Biographical Information: S.S. Sadhal

Permanent Address

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Citizenship: U.S. Citizen

EDUCATION

Ph.D. (1979) Engineering Science California Institute of Technology Pasadena, CA 91125. (Thesis Advisor: Dr. Milton S. Plesset)

M.A.Sc. (1976) Mechanical Engineering University of Toronto (Thesis Advisor: Dr. W.W. Martin) Toronto, Ontario, Canada M5S 1A4.

B.A.Sc.(Honours) (1975) Nuclear/Thermal Engineering Science University of Toronto (Bachelor's Thesis Advisor: Dr. Charles A. Ward).

PROFESSIONAL EXPERIENCE

University of Southern California Department of Mechanical Engineering (now Aerospace & Mechanical Engineering)

Department Chairman (1997--98) Associate Chairman (1992--97, 98--) Acting Chairman (1990--92, 1996) Professor (1993--) Associate Professor (1984--93) Assistant Professor (1982--84)

Children's Hospital Los Angeles Visiting Professor, Radiology, 2012-

USC Keck School of Medicine Professor of Ophthalmology (courtesy appointment), 2019-

University of Pennsylvania Department of Mechanical Engineering Assistant Professor (1978--1981)

Jet Propulsion Laboratory NASA/ASEE Fellow (Summer 1990, 1991, 2000) Pasadena, California

University of Cambridge Senior Visitor (1988--1989), Department of Applied Mathematics & Theoretical Physics Fellow of Clare Hall College (1988-89) Life Fellow of Clare Hall College (1989--)

Professional Societies

American Society of Mechanical Engineers, 1978--, Fellow & Life Member Association for Research on Vision and Ophthalmology, 2010-American Physical Society, 2011-

Editorial Duties

ASME Journal of Heat & Mass Transfer, Associate Technical Editor (1999--2002). Journal of Non-Equilibrium Thermodynamics, Member of Editorial Board (1998-2003) Annals of the New York Academy of Sciences, Editor-in-Chief of biennial volume on Interdisciplinary Transport Phenomena (2002-08)

International Journal of Transport Phenomena, Guest Editor Interdisciplinary Transport Phenomena Conference Proceedings (2009)

Translational Vision Science & Technology (TVST), Editorial Board Member, 2020-

Honors and Awards

AIChE/ASME Donald Q. Kern Award, 2024 ASME Heat Transfer Memorial Award, 2019 Northrop Grumman Award for Teaching Excellence, April 2009 2007 James Harry Potter Gold Medal (ASME) in Thermodynamics, November 12, 2007 USC A.A.A. Exemplary Performance of Professors Recognition, October 10, 2007. Fellow of the American Society of Mechanical Engineers, 1996--Life Fellow, Clare Hall College, University of Cambridge, 1989--NASA/ASEE Fellow, Jet Propulsion Laboratory (1990, 1991) Presidential Young Investigator Award (1984-89) Postgraduate Scholarship, NRC Canada (Caltech/Toronto) (1975--78) Helen E. Rogers Admission Scholar (Toronto) (1971--75) First Wallberg Scholar (Toronto) (1972) Professional Engineers' Prize (Toronto) (1972) John M. Empey Prize (Toronto) (1972) McKee-Gilchrist Prize (Toronto) (1972) MacLennan-MacLeod Memorial Prize (Toronto) (1972)

Doctoral Students

- 1. Hasan N. Oguz, Ph.D. May 1987
- 2. So T. Vuong, Ph.D. December 1989
- 3. Kek-Kiong Tio, Ph.D. November 1990, Associate Professor, Malaysia Multimedia University
- 4. Ashok K. Das, Ph.D. December 1994
- 5. Hong Zhao, Ph.D. September 1999
- 6. Sungho Lee, PhD, May 2004, Research Engineer, Hyundai Corp., South Korea.
- 7. Channarong Asavatesanupap, PhD Spring 2007, Asst. Prof., Thammasat University, Thailand
- 8. Leslie King, PhD, September 2009, Research Engineer, Aerospace Corporation, El Segundo, CA
- 9. Hao-Kun Chu, PhD June 2011, Research Engineer, GM Corporation, Warren, MI
- 10. Mohammed Alhamli, PhD, August 2015, Assistant Professor, University of Kuwait.
- 11. Ramtin Sheikhhassani, PhD, May 2015, Lecturer, University of Southern California
- 12. Dejuan Kong, PhD, August 2016, Research Engineer, Boeing El Segundo.
- 13. Komsan Rattanakijsuntorn, PhD, May 2016, Asst. Prof, Ubon Ratchathani University, Thailand
- 14. 15. Shuqi Zhang, PhD, May 2023.
- 15. Anahid Khoobyaar, July 2024
- 16. Gang Ding, November 2024

Postdoctoral Fellows and Research Associates

Alexey Rednikov, 1998-2005 Kenichi Ohsaka, 2000-2005 Anita Penkova 2009-2014. Presently, Research Assistant Professor, USC

FUNDED PROJECTS

Current Grants

1. "Mathematical Modeling and Analysis of Ocular Fluid Dynamics and Transport Phenomena for Retinal Drug Delivery,"

National Eye Institute/National Institutes of Health, 2016-2022 \$2,000,000. Role: Principal Investigator Other Investigators: Rex Moats, CHLA, PI; Anita Penkova, Co-I; Mark Humayun, Co-I, Scott Fraser, Co-I

 "Assessing Intravitreal Drug Distribution with an in Vitro Model of the Vitreous," Children's Hospital Los Angeles & Allergan, Inc., 2010-2018 Total funding through 2018: \$681,000. Role: Principal Investigator Co-PI: Anita Penkova

Past Research Grants:

3. "New Graduate Program Development in Nuclear Engineering, Delivered via USC Distance Education Network (DEN),"

US Nuclear Regulatory Commission, 2011-2014, \$200,000. Role: Principal Investigator

- 4. "Transmission into and Response of Not-So-Soft Tissue; Acoustic Streaming in Blood Flow and in Tissues Environments" 2007—date
 H.-K. Cheng Foundation (USC), (co-I, Kirk Shung, BME) \$20,000
- "Non-Intrusive Measurement of Thermophysical Properties of Liquids by Electrostatic-Acoustic Hybrid Levitation." Funding Agency: NASA, Microgravity Program Co-Investigator: Dr. Kenichi Ohsaka, JPL Amount Funded: \$485,000

Period: 2000-2004.

- "Ground-Based Studies of Internal Flows in Levitated Laser-Heated Drops" Funding Agency: NASA, Microgravity Program Co-Investigator: Dr. Eugene H. Trinh, JPL Amount Funded: \$555,000 Period: 1996-2000.
- "Ground-Based Studies of Thermocapillary Flows in Levitated Drops " Funding Agency: NASA, Microgravity Program Amount Funded: \$210,000 Period: 1993-96
- "Internal Flow of a Free Drop" (Space-Shuttle Glovebox Experiment) Funding Agency: NASA, Microgravity Program Co-Investigator: Dr. Eugene H. Trinh, JPL Amount Funded: \$283,000 (managed by JPL) Period: 1995-97.
- "Thermal Measurements and Analysis of Flows for Containerless Processing " Funding Agency: NASA, Microgravity Program Amount Funded: \$20,000 Award Periods: Summer 1990, 1991
- "Droplet Evaporation from Heated Surfaces: Analysis of Systems" Funding Agency: National Science Foundation Amount Funded: \$38,600 Award Period: 1988-90
- 11. "Heat Transfer and Fluid Dynamics of Multiphase Systems." Presidential Young Investigator Award

Funding Agency: National Science Foundation Amount Funded: \$170,000 Award Period: 1984-90 Other Funding of this Project: TRW Systems, Inc.: \$30,000 (1984-86) Ralph M. Parsons Foundation: \$10,000 (1984-85)

- "Thermoelectric Control and Analysis of Microelectronic Systems." Funding Agency: Charles Lee Powell Foundation Amount Funded: \$5,000 Award Period: 1987
- "Hydrodynamics and Thermodynamics of Multiphase Systems " Funded by: USC Faculty Research and Innovation Fund Amount Funded: \$ 16,500 Award Period: 1983-84.
- 14. "Laminar Condensation on a Droplet Translating in a Steam-Air Mixture" (with P. S. Ayyaswamy).
 Funding Agency: National Science Foundation
 Amount Funded: \$60,770
 Award Period: 1981-83
- 15. "A Theoretical Study of Dropwise Condensation" Funded by: University of Pennsylvania Fellowship Fund Amount Funded: \$2,000 Award Period: Summer 1979.

Conference Grants

- 16. "Interdisciplinary Transport Phenomena VII: NSF: \$16,000 Period: 2011-12
- 17. "Interdisciplinary Transport Phenomena VI: NSF: \$12,500 Period: 2009-10
- 18. "Interdisciplinary Transport Phenomena V: NSF: \$10,000 Period: 2007-08
- 19. "Interdisciplinary Transport Phenomena in Microgravity and Space Sciences IV," NASA: \$15,000
 NSF: \$10,000
 Period: 2005-06
- 20. "Microgravity Transport Processes in Fluid, Thermal, Materials, and Biological Sciences III," NASA: \$15,000 NSF: \$10,000 Period: 2003-04
- 21. "Microgravity Transport Processes in Fluid, Thermal, Materials, and Biological Sciences II," NASA: \$15,000
 NSF: \$10,000
 Period: 2001-02

Invited Keynote/Plenary Lectures

- 1. Donald Q. Kern Award Keynote Lecture, "Physicochemical Hydrodynamics of Drops and Bubbles with Surfactants," presented at the ASME Summer Heat Transfer Conference, Anaheim, July 16, 2024.
- Invited Plenary Lecture: "Drug Diffusion in Ocular Tissue: Mathematical Modelling and Experimentation," presented at the 26th International Conference of IAPS (online) on Advances in Differential Equations & Mathematical Modelling (IC-ADE-MM-2020), Jointly organized by School of Computational and Integrative Sciences, Jawaharlal Nehru University, New Delhi, India & International Academy of Physical Sciences (IAPS), December 18-20, 2020.
- 3. "Measurement of Thermophysical Properties of Highly Viscous Liquids by Non-Contact Methods Using Acoustic and Electrostatic Levitation," M.V. Krishna Murthy Distinguished Lecture, Sixth ISHMT-ASME Heat and Mass Transfer Conference, January 5-6, 2004, Kalpakkam India.
- 4. Non-Contact Measurement of Thermophysical of Liquids by Acoustic and Electrostatic Levitation," 4th ASME/JSME Joint Fluids Engineering Conference, July 6-11, 2003, Honolulu Hawaii.
- "Non-Contact Measurement of Thermophysical Properties of Liquids by Acoustic and Electrostatic Levitation," BSME-ASME International Conference on Thermal Engineering, 31 December 2001 -2 January 2002, Dhaka, Bangladesh. ISBN: 984-32-0029-0.
- "Transport Processes during Protein Crystal Growth Under Microgravity and Earth Gravity Conditions," in "Proceedings of the International Symposium on Recent Trends in Heat and Mass Transfer," S. Mishra & S.S. Sadhal, Editors, pages 57-80, Tata McGraw-Hill, ISBN: 0-07-047448-6, January 7-9, 2002, Indian Institute of Technology, Guwahati, India
- 7. "Acoustically Levitated Drops," presented at the Summer School Lecture Series on Drops, Bubbles and Films," Universidad Internacional Menendez Pelayo, Santander, Spain, September 9--13, 1996.

Other Invited Lectures

- 1. "Non-intrusive theromphysical property measurement by acoustic and electrostatic levitation of liquids," Ninth International Balkan Conference on Applied Physics, Constanta, Romania, July 7-9, 2008.
- 2. Invited Speaker for 6 Lectures on Acoustic Streaming at "Ultrasound Standing Wave Action on Suspensions and Biosuspensions in Micro- and Macrofluidic Devices," at International Centre for Mechanical Sciences, Udine, Italy, June 7-11, 2010.

Invited Seminars

- 1. "Condensation and Evaporation of Drops on Solid Surfaces: Effects of Solid Properties and Contact Angle" University of California, Berkeley, CA (April 22, 1980).
- 2. "Condensation and Evaporation of Drops on Solid Surfaces: Effects of Solid Properties and Contact Angle," Georgia Institute of Technology, Atlanta, GA (May 12, 1980).
- 3. "Condensation and Evaporation of Drops on Solid Surfaces: Effects of Solid Properties and Contact Angle," Purdue University, West Lafayette, IN (January 13, 1981)
- 4. "Condensation and Evaporation of Drops on Solid Surfaces: Effects of Solid Properties and Contact Angle," University of Toronto, Toronto, Canada (Feb. 2, 1981).
- 5. "Flow Past Drops and Bubbles Partially Coated with Thin Films," U.S Armament Research Command, Aberdeen Proving Ground, MD (June 18, 1982).
- "Flow Past Drops with Large Non-Uniform Radial Flow," Calif. Institute of Technology, Pasadena, CA (Dec. 12, 1983)
- 7. "Flow Past Drops with Large Non-Uniform Radial Flow," University of California, San Diego, CA (January 25, 1984).
- 8. "Thin Film Conductive Coatings for Surface Heating and Decontamination," U.S. Armament Research Command, Aberdeen Proving Ground, MD (November 29, 1984).
- 9. "Fluid Dynamics and Stability Analysis of Compound Drops and Bubbles," Department of Mechanical Engineering, Washington State University, Pullman, WA (December 2, 1987).
- 10. "Fluid Dynamics and Stability Analysis of Compound Drops and Bubbles," D.A.M.T.P., University of Cambridge (November 4, 1988).

- 11. "Fluid Dynamics and Stability Analysis of Compound Drops and Bubbles," Mathematics Institute, Oxford University (November 7, 1988).
- 12. "Fluid Dynamics and Stability Analysis of Compound Drops and Bubbles," Department of Mathematics, University College, London (March 20, 1989).
- 13. "Solid-Liquid Thermal Interaction During Phase Change at a Wall," Department of Mechanical & Aerospace Engineering, University of California, Irvine, CA (February 9, 1990).
- 14. "Phase Change Problems at Solid Surfaces: Effect of Solid Properties and Contact Angle," Idaho National Engineering Laboratory, Idaho Falls, ID (May 10, 1990).
- 15. "Thermal Analysis of Droplet Spray Evaporation from a Heated Solid Surface," Department of Mechanical Engineering, The Johns Hopkins University, Baltimore, MD (April 9, 1992).
- 16. "Multiphase Flows: Spray Droplet Evaporation from a Heated Surfaces," Naval Ocean Systems Center, San Diego, CA (October 7, 1992).
- 17. "Boundary Conditions for Heat Transfer in Heterogeneous Media," U.C. Santa Barbara, October 31, 1994.
- "Perturbation Analysis of Acoustically Levitated Particles," University of Hong Kong, April 15, 1998.
- 19. Singular Perturbation Analysis of Acoustically Levitated Particles," University of California, Irvine, February 18, 1999.
- 20. "Singular Perturbation Analysis of Acoustically Levitated Particles," University of California, San Diego, April 21, 1999.
- 21. "Singular Perturbation Analysis and Experiments with Acoustically Levitated Particles," University of Twente, Enschede, The Netherlands, April 18, 2000.
- 22. "Theoretical Analysis and Experimentation with Acoustically Levitated Drops," University of Alberta, Edmonton, Canada, September 27, 2001.
- 23. "Non-Intrusive Techniques for Measuring Thermophysical Properties of Liquids using Acoustic and Electrostatic Levitation," Brookhaven National Laboratory, December 15, 2003.
- 25. "Singular Perturbation Analysis of Drops in Acoustic Levitation Fields," University of California, San Diego, April 21, 2008.
- 26. Invited Talk: "Acoustic Streaming with Drops, Bubbles and Particles: Singular Perturbation Analysis," Workshop on "Acoustic Streaming in Resonant Enclosures," University of Southampton, July 4, 2012.
- 27. "Measurement of Transport Parameters for Ocular Drug Delivery," University of California, San Diego, February 18, 2016.
- 28. "Singular Perturbation Analysis of Drops in Acoustic Levitation Fields," Department of Mechanical Engineering & Applied Mechanics, University of Pennsylvania, November 14, 2017.
- 29. "Diffusive Transport in the Vitreous Humor: Experimental and Analytical Studies," Invited Speaker at the Special Symposium in Honor of Dr. P.S. Ayyaswamy, University of Pennsylvania, February 9, 2018.
- 30. "Diffusive Transport in the Vitreous Humor for Ocular Drug Delivery," Presented at Tufts University, September 26, 2019,

PUBLICATIONS IN REFEREED JOURNALS

- 1. Sadhal, S.S. & Martin, W.W., "Heat Transfer through Drop Condensate using Differential Inequalities," *Int. J. Heat Mass Transfer* **20**: 1401-1407 (1977).
- 2. Martin W.W. & Sadhal, S.S.,"Bounds on the Transient Temperature Distribution due to a Buried Cylindrical Heat Source ", *Int. J. Heat Mass Transfer* **21**: 783-789 (1978)
- 3. Sadhal, S.S. & Plesset, M.S.,"Effect of Solid Properties and Contact Angle in Dropwise Condensation and Evaporation ", *Journal of Heat Transfer* **101**: 48-54 (1979).
- 4. Plesset, M.S. & Sadhal, S.S., "An Analytical Estimate of the Microlayer Thickness in Nucleate Boiling" *Journal of Heat Transfer* **101**: 180-183 (1979).
- 5. Sadhal, S.S., "Comments about Yang's Analysis on Droplets Evaporating from Solid Surfaces", *Letters Heat Mass Transfer* **6:** 149-155 (1979).

