

# Nikolai V. Priezjev

ASSISTANT PROFESSOR

## PERSONAL

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## EDUCATION

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*Brown University, Providence, RI*

**Ph. D. in Physics**, 2002

- Thesis title: “[Simulations of nematic liquid crystals: confined geometries, phase transitions and topological defects](#)”. Thesis advisor: Prof. Robert A. Pelcovits

**M. S. in Physics**, 1999

*Moscow Institute of Physics and Technology (MFTI, Phystech)*

**B. S. in Physics and Applied Mathematics**, 1992-1997

## RESEARCH INTERESTS

[Research Gate profile](#)

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*Wright State University, Department of Mechanical and Materials Engineering, 2013-present*

**Assistant Professor**

- Molecular simulations of complex fluids and amorphous materials, nanoparticles, fluid transport in micro- and nanofluidic systems, slip boundary conditions, microfiltration of oil-in-water emulsions, tribology, ice adhesion, hybrid multi-scale methods, metallic glasses, liquid crystals, polymers, porous materials, lipid membranes, and statistical mechanics.

*Michigan State University, Department of Mechanical Engineering, 2005-2013*

**Adjunct Professor**, 2013-present

*Princeton University, Department of Chemical Engineering, 2002-2005*

**Postdoctoral Research Associate**

- Transport phenomena in micro- and nanofluidic systems: slippage at liquid-solid interfaces, thermocapillary fluid motion, dynamical and structural properties of confined polymers.

*Brown University, Physics Department, 1997-2002*

**Research Assistant**

- Theoretical soft condensed matter physics with emphasis on liquid crystals. Numerical techniques such as Monte Carlo and molecular dynamics simulations were used to study a variety of problems involving nematic liquid crystals: nematic-isotropic phase transition, coarsening dynamics, effect of confined geometries, and topological line and point defects.

**Research papers:**

1. T. Darvishzadeh, B. Bhattarai, N. V. Priezjev, “The critical pressure for microfiltration of oil-in-water emulsions using slotted-pore membranes”, *Journal of Membrane Science* **563**, 610-616 (2018). [DOI](#)
2. N. V. Priezjev, “Slow relaxation dynamics in binary glasses during stress-controlled, tension-compression cycling loading”, *Computational Materials Science* **153**, 235-240 (2018). [DOI](#)
3. N. V. Priezjev, “The yielding transition in periodically sheared binary glasses at finite temperature”, *Computational Materials Science* **150**, 162-168 (2018). [DOI](#)
4. N. V. Priezjev and M. A. Makeev, “Structural transformations and mechanical properties of porous glasses under compressive loading”, *Journal of Non-Crystalline Solids* **495** (2018), in press. [Preprint: [cond-mat/1712.10265](#)]. [DOI](#)
5. H. Hu, D. Wang, F. Ren, L. Bao, N. V. Priezjev, J. Wen, “A comparative analysis of the effective and local slip lengths for liquid flows over a trapped nanobubble”, *International Journal of Multiphase Flow* **104**, 166-173 (2018). [DOI](#)
6. N. V. Priezjev and M. A. Makeev, “Strain-induced deformation of the porous structure in binary glasses under tensile loading”, *Computational Materials Science* **150**, 134 (2018). [DOI](#)
7. B. Bhattarai and N. V. Priezjev, “Wetting properties of structured interfaces composed of surface-attached spherical nanoparticles”, *Computational Materials Science* **143**, 497 (2018). [DOI](#)
8. L. Bao, Z. Huang, N. V. Priezjev, S. Chen, K. Luo, H. Hu, “A significant reduction of ice adhesion on nanostructured surfaces that consist of an array of single-walled carbon nanotubes: A molecular dynamics simulation study”, *Applied Surface Science* **437**, 202 (2018). [DOI](#)
9. M. A. Makeev and N. V. Priezjev, “Distributions of pore sizes and atomic densities in binary mixtures revealed by molecular dynamics simulations”, *Physical Review E* **97**, 023002 (2018). [DOI](#)
10. N. V. Priezjev, “Molecular dynamics simulations of the mechanical annealing process in metallic glasses: Effects of strain amplitude and temperature”, *Journal of Non-Crystalline Solids* **479**, 42 (2018). [DOI](#)
11. N. V. Priezjev and M. A. Makeev, “Evolution of the pore size distribution in sheared binary glasses”, *Physical Review E* **96**, 053004 (2017). [DOI](#)
12. L. Bao, N. V. Priezjev, H. Hu, K. Luo, “The effects of viscous heating and wall-fluid interaction energy on rate-dependent slip behavior of simple fluids”, *Physical Review E* **96**, 033110 (2017). [DOI](#)
13. A. Kharazmi and N. V. Priezjev, “Molecular dynamics simulations of the rotational and translational diffusion of a Janus rod-shaped nanoparticle”, *Journal of Physical Chemistry B* **121**, 7133 (2017). [DOI](#)

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<sup>1</sup> [ResearcherID](#), [Google Scholar](#), [Scopus](#)

