

Gareth H. McKinley
School of Engineering Professor of Teaching Innovation
Department of Mechanical Engineering, MIT

Education:

Ph.D. in Chemical Engineering, Massachusetts Inst. of Technology, Cambridge, MA. 1991
M. Eng. in Chemical Engineering, University of Cambridge, Cambridge, England. 1986
B.A. in Natural Sciences/Chemical Engineering, University of Cambridge, Cambridge, England, 1985

MIT Service:

14 years on the MIT faculty	
2008-present	Associate Head for Research, Department of Mechanical Engineering
2005-2008	Member of Mechanical Engineering Council & Area Head (Area 1; MMEC)
2004-2009	Director, MIT Program in Polymer Science and Technology (PPST)
2001-2008	Head, Hatsopoulos Microfluids Laboratory
2001-2005	Professor of Mechanical Engineering
1997-2001	Lord Associate Professor of Mechanical Engineering

Other Related Experience:

2002 Jan-July	Visiting Professor, Monash University & Distinguished Miegunyah Fellow, University of Melbourne, Melbourne Australia
1991-1995	Harvard University, Gordon McKay Assistant Professor of Engineering Sciences
1995-1997	Harvard University, John L. Loeb Associate Professor of the Natural Sciences
1996	Paul & Gabriella Rosenbaum Visiting Fellow, Isaac Newton Institute, U. Cambridge UK.

Consulting & Patents:

Consultant for Bridgestone/Firestone, W.R. Grace & Co., PPG Fiberglass, GE Research & Development, Proctor & Gamble, Nestlé S.A., ExtrudeHone Corp., Saltime Inc., ASM International, Minerals Technologies Inc., Instrumentation Laboratories, Cabot Corp., Schick Wilkinson Sword, T.A. Instruments, Warner-Lambert (now Pfizer), Daktari LLC, 24-M LLC.

US Patent # 5,588,509 *Splined Vibration Device Using ER Fluids* (w/ Bridgestone Corp.)

US Patent # 6,711,941 Braithwaite G, McKinley G.H., Spiegelberg S.H., *Apparatus and Methods for Measuring Extensional Rheological Properties of a Material* (w/ Cambridge Polymer Group).

U.S. Patent #6,852,772 Muratoglu, Orhun; Spiegelberg Stephen H.; McKinley, Gareth H.; *A High Modulus Crosslinked Polyethylene with Reduced Residual Free Radical Concentration Prepared Below the Melt*; (w/ Cambridge Polymer Group); continued by U.S. Patent #7,166,650

U.S. Patent # 7,896,019, S. Deshmukh, G. Bettin, G. H. McKinley, *Active Controlled Energy Absorber Using Responsive Fluids*.

Co-Founder and minority share-holder, *Cambridge Polymer Group*, July 1997-present

Professional Registration: None

Selected Principal Publications (last five years): Selected from 72 papers in 2006-2011.

Liff, S.M., Kumar, N. and McKinley, G.H., High Performance Elastomeric Nanocomposites via Solvent Exchange Processing, *Nat. Mat.*, (2007), **6**(1), 76 – 84.

Tuteja, A., Choi, W., Ma, M., Mabry, J.M., Mazzella, S.A., Rutledge, G.C., Cohen, R.E. and McKinley, G.H., Designing Superoleophobic Surfaces, *Science*, **318** (2007), 1618-1622.

Clasen, C., Bico, J., Entov, V.M. and McKinley, G.H., 'Gobbling Drops': The Jetting/Dripping Transition in Flows of Polymer Solutions, *J. Fluid Mech.*, **636**, (2009), 5-40.[†]

[†]Featured commentary by E. Villermaux, "Hesitant Nature", *JFM* **636**, pp. 1-4

Celli, J.P., Turner, B.S., Afdahl, N.H., Keates, S., Ghiran, I., Kelly, C., Ewoldt, R.H., McKinley, G.H., So, P., Erramilli, S. and Bansil, R., Helicobacter pylori moves through mucus by reducing mucin viscoelasticity, *Proc. Nat. Acad. Sci.*, **106**(34), (2009) 14321-14326.

Bhat, P., Appathurai, S., Harris, M.T., Pasquali, M., McKinley, G.H. and Basaran, O., Formation of Beads-on-a-String Structures during Breakup of Viscoelastic Filaments, *Nat. Phys.*, (2010) **6**(8), 625-631.

- Meuler, A.J., McKinley G.H. and Cohen, R.E. “Exploiting Topographical Texture to Impart Icephobicity”, *ACS Nano* **4**(12) 7048-7052, Dec. 2010.
- Hyun, K., Wilhelm, M., Klein, C.O., Cho, K.S., Nam, J.G., Ahn, K.H., Lee, S.J., Ewoldt, R.H. and McKinley, G.H., A Review of Nonlinear Oscillatory Shear Tests: Analysis and Application of Large Amplitude Oscillatory Shear (LAOS), *Rev. Poly. Sci.*, (2011), **36**, 1697–1753.
- Fardin, M.A., T.J. Ober, C. Gay, G. Grégoire, G.H. McKinley, and S. Lerouge, Criterion for purely elastic Taylor-Couette instability in the flows of shear-banding fluids, *Europhys Lett.*, **96** (2011), 44004.
- Erni, P., Varagnat, M., Clasen, C., Crest, J. and McKinley, G.H., Microrheometry of Sub-Nanoliter Biopolymer Samples; Non-Newtonian Flow Phenomena of Carnivorous Plant Mucilage. *Soft Matter*, (2011), **7**, 10889-10898.
- McKinley, G.H. and Renardy, M., Wolfgang von Ohnesorge, *Phys Fluids*. (2011), **23**, 127101.

Scientific & Professional Societies:

- Member, Society of Rheology (1991 – present)
- Member, British Society of Rheology (1991 – 2008)
- Associate Member, American Institute of Chemical Engineers (1991 – present)
- Materials Research Society (2009-present)
- American Society of Mechanical Engineers (2008-present)

Honors & Awards:

- Elected Fellow, *American Physical Society- Division of Fluid Dynamics*, 2007
- TA Instruments/*Society of Rheology Best Paper Award* Oct. 2007
- School of Engineering Professor of Teaching Innovation, 2006
- Class of 1960 Fellow*, Office of the Provost, MIT, May 2005
- Frenkiel Award*, APS Division of Fluid Dynamics, Nov. 2002
- Miegunyah Distinguished Fellow*, University of Melbourne, Jan.– June 2002
- Spira Award for Undergraduate Teaching*, Department of Mechanical Engineering, MIT April 2000
- Bose Award for Teaching Excellence*, School of Engineering, MIT May 2000

Institutional & Professional Service (last five years):

- Member of Technical Advisory Board for EPSRC Portfolio Partnership in Complex Fluids; Univ. of Wales, U.K., 2005-2008
- Member-at-Large, U.S. National Committee for Theoretical and Applied Mechanics (USNC/TAM) Nov. 2007-present
- Member of Executive Committee, *Society for Engineering Sciences*; June 2006 - Dec. 2008
- Associate Editor, *J. Fluid Mechanics*; Jan. 2006 – Dec. 2008
- Member of APS Fluid Dynamics Prize Committee; Spring 2007 - Spring 2009
- Member of SES Awards Subcommittee, *Society for Engineering Science (SES)*; 2006 – 2008
- Member-at-Large, U.S. National Committee for Theoretical and Applied Mechanics (USNC/TAM); Nov. 2007-present
- Symposium Organizer, *XIVth International Congress on Rheology*; Monterey CA, August 2008
- Member of the International Advisory Committee, *Vth Pacific Rim Congress on Rheology*, Sapporo, Japan; Aug. 2010
- Scientific Advisory Committee; *Biological & Pharmaceutical Complex Fluids: New Trends in Characterizing Microstructure, Interactions & Properties*; Tomar Portugal, 2012
- Executive Editor, *J. Non-Newt. Fluid Mech.* Jan. 2001 – Dec. 2009.
- Editorial Boards, *Applied Rheology*; *Rheologica Acta*, *J. Rheology*, *J. Non-Newt. Fluid Mech.* Ongoing
- Society of Rheology Executive Committee, Member at Large 2012-2013.

Professional Development Activities (last five years):

- Golden Gate Polymer Forum; 2 Day Short Course in Complex Fluids, Palo Alto, CA. June 2011.
- AIP Industrial Rheology Forum, Cleveland, OH Oct. 2011.