Charles M. Schroeder III

James Economy Professor
Department of Materials Science and Engineering
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Affiliations

Department of Materials Science and Engineering
Department of Chemical & Biomolecular Engineering
Beckman Institute for Advanced Science and Technology (Full-time faculty)
Department of Chemistry, Affiliate
Department of Bioengineering, 0% appointment
Materials Research Lab (MRL), 0% appointment
Center for Biophysics and Quantitative Biology
Carl R. Woese Institute for Genomic Biology / Biosystems Design, Affiliate
University of Illinois at Urbana-Champaign, Urbana, IL

Research Interests

Soft matter dynamics, vesicles, single polymer dynamics, molecular rheology
Molecular electronics, bioelectronics
Materials discovery, automated synthesis

Education

Ph. D.	Chemical Engineering, **Stanford University**, Stanford, CA, 2005. Thesis title: *Investigating Polymer Physics with Single Molecule Experiments and Brownian Dynamics Simulations* Thesis advisors: Eric S. G. Shaqfeh and Steven Chu
M. S.	Chemical Engineering, **Stanford University**, Stanford, CA, 2001.
B. S.	Chemical Engineering, **Carnegie Mellon University**, Pittsburgh, PA, 1999. with University Honors

Professional Experience

8/21-present	James Economy Professor Department of Materials Science and Engineering Department of Chemical & Biomolecular Engineering Group Leader, AI for Materials Discovery (AIM), Beckman Institute **University of Illinois at Urbana-Champaign**, Urbana, IL, 61801
8/18-4/24	Co-Chair, Molecular Science and Engineering Theme Beckman Institute for Advanced Science and Technology **University of Illinois at Urbana-Champaign**, Urbana, IL, 61801
8/17-8/20	Professor and Ray and Beverly Mentzer Faculty Scholar Department of Chemical & Biomolecular Engineering **University of Illinois at Urbana-Champaign**, Urbana, IL, 61801

1/17-5/17	Visiting Associate, Division of Chemistry and Chemical Engineering **California Institute of Technology**, Pasadena, CA, 91125
8/14-8/17	Associate Professor, Department of Chemical & Biomolecular Engineering **University of Illinois at Urbana-Champaign**, Urbana, IL, 61801
8/08-8/14	Assistant Professor, Department of Chemical & Biomolecular Engineering **University of Illinois at Urbana-Champaign**, Urbana, IL, 61801
12/07-7/08	Postdoctoral Fellow, Department of Chemical Engineering **University of California, Berkeley**, Berkeley, CA, 94720
11/04-11/07	Postdoctoral Fellow, Department of Chemistry and Chemical Biology (Xie Group) **Harvard University**, Cambridge, MA 02138
3/00-11/04	Graduate Research Assistant, Department of Chemical Engineering **Stanford University**, Stanford, CA 94305
5/99-8/99	Research Engineer Intern, Chemical/Mechanical Polish, Fab 15 (Summer 1999) **Intel Corporation**, Portland, OR 97007
5/98-8/98	Research Engineer Intern, Photolithography, Fab 15 (Summer 1998) **Intel Corporation**, Portland, OR 97007
5/97-5/99	Research Assistant, Department of Chemical Engineering, Jhon/Tilton Groups **Carnegie Mellon University**, Pittsburgh, PA 15213