14. N. V. Priezjev, “Collective nonaffine displacements in amorphous materials during large-amplitude oscillatory shear”, *Physical Review E* **95**, 023002 (2017). [DOI](#)
15. H. Hu, L. Bao, N. V. Priezjev, K. Luo, “Identifying two regimes of slip of simple fluids over smooth surfaces with weak and strong wall-fluid interaction energies”, *Journal of Chemical Physics* **146**, 034701 (2017). [DOI](#)
16. N. V. Priezjev, “Nonaffine rearrangements of atoms in deformed and quiescent binary glasses”, *Physical Review E* **94**, 023004 (2016). [DOI](#)
17. N. V. Priezjev, “Reversible plastic events during oscillatory deformation of amorphous solids”, *Physical Review E* **93**, 013001 (2016). [DOI](#)
18. N. V. Priezjev, “The effect of a reversible shear transformation on plastic deformation of an amorphous solid”, *Journal of Physics: Condensed Matter* **27**, 435002 (2015). [DOI](#)
19. A. Kharazmi and N. V. Priezjev, “Diffusion of a Janus nanoparticle in an explicit solvent: A molecular dynamics simulation study”, *Journal of Chemical Physics* **142**, 234503 (2015). [DOI](#)
20. N. V. Priezjev, “Plastic deformation of a model glass induced by a local shear transformation”, *Physical Review E* **91**, 032412 (2015). [DOI](#)
21. N. V. Priezjev, “Dynamical heterogeneity in periodically deformed polymer glasses”, *Physical Review E* **89**, 012601 (2014). [DOI](#)
22. T. Darvishzadeh, V. V. Tarabara, N. V. Priezjev, “Oil droplet behavior at a pore entrance in the presence of crossflow: Implications for microfiltration of oil-water dispersions”, *Journal of Membrane Science* **447**, 442-451 (2013). [DOI](#)
23. N. V. Priezjev, “Heterogeneous relaxation dynamics in amorphous materials under cyclic loading”, *Physical Review E* **87**, 052302 (2013). [DOI](#)
24. N. V. Priezjev, “Molecular dynamics simulations of oscillatory Couette flows with slip boundary conditions”, *Microfluidics and Nanofluidics* **14**, 225 (2013). [DOI](#)
25. T. Darvishzadeh and N. V. Priezjev, “Effects of crossflow velocity and transmembrane pressure on microfiltration of oil-in-water emulsions”, *Journal of Membrane Science* **423–424**, 468–476 (2012). [DOI](#)
26. N. V. Priezjev, “Interfacial friction between semiflexible polymers and crystalline surfaces”, *Journal of Chemical Physics* **136**, 224702 (2012). [DOI](#)
27. N. V. Priezjev, “Molecular diffusion and slip boundary conditions at smooth surfaces with periodic and random nanoscale textures”, *Journal of Chemical Physics* **135**, 204704 (2011). [DOI](#)
28. N. V. Priezjev, “Relationship between induced fluid structure and boundary slip in nanoscale polymer films”, *Physical Review E* **82**, 051603 (2010). [DOI](#)
29. A. Niavarani and N. V. Priezjev, “Modeling the combined effect of surface roughness and shear rate on slip flow of simple fluids”, *Physical Review E* **81**, 011606 (2010). [DOI](#)
30. N. V. Priezjev, “Shear rate threshold for the boundary slip in dense polymer films”, *Physical Review E* **80**, 031608 (2009). [DOI](#)

31. A. Niavarani and N. V. Priezjev, “The effective slip length and vortex formation in laminar flow over a rough surface”, *Physics of Fluids* **21**, 052105 (2009). [DOI](#)
32. A. Niavarani and N. V. Priezjev, “Rheological study of polymer flow past rough surfaces with slip boundary conditions”, *Journal of Chemical Physics* **129**, 144902 (2008). [DOI](#)
33. A. Niavarani and N. V. Priezjev, “Slip boundary conditions for shear flow of polymer melts past atomically flat surfaces”, *Physical Review E* **77**, 041606 (2008). [DOI](#)
34. N. V. Priezjev, “Effect of surface roughness on rate-dependent slip in simple fluids”, *Journal of Chemical Physics* **127**, 144708 (2007). [DOI](#)
35. N. V. Priezjev, “Rate-dependent slip boundary conditions for simple fluids”, *Physical Review E* **75**, 051605 (2007). [DOI](#)
36. N. V. Priezjev and S. M. Troian, “Influence of periodic wall roughness on the slip behaviour at liquid/solid interfaces: molecular scale simulations versus continuum predictions”, *Journal of Fluid Mechanics* **554**, 25 (2006). [DOI](#)
37. N. V. Priezjev, A. A. Darhuber, S. M. Troian, “Slip behavior in liquid films on surfaces of patterned wettability: Comparison between continuum and molecular dynamics simulations”, *Physical Review E* **71**, 041608 (2005). [DOI](#)
38. N. V. Priezjev and S. M. Troian, “Molecular origin and dynamic behavior of slip in sheared polymer films”, *Physical Review Letters* **92**, 018302 (2004). [DOI](#)
39. N. Akino, C. Giardina, J. M. Kosterlitz, N. V. Priezjev, “Numerical study of random superconductors”, *Physica C* **408**, 484 (2004). [DOI](#)
40. N. V. Priezjev, G. Skacej, R. A. Pelcovits, S. Zumer, “External and intrinsic anchoring in nematic liquid crystals: A Monte Carlo study”, *Physical Review E* **68**, 041709 (2003). [DOI](#)
41. I. Amimori, N. V. Priezjev, R. A. Pelcovits, G. P. Crawford, “Optomechanical properties of stretched polymer dispersed liquid crystal films for scattering polarizer applications”, *Journal of Applied Physics* **93**, 3284 (2003). [DOI](#)
42. P. A. Kosyrev, J. Qi, N. V. Priezjev, R. A. Pelcovits, G. P. Crawford, “Virtual surfaces, director domains and the Fréedericksz transition in polymer stabilized nematic liquid crystals”, *Applied Physics Letters* **81**, 2986 (2002). [DOI](#)
43. N. V. Priezjev and R. A. Pelcovits, “Coarsening dynamics of biaxial nematic liquid crystals”, *Physical Review E* **66**, 051705 (2002). [DOI](#)
44. N. V. Priezjev and R. A. Pelcovits, “Disclination loop behavior near the nematic-isotropic phase transition”, *Physical Review E* **64**, 031710 (2001). [DOI](#)
45. N. V. Priezjev and R. A. Pelcovits, “Cluster Monte Carlo simulations of the nematic-isotropic phase transition”, *Physical Review E* **63**, 062702 (2001). [DOI](#)
46. N. V. Priezjev and R. A. Pelcovits, “Surface extrapolation length and director structures in confined nematics”, *Physical Review E* **62**, 6734 (2000). [DOI](#)