- 6. Sadhal, S.S., "Further Developments of Dropwise Condensation Theory -- Discussion," *J. Heat Transfer* **102:** 394 (1980).
- 7. Sadhal, S.S., "Transient Thermal Response of Two Solids in Contact over a Circular Disk," *Int. J. Heat Mass Transfer* **23**: 731-733 (1980).
- 8. Sadhal, S.S., "Transient Thermal Response Between Solids with Partially Contacting Interface," *Journal of Heat Transfer* **103**: 32-35 (1981).
- 9. Sadhal, S.S., "Explicit Solutions to a Class of Mixed Boundary Value Problems," *Int. J. Engrg. Sci.* **19**: 1077-1082 (1981).
- 10. Plesset, M.S, & Sadhal, S.S., "On the Stability of Bubbles in Liquid-Gas Solutions" (invited paper at the IUTAM Symposium, Pasadena, CA, June 15-19, 1981), *Appl Sci. Res.* **38:** 133-141 (1982).
- 11. Bau, H.H. & Sadhal, S.S., "Heat Losses from a Fluid Flowing in a Buried Pipe," *Int. J. Heat Mass Transfer* **25**: 1621-1629 (1982).
- 12. Sadhal, S.S.,"A Note on the Thermocapillary Migration of a Bubble Normal to a Plane Surface," *Journal of Colliod and Interface Science* **95:** 283-285 (1983).
- 13. Sadhal, S.S. & Johnson, R.E., "Stokes Flow Past Bubbles and Drops Partially Coated with Thin Films. Part 1: Stagnant Cap of Surfactant Film -- Exact Solution," *J. Fluid Mech.* **126**: 237--250 (1983).
- Johnson, R.E. & Sadhal, S.S., "Stokes Flow Past Bubbles and Drops Partially Coated with Thin Films. Part 2: Thin Films with Internal Circulation - a Perturbation Solution," *J. Fluid Mech.* 132: 295--318 (1983).
- 15. Sadhal, S.S. & Ayyaswamy, P.S., "Flow Past a Drop with a Large Non-Uniform Radial Velocity," *J. Fluid Mech.* **133:** 65--81 (1983).
- 16. Chung, J.N., Ayyaswamy, P.S. & Sadhal, S.S., "Laminar Condensation on a Moving Drop. Part 1: Singular Perturbation Technique," *J. Fluid Mech.* **139**: 105--130 (1984).
- 17. Chung, J.N., Ayyaswamy, P.S. & Sadhal, S.S., "Laminar Condensation on a Moving Drop. Part 2: Numerical Solutions," *J. Fluid Mech.***139:**131--144 (1984).
- 18. Sadhal, S.S. & Oguz, H.N., "Stokes Flow Past Compound Multiphase Drops: Cases of Completely Engulfed Drops/Bubbles," *J. Fluid Mech.***160**: 511--529 (1985).
- 19. Johnson, R.E. & Sadhal, S.S., "Fluid Mechanics of Compound Multiphase Drops and Bubbles," Invited Review Article, Annual Review of Fluid Mechanics **17:** 289--320 (1985).
- 20. Gogos, G., Sadhal, S.S., Ayyaswamy, P.S. & Sundararajana, "Thin-Flame Theory for the Combustion of a Moving Liquid Droplet," *J. Fluid Mech.***171:** 121--144 (1986).
- 21. Oguz, H.N. & Sadhal, S.S.,"Growth and Collapse of Translating Compound Drops: Analysis of Fluid Mechanics and Heat Transfer," *J. Fluid Mech.* **179:** 105--136 (1987).
- 22. Sadhal, S.S. & Johnson, R.E., "On the Deformation of Drops and Bubbles with Varying Interfacial Tension", *Chem. Engrg. Comm.* **46:** 97--109 (1986).
- 23. Oguz, H.N. & Sadhal, S.S., "Effects of Soluble and Insoluble Surfactants on the Motion of Drops," *J. Fluid Mech.* **194:** 563--579 (1988).
- 24. Oguz, H.N. & Sadhal, S.S., "Fluid Dynamics and Stability Analysis of a Compound Drop in an Electric Field," *Quart. J. Mech. Appl. Maths.* **42:** 65-83 (1989).
- 25. Wang, D.G., Sadhal, S.S. & Campbell, C.S., "Particle Rotation as a Heat Transfer Mechanism," *Int. J. Heat Mass Transfer* **32:** 1413 (1989).
- 26. Vuong, S.T. & Sadhal, S.S., "Growth and Translation of a Liquid-Vapour Compound Drop in a Second Liquid. Part 1: Fluid Mechanics," *J. Fluid Mech.* **209:** 617-637 (1989).
- 27. Vuong, S.T. & Sadhal, S.S. "Growth and Translation of a Liquid-Vapour Compound Drop in a Second Liquid. Part 2: Heat Transfer," *J. Fluid Mech.* **209:** 639-660 (1989).
- 28. Sadhal, S.S.,"Heat Transport to a Slowly Growing Bubble on a Solid Surface", *Quart. J.Mech. Appl. Maths.* **42:** 476-493 (1989).
- 29. Ayyaswamy, P.S., Sadhal, S.S. & Huang, L.J, "Effect of Internal Circulation on the Transport to a Moving Liquid Drop," *Int. Comm. Heat Mass Transfer* **17**: 689-702 (1990).
- Tio, K.-K. & Sadhal, S.S., "Analysis of Thermal Constriction Resistance with Adiabatic Circular Gaps," *J. Thermophysics Heat Transfer* 5: 550-559 (1991).
- 31. Tio, K.-K. & Sadhal, S.S., "Thermal Constriction Resistance: Effect of Boundary Conditions and Contact Geometries," *Int. J Heat Mass Transfer* **35:** 1533--1544 (1992).