Honors and Awards

2023	Fellow, American Physical Society
2023	Fellow, Society of Rheology
2023	Vision and Spirit Award, Beckman Institute
2022	Fellow, American Association for the Advancement of Science (AAAS)
2021	James Economy Professor, University of Illinois at Urbana-Champaign
2020	List of Teachers Ranked as Excellent, University of Illinois, S'20
2019	Society of Rheology Publication Award
2019	Ray & Beverly Mentzer Professor, University of Illinois at Urbana-Champaign
2014	Beckman Fellow, Center for Advanced Study, University of Illinois
2013	Camille & Henry Dreyfus Teacher-Scholar Award
2013	Dean's Award for Excellence in Research, College of Engineering, University of Illinois
2013	NSF CAREER Award, National Science Foundation
2012	Arthur B. Metzner Early Career Award, Society of Rheology
2012	U.S. Frontiers of Engineering, National Academy of Engineering (FOE NAE)
2011	Packard Fellowship, David & Lucile Packard Foundation
2008	Tomorrow's PI, *Genome Technology* magazine
2008	List of Teachers Ranked as Excellent, University of Illinois, F'08, S'11
2006	NIH Pathway to Independence Award (K99/R00)
2005	Jane Coffin Childs Memorial Fund for Medical Research Postdoctoral Fellowship
2003	Gerald J. Lieberman Fellowship, Stanford University
1999	National Science Foundation (NSF) Graduate Fellowship
1999	Stanford Graduate Fellowship (SGF), Stanford University
1999	University Honors (equivalent to *summa cum laude*), Carnegie Mellon University
1998	Andrew Carnegie Scholar, Carnegie Mellon University
1998	Phi Kappa Phi Honor Society
1997	Donald F. Othmer Academic Excellence Award, AIChE

Publications

120. S. Jang, C. M. Schroeder, C. M. Evans, "Multiple Energy Dissipation Modes in Dynamic Polymer Networks with Neutral and Ionic Junctions", submitted (2024).

119. X. Liu, H. Yang, H. Harb, R. Samajdar, T. J. Woods, O. Lin, Q. Chen, A. I. B. Romo, J. Rodríguez-López, R. S. Assary, J. S. Moore, C. M. Schroeder, "Shape-persistent Molecules Exhibit Nanogap-independent Conductance in Single-molecule Junctions", submitted/in revision (2024). ChemRxiv: DOI: 10.26434/chemrxiv-2023-29v0h

118. N. H. Angello, D. M. Friday, C. Hwang, S. Yi, A. H. Cheng, T. C. Torres Flores, E. R. Jira, W. Wang, A. Aspuru-Guzik, M. D. Burke*, C. M. Schroeder*, Y. Diao*, N. E. Jackson*, "Closed-Loop Transfer Enables AI to Yield Chemical Knowledge", submitted/in revision (2024). ChemRxiv: DOI: 10.26434/chemrxiv-2023-jqbqt

117. R. Samajdar, M. Meigooni, H. Yang, J. Li, M. A. Mosquera, N. E. Jackson, E. Tajkhorshid, C. M. Schroeder*, "Secondary Structure Determines Electron Transport in Peptides", submitted/in revision (2024). bioRxiv: DOI: 10.1101/2024.02.18.578245

116. S. Chaudhary, S. S. Velankar, C. M. Schroeder, "Dynamics of Meniscus-Bound Particle Clusters in Extensional Flow", *Journal of Rheology*, 68, 397-413 (2024).

    This article was featured on the front cover of *Journal of Rheology*.

115. F. Kalutantirige, J. He, L. Yao, S. Cotty, S. Zhou, J. Smith, E. Tajkhorshid, C. M. Schroeder, J. S. Moore, H. An, X. Su, Y. Li, Q. Chen, "Beyond Nothingness: Formation and Functional Relevance of Voids in Polymer Films", *Nature Communications*, 15, 2852 (2024).

114. S. Kim and C. M. Schroeder, "Scaling Up Discovery", *Nature Synthesis* (2024). DOI: 10.1038/s44160-024-00498-5. News and Views Article.

113. I. Oh, M. Pence, N. Lukhanin, O. Rodriguez, C. M. Schroeder*, J. Rodriguez-Lopez*, "The Electrolab: An Open-Source, Modular Electrochemical Platform Using a Solution Handling Robot for Automated Characterization of Redox-Active Electrolytes", *Device*, 1, 100103 (2023).

112. S. Jang, E. Hernandez Alvarez, B. Jing, C. Shen, A. Schleife, C. M. Schroeder*, C. Evans*, "Control of Lithium Salt Partitioning, Coordination, and Solvation in Vitrimer Electrolytes", *Chemistry of Materials*, 35, 8039-8049 (2023).