### Conference proceedings:

1. P. A. Kossyrev, J. Qi, N. V. Priezjev, R. A. Pelcovits, G. P. Crawford, “Model of Fréedericksz transition and hysteresis effect in polymer stabilized nematic liquid crystal configurations for display applications”, *Society for Information Display Digest* **32**, 506-509 (2002). [DOI](#)
2. P. A. Kossyrev, J. Qi, N. V. Priezjev, R. A. Pelcovits, G. P. Crawford, “Modeling electro-optic performance in polymer stabilized nematic liquid crystal display configurations”, *Proceedings of the 7th Asian Symposium on Information Display* **7**, 371-374 (2002).
3. I. Amimori, J. N. Eakin, N. V. Priezjev, R. A. Pelcovits, G. P. Crawford, “Optical and mechanical properties of stretched PDLC films for scattering polarizers”, *Society for Information Display Digest* **33**, 834-837 (2002). [DOI](#)

### Book chapters:

1. N. V. Priezjev, “Fluid structure and boundary slippage in nanoscale liquid films”, Chapter 16 in “[Detection of Pathogens in Water Using Micro and Nano-Technology](#)”, IWA (International Water Association) Publishing (2012). ISBN: 9781780401089.

### Unpublished manuscripts:

1. C. Giardina, N. V. Priezjev, J. M. Kosterlitz, “Strongly screened vortex lattice model with disorder” (2003). [Preprint is available online [cond-mat/0202487](#)].
2. N. V. Priezjev and S. M. Troian, “Nanodroplet migration by thermal tuning of the liquid-solid interfacial tension”, in preparation.
3. A. A. Darhuber, N. V. Priezjev, S. M. Troian, “Poiseuille flow in nanochannels patterned with periodic stick-slip: Divergent predictions from continuum versus molecular dynamics simulations”, in preparation.

### PRESENTATIONS

*(underline indicates presenter; see ppt slides for selected talks)*

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### Talks at conferences and seminars:

1. N. V. Priezjev, “[Wetting properties of structured interfaces composed of surface-attached spherical nanoparticles](#)”, seminar in the International Laboratory for Supercomputer Atomistic Modelling and Multiscale Analysis, National Research University Higher School of Economics (HSE), Moscow, Russia, June 8, 2018.
2. N. V. Priezjev, “[Mechanical annealing of binary glasses: Effects of strain amplitude and temperature](#)”, APS March Meeting; Session C47: Disordered and Glassy Systems, Los Angeles, CA, March 5, 2018.
3. N. V. Priezjev, “[Slip behavior in liquid films: Influence of patterned surface energy, flow orientation, and deformable gas-liquid interface](#)”, seminar in the International Laboratory for

Supercomputer Atomistic Modelling and Multiscale Analysis, National Research University Higher School of Economics (HSE), Moscow, Russia, July 3, 2017.

4. N. V. Priezjev, “*Collective nonaffine displacements of atoms in periodically deformed and quiescent binary glasses*”, seminar in the International Laboratory for Supercomputer Atomistic Modelling and Multiscale Analysis, National Research University Higher School of Economics (HSE), Moscow, Russia, June 28, 2017.
5. N. V. Priezjev, “*Atomistic modeling of the structure and boundary slippage in nanoscale polymer films*”, The Institute of Physical Chemistry and Electrochemistry, Russian Academy of Sciences, Moscow, Russia, June 22, 2017.
6. N. V. Priezjev, “*Collective nonaffine rearrangements in binary glasses during large-amplitude oscillatory shear*”, APS March Meeting; Session R16: Friction, Deformation, and Fracture, New Orleans, LA, March 16, 2017.
7. A. Kharazmi and N. V. Priezjev, “*Molecular dynamics simulation study of the diffusion of a Janus nano-particle in an explicit solvent*”, Society for Industrial and Applied Mathematics (SIAM) Conference on Computational Science and Engineering; Session MS83: Small-Scale Flows with Industrial Applications: Modeling and Simulations, Atlanta, GA, February 27, 2017.
8. N. V. Priezjev, “*Nonaffine displacements of atoms in periodically deformed and quiescent binary glasses*”, Materials Research Society (MRS) Fall Meeting, Symposium MB6: Cyclic Deformation and Fracture at the Nanoscale, Boston, MA, November 30, 2016.
9. A. Kharazmi and N. V. Priezjev, “*Molecular dynamics simulations of the rotational and translational diffusion of a Janus rod-shaped nanoparticle*”, APS 69<sup>th</sup> DFD Meeting; Session D22: Nano Flows: Computations and Modeling, Portland, OR, November 20, 2016.
10. N. V. Priezjev, “*Plastic deformation of a model glass induced by a local shear transformation*”, APS March Meeting; Session J43: Manipulating Glasses: Mechanics, San Antonio, TX, March 3, 2015.
11. A. Kharazmi and N. V. Priezjev, “*Translational and rotational diffusion of a single Janus nanoparticle in an explicit solvent*”, APS 67<sup>th</sup> DFD Meeting; Session M36: Nano Flows II, San Francisco, CA, November 25, 2014.
12. N. V. Priezjev, “*Dynamical heterogeneity and structural relaxation in periodically deformed polymer glasses*”, APS March Meeting; Session Z19: Supercooled Polymer Liquids and Glasses, Denver, CO, March 7, 2014.
13. A. Kharazmi and N. V. Priezjev, “*Correlation between rotational and translational diffusion of a Janus nanoparticle in explicit solvent: A molecular dynamics simulation study*”, APS March Meeting; Session B20: Focus Session: Microfluidics and Nanofluidics II - Colloidal Hydrodynamics and Active Particles, Denver, CO, March 3, 2014.
14. T. Darvishzadeh, V.V. Tarabara, N. V. Priezjev, “*Oil droplet dynamics at a porous surface in the presence of crossflow: Implications for microfiltration of oil-water dispersions*”, APS March Meeting; Session B15: Bubbles, Interfaces and Porous Media, Denver, CO, March 3, 2014.

