by Graphene Layers on Sliding Steel Surfaces in Dry Nitrogen*”, Carbon, <http://dx.doi.org/10.1016/j.carbon.2013.03.006>

D. Berman, J. Krim: “*Surface Science, MEMS and NEMS: Progress and opportunities for surface science research performed on, or by, microdevices.*” Progress in Surface Science, Invited Review Article, in press.

D. Berman, M.J. Walker and J. Krim: “*Contact voltage-induced softening of RF microelectromechanical system gold-on-gold contacts at cryogenic temperatures.*” J. Appl. Phys. **108**, 044307 (2010)

D. Berman, M. J. Walker, C. Nordquist, and J. Krim: “*Impact of adsorbed organic monolayers on vacuum electron tunneling contributions to electrical resistance at an asperity contact.*” J. Appl. Phys., **110**, 11 (2011)

M. J. Walker, **D. Berman**, C. Nordquist, and J. Krim: “*Electrical Contact Resistance and device lifetime measurements of Au-RuO₂ based RF MEMS exposed to hydrocarbons in vacuum and nitrogen environments.*” Tribol. Lett., **44**, 305 (2011)

D. Berman, and J. Krim: “*QCM roughness changes induced by Oxygen and Argon plasmas*”, Thin Solid Films, **520**, 6201–6206 (2012)

PATENT APPLICATION

A.V. Sumant, D. Berman, J. Choi, A. Erdemir, Superlubricating Graphene Films (ANL-IN-11-056)

PRESENTATIONS

“Graphene-Enabled Wear and Friction Reduction on Sliding Steel Surfaces” Argonne Annual Postdoctoral Research Symposium, 2012

“Impact of adsorbed organic monolayers on vacuum electron tunneling contributions to electrical resistance at an asperity contact.” APS March Meeting Boston, MA (March 2012)

“Impact of adsorbed organic monolayers on vacuum electron tunneling contributions to electrical resistance at an asperity contact.” AVS Mid-Atlantic Fall Symposium, Raleigh, NC (November 2011)

“Contact Resistance of RF MEMS at a randomly rough surface in the presence and absence of adsorbed organic monolayers.” AVS Symposium, Nashville, TN (November 2011)

“Contact voltage-induced softening transition of gold-on-gold contacts at cryogenic temperatures.” APS March Meeting, Dallas, TX (March 2011)

“High Energy Particles in Supernovae Remnants”, poster presentation at SAMSI Workshop in Astrostatistics, Research Triangle Park, NC (January 2006)

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**ACTIVITIES/
HONORS**

American Physical Society
American Vacuum Society
Honor Society of Phi Kappa Phi

2010 -present

2011 -present

2008 – 2009