- 32. Tio, K.-K. & Sadhal, S.S., "Thermal Analysis of Droplet Spray Evaporation from a Heated Surface," *J. Heat Transfer* **114**: 220--226 (1992).
- 33. Tio, K.-K. & Sadhal, S.S., "Droplet Evaporation from Heated Surfaces: Analysis of Multidrop Systems," *Int. J. Heat Mass Transfer* **35:** 1987--2004 (1992).
- 34. Das, A.K., & Sadhal, S.S., "Thermal Constriction Resistance: The Effect of Interstitial Fluid," *J. Heat Transfer* **114**: 1045--1048 (1992).
- 35. Sadhal, S.S., "Transient Heat Transfer from a Solid Sphere Translating at Low Reynolds Number: a Perturbation Solution at Low Peclet Number," *Heat and Mass Transfer* (formerly, Warme-und Stoffubertragung) **28:** 365--370 (1993).
- 36. Sadhal, S.S., "Solutions to a Class of Transport Problems with Radially Dominant Convection," J. Appl. Math. Physics (ZAMP) 44: 314--332 (1993).
- 37. Tio, K.-K. & Sadhal, S.S., "Boundary Conditions for Stokes Flow Near a Porous Membrane," *Appl. Sci. Res.* **52:** 1--20 (1994).
- 38. Sadhal, S.S., Trinh, E.H. & Wagner, P., "Unsteady Spot Heating of a Drop in a Microgravity Environment," *Microgravity Science and Technology* **9:** 80--85 (1997).
- 39. Das, A.K. & Sadhal, S.S., "A Note on the Evaluation of Thermal Constriction Resistance for Finite Thickness Gaps," *J. Heat Transfer* **119**: 177--180 (1997).
- 40. Das, A.K. & Sadhal, S.S. "Analytical Solution for Constriction Resistance with Interstitial Fluid in the Gap," *Heat and Mass Transfer* **34**: 111-119 (1998).
- 41. Zhao, H., Sadhal, S.S. & Trinh, E.H., "Singular Perturbation Analysis of an Acoustically Levitated Sphere: Flow About the Velocity Node," *J. Acoust. Soc. Am.* **106:** 589-595 (1999).
- 42. Zhao, H., Sadhal, S.S. & Trinh, E.H.,"Internal Circulation in a Drop in an Acoustic Field," *J. Acoust. Soc. Am.* **106**: 3289-3295 (1999).
- 43. Das, A.K. & Sadhal, S.S. "Thermal Constriction Resistance Between Two Solids for Random Distribution of Contacts," *Heat and Mass Transfer* **35:** 101-111 (1999).
- Ohsaka, K., Rednikov, A., Sadhal, S.S. & Trinh, E.H., "Noncontact technique for determining viscosity from the shape relaxation of ultrasonically levitated and initially elongated drops," *Rev. Sci. Instrum.*, 73: 2091-2096 (2002).
- 45. Ohsaka, K., Rednikov, A. and Sadhal, S. S. "Thermal diffusivity coefficient of glycerin determined on an acoustically levitated drop" *Ann. New York Acad. Sci.*, vol. **974:** 124-131 (2002)
- 46. Ohsaka, K., Sadhal, S.S. and Rednikov, A., "Thermocapillary Flow Induced by Laser-Heating of an Acoustically Levitated Flattened Glycerin Drop," *J. Heat Transfer*, **124**:599 (2002).
- 47. Rednikov, A., Riley, N. & Sadhal, S.S., "The Behaviour of a Levitated Particle in Orthogonal Acoustic Fields," *J. Fluid Mech.*, **486:** 1-20 (2003).
- 48. Ohsaka, K., Rednikov, A. & Sadhal, S.S., "Noncontact technique for determining the thermal diffusivity coefficient on acoustically levitated liquid drops," *Rev. Sci. Instrum*, **74:** 1107-1112 (2003).
- 49. Rednikov, A. and Sadhal, S.S., "Steady Streaming from an Oblate Spheroid due to Vibrations along its Axis," *J. Fluid Mech.* **499:** 345-380 (2004).
- 50. Sadhal, S.S., Rednikov, A.Y. & Ohsaka, K. "Shape Relaxation of a Liquid Drop in a Microgravity Environment," *Ann. New York Acad. Sci.*, **1027:** 447-463 (2004).
- Rednikov, A.Y., Zhao, H., Sadhal, S.S. & Trinh, E.H., "<u>Steady Streaming Around a Spherical Drop</u> <u>Displaced from the Velocity Antinode in an Acoustic Levitation Field</u>," *Q. J. Mech. Appl. Math.* 59: 377-397 (2006).
- 52. S.H. Lee, K. Ohsaka, A.Y. Rednikov & S.S. Sadhal, "Noncontact Thermophysical Property Measurement by Levitation of a Thin Liquid Disk," *Ann. New York Acad. Sci.*, **1077:** 75-95 (2006).
- 53. S.H. Lee, S.S. Sadhal & A.Y. Rednikov, "An analytical model for external streaming and heat transfer for a levitated flattened liquid drop," *J. Heat Transfer* **130**: 091602-1-8 (2008).
- 54. S.S. Sadhal, A.Y. Rednikov, and K. Ohsaka, "Non-intrusive theromphysical property measurement by acoustic and electrostatic levitation of liquids," *J. Optoelectronics and Adv. Materials* **10**(11): 2840 2853 (2008).
- 55. Channarong Asavatesanupap and S.S. Sadhal, "Transient dynamics of a rotating spherical liquid drop," *J. Engineering Mathematics* **64**:251–268 (2009)
- 56. Channarong Asavatesanupap and S.S. Sadhal, "Fluid dynamics of a particle with large vapor transport in Poiseuille flow," *Ann. New York Acad. Sci.***1161**: 268-276 (2009).