15. A. Kharazmi and N. V. Priezjev, “*Correlation between translational and rotational diffusion of a Janus nanoparticle in explicit solvent: A molecular dynamics simulation study*”, APS 66<sup>th</sup> DFD Meeting; Session M7: Nanofluids II, Pittsburgh, PA, November 26, 2013.
16. T. Darvishzadeh, V.V. Tarabara, N. V. Priezjev, “*Oil droplet behavior at a pore entrance in the presence of crossflow: Implications for microfiltration of oil-water dispersions*”, APS 66<sup>th</sup> DFD Meeting; Session M34: Drops XIV: Shape Dynamics and Confinement, Pittsburgh, PA, November 26, 2013.
17. N. V. Priezjev, “*Effect of chain stiffness on interfacial slip in nanoscale polymer films*”, APS 66<sup>th</sup> DFD Meeting; Session L19: Nanofluidics I, Pittsburgh, PA, November 25, 2013.
18. N. V. Priezjev, “*Structural relaxation in periodically deformed polymer glasses and shear response of thin polymer films: Recent results from molecular dynamics simulations*”, Functional Materials Branch, AFRL, Dayton, OH, November 4, 2013.
19. N. V. Priezjev, “*Atomistic modeling of the structure and boundary slippage in nanoscale polymer films*”, seminar in the Department of Mechanical and Materials Engineering at Wright State University, Dayton, OH, May 13, 2013.
20. N. V. Priezjev, “*Heterogeneous relaxation dynamics in amorphous materials under cyclic loading*”, APS March Meeting; Session Y30: Jamming and Shearing, Baltimore, MD, March 22, 2013.
21. N. V. Priezjev, “*Slip flow regimes and induced fluid structure in nanoscale polymer films: Recent results from molecular dynamics simulations*”, seminar in the School of Mathematical Sciences at Rochester Institute of Technology, Rochester, NY, March 28, 2013.
22. N. V. Priezjev, “*Slip flow regimes and induced fluid structure in nanoscale polymer films: Recent results from molecular dynamics simulations*”, seminar in the Mechanical Engineering Department at the Catholic University of America, Washington, DC, December 6, 2012.
23. T. Darvishzadeh, N. V. Priezjev, V.V. Tarabara, “*Numerical study of crossflow-enhanced microfiltration of oil-in-water emulsions*”, APS 65<sup>th</sup> DFD Meeting; Session R3: Multiphase General II, San Diego, CA, November 20, 2012.
24. A. Kharazmi and N. V. Priezjev, “*Influence of slip boundary conditions and confinement on molecular diffusion in nanochannels: A molecular dynamics simulation study*”, APS 65<sup>th</sup> DFD Meeting; Session D30: Nanofluids: Computations, San Diego, CA, November 18, 2012.
25. N. V. Priezjev, “*Molecular dynamics simulations of oscillatory Couette flows with slip boundary conditions*”, APS 65<sup>th</sup> DFD Meeting; Session D30: Nanofluids: Computations I, San Diego, CA, November 18, 2012. (Chair of the [Session D30: Nanofluids](#)).
26. N. V. Priezjev, “*Atomistic modeling of the structure and shear response in nanoscale polymer films*”, colloquium “Materials Modeling – Hierarchies on the Atomic Scale”, RWTH Aachen University, Aachen, Germany, April 16, 2012.
27. N. V. Priezjev, “*Molecular diffusion and tensorial slip at surfaces with periodic and random nanoscale textures*”, APS March Meeting, Session X50: Focus Session: Micro and Nano Fluidics II: Structured or Active Surfaces and Electrotransport, Boston, MA, March 1, 2012.

28. A. Kharazmi and N. V. Priezjev, “*Investigation of flow boundary conditions and diffusion in nanochannels using molecular dynamics simulations*”, APS 64<sup>th</sup> DFD Meeting; Session D2: Nanofluids I, Baltimore, MD, November 20, 2011.
29. N. V. Priezjev, “[\*Molecular diffusion and tensorial slip at surfaces with periodic and random nanoscale textures\*](#)”, APS 64<sup>th</sup> DFD Meeting; Session D2: Nanofluids I, Baltimore, MD, November 20, 2011. (Chair of the [Session D2: Nanofluids I](#)).
30. T. Darvishzadeh and N. V. Priezjev, “*Strategies for efficient microfiltration of oil-in-water emulsions*”, APS 64<sup>th</sup> DFD Meeting; Session A4: Drops I: Numerical Methods, Baltimore, MD, November 20, 2011.
31. N. V. Priezjev, “*Slip flow regimes and induced fluid structure in nanoscale polymer films: Recent results from molecular dynamics simulations*”, seminar in the Liquid Crystal Institute, Kent State University, Kent, OH, September, 28, 2011.
32. N. V. Priezjev, “*Slip flow regimes and induced structure in nanoscale liquid films: Recent results from molecular dynamics simulations*”, NNIN/C Symposium "Advanced Modeling and Simulation of NEMS/MEMS and Nano/Micro-fluidic Devices", University of Michigan, Ann Arbor, MI, April 20, 2011. [Website: [www.lnf.umich.edu/nnin-at-michigan](http://www.lnf.umich.edu/nnin-at-michigan)].
33. N. V. Priezjev, “*Molecular dynamics simulation study of slip flows over surfaces with periodic and random anisotropic textures*”, APS March Meeting; Session Q44: Focus Session: Dynamics of Polymers – Phenomena due to Confinement, Dallas, TX, March 23, 2011.
34. N. V. Priezjev, “*The relationship between induced fluid structure and boundary slip in nanoscale polymer films*”, APS 63<sup>nd</sup> DFD Meeting; Session AP: Nanofluids I, Long Beach, CA, November 21, 2010.
35. N. V. Priezjev, “[\*The relationship between induced fluid structure and boundary slip in nanoscale polymer films\*](#)”, seminar in the Department of Mechanical Engineering, Michigan State University, East Lansing, MI, October 5, 2010.
36. N. V. Priezjev, “*The relationship between induced fluid structure and boundary slip in nanoscale polymer films*”, seminar in the Applied Physics Department, California Institute of Technology, Pasadena, CA, August 16, 2010.
37. N. V. Priezjev, “*The relationship between induced fluid structure and boundary slip in nanoscale polymer films*”, Workshop on Nano-Bio Mathematics and Mechanics, Department of Mathematics, Michigan State University, East Lansing, MI, August 5, 2010.
38. N. V. Priezjev, “*The relationship between induced fluid structure and boundary slip in nanoscale polymer films*”, seminar in the Department of Chemical and Biomolecular Engineering, Johns Hopkins University, Baltimore, MD, July 8, 2010.
39. N. V. Priezjev, “*Inverse problem for slip boundary conditions in nanoscale polymer films: A molecular dynamics simulation approach*”, Inverse Problems Symposium, Michigan State University, East Lansing, MI, June 8, 2010.
40. N. V. Priezjev, “*Influence of shear rate and fluid density on slip boundary conditions in nanoscale polymer films confined between smooth surfaces: A molecular dynamics study*”,



Applied Mathematics Colloquium, University of Western Ontario, London, Canada, May 11, 2010.

41. [A. Niavarani](#) and N. V. Priezjev, "[Slip boundary conditions for the moving contact line in molecular dynamics and continuum simulations](#)", APS March Meeting; Session X12: General Fluid Mechanics: Surface and Thermal Effects, Portland, OR, March 18, 2010.
42. [N. V. Priezjev](#), "*Unified description of the slip phenomena in sheared polymer films: A molecular dynamics study*", APS March Meeting; Focus Session Q17: Glass Transition in Thin Films, Portland, OR, March 17, 2010.
43. [N. V. Priezjev](#), "*Effect of shear rate and surface energy on slip boundary conditions in thin polymer films confined between atomically smooth surfaces: A molecular dynamics study*", Polymer Division Seminar at the National Institute of Standards and Technology (NIST), Gaithersburg, MD, March 8, 2010.
44. [N. V. Priezjev](#), "*Effect of shear rate and surface energy on slip boundary conditions in thin polymer films confined between atomically smooth surfaces: A molecular dynamics study*", colloquium in the Department of Physics, Oakland University, Rochester, MI, February 11, 2010.
45. [N. V. Priezjev](#), "*Shear rate threshold for the boundary slip in dense polymer films*", Materials Research Society (MRS) Fall Meeting; Session JJ9: Friction and Nanotribology, Boston, MA, December 3, 2009.
46. [N. V. Priezjev](#), "*Shear rate threshold for the boundary slip in dense polymer films*", APS 62<sup>nd</sup> DFD Meeting; Session MG: Nano-Fluids, Minneapolis, MN, November 24, 2009.
47. [A. Niavarani](#) and N. V. Priezjev, "[Modeling the combined effect of surface roughness and shear rate on slip flow of simple fluids](#)", APS 62<sup>nd</sup> DFD Meeting; Session PF: Microfluidics: Slip and Experimental Methods, Minneapolis, MN, November 24, 2009.
48. [N. V. Priezjev](#), "*Shear rate threshold for the boundary slip in dense polymer films*", Midwest Thermodynamics and Statistical Mechanics Conference, Wayne State University, Detroit, MI, May 19, 2009.
49. [N. V. Priezjev](#), "*Shear rate threshold for the onset of boundary slip in dense polymer films*", APS March Meeting; Session W20: Theory and Simulation, Pittsburgh, PA, March 19, 2009.
50. [A. Niavarani](#) and N. V. Priezjev, "*Modeling the combined effect of surface roughness and shear rate on slip flow of simple fluids*", APS March Meeting; Session A13: Metropolis Thesis Prize and Multiscale Modeling, Pittsburgh, PA, March 16, 2009.
51. [A. Niavarani](#) and N. V. Priezjev, "[The effective slip length and vortex formation in laminar flow over a rough surface](#)", APS 61<sup>st</sup> DFD Meeting; Session AN: Micro Fluids, San Antonio, TX, November 23, 2008.
52. [N. V. Priezjev](#) and A. Niavarani, "*Velocity-dependent friction at the interface between a polymer melt and a solid substrate: A molecular dynamics study*", AIChE Meeting; Session # 562: Solid-Liquid Interfaces, Philadelphia, PA, November 19, 2008.

53. N. V. Priezjev, “*Slip boundary conditions for shear flow of simple fluids and polymer melts past atomically smooth surfaces: A molecular dynamics study*”, Complex Fluids Seminar in the Department of Chemical Engineering at the University of Michigan, Ann Arbor, MI, April 18, 2008.
54. N. V. Priezjev and A. Niavarani, “*Velocity-dependent friction coefficient at the interface between a polymer melt and a solid substrate*”, APS March Meeting; Session J9: Fluid Structure and Properties, New Orleans, LA, March 11, 2008. (Chair of the [Session J9](#)).
55. A. Niavarani and N. V. Priezjev, “*Slip behavior of the confined polymer melt near periodically roughened surface: comparison between molecular dynamics and continuum simulations*”, APS March Meeting; Session D18: Polymers at Surfaces, New Orleans, LA, March 10, 2008.
56. N. V. Priezjev and A. Niavarani, “*Molecular dynamics simulations of the shear-rate-dependent slip length in thin liquid films*”, APS 60<sup>th</sup> DFD Meeting; Session EN: Nano-Fluids, Salt Lake City, Utah, November 18, 2007.
57. A. Niavarani and N. V. Priezjev, “[Slip behavior of the confined polymer melt near periodically roughened surface: comparison between molecular dynamics and continuum simulations](#)”, APS 60<sup>th</sup> DFD Meeting; Session KA: Micro- Fluids, Salt Lake City, Utah, November 20, 2007.
58. N. V. Priezjev, “*To slip or not to slip?*”, College of Science Seminar in the Department of Mathematical Sciences at George Mason University, Fairfax, VA, April 12, 2007.
59. N. V. Priezjev, “*Slip behavior at liquid/solid interfaces: Comparison between continuum and molecular dynamics simulations*”, seminar in the Department of Mechanical Engineering, University of Michigan-Dearborn, MI, March 30, 2007.
60. N. V. Priezjev, “[Effect of surface roughness on shear-rate-dependent slip flow of simple fluids](#)”, APS March Meeting; Session U29: Suspensions and Fluid Dynamics, Denver, CO, March 8, 2007.
61. N. V. Priezjev, “*Effect of surface roughness on shear-rate-dependent slip flow of simple fluids*”, APS 59<sup>th</sup> DFD Meeting; Session KC: Microfluidics, Tampa, FL, November 20, 2006.
62. N. V. Priezjev, “*Influence of surface conditions on the slip behavior at liquid/solid interfaces: Comparison between continuum and molecular dynamics simulations*”, Applied and Interdisciplinary Mathematics Seminar at Michigan State University, East Lansing, MI, November 14, 2006.
63. N. V. Priezjev, “*Influence of surface conditions on the slip behavior at liquid/solid interfaces: Comparison between continuum and molecular dynamics simulations*”, Condensed Matter Physics Seminar, Physics Department, Michigan State University, East Lansing, MI, October 9, 2006.
64. A. A. Darhuber, N. V. Priezjev, and S. M. Troian, “*Slip behavior at liquid/solid interfaces: Hydrodynamic predictions versus molecular dynamics simulations*”, 5<sup>th</sup> International Symposium on Contact Angle, Wettability and Adhesion; Session on Colloids, Powders and Droplets: Fractal and Wetting Aspects, Toronto, Canada, June 21, 2006.

65. N. V. Priezjev and S. M. Troian, “*Source of shear-dependent slip at liquid/solid interfaces*”, APS March Meeting; Session P21: Microfluidic Physics, Baltimore, MD, March 15, 2006.
66. N. V. Priezjev and S. M. Troian, “*Dynamic response of the slip length at liquid/solid interfaces*”, Materials Research Society (MRS) Fall Meeting; Session N1: Dynamics in Small Confined Systems, Boston, MA, November 28, 2005.
67. N. V. Priezjev and S. M. Troian, “*Source of shear-dependent slip at liquid/solid interfaces*”, APS 58<sup>th</sup> DFD Meeting; Session FC, Microfluidics: Slip Flow, Chicago, IL, November 21, 2005.
68. N. V. Priezjev, “*Slip behavior in liquid nanoscale films: Influence of molecular ordering, wall roughness, and patterned surface energy*”, seminar in the Department of Chemical Engineering and Materials Science, Michigan State University, East Lansing, MI, October 13, 2005.
69. N. V. Priezjev, “*Slip behavior in liquid nanoscale films: Influence of molecular ordering, wall roughness and patterned surface energy*”, seminar in the Department of Engineering Sciences and Applied Mathematics, Northwestern University, Evanston, IL, September 30, 2005.
70. N. V. Priezjev, “*Slip behavior in liquid nanoscale films: Influence of molecular ordering, wall roughness and patterned surface energy*”, Complex Fluids Seminar in the Department of Chemical Engineering at University of Michigan, Ann Arbor, MI, September 21, 2005.
71. N. V. Priezjev, “*Slip behavior in liquid nanoscale films: Influence of molecular ordering, wall roughness and patterned surface energy*”, seminar in the Department of Mechanical Engineering, Michigan State University, East Lansing, MI, May 6, 2005.
72. N. V. Priezjev, “*Slip behavior in liquid nanoscale films: Influence of molecular ordering, wall roughness and patterned surface energy*”, APS March Meeting; [Invited Session U6: Physics of Slip Phenomena at Liquid/Solid Interfaces](#), Los Angeles, CA, March 24, 2005.
73. N. V. Priezjev, “*Slip behavior in liquid nanoscale films: Influence of molecular ordering, wall roughness and patterned surface energy*”, seminar in the Physics Department at Brown University, Providence, RI, April 21, 2005.
74. N. V. Priezjev and S. M. Troian, “*Droplet migration by modulation of the liquid-solid interfacial energy*”, APS 57<sup>th</sup> DFD Meeting; Session KP: Surface Tension, Seattle, WA, November 23, 2004.
75. N. V. Priezjev, A. A. Darhuber, and S. M. Troian, “[Slip flow on surfaces of mixed wettability: Comparison between continuum and molecular dynamics simulations](#)”, APS 57<sup>th</sup> DFD Meeting; Session AC: Microfluid Dynamics: Micropatterned Surfaces and Wettability, Seattle, WA, November 21, 2004.
76. A. A. Darhuber, N. V. Priezjev, and S. M. Troian, “*Microfluidic drag reduction mediated by superhydrophobic surfaces*”, SPIE Optics East Symposium, Philadelphia, PA, October 25-28, 2004.
77. N. V. Priezjev and S. M. Troian, “*Origin of slip phenomena in sheared nanoscale films*”, 8<sup>th</sup> Complex Fluids Symposium, Princeton Materials Institute, Princeton University, Princeton, NJ, May 1, 2004.

