Hassan Masoud

Contact Information

Department of Mechanical Engineering
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Education

Ph.D. Mechanical Engineering — May 2009 – July 2012
Georgia Institute of Technology, Atlanta, GA

M.S. Mechanical Engineering — August 2007 – April 2009
State University of New York at Buffalo, Buffalo, NY

B.S. Aerospace Engineering (Summa Cum Laude) — September 2002 – July 2006
Sharif University of Technology, Tehran, Iran

Employment

Dean's Associate Professor — July 2024 – present
Department of Mechanical Engineering
Clemson University, Clemson, SC

Associate Professor — April 2023 – July 2024
Assistant Professor — July 2017 – April 2023
Department of Mechanical Engineering-Engineering Mechanics
Michigan Technological University, Houghton, MI

Assistant Professor — July 2015 – June 2017
Department of Mechanical Engineering
University of Nevada, Reno, NV

Lecturer — February 2015 – June 2015
Department of Mechanical and Aerospace Engineering
Princeton University, Princeton, NJ

Post-doctoral Fellow — September 2012 – June 2015
Applied Mathematics Laboratory
Courant Institute of Mathematical Sciences, New York, NY
Advisor: Michael J. Shelley (NAS member)

Department of Mechanical and Aerospace Engineering
Princeton University, Princeton, NJ
Advisor: Howard A. Stone (NAE and NAS member)

Awards & Honors

Innovating Distributed Embedded Energy Prize (Phases I and II), Water Power Technologies Office, Department of Energy — 2023
Sustainability & Resilience Faculty Fellowship, Michigan Technological University — 2023
CAREER Award, National Science Foundation — 2022
Research Excellence Fund Award, Michigan Technological University — 2021
Summer Faculty Fellowship, U.S. Air Force — 2019
Travel Fellowship, U.S. National Committee for Theoretical and Applied Mechanics — 2016
Finalist, Society in Science – The Branco Weiss Fellowship — 2014
Postdoctoral Fellowship, Institute for Complex Adaptive Matter — 2012
TechSTAR Award, Georgia Institute of Technology — 2012

GTRIC Fellowship, Georgia Institute of Technology 2012

Graduate Student Silver Award, Materials Research Society 2011

Finalist, Frank J. Padden, Jr. Award for Excellence in Polymer Physics Research, American Physical Society Division of Polymer Physics 2011

Elected to Who's Who Among Students in American Universities and Colleges 2011

Elected Full Member, SIGMA XI, The Scientific Research Society 2010

Engineering Graduate School Ambassador Award, State University of New York at Buffalo 2009

Elected Member, Iranian National Elite Foundation 2008

Outstanding Student Award, Sharif University of Technology and Iranian Aerospace Society 2007

Grants

Collaborative Research: ISS: Marangoni-Driven Propulsion, Assembly, and Disassembly along Curved Interfaces and Membranes
$840,138 ($500,209 + $339,929) – *National Science Foundation (CBET-PMP) and Center for the Advancement of Science in Space (CASIS)*
PIs: **H. Masoud** (lead) and J. P. Rothstein
Implementation Partner: ZIN Technologies Inc. (funded directly by CASIS for $339,929)
PI Masoud's Share: $250,209
Period: 08/15/2024 – 08/14/2027

Colloidal transport, self-assembly, and deposition in evaporating droplets
$347,379 – *National Science Foundation (CBET-PMP)*
PI: **H. Masoud**
Period: 04/15/2024 – 04/14/2027

AI-powered pattern analysis of blood and saliva stains for disease detection and infectivity assessment
$25,000 – *MTU Health Research Institute*
PI: **H. Masoud**, co-PIs: C. L. Heldt and S. J. Han
Period: 02/01/2024 – 01/31/2025

Harnessing kirigami-inspired composites for wave energy conversion
$10,000 – *MTU Great Lakes Research Center*
PI: **H. Masoud**
Period: 01/08/2024 – 05/06/2024

Harnessing perforated heave plates to improve the efficiency of two-body WECs
$42,521 – *National Renewable Energy Laboratory*
PI: **H. Masoud**
Period: 07/01/2023 – 03/31/2024

CAREER: Collective hydrodynamics of robotic swimmers and surfers at high Reynolds numbers
$520,255 – *National Science Foundation (CBET-FD)*
PI: **H. Masoud**
Period: 12/01/2022 – 11/30/2027

Physics-informed deep learning for 4D flow visualization
$21,283 – *MTU Vice President for Research Office*
PI: **H. Masoud**
Period: 01/01/2021 – 12/31/2021

Collaborative Research: Individual and collective dynamics of Marangoni surface tension effects between particles
$395,436 – *National Science Foundation (CBET-FD)*
PIs: **H. Masoud** (lead) and J. P. Rothstein
PI Masoud's Share: $216,298
Period: 08/01/2017 – 07/31/2020

Acquisition of a high-performance computer cluster
$15,000 – *UNR College of Engineering and Department of Mechanical Engineering*
PIs: **H. Masoud**, M. Aureli, L. Yliniemi, and M. Greiner
Period: Summer 2016

Acquisition of two high-speed cameras
$9,000 – *UNR College of Engineering and Department of Mechanical Engineering*
PIs: **H. Masoud**, H. Fu, and L. Yliniemi
Period: Summer 2016

Environmental sensing using autonomous underwater vehicles
$10,000 – *Nevada Advanced Autonomous Systems Innovation Center (NAASIC)*
PIs: M. Aureli and **H. Masoud**
PI Masoud's Share: $5,000
Period: 05/01/2016 – 01/31/2017

Development of autonomous water vehicles to sense environmental change in freshwater ecosystems
$10,000 – *Nevada Advanced Autonomous Systems Innovation Center (NAASIC)*
PIs: S. Chandra, M. Aureli, K. Alexis, **H. Masoud**, E. Folmer, Z. Hogan, and S. Tyler
PI Masoud's Share: $1,000
Period: 05/01/2016 – 01/31/2017

Harnessing self-oscillating gels to design active soft matter systems
$55,000 – *Institute for Complex Adaptive Matter (Post-doctoral Fellowship)*
PI: **H. Masoud**
Period: 09/01/2012 – 08/31/2014

University & Professional Service

Associate Editor, Journal of Engineering Mathematics	October 2023 – present
Faculty Advisor, Marine Energy Collegiate Competition, Michigan Tech	Fall 2022 – Spring 2024
Proposal Merit Reviewer, Department of Energy	2022
Ad-hoc Proposal Reviewer, American Chemical Society Petroleum Research Fund	2022
Coordinator, Naval Systems Engineering Minor, Michigan Tech	Fall 2022 – Spring 2024
Member, MEEM Graduate Program Committee, Michigan Tech	Fall 2022
Topics Editor, Fluids	2020 – 2021
Co-Chair, External Affairs Committee, APS Division of Fluid Dynamics	2020 – 2021
Proposal Review Panelist, National Science Foundation	2016, 2019, & 2021
Ad-hoc Proposal Reviewer, National Science Foundation	2021
Ad-hoc Proposal Reviewer, Center for the Advancement of Science in Space	2021, 2023
Session Chair, APS Division of Fluid Dynamics Annual Meeting, Seattle, WA	2019
Symposium Organizer and Session Chair, 56^{th} Annual Technical Meeting of the Society of Engineering Science, St. Louis, MO	2019
Non-Voting Member, MEEM Faculty Development Committee, Michigan Tech	Fall 2018
Leading Scholar Faculty Host, Michigan Tech	Fall 2018
Ad-hoc Proposal Reviewer, Swiss National Supercomputing Center	2018
Proposal Reviewer, Michigan Tech Research Excellence Fund	2018
Faculty Host, STEM Internship Program at Michigan Tech for Under-represented High School Students	Summer 2018
Member, External Affairs Committee, APS Division of Fluid Dynamics	2018 – 2019
Symposium Organizer and Session Chair, U.S. National Congress on Theoretical & Applied Mechanics, Chicago, IL	2018
Faculty Advisor, Tau Beta Pi, Michigan Beta Chapter	2017 – 2019

Session Chair, APS Division of Fluid Dynamics Annual Meeting, Denver, CO 2017

Associate Editor, European Journal of Computational Mechanics 2017 – 2019

Editorial Board Member and Guest Editor of "Fluid Flows with Interactive Boundaries" Special Issue, European Journal of Computational Mechanics 2016 – 2017

Member, MEEM Seminar Committee, Michigan Tech 2017 – 2019

Symposium Organizer, 53rd Annual Technical Meeting of the Society of Engineering Science, College Park, MD 2016

Organizer, ME Poster Competition, University of Nevada, Reno 2016

Chair, ME Seminar Committee, University of Nevada, Reno 2015 – 2016

Member, Thermal Science Search Committee, University of Nevada, Reno 2015 – 2016

Symposium Organizer and Session Chair, 51st Annual Technical Meeting of the Society of Engineering Science, West Lafayette, IN 2014

Minisymposium Organizer, U.S. National Congress on Theoretical & Applied Mechanics, East Lansing, MI 2014

Session Chair, APS Division of Fluid Dynamics Annual Meeting, Pittsburgh, PA 2013

Organizer, Bi-weekly Applied Math Lab Seminar and Monthly Chalk Talk Series, Courant Institute of Mathematical Sciences 2013 – 2015

Session Chair, SES-ASME Annual Technical Meeting, Providence, RI 2013

Symposium Assistant, Materials Research Society Fall Meeting & Exhibit, Boston, MA 2011

Session Chair, Canadian-American-Mexican Graduate Student Physics Conference, Washington, DC 2011

Member-at-large, APS Forum on Graduate Student Affairs Executive Committee 2011 – 2012

Member-at-large, Sharif University of Technology Aerospace Engineering Student Association 2005 – 2006

Reviewed for:
Nature Communications, Advanced Functional Materials, Physical Review Letters, PNAS Nexus, Scientific Reports, Physical Chemistry Chemical Physics, Soft Matter, Journal of the Royal Society Interface, PLoS One, New Journal of Physics, Applied Physics Letters, Journal of Physical Chemistry, Nonlinear Dynamics, Physical Review E, Journal of Fluid Mechanics, Physical Review Fluids, Physics of Fluids, Chemical Engineering Science, SIAM Journal on Applied Mathematics, AIP Advances, International Journal of Heat and Mass Transfer, International Journal of Multiphase Flow, Journal of Fluids and Structures, Computers and Fluids, Colloids and Surfaces A, Polymer, Journal of Fluids Engineering, Journal of Thermophysics and Heat Transfer, European Physics Journal, European Journal of Computational Mechanics, Journal of Applied Fluid Mechanics, CRC Press

Publications

(Google Scholar Citations: **1413** h-index: **21** i10-index: **25**)

(Advisees' names are underlined)

(Superscript * denotes authors of equal contribution)

41. Multi-body hydrodynamic interactions in fish-like swimming
M. L. Timm, R. S. Pandhare, and **H. Masoud**, *Applied Mechanics Reviews* 76, 030801 (2024) (Invited review article)

40. A second-order-accurate approximation for the shape of a sessile droplet deformed by gravity
M. L. Timm, R. S. M. Alassar, and **H. Masoud**, *Journal of Engineering Mathematics* 142, 5 (2023)

39. Using footpad sculpturing to enhance the maneuverability and speed of a robotic Marangoni surfer
S. Bechard, M. L. Timm, **H. Masoud**, and J. P. Rothstein, *Biomimetics* 8, 440 (2023)

38. Drying dynamics of sessile-droplet arrays
A. Iqtidar, J. J. Kilbride, F. F. Ouali, D. J. Fairhurst, H. A. Stone, and **H. Masoud**, *Physical Review Fluids* 8, 013602 (2023)

37. Diffusive mass transfer from a Janus sphere
H. Masoud and J. P. Rothstein, *Physical Review Fluids* 7, 070501 (2022)

(Invited article for a special collection on Interfacial Active Matter)

36. Free-decay heave motion of a spherical buoy
J. Colling, S. Jafari Kang, E. Dehdashti, S. Husain, **H. Masoud**, and G. G. Parker, *Fluids* 7, 188 (2022)
(Invited article for the special issue on *Fluid Structure Interaction: Methods and Applications*)
(Selected by editors as cover story)

35. A remotely controlled Marangoni surfer
M. L. Timm, S. Jafari Kang, J. P. Rothstein, and **H. Masoud**, *Bioinspiration & Biomimetics* 16, 066014 (2021)
(Highlighted in *Michigan Tech's Unscripted Research Blog*, *Tech Explore*, and *Nanowerk*)

34. Evaporation of multiple droplets
H. Masoud, P. D. Howell, and H. A. Stone, *Journal of Fluid Mechanics (Rapids)* 927, R4 (2021)
(Highlighted in a *Focus on Fluids* article by JFM)

33. Continuous purification of an enveloped and non-enveloped viral particle using an aqueous two-phase system
D. G. Turpeinen, P. U. Joshi, S. A. Kriz, S. Kaur, N. M. Nold, D. O'Hagan, S. Nikam, **H. Masoud**, and C. L. Heldt, *Separation and Purification Technology* 269, 118753 (2021)

32. Heat transfer from a particle in laminar flows of a variable thermal conductivity fluid
E. Dehdashti, M. Razizadeh, and **H. Masoud**, *International Journal of Heat and Mass Transfer* 171, 121067 (2021)

31. Collective sensitivity of artificial hair sensors to flow direction
E. Dehdashti, G. W. Reich, and **H. Masoud**, *AIAA Journal* 59, 1135–1141 (2021)

30. The Effect of Shape on the Motion and Stability of Marangoni Surfers
S. Sur, N. Uvanovic, **H. Masoud**, and J. P. Rothstein, *Journal of Fluids Engineering* 143, 011301 (2021)

29. Forward, reverse, and no motion of Marangoni surfers under confinement
S. Jafari Kang, S. Sur, J. P. Rothstein, and **H. Masoud**, *Physical Review Fluids* 5, 084004 (2020)
(Highlighted in *Michigan Tech News*, *Phys.org*, *Science Daily*, and *Nanowerk*)

28. Forced convection heat transfer from a particle at small and large Peclet numbers
E. Dehdashti and **H. Masoud**, *Journal of Heat Transfer* 142, 061803 (2020)

27. How to walk on water and climb up walls: Animal movement and the robots of the future
H. Masoud, *American Journal of Physics* 88, 423 (2020)
(Invited book review)

26. Evaporation of a sessile droplet on a slope
M. L. Timm, E. Dehdashti, A. Jarrahi Darban, and **H. Masoud**, *Scientific Reports* 9, 19803 (2019)

25. Translational and rotational motion of disk-shaped Marangoni surfers
S. Sur, **H. Masoud**, and J. P. Rothstein, *Physics of Fluids* 31, 102101 (2019)

24. The reciprocal theorem in fluid dynamics and transport phenomena
H. Masoud and H. A. Stone, *Journal of Fluid Mechanics* 879, P1 (2019)
(Invited "Perspectives" article)

23. Optimal viscous damping of vibrating porous cylinders
S. Jafari Kang, E. Dehdashti, V. Vandadi, and **H. Masoud**, *Journal of Fluid Mechanics* 874, 339–358 (2019)

22. Conduction heat transfer from oblate spheroids and bispheres
S. Jafari Kang, E. Dehdashti, and **H. Masoud**, *International Journal of Heat and Mass Transfer* 139, 115–120 (2019)

21. Fluid flows with interactive boundaries
H. Masoud and A. M. Ardekani, *European Journal of Computational Mechanics* 26, 1–3 (2017)
(Editorial article for a special issue)

20. Reverse Marangoni surfing
V. Vandadi, S. Jafari Kang, and **H. Masoud**, *Journal of Fluid Mechanics* 811, 612–621 (2017)