111. Y. Tan*, J. Li*, S. Li, H. Yang, T. Chi, S. B. Shiring, K. Liu, B. M. Savoie, B. W. Boudouris*, C. M. Schroeder*, "Enhanced Electron Transport in Nonconjugated Radical Oligomers Occurs by Tunneling", *Nano Letters*, 23, 5951-5958 (2023).

110. S. Kim, C. M. Schroeder, N. E. Jackson, "Open Macromolecular Genome: Generative Design of Synthetically Accessible Polymers", *ACS Polymers Au*, 3, 318-330 (2023).

109. J. Li, B.-J. Peng, S. Li, D. P. Tabor, L. Fang*, C. M. Schroeder*, "Ladder-type Conjugated Molecules as Robust Multi-state Single-Molecule Switches", *Chem*, 9, 1-16 (2023).

108. M. Q. Tu, O. Davydovich, B. Mei, P. K. Singh, G. S. Grest, K. S. Schweizer, T. C. O'Connor, C. M. Schroeder, "Intermolecular Interactions Drive Unexpected Slow Relaxation Dynamics in Pure Ring Polymers", *ACS Polymers Au*, 3, 307-317 (2023).

107. M. Q. Tu, H. V. Nguyen, M. I. Jacobs, C. M. Schroeder, "3D Manipulation of Colloidal Particles and Droplets in 3D Flows using Automated Flow Control", *Journal of Rheology*, 67, 877-890 (2023).

106. P. Banerjee, G. R. Burks, S. B. Bialik, M. Nassr, E. Bello, M. Alleyne, B. D. Freeman, J. E. Barrick, C. M. Schroeder, D. J. Milliron, "Nanostructure-derived Anti-reflectivity in Leafhopper Brochosomes", *Advanced Photonics Research*, 2200343 (2023).

105. S. Qu, Zihao Ou, Y. Savsatli, L. Yao, Y. Cao, E. C. Montoto, H. Yu, J. Hui, B. Li, J. A. N. T. Soares, L. Kisley, B. Bailey, E. A. Murphy, J. Liu, C. M. Evans, C. M. Schroeder, J. Rodríguez-López, J. S. Moore, Q. Chen, P. V. Braun, "Visualizing Energy Transfer Between Redox-Active Colloids", submitted, arXiv (2023). DOI: arXiv:2204.00195

104. M. Pence, O. Rodríguez, N. Lukhanin, C. M. Schroeder, J. Rodríguez-López, "Automated Measurement of Electrogenerated Redox Species Degradation Using Multiplexed Interdigitated Electrode Arrays", *ACS Measurement Science Au*, 3, 62-72 (2023).

103. G. R. Burks, L. Yao, F. Kalutantirige, K. Gray, E. Bello, S. Rajagopalan, S. Bialik, J. Barrick, M. Alleyne, Q. Chen, C. M. Schroeder, "Electron Tomography and Machine Learning for Understanding the Highly Ordered Structure of Leafhopper Brochosomes", *Biomacromolecules*, 24, 190-200 (2023).

102. H. Yu, F. Kalutantirige, L. Yao, C. M. Schroeder, Q. Chen, J. S. Moore, "Self-Assembly of Repetitive Segment and Random Segment Polymer Architectures", *ACS Macro Letters*, 11, 1366-1372 (2022).

101. N. H. Angello, V. Rathore, W. Beker, A. Wolos, E. R. Jira, R. Roszak, T. C. Wu, C. M. Schroeder, A. Aspuru-Guzik, B. A. Grzybowski, M. D. Burke, "Closed-loop Optimization of General Reaction Conditions", *Science*, 378, 399-405 (2022).

    This article received broad news coverage: C&E News, Phys Org, EurekAlerts, ScienMag, Nanotechnology Now, Bioengineer.org, Nanowerk.

100. M. I. Jacobs, P. Bansal, D. Shukla, C. M. Schroeder, "Understanding Supramolecular Assembly of Supercharged Proteins", *ACS Central Science*, 8, 1350-1361 (2022).

    This article was featured on the back cover of *ACS Central Science*.

99. P. Singh, M. Pacholski, J. