

## **Randy H. Ewoldt, Ph.D.**

Associate Professor | Department of Mechanical Science & Engineering (MechSE)

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### **Education and Professional Preparation**

|                                       |   |                        |
|---------------------------------------|---|------------------------|
| Iowa State University                 | Mechanical Engineering  | B.S., 2004             |
| Massachusetts Institute of Technology | Mechanical Engineering  | S.M., 2006             |
| Massachusetts Institute of Technology | Mechanical Engineering  | Ph.D., 2009            |
| University of Minnesota – Twin Cities | Institute for Math. and its Apps.<br>& Dept. Chem. Engr. and Matl. Sci. | Post-Doc,<br>2009-2011 |

### ***Graduate and Postdoctoral Advisors***

Ph.D./S.M.: Gareth McKinley & Anette “Peko” Hosoi (MIT)

Post-Doctoral: Christopher Macosko (Minnesota)

### **Professional Appointments & Experience**

|                             |                       |
|-----------------------------|-----------------------|
| Associate Professor, UIUC   | Aug. 2017 – Present   |
| Guest Professor, ETH Zürich | Jan. 2018 – June 2018 |
| Assistant Professor, UIUC   | Aug. 2011 – Aug. 2017 |

### **Research Awards (selected)**

Presidential Early Career Award for Science and Engineering (PECASE), 2017

*The highest honor bestowed by the United States government on outstanding scientists and engineers in the early stages of their independent research careers. The White House, following recommendations from participating agencies, confers the awards annually.*

Arthur B. Metzner Early Career Award from The Society of Rheology, 2014

*International award given to one person each year that has distinguished him/herself in rheological research, rheological practice, or service to rheology*

DuPont Young Professor Award, 2014

NSF-CAREER Award, 2014

3M Nontenured Faculty Award, 2014

2013 Gold Medal from The American Society of Mechanical Engineers / Pi Tau Sigma

*National award given to one person each year for outstanding achievement in mechanical engineering within 10 years after graduation from an engineering curriculum*

Distinguished Young Rheologist Award, TA Instruments, 2013

Luis de Florez Award for Outstanding Ingenuity and Creativity, M.I.T., 2009

### **Teaching Awards**

Collins Award for Innovative Teaching, College of Engineering, UIUC, 2018

MechSE Alumni Two-Year Effective Teaching Award, UIUC, 2017

Rose Award for Teaching Excellence, College of Engineering, UIUC, 2015

Regularly in "List of Teachers Ranked As Excellent By Their Students", UIUC, 2012-present

**Publications (from 64 peer-reviewed journal articles, 1 book chapter, 1 patent)**

- [1] Nelson, A. Z., R. H. Ewoldt, "Design of yield-stress fluids: A rheology-to-structure inverse problem," **Soft Matter**, 13(41), 7578-7594 (2017)
- [2] Lee, Y. H., J. K. Schuh, R. H. Ewoldt, J. T. Allison, "Enhancing full-film lubrication performance via arbitrary surface texture design," **Journal of Mechanical Design**, 139(5), 053401 (2017). (2017 **Journal of Mechanical Design** Editors' Choice Award - Honorable Mention)
- [3] Blackwell, B. C., A. E. Nadhan, R.H. Ewoldt, "Impacts of yield-stress fluid drops on permeable meshes," **Journal of Non-Newtonian Fluid Mechanics**, 238, 107-114 (2016)
- [4] Ewoldt, R.H., M.T. Johnston, L.M. Caretta, "Experimental challenges of shear rheology: how to avoid bad data," in: S. Spagnolie (Editor), **Complex Fluids in Biological Systems**, Springer, pp 207-241 (2015)
- [5] Ewoldt, R.H., "Extremely soft: Design with rheologically-complex fluids," **Soft Robotics**, 1(1) (2014) (invited review for inaugural issue)
- [6] Ewoldt, R.H., N.A. Bharadwaj, "Low-dimensional intrinsic material functions for nonlinear viscoelasticity", **Rheologica Acta**, 52(3) 201-219 (2013)
- [7] Hyun, K., M. Wilhelm, C.O. Klein, K.S. Cho, J.G. Nam, K.H. Ahn, S.L. Lee, R.H. Ewoldt, and G.H. McKinley "A review of nonlinear oscillatory shear tests: Analysis and application of Large Amplitude Oscillatory Shear (LAOS)," **Progress in Polymer Science**, 36(12), 1697-1753 (2011) (most cited among all my publications)
- [8] Celli, J.P., B.S. Turner, N.H. Afdahl, S. Keates, I. Ghiran, C. Kelly, R.H. Ewoldt, G.H. McKinley, P. So, S. Erramilli, and R. Bansil, "Helicobacter pylori moves through mucus by reducing mucin viscoelasticity," **Proceedings of the National Academy of Sciences**, 106 (34) 14321-14326 (2009)
- [9] Ewoldt, R.H., A.E. Hosoi and G.H. McKinley, "New measures for characterizing nonlinear viscoelasticity in large amplitude oscillatory shear," **Journal of Rheology** 52(6), 1427-1458 (2008); (highest number of citations among all articles published in **Journal of Rheology** 1999-2018)

**Synergistic Activities**

- [1] *Industrially-relevant short courses on rheology*: Lecturer for rheology short courses for practicing users of rheology (Minneapolis, San Francisco, Boston, Belgium, Montreal).
- [2] *The Rheology Zoo*: Outreach and educational effort to encourage diversity and broad participation of underrepresented groups in engineering.
- [3] *School of Art+Design Collaborative teaching*: Collaborative teaching to use rheology as a disruptive technology in industrial design studio projects, and integrate design and creativity into a graduate-level course on non-Newtonian fluids and rheology.
- [4] *Software Development: MITlaos*, a fully-documented and free software to calculate rheological properties from data (requested by >200 corporate and academic groups worldwide)