Nicolas G. Hadjiconstantinou

Professor, Department of Mechanical Engineering, MIT
Co-Director, Computation for Design and Optimization
Co-Director, Computational Science and Engineering

Education

Ph.D.	Mechanical Engineering, Massachusetts Institute of Technology	1998
	Thesis advisor: Prof. A.T. Patera	
S.M.	Physics, Massachusetts Institute of Technology	1998
M.A.	Engineering, Cambridge University, United Kingdom	1997
S.M.	Mechanical Engineering, Massachusetts Institute of Technology	1995
B.A.	Engineering, Cambridge University, United Kingdom	1993

Professional Employment and Affiliations, Other Positions Held

Co-Director, Computational Science and Engineering, MIT	2013–present
MMEC Area Head, Department of Mechanical Engineering, MIT	2013–present
Professor, Department of Mechanical Engineering, MIT	2012–present
Co-Director, Computation for Design and Optimization, MIT	2010–present
Associate Professor with Tenure, Department of Mechanical Engineering, MIT	2006–2012
Associate Professor, Department of Mechanical Engineering, MIT	2003–2006
Assistant Professor, Department of Mechanical Engineering, MIT	1999–2003
Lawrence Livermore National Laboratory	1998–1999

Professional Activities

Chair, Committee on Graduate Programs, MIT	2013–present
Chair, Task Force on Improving Graduate Admissions, MIT	Spring 2011
Vice Chair, APS Frenkiel Award committee	2009–2011
Associate Editor, Physics of Fluids	2006–2014
Board of Editors, Mathematical Modeling and Numerical Analysis	2006–2012

Honors and Awards

Gustus L. Larson Award, ASME	2012
Best Poster Award, MIT Energy Conference	2012
ASME Fellow	2011
Best Poster Award, MIT Energy Conference	2011
Rockwell International Career Development Chair	2001–2004
SMA Associate Fellow	2001
Lawrence Livermore Fellow	1998
St. John's College Postgraduate Scholarship, Cambridge University	1993
King's College Postgraduate Scholarship, Cambridge University	1993
Ricardo Prize in Thermodynamics, Cambridge University	1993
Philip Haycock Prize in Engineering, Robinson College, Cambridge University	1991

Representative Publications

Hadjiconstantinou, N.G., "Hybrid Atomistic-Continuum Formulations and the Moving Contact-Line Problem," Journal of Computational Physics, **154**, 245-265, 1999.

Hadjiconstantinou, N.G., "Analysis of Discretization in the Direct Simulation Monte Carlo," Physics of Fluids, **12**, 2634-2638, 2000.

Hadjiconstantinou, N.G. and O. Simek, "Constant-Wall-Temperature Nusselt Number in Micro

and Nano Channels," Special issue of the Journal of Heat Transfer on Nanoscale Heat Transfer, **124**, 356-364, 2002.

Hadjiconstantinou, N.G., "Dissipation in Small Scale Gaseous Flows," Journal of Heat Transfer, **125**, 944-947, 2003.

Hadjiconstantinou, N.G., A.L. Garcia, M.Z. Bazant and G. He, "Statistical Error in Particle Simulations of Hydrodynamic Phenomena," Journal of Computational Physics, **187**, 274-297, 2003.

Hadjiconstantinou, N.G., "Comment on Cercignani's Second-Order Slip Coefficient," Physics of Fluids, **15**, 2352-2354, 2003.

He, G. and N.G. Hadjiconstantinou, "A Molecular View of Tanner's Law: Molecular Dynamics Simulations of Droplet Spreading," Journal of Fluid Mechanics, **497**, 123-132, 2003.

Kadau, K., T.C. Germann, N.G. Hadjiconstantinou, P.S. Lomdahl, G. Dimonte, B.L. Holian and B.J. Alder, "Nanohydrodynamics Simulations: An Atomistic View of the Rayleigh-Taylor Instability," Proceedings of the National Academy of Sciences, **101**, 5851-5855, 2004.

Wijesinghe, H.S., Hornung, R., Garcia, A.L., and N.G. Hadjiconstantinou, "Three-Dimensional Hybrid Continuum-Atomistic Simulations for Multiscale Hydrodynamics," Journal of Fluids Engineering, **126**, 768-777, 2004.

Hadjiconstantinou, N.G. and H.A. Al-Mohssen, "A Linearized Kinetic Formulation Including a Second-Order Slip Model for an Impulsive Start Problem at Arbitrary Knudsen Numbers," Journal of Fluid Mechanics, **533**, 47-56, 2005.

Baker, L.L. and N.G. Hadjiconstantinou, "Variance Reduction for Monte Carlo Solutions of the Boltzmann Equation," Physics of Fluids, **17**, 051703, 2005.

Hadjiconstantinou, N.G., "Oscillatory Shear-Driven Gas Flows in the Transition and Free-Molecular-Flow Regimes," Physics of Fluids, **17**, 100611, 2005.

Hadjiconstantinou, N.G., "The Limits of Navier-Stokes Theory and Kinetic Extensions for Describing Small Scale Gaseous Hydrodynamics," Physics of Fluids, **18**, 111301, 2006.

Homolle, T.M.M. and N.G. Hadjiconstantinou, "A Low-variance Deviational Simulation Monte Carlo for the Boltzmann Equation," Journal of Computational Physics, **226**, 2341-2358, 2007.

Manela, A. and N.G. Hadjiconstantinou, "On the Motion Induced in a Gas Confined in a Small- scale Gap Due to Instantaneous Heating," Journal of Fluid Mechanics, **593**, 453-462, 2007.

Manela, A. and N.G. Hadjiconstantinou, "Gas Motion Induced by Unsteady Boundary Heating in a Small-scale Slab," Physics of Fluids, **20**, 117104, 2008.

Radtke, G.A. and N.G. Hadjiconstantinou, "Variance-reduced Particle Simulation of the Boltzmann Transport Equation in the Relaxation-time Approximation," Physical Review E, **79**, 056711, 2009.

Li, Z.R., G.R. Liu, J. Han, Y.Z. Chen, J-S. Wang, and N.G. Hadjiconstantinou, "Analytical Description of Ogston-regime Biomolecule Separation using Nanofilters and Nanopores," Physical

Review E, **80**, 041911, 2009.

Hadjiconstantinou, N.G., Radtke, G.A. and L.L. Baker, "On Variance Reduced Simulations of the Boltzmann Transport Equation for Small-scale Heat Transfer Applications," Journal of Heat Transfer, **132**, 112401, 2010.

Radtke, G.A., Hadjiconstantinou, N.G., and W. Wagner, "Low-Noise Monte Carlo Simulation of the Variable Hard-Sphere Gas," Physics of Fluids, **23**, 030606, 2011.

Peraud, J-P. M. and N. G. Hadjiconstantinou, "Efficient Simulation of Multidimensional Phonon Transport Using Energy-based Variance-reduced Monte Carlo Formulations," Physical Review B, **84**, 205331, 2011.

Peraud, J-P. M. and N. G. Hadjiconstantinou, "An Alternative Approach to Efficient Simulation of Micro/Nanoscale Phonon Transport," Applied Physics Letters, **101**, 153114, 2012.

Radtke, G.A., Peraud, J-P. M. and N. G. Hadjiconstantinou, "On Efficient Simulations of Multiscale Kinetic Transport," Philosophical Transactions of the Royal Society A, **371**, 2012182, 2013.