19. Alternative mechanism for coffee-ring deposition based on active role of free surface
S. Jafari Kang, V. Vandadi, J. D. Felske, and **H. Masoud**, *Physical Review E* 94, 063104 (2016)
(Highlighted in *Materials Today*, *Nevada Today*, *Phys.org*, *Science Daily*, and *Membrane Quarterly*)

18. Reciprocal theorem for convective heat and mass transfer from a particle in Stokes and potential flows
V. Vandadi, S. Jafari Kang, and **H. Masoud**, *Physical Review Fluids (Rapid Communications)* 1, 022001(R) (2016)

17. Oscillatory Marangoni flows with inertia
O. Shardt, **H. Masoud**, and H. A. Stone, *Journal of Fluid Mechanics* 803, 94–118 (2016)

16. Drag and diffusion coefficients of a spherical particle attached to a fluid-fluid interface
A. Dörr, S. Hardt, **H. Masoud**, and H. A. Stone, *Journal of Fluid Mechanics* 790, 607–618 (2016)

15. Hydrodynamic schooling of flapping swimmers
A. Becker*, **H. Masoud***, J. Newbolt, M. J. Shelley, and L. Ristroph, *Nature Communications* 6, 8514 (2015)
(Highlighted in *National Science Foundation News*, *APS Physics Central Podcast*, *Science Daily*, and *Futurity*)

14. Mobility of membrane-trapped particles
H. A. Stone and **H. Masoud**, *Journal of Fluid Mechanics* 781, 494–505 (2015)

13. Collective surfing of chemically active particles
H. Masoud and M. J. Shelley, *Physical Review Letters* 112, 128304 (2014)
(Highlighted as PRL Editors' Suggestion)

12. A reciprocal theorem for Marangoni propulsion
H. Masoud and H. A. Stone, *Journal of Fluid Mechanics (Rapids)* 741, R4 (2014)

11. On the rotation of porous ellipsoids in simple shear flows
H. Masoud, H. A. Stone, and M. J. Shelley, *Journal of Fluid Mechanics (Rapids)* 733, R6 (2013)

10. Designing maneuverable micro-swimmers actuated by responsive gel
H. Masoud, B. I. Bingham, and A. Alexeev, *Soft Matter* 8, 8944 (2012)
(Highlighted in *IEEE Computer Society News*, *Science Daily*, *Phys.Org*, *MedGadget*, *ASME Nanotechnology Institute News*, *Soft Matter World*, *Communications of the ACM*, *Futurity Magazine*, *Georgia Tech's Homepage*, etc.)

9. Efficient flapping flight using flexible wings oscillating at resonance
H. Masoud and A. Alexeev, In *Natural Locomotion in Fluids and on Surfaces*, Edited by S. Childress, A. E. Hosoi, W. W. Schultz, and Z. J. Wang, pp. 235-245, Springer, New York (2012)

8. Controlled release of nanoparticles and macromolecules from responsive microgel capsules
H. Masoud and A. Alexeev, *ACS Nano* 6, 212 (2012)

7. Harnessing synthetic cilia to regulate motion of microparticles
H. Masoud and A. Alexeev, *Soft Matter* 7, 8702 (2011)
(Invited "Highlight" article)

6. Selective control of surface properties using hydrodynamic interactions
H. Masoud and A. Alexeev, *Chemical Communications* 47, 472 (2011)
(Highlighted in the *Virtual Journal of Nanoscale Science & Technology* 22, 25, 2010)

(Invited article for a special themed issue on Emerging Investigators)

5. Permeability and diffusion through mechanically deformed random polymer networks
H. Masoud and A. Alexeev, *Macromolecules* 43, 10117 (2010)

4. Resonance of flexible flapping wings at low Reynolds number
H. Masoud and A. Alexeev, *Physical Review E* 81, 056304 (2010)
(Featured in the spring 2011 issue of Georgia Tech Research Horizons Magazine)
(Highlighted in *National Science Foundation News*, *U.S. News & World Report*, *Innovations Report*, *ScienceMagNews*, *Georgia Tech's Homepage*, etc.)

3. Modeling magnetic microcapsules that crawl in microchannels
H. Masoud and A. Alexeev, *Soft Matter* 6, 794 (2010)
(Highlighted in the *Virtual Journal of Nanoscale Science & Technology* 21, 9, 2010)
(Invited article for a special issue on Emerging Themes in Soft Matter: Responsive and Active Soft Materials)

2. Analytical solution for Stokes flow inside an evaporating sessile drop: Spherical and cylindrical cap shapes
H. Masoud, J. D. Felske, *Physics of Fluids* 21, 042102 (2009)

1. Analytical solution for inviscid flow inside an evaporating sessile drop
H. Masoud, J. D. Felske, *Physical Review E* 79, 016301 (2009)

Conference Abstracts

(Advisees' names are underlined)

58. Collective hydrodynamis of robotic fish
M. Usman, R. S. Pandhare, and **H. Masoud**, 76$^{\text{th}}$ Annual Meeting of the APS Division of Fluid Dynamics, Washington, DC, November 19–21, 2023

57. Small-amplitude heave oscillations of an annular disk
M. Usman and **H. Masoud**, 75$^{\text{th}}$ Annual Meeting of the APS Division of Fluid Dynamics, Indianapolis, IN, November 20–22, 2022

56. Drying dynamics of sessile-droplet arrays
A. Iqtidar, J. J. Kilbride, F. F. Ouali, D. J. Fairhurst, H. A. Stone, and **H. Masoud**, 75$^{\text{th}}$ Annual Meeting of the APS Division of Fluid Dynamics, Indianapolis, IN, November 20–22, 2022

55. A remotely controlled Marangoni surfer
M. L. Timm, S. Jafari Kang, J. P. Rothstein, and **H. Masoud**, 74$^{\text{th}}$ Annual Meeting of the APS Division of Fluid Dynamics, Phoenix, AZ, November 21–23, 2021

54. Optimal Marangoni surfing
S. Jafari Kang, E. Dehdashti, J. P. Rothstein, and **H. Masoud**, 74$^{\text{th}}$ Annual Meeting of the APS Division of Fluid Dynamics, Phoenix, AZ, November 21–23, 2021

53. Small-amplitude oscillations of perforated disks
M. Usman, S. Jafari Kang, and **H. Masoud**, 74$^{\text{th}}$ Annual Meeting of the APS Division of Fluid Dynamics, Phoenix, AZ, November 21–23, 2021

52. Forward, halted, and reverse motion of an active particle atop a finite liquid layer
S. Jafari Kang, J. P. Rothstein, and **H. Masoud**, 72$^{\text{nd}}$ Annual Meeting of the APS Division of Fluid Dynamics, Seattle, WA, November 23–26, 2019

51. Reverse Marangoni propulsion of disks and hemispheres at finite Reynolds numbers
S. Sur, **H. Masoud**, and J. P. Rothstein, 72$^{\text{nd}}$ Annual Meeting of the APS Division of Fluid Dynamics, Seattle, WA, November 23–26, 2019

50. Collective hydrodynamis of robotic fish
R. S. Pandhare, M. L. Timm, and **H.Masoud**, 56$^{\text{th}}$ Annual Technical Meeting of Society of Engineering Science, St. Louis, MO, October 13–15, 2019

49. Marangoni-driven motion of particles at liquid-gas interfaces

S. Jafari Kang, E. Dehdashti, and **H. Masoud**, SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 19–23, 2019

48. Forced convection heat transfer from a particle at small and large Peclet numbers
E. Dehdashti and **H. Masoud**, 71st Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, GA, November 18–20, 2018

47. Inertial Marangoni propulsion: simulation
S. Jafari Kang, E. Dehdashti, J. P. Rothstein, and **H. Masoud**, 71st Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, GA, November 18–20, 2018

46. Inertial Marangoni propulsion: experiments
S. Sur, **H. Masoud**, and J. P. Rothstein, 71st Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, GA, November 18–20, 2018

45. Coffee-ring effect revisited
S. Jafari Kang ,V. Vandadi, J. D. Felske, and **H. Masoud**, 18th U.S. National Congress for Theoretical and Applied Mechanics, Chicago, IL, June 5–9, 2018

44. Stability of a chemically active floating disk
V. Vandadi, S. Jafari Kang, J. P. Rothstein, and **H. Masoud**, 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, CO, November 19–21, 2017

43. Optimal viscous damping of vibrating porous cylinders
S. Jafari Kang and **H. Masoud**, 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, CO, November 19–21, 2017

42. Evaporation of a sessile droplet on a slope
A. Jarrahi Darban, S. Jafari Kang, and **H. Masoud**, 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, CO, November 19–21, 2017

41. Heat transfer from a particle in creeping flow of a variable-conductivity fluid
E. Dehdashti, M. Razizadeh, and **H. Masoud**, 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, CO, November 19–21, 2017

40. Interfacial transport alone accounts for coffee-ring deposition
V. Vandadi, S. Jafari Kang, J. D. Felske, and **H. Masoud**, 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, OR, November 20–22, 2016

39. Towards designing miniature surfing robots*
S. Jafari Kang, V. Vandadi, and **H. Masoud**, 69*th* Annual Meeting of the APS Division of Fluid Dynamics, Portland, OR, November 20–22, 2016
*Also presented at the American Institute of Chemical Engineers Annual Meeting, San Francisco, CA, November 13-18, 2016 and at 53rd Annual Technical Meeting of the Society of Engineering Science, College Park, MD, October 4–7, 2016

38. A reciprocal theorem for convective heat and mass transfer in Stokes and potential flows*
H. Masoud, V. Vandadi, and S. Jafari Kang, 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, OR, November 20–22, 2016
*Also presented at the American Institute of Chemical Engineers Annual Meeting, San Francisco, CA, November 13–18, 2016 and at 24th International Congress of Theoretical and Applied Mechanics, Montral, Canada, August 21–26, 2016

37. Mobility of membrane-trapped particles
H. Masoud and H A. Stone, 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA, November 22–24, 2015

36. Marangoni-driven flow oscillations during the dissolution of surfactant powders*
O. Shardt, H. Kim, **H. Masoud**, and H. A. Stone, 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA, November 22–24, 2015

*Also presented at the American Institute of Chemical Engineers Annual Meeting, Salt Lake City, UT, November 8–13, 2015 and at the 65th Canadian Chemical Engineering Conference, Calgary, AB, October 4–7, 2015

35. Drag and diffusion coefficient of a spherical particle attached to a fluid interface
A. Dörr, S. Hardt, **H. Masoud**, and H. A Stone, 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA, November 22–24, 2015

34. Schooling of flapping wings: Simulations
H. Masoud, A. Becker, L. Ristroph, and M. J. Shelley, 67th Annual Meeting of the APS Division of Fluid Dynamics, San Francisco, CA, November 23–25, 2014

33. Schooling of flapping wings: Experiments
L. Ristroph, A. Becker, **H. Masoud**, J. Newbolt, and M. J. Shelley, 67th Annual Meeting of the APS Division of Fluid Dynamics, San Francisco, CA, November 23–25, 2014

32. Chemical surfing of active particles and connection to chemotaxis of slime mold colonies
H. Masoud, H. A. Stone, and M. J. Shelley, The Society of Rheology 86th Annual Meeting, Philadelphia, PA, October 5–9, 2014

31 Individual and collective surfing of chemically active particles*
H. Masoud, M. J Shelley, and H. A. Stone, Aspen Center for Physics Winter Conference, Aspen, CO, January 27–February 1, 2014
*Also presented at the U.S. National Congress on Theoretical & Applied Mechanics, East Lansing, MI, June 2014

30 Rotation of porous ellipsoids in simple shear flows
H. Masoud, H. A. Stone, and M. J. Shelley, 66th Annual Meeting of the APS Division of Fluid Dynamics, Pittsburgh, PA, November 24–26, 2013

29. Marangoni-driven chemotaxis, chemotactic collapse, and the Keller-Segel equation
M. J. Shelley and **H. Masoud**, 66th Annual Meeting of the APS Division of Fluid Dynamics, Pittsburgh, PA, November 24–26, 2013

28 Rotational behavior of porous elliptical cylinders in a simple shear flow
H. Masoud, H. A. Stone, and M. J. Shelley, SES 50th Annual Technical Meeting and ASME-AMD Annual Summer Meeting, Providence, RI, July 28–31, 2013

27. Friction of elastomers on directional surfaces
H. Masoud and A. Alexeev, Materials Research Society Fall Meeting & Exhibit, Boston, MA, November 25–30, 2012

26. Swimming micro-robot powered by stimuli-sensitive gel
H. Masoud and A. Alexeev, 65th Annual Meeting of the APS Division of Fluid Dynamics, San Diego, CA, November 18–20, 2012

25. Harnessing responsive gels to design synthetic microswimmers
H. Masoud and A. Alexeev, 49th Annual Technical Meeting of Society of Engineering Science, Atlanta, GA, October 10–12, 2012

24. Harnessing polymer gels to regulate friction between sliding surfaces
H. Masoud and A. Alexeev, American Physical Society, APS March Meeting, Boston, MA, February 27–March 2, 2012

23. Modeling controlled release from responsive microgel capsules
A. Alexeev and **H. Masoud**, American Physical Society, APS March Meeting, Boston, MA, February 27–March 2, 2012

22. Modeling nanoparticle release from responsive microcapsules
H. Masoud and A. Alexeev, Materials Research Society Fall Meeting & Exhibit, Boston, MA, November 28–December 2, 2011

21. Regulating solute transport using nano-structured surfaces
H. Masoud and A. Alexeev, Materials Research Society Fall Meeting & Exhibit, Boston, MA, November 28–December 2, 2011

20. A novel release mechanism from responsive microgel capsules
H. Masoud and A. Alexeev, American Physical Society, 64$^{\text{th}}$ Annual Meeting of the APS Division of Fluid Dynamics, Baltimore, MD, November 20–22, 2011

19. Designing self-propelling micro-swimmers using responsive gels
B. I. Bingham, **H. Masoud**, and A. Alexeev, American Physical Society, 64$^{\text{th}}$ Annual Meeting of the APS Division of Fluid Dynamics, Baltimore, MD, November 20–22, 2011

18. Polymer networks: modeling and emerging applications
H. Masoud, American Institute of Chemical Engineers Annual Meeting, Minneapolis, MN, October 16–21, 2011

17. Mesoscale modeling of transport through polymer gels
H. Masoud, 5$^{\text{th}}$ Canadian-American-Mexican Graduate Student Physics Conference, Washington, DC, September 29–October 1, 2011

16. Fast release of nanoparticles from microgel capsules
H. Masoud, 5$^{\text{th}}$ South–East Workshop on Soft Materials and Interfaces, Atlanta, GA, May 25, 2011

15. Transport properties of mechanically deformed polymer networks
H. Masoud and A Alexeev, American Physical Society, APS March Meeting, Dallas, TX, March 21–25, 2011

14. Designing self-propelling micro-swimmer that navigates in microfluidic channels
B. Bingham, **H. Masoud**, and A. Alexeev, American Physical Society, APS March Meeting, Dallas, TX, March 21–25, 2011

13. Designing patterned microchannels to separate colloid-polymer suspensions
H. Masoud and A. Alexeev, American Physical Society, 63$^{\text{rd}}$ Annual Meeting of the APS Division of Fluid Dynamics, Long Beach, CA, November 21–23, 2010

12. Efficient flapping flight using flexible wings oscillating at resonance
A. Alexeev and **H. Masoud**, American Physical Society, 63$^{\text{rd}}$ Annual Meeting of the APS Division of Fluid Dynamics, Long Beach, CA, November 21–23, 2010

11. Transport through random biological networks in tension
H. Masoud, From Computational Biophysics to Systems Biology Workshop, Traverse City, MI, June 6–8, 2010