78. N. V. Priezjev and S. M. Troian, "[\*Droplet propulsion by thermal modulation of the liquid-solid interfacial energy\*](#)", APS March Meeting; Session V22: Complex Fluids, Montreal, Canada, March 25, 2004.
79. N. V. Priezjev, A. A. Darhuber, and S. M. Troian, "*Effect of hydrophobically patterned substrates on the slip behavior of liquids subject to planar shear*", APS March Meeting; Session W34: Multiscale Phenomena for Fluids and Solids, Montreal, Canada, March 25, 2004.
80. N. V. Priezjev and S. M. Troian, "*Influence of surface corrugation on the slip length in sheared liquid films*", APS March Meeting; Session S22: Fluid Dynamics and Properties, Montreal, Canada, March 24, 2004.
81. N. V. Priezjev and S. M. Troian, "*Molecular origin and dynamic behavior of slip in short polymer films*", APS 56<sup>th</sup> DFD Meeting; Session on Computational Fluid Dynamics, Meadowlands, NJ, November 25, 2003.
82. N. V. Priezjev and S. M. Troian, "*Influence of surface boundary curvature on local slip in sheared fluid flow*", APS 56<sup>th</sup> DFD Meeting; Session on Computational Fluid Dynamics, Meadowlands, NJ, November 25, 2003.
83. N. V. Priezjev and S. M. Troian, "*Equilibrium and dynamical behavior of slip in polymer films*", ASME Annual Meeting; Session on Tribology: Surface Friction, paper TRIB-1, Washington, DC, November 16, 2003.
84. N. V. Priezjev and S. M. Troian, "*Equilibrium and dynamical behavior of slip in polymer films*", ASME Annual Meeting; Session on Modeling and Simulation of Micro-/Nano- Scale Fluid Dynamics, paper AMD.1C, Washington, DC, November 19, 2003.
85. N. V. Priezjev, "*Molecular origin and dynamic behavior of slip in sheared polymer films*", Brown Bag Seminar in the Physics Department, Princeton University, Princeton, NJ, October 7, 2003.
86. N. V. Priezjev and S. M. Troian, "*Molecular origin and dynamic behavior of slip in short polymer films*", 14<sup>th</sup> Complex Fluid Workshop at the University of Massachusetts, Boston, MA, March 21, 2003.
87. N. V. Priezjev and S. M. Troian, "*Slip behavior of short chain polymers in nano-couette flow*", APS March Meeting; Focus Session P13: Micro/Nano- Fluidics, Austin, TX, March 5, 2003.
88. N. V. Priezjev and R. A. Pelcovits, "[\*Coarsening dynamics of biaxial nematics\*](#)", APS March Meeting; Session Q26: Liquid Crystals, Indianapolis, IN, March 20, 2002.
89. N. V. Priezjev, "[\*Disclination loop behavior near the nematic-isotropic phase transition\*](#)", seminar in the Physics Department, Boston University, Boston, MA, January 20, 2002.
90. N. V. Priezjev and R. A. Pelcovits, "*Coarsening dynamics of biaxial nematic liquid crystals*", 9<sup>th</sup> Complex Fluid Workshop, Harvard University, Cambridge, MA, December 7, 2001.
91. N. V. Priezjev and R. A. Pelcovits, "*Coarsening dynamics of biaxial nematics*", 86<sup>th</sup> Statistical Mechanics Meeting, Rutgers University, New Brunswick, NJ, December 18, 2001.

92. N. V. Priezjev and R. A. Pelcovits, “*Disclination loop behavior near the nematic-isotropic phase transition*”, Division of Computational Physics (DCOMP 2001) Annual Meeting; Session H4: Phase Transitions and Computational Methods, MIT, Cambridge, MA, June 26, 2001.
93. N. V. Priezjev and R. A. Pelcovits, “*[Surface extrapolation length and director structures in confined nematics](#)*”, APS March Meeting; Session W19: Liquid Crystals: Surfaces and Confined Geometry, Seattle, WA, March 15, 2001.
94. N. V. Priezjev and R. A. Pelcovits, “*Surface extrapolation length and director structures in confined nematics*”, seminar in the Liquid Crystal Physics Group at University of Colorado, Boulder, CO, July 16, 2000.
95. N. V. Priezjev and R. A. Pelcovits, “*Surface extrapolation length and director structures in confined nematics*”, 2<sup>nd</sup> Complex Fluid Workshop, University of Massachusetts Amherst, Amherst, MA, June 15, 2000.
96. N. V. Priezjev and R. A. Pelcovits, “*Surface extrapolation length in confined nematic liquid crystals*”, seminar in the Physics Department, University of Ljubljana, Slovenia, February 26, 2000.

#### Poster presentations:

(underline indicates presenter)

1. N. V. Priezjev and M. A. Makeev, “*Distributions of pore sizes and atomic densities in binary LJ glasses revealed by molecular dynamics simulations*”, APS March Meeting; Session L60: Poster Session II, Los Angeles, CA, March 7, 2018.
2. N. V. Priezjev, “*Dynamical heterogeneity and structural relaxation in periodically deformed polymer glasses*”, Materials Research Society (MRS) Fall Meeting; Session UU10, Boston, MA, December 4, 2014.
3. N. V. Priezjev, “*The relationship between induced fluid structure and boundary slip in nanoscale polymer films*”, Materials Research Society (MRS) Fall Meeting; Session JJ5, Boston, MA, December 1, 2010.
4. A. Niavarani and N. V. Priezjev, “*[Effect of surface roughness on slip flows in nano-scale polymer films](#)*”, APS 60<sup>th</sup> DFD Meeting, Poster Session, Salt Lake City, UT, November 19, 2007.
5. N. V. Priezjev and S. M. Troian, “*Effect of boundary curvature and local slip in nanofluidic shear flow*”, APS March Meeting, Poster Session R1, Austin, TX, March 5, 2003.
6. N. V. Priezjev and R. A. Pelcovits, “*Disclination loop behavior near the nematic-isotropic phase transition*”, APS March Meeting, Poster Session P33, Indianapolis, IN, March 20, 2002.
7. N. V. Priezjev and R. A. Pelcovits, “*Disclination loop behavior near the nematic-isotropic phase transition*”, 21st IUPAP International Conference on Statistical Physics (STATPHYS 21), Cancun, Mexico, July 19, 2001.

## SHORT COURSES AND WORKSHOPS ATTENDANCE

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- Participant at the Boulder Summer School for Condensed Matter and Materials Physics “*Introduction to Superconductivity: Fundamentals and Applications*”, July 2-29, 2000.
- Grants 101: Professional Grant Proposal Writing Workshop at the University of Michigan, Ann Arbor, MI, August 21-23, 2006.
- Workshop on the Graduate Assistance in Areas of National Need (GAANN), U.S. Department of Education, Washington, DC, September 28-29, 2006.
- National Effective Teaching Institute (NETI) Workshop lead by Prof. Felder, and the ASEE Annual Conference (American Society for Engineering Education), Honolulu, Hawaii, June 21-27, 2007.
- Spring Institute on College Teaching and Learning Program C: *Creativity and Innovation: Enhancing Performance and Effectiveness*, Michigan State University, May 19-20, 2011.

## COURSES TAUGHT AT WRIGHT STATE UNIVERSITY

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(web links for syllabi)

- ME 4720/6720: [Engineering Polymers](#) (Fall 2017).
- ME 4010/6010: [Computational Methods for Mechanical Engineering](#) (Fall 2015, Fall 2016).
- ME 3760: [Diffusion and Kinetics](#) (Spring 2015, Spring 2016, Spring 2017, Spring 2018).
- ME 2210: [Engineering Mechanics: Dynamics](#) (Spring 2014, Fall 2014, Spring 2015, Spring 2016, Spring 2017, Fall 2017, Spring 2018).
- ME 2120: [Engineering Mechanics: Statics](#) (Fall 2013, Fall 2014, Fall 2015, Fall 2016).

## COURSES TAUGHT AT MICHIGAN STATE UNIVERSITY

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- ME 361: [Engineering Mechanics: Dynamics](#) (2006-2013).
- ME 891: [Molecular Modeling in Engineering: Methods and Applications](#) (Spring 2011).
- ME 481: [Mechanical Engineering Design](#) (Whirlpool - Spring 2006; DeVilbiss Automotive Refinishing - Fall 2007; Dow Chemical - Spring 2010; Heartwood School - Fall 2011; Special Needs Bicycle - Fall 2011; Heartwood School - Spring 2012; Whirlpool and GM - Fall 2012).
- ME 391: [Advanced Engineering Mathematics](#) (Spring 2006).

## GRANTS AND AWARDS

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- Michigan State University, Intramural Research Grants Program (IRGP) Award (PI: N.V. Priezjev) \$50,000 (2005-2007).

- American Chemical Society, Petroleum Research Fund (PRF) Grant, “*Numerical Modeling of Fluid Droplet Spreading and Contact Angle Hysteresis*” (PI: N.V. Priezjev) \$50,000 (2008-2010).
- NSF, CBET, Cyber-Enabled Discovery and Innovation (CDI) Grant, “*CDI-Type II: Discovery of Biophysical Mechanisms Inducing Signaling and Cytotoxicity: An Experimental Approach Enabled by Cyber Tools*” (PI: C. Chan) \$1,272,629 (2009-2013).
- Michigan State University, Strategic Partnership Grant (SPG) “*Advanced Membrane Technologies for a Sustainable Future*” (PI: V. Tarabara) \$400,000 (2010-2013).
- NSF, CBET, Fluid Dynamics Program, “*Influence of Confinement on Flow, Diffusion, and Boundary Conditions in Nano Channels: A Combined Quantum Dot Imaging and Molecular Dynamics Simulations Approach*” (PI: N.V. Priezjev, co-PI: M.M. Koochesfahani) \$360,000 (2010-2014).
- NSF, CNS Program, “*MRI: Acquisition of High Performance Computer Cluster for Multi-disciplinary Computational Research and Education*” (PI: Sharma, co-PIs: Priezjev, Paliy and Sulman) \$150,000 (2015-2018).
- National Research University Higher School of Economics, Moscow, Russia, “*International Laboratory for Supercomputer Atomistic Modelling and Multiscale Analysis*” (V. Stegailov, A. Kalinichev, N. Priezjev, G. Norman) (2016-2019). [Website: <https://samma.hse.ru/en>].

#### PH.D. STUDENTS

(web links for PhD theses)

- Tohid Darvishzadeh. Thesis title: “[\*Numerical Simulation of Microfiltration of Oil-in-Water Emulsions\*](#)”. Ph.D. Spring 2014. Michigan State University. Now at Blue Origin.
- Anoosheh Niavarani. Thesis title: “[\*Molecular Dynamics and Continuum Simulations of Fluid Flows with Slip Boundary Conditions\*](#)”. Ph.D. Spring 2011. Michigan State University – College of Engineering – Fitch Beach Outstanding Graduate Research Award 2010.

#### PROFESSIONAL ACTIVITIES

- Referee for scientific journals: *Physical Review E*, *Physical Review Letters*, *Europhysics Letters*, *Journal of Computational Physics*, *Journal of Chemical Physics*, *Journal of Physical Chemistry*, *Microfluidics and Nanofluidics*, *Nature*, *Science*, *Journal of Colloid and Interface Science*, *Journal of Membrane Science*, *Journal of Non-Crystalline Solids*, *Journal of Polymer Science Part B: Polymer Physics*, *Physics of Fluids*, *Journal of Fluid Mechanics*, *Langmuir*, *Journal of Applied Physics*, *Applied Physics Letters*, *Applied Surface Science*, *Mathematical Modeling of Natural Phenomena*, *Journal of Algorithms and Computational Technology*, *Scientia Iranica*, *ASME Journal of Fluids Engineering*, *Physical Review Fluids*, *Theoretical and Computational Fluid Dynamics*, *Heat Transfer Engineering*, *Journal of Membrane Science*, *Structural and Multidisciplinary Optimization*, *Computational Materials Science*, *Molecular Simulation*.

- Reviewer of proposals for the funding agencies: the National Science Foundation and the American Chemical Society Petroleum Research Fund.
- Member of the American Physical Society (APS), Material Research Society (MRS), American Society of Engineering Education (ASEE).