- 57. A.Y. Rednikov & S.S. Sadhal, "Acoustic/steady streaming from a motionless boundary and related phenomena: generalized treatment of inner streaming and examples, *J. Fluid Mech.* **667**: 426–462. (2011).
- 58. Hao-Kun Chu & S.S. Sadhal, "Fluid Flow Analysis of a Two-Dimensional Sessile Drop in Linear Shear Flow," *Int. J. of Transport Phenomena* **12**:199-210 (2011).
- 59. S.S. Sadhal, "Acoustofluidics 13: Analysis of Acoustic Streaming by Perturbation Methods," *Lab Chip*, **12**(13): 2292-2300 (2012). DOI: 10.1039/C2LC40202E [Invited review article].
- 60. S.S. Sadhal, "Acoustofluidics 15: Streaming with Sound Waves Interacting with Solid Particles," *Lab Chip*, **12**(15): 2600-2611 (2012). DOI: 10.1039/C2LC40243B
- 61. S.S. Sadhal, "Acoustofluidics 16: Acoustics streaming near liquid-gas interfaces: drops and bubbles," *Lab Chip*, **12**(16): 2771-2781 (2012). DOI: 10.1039/C2LC40283A
- 62. Leslie King, S.S. Sadhal, "Effect of surfactants on the growth and departure of bubbles from solid surfaces," *Heat Mass Transfer* **50**:373–382 (2014); DOI 10.1007/s00231-014-1293-5
- 63. Anita Penkova, Komsan Rattanakijsuntorn, S.S. Sadhal, Yang Tang, Rex Moats, Patrick M. Hughes, Michael R. Robinson, Susan S. Lee, "A technique for drug surrogate diffusion coefficient measurement by intravitreal injection," *Int. J. Heat Mass Transfer*, DOI:10.1016/j.ijheatmasstransfer.2013.11.002 [print version: vol **70**: 504–514 (2014)]
- 64. Dejuan Kong, Anita Penkova, S.S. Sadhal, "Oscillatory flow between two hemispheres for shearing protein solution," *ASME J. Fluids Engineering*, 2015. doi:10.1115/1.4030484. (presented at ASME International Mechanical Engineering Congress & Exposition, San Diego, 2013)
- 65. Dejuan Kong, Anita Penkova, S.S. Sadhal, "Oscillatory and streaming flow between two spheres due to combined oscillations *J. Fluid Mech.*, 826: 335–362. (2017). doi:10.1017/jfm.2017.449
- 66. K. Rattanakijsuntorn, A. Penkova and S. S. Sadhal, "Mass diffusion coefficient measurement for vitreous humor using FEM and MRI," *IOP Conf. Series: Materials Science and Engineering*, 297: 012024: 1-9, 2018.
- 67. Anita Penkova, Rex Moats, Mark Humayun, Scott Fraser & S.S. Sadhal, "Diffusive transport in the vitreous humor," invited review article, *ASME J. Heat Transfer* **141**(5): 050801-1-050801-11 (2019). https://doi.org/10.1115/1.4042297
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Reviewer for Scientific Journals

AIAA Journal ASME Journal of Fluids Engineering ASME Journal of Heat Transfer Journal of the Optical Society of America International Journal of Heat and Mass Transfer International Journal of Heat and Fluid Flow Numerical Heat Transfer Journal of Fluid Mechanics Physics of Fluids Heat and Mass Transfer

NSF Panelist: Presidential Young Investigator Program, 1992 *NASA Panelist*: Microgravity Fluid Science Applications Proposal Review.

Workshop Participation

JANNAF Workshop on Research Needs in Near Critical Phenomena, Irvine, CA, November 1989. NASA Workshop on Microgravity Science Applications, NASA Lewis, Cleveland, OH, August 7--9, 1990. NSF Thermal Sciences Workshop, Chicago, April 18-21, 1991. International Workshop on Boiling, Condensation and Two-Phase Flow Heat Transfer, January 11--12, 1994, Visakhapatnam, India

Academic Program External Reviewer,

MSME Program, University of Nevada, Las Vegas, November 1991 Graduate Program, Mechanical and Industrial Engineering, University of Toronto, 2008.

Service at USC
CIMES Co-Director (VSoE-Math) 2006-date
AME PhD Admissions Committee, 2023-date
TA Coordinator, AME Department, 2013-15, 2018-date
AME Curriculum Committee Chair, 2000-2005
AME Publications (poster, brochure and newsletter)
APT (Appointments, Promotions and Tenure) Committee, 1985-87 and 1993-95, 2006-08.
APT Committee Chairman, 1994-95.
Department Chairman, 1997-98
Acting Department Chairman, 1990-92, 1996.
Associate Chairman, 1992-97, 1998-2006
ME Graduate Affairs Committee Chairman 1992-97, 1998-2005
Graduate Recruitment and Enrollment Management Committee, 1991-94.
Curriculum Review Task Force, 1993-94

University Senate, 1984-85. ITV (Interactive Television Network) Review Committee, 1993-94 Academic Planning and Budget Advisory Committee, 1989-90 Seminar Coordinator (Mechanical Engineering), 1989-90, 2005

Professional Society Service (ASME)

ASME Student Chapter Faculty Advisor, University of Pennsylvania, 1979-1981. Region III Student Conference Host, University of Pennsylvania, 1979. Reviewer for Journal of Heat Transfer (1978 - date) Journal of Applied Mechanics (1978 - date) Journal of Fluids Engineering (1985 - date) ASME Winter Annual Meeting / IMECE (1979 - date) Heat Transfer in Energy Systems Committee (K-6) Member (1983 - date) Secretary (2001-2004) Chair (2004-2007) Poster Sessions Evaluation Committee, ASME Winter Annual Meeting, Atlanta, December 1991.

Technical Sessions Chair/Co-Chair

Direct Contact Heat Exchange Session, National Heat Transfer Conference, Denver, 1985. ASME/JSME Thermal Engineering Joint Conference, Honolulu, April 1987.
Sessions on Heat Transfer in Microgravity Systems, National Heat Transfer Conference, Atlanta , 1993. IMECE, Chicago, 1994. National Heat Transfer Conference, Portland, 1995. IMECE, San Francisco, 1995. IMECE, Atlanta, 1996. IMECE, Dallas, 1996. IMECE, Atlanta, 1997. IMECE, Anaheim, 1998. ASME-JSME Thermal Engineering Conference, San Diego, 1999. IMECE, Orlando, 2000.

Conference Chair/Co-Chair

Conference Chair: "Interdisciplinary Transport Phenomena VII: Fluid, Thermal, Biological, Materials and Space Sciences," Dresden, Germany, September 19-23, 2011.

Conference Chair: "Interdisciplinary Transport Phenomena VI: Fluid, Thermal, Biological, Materials and Space Sciences," Volterra, Tuscany, Italy, October 4-9, 2009.

Conference Chair: "Interdisciplinary Transport Phenomena V: Fluid, Thermal, Biological, and Materials Sciences," Bansko, Bulgaria, October 14-19, 2007.

Conference Chair: "ECI Interdisciplinary Transport Phenomena in Microgravity and Space Sciences IV," Tomar, Portugal, August 7-12, 2005.

Conference Chair: "ECI Microgravity Transport Processes in Fluid, Thermal, Materials, and Biological Sciences III," Davos Switzerland, September 14-19, 2003.

Conference Chair: "UEF Microgravity Transport Processes in Fluid, Thermal, Materials, and Biological Sciences II," Banff, Canada, September 29- October 5, 2001.

Conference Co-Chair: "Fifth ISHMT/ASME Heat and Mass Transfer Conference," Science City, Calcutta, India, January 3-5, 2002.