10. Low Reynolds number aerodynamics of flexible flapping wings at resonance
H. Masoud and A Alexeev, IMA Workshop on Natural Locomotion in Fluids and on Surfaces: Swimming, Flying, and Sliding, Minneapolis, MN, June 1–5, 2010

9. Transport through random polymer networks in tension
H. Masoud, 4$^{\text{th}}$ South-East Workshop on Soft Materials and Interfaces, Atlanta, GA, May 13, 2010

8. Effective diffusion rate through a random polymer network in tension
H. Masoud and A. Alexeev, American Physical Society, APS March Meeting, Portland, OR, March 15–19, 2010

7. Modeling flexible flapping wings oscillating at resonance
A. Alexeev and **H. Masoud**, American Physical Society, APS March Meeting, Portland, OR, March 15–19, 2010

6. Regulating motion of magnetic capsules in microfluidic systems
H. Masoud, A. Kilimnik, and A Alexeev, ASME First Global Congress on NanoEngineering for

Medicine and Biology, Houston, TX, February 7–10, 2010

5. Modeling magnetically driven synthetic microcapsules
H. Masoud and A Alexeev, American Physical Society, 62nd Annual Meeting of the APS Division of Fluid Dynamics, Minneapolis, MN, November 22–24, 2009

4. Particle deposition in evaporating colloidal sessile drops
J. D. Felske and **H. Masoud**, American Physical Society, 62nd Annual Meeting of the APS Division of Fluid Dynamics, Minneapolis, MN, November 22–24, 2009

3. Flow in an evaporating sessile drop
H. Masoud and J. D. Felske, American Physical Society, 61st Annual Meeting of the APS Division of Fluid Dynamics, San Antonio, TX, November 23–25, 2008

2. Analytical solution for stress field in problem of contact between symmetrical wedge and a half space
D. Naderi, S. Adibnazari, A. Abedian, and **H. Masoud**, 6th Conference of Iranian Aerospace Society, Tehran, Iran, February 24–26, 2007

1. Non-symmetrical plane contact
D. Naderi, **H. Masoud**, S. Adibnazari, and A. Abedian, International Conference of Solid Mechanics, Crakow, Poland, September 4–8, 2006

Seminars & Invited Presentations

37. Department of Mechanical and Aerospace Engineering, Case Western Reserve University, Cleveland, OH, April 16, 2024

36. Department of Mechanical Engineering, Clemson University, Clemson, SC, February 29, 2024

35. Membrane Separation Science Workshop, Mathematical Institute, Oxford University, Oxford, UK, June 28, 2023

34. Department of Physics, Michigan Tech, Houghton, MI, December 8, 2022

33. Benjamin Levich Institute for Physico–Chemical Hydrodynamics, City College of New York, New York, NY, September 13, 2022

32. Department of Mathematics and Statistics, University of Strathclyde, Glasgow, UK, November 16, 2021

31. Department of Mechanical, Industrial, and Manufacturing Engineering, University of Toledo, Toledo, Ohio, March 19, 2021

30. Seeking Simplicity in Complex Fluids Workshop, Princeton University, Princeton, NJ, January 20, 2020

29. American Mathematical Society, Fall Central Sectional Meeting, University of Michigan, Ann Arbor, MI, October, 2018

28. Workshop on Dynamic Contact Lines: Progress and Opportunities, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN, March 28, 2018

27. Department of Mathematical Sciences, Michigan Tech, Houghton, MI, November 3, 2017

26. Department of Mechanical Engineering, University of Delaware, Newark, DE, February 27, 2017

25. Department of Mechanical Engineering-Engineering Mechanics, Michigan Tech, Houghton, MI, January 30, 2017

24. Department of Mechanical Engineering, University of Houston, Houston, TX, January 19, 2017

23. Biomaterials Innovation Research Center, Harvard-MIT Division of Health Sciences and Technology, Boston, MA, June 10, 2016

22. Meet Future Collaborators – Lightning Talks, University of Nevada, Reno, NV, April 5, 2016

21. Fluid Mechanics Seminar Series, Department of Mechanical and Process Engineering, ETH Zurich, Switzerland, May 18, 2015

20. Department of Mechanical Engineering, University of Nevada, Reno, NV, March 6, 2015

19. Department of Biomedical Engineering and Mechanics, Virginia Tech, Blacksburg, VA, February 23, 2015

18. Department of Chemical Engineering, Virginia Tech, Blacksburg, VA, February 2, 2015

17. Applied Mathematics Colloquium, Department of Engineering Sciences and Applied Mathematics, Northwestern University, Evanston, IL, January 12, 2015

16. Applied Math Lab Seminar, Courant Institute of Mathematical Sciences, New York University, New York, NY, September 11, 2014

15. Annual ICAM–I2CAM Conference, Davis, CA, May 19, 2014

14. Benjamin Levich Institute for Physico–Chemical Hydrodynamics, City College of New York, New York, NY, March 25, 2014

13. Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, March 17, 2014

12. Department of Mechanical Engineering, Rice University, Houston, TX, March 10, 2014

11. School of Mechanical Engineering, Purdue University, West Lafayette, IN, February 13, 2014

10. The Fourth Collaborative Workshop Initiative, Mathematical Institute, Oxford University, Oxford, UK, January 2014

9. Fluid Mechanics Seminar, Department of Mathematical Sciences, New Jersey Institute of Technology, Newark, NJ, February 25, 2013

8. Applied Math Lab Seminar, Courant Institute of Mathematical Sciences, New York University, New York, NY, September 20, 2012

7. Department of Mechanical & Industrial Engineering, University of Toronto, Toronto, ON, January 18, 2012

6. Department of Mechanical Engineering, Iowa State University, Ames, IA, January 13, 2012

5. Squishy Physics Seminar Series, School of Engineering and Applied Sciences and Department of Physics, Harvard University, Cambridge, MA, November 30, 2011

4. Department of Polymer Engineering, The University of Akron, Akron, OH, November 14, 2011

3. GaP Seminar Series, Parker H. Petit Institute of Bioengineering and Biosciences, Georgia Institute of Technology, Atlanta, GA, September 7, 2011

2. Gordon-Kenan Research Seminar on Soft Condensed Matter Physics, New London, NH, August 14, 2011

1. Colloid & Soft Matter Seminar Series, Georgia Institute of Technology, Atlanta, GA, June 28, 2011

Teaching Experience

Michigan Technological University

SENSE Enterprise (ENT 3950/3960/4950/4960)	Fall 2022 – Spring 2024
Mechanical Eng. Practice III – Model-Based Design (MEEM 3901)	Fall 2019 – Spring 2024
Advanced Heat Transfer (MEEM 5230)	Spring and Fall 2018, Fall 2019
Special Topics: CFD Analysis Using OpenFOAM (MEEM 5990)	Spring 2020, Fall 2023
Special Topics: Hydrodynamics of Interacting Vortices (MEEM 5990)	Spring 2018

University of Nevada, Reno

Convection Heat Transfer (ME 761) — Spring 2016 and 2017
Intermediate Heat Transfer (ME 414/614) — Fall 2015 and 2016

Princeton University

Mathematics in Engineering II (MAE 306/MAT 302) — Spring 2015

Post-doctoral & Student Advisees

Post-doctoral Fellows

1. Dr. Vahid Vandadi — September 2015 – August 2017
   Recipient of Postdoctoral Award for Professional Development (2016)
   Current position: CAE/CFD Engineer at General Motors

Ph.D. Students

5. Muhammad Usman — August 2019 – present
   Recipient of U.S.–Pakistan Knowledge Corridor Ph.D. Scholarship

4. Rohit S. Pandhare — September 2017 – December 2022
   Recipient of Dean's Award for Outstanding Scholarship (2022)
   Recipient of Dean's Award for Outstanding Graduate Student Teaching (2018)
   Current position: Research Engineer at CNH Industrial N.V.

3. Mitchel L. Timm — January 2019 – August 2022
   Recipient of Doctoral Finishing Fellowship (2022)
   Recipient of Dean's Award for Outstanding Scholarship (2022)
   Recipient of Michigan Space Grant Consortium Gratudate Fellowship (2020)
   Recipient of Dean's Award for Outstanding Graduate Student Teaching (2019)
   Current position: Research Engineer at Bosch

2. Esmaeil Dehdashti — August 2016 – May 2021
   Recipient of Doctoral Finishing Fellowship (2020)
   Current position: Data Scientist at PredictiveIQ

1. Saeed Jafari Kang — August 2015 – May 2021
   Recipient of Outstanding Scholarship Award (2021)
   Recipient of Distinguished Doctoral Teaching Fellowship (2019)
   Recipient of Doctoral Finishing Fellowship (2018)
   Recipient of Outstanding International Graduate Student Scholarship (2017)
   Recipient of American Physical Society Division of Fluid Dynamics Travel Award (2016)
   Current position: CFD Engineer/Data Scientist at Amgen Inc.

M.S. Students

4. Rajat R. Gadhave (Course Work Option, Co-advised) — December 2020 – December 2021
   Current position: Associate Manufacturing Engineer at BD

3. Muhammad Usman (Report Option) — August 2019 – August 2021

2. Paras Ghumare (Course Work Option) — January 2018 – December 2018
   Current position: Engineering Documentation Writer at SimScale

1. Mitchel L. Timm (Thesis Option) — December 2017 – December 2018
   Recipient of Dean's Award for Outstanding Scholarship (2018)

Undergraduate Students

5. Robert Slater — June 2023 – April 2024

4. Estyn LaMotte — June 2023 – December 2023
   Recipient of Undergraduate Research Internship Program Award (URIP 2023)

3. Kevin Li — February 2023 – August 2023

2. Erik W. Pitcher — January 2020 – August 2021
   Recipient of MEEM Department Scholar Award (2021)
   Recipient of Summer Undergraduate Research Fellowship (SURF 2020)
   Current position: Engineering Analyst at Woodward Inc.

1. Kristen Shutt — Spring 2017

Ph.D. & M.S. Advisory Committee Memberships

Ph.D.

8. Tania D. Gonzalez — 2024
7. Apurva Baruah — 2023
6. Masoud Ahmadi — 2022
5. Salman Husain — 2022
4. Sarah Jalal — 2020
3. Matthew Roberts — 2019
2. Soroush Sepahyar — 2019
1. Farshad Meshkati — 2016

M.S.

7. Madelyn VanWieren — 2024
6. Jacob K. Colling — 2021
5. Apurva Baruah — 2021
4. Tania Demonte Gonzalez — 2021
3. Umamaheswar Puttur — 2020
2. Sai P. Kumar — 2020
1. Praveen B. S. Naga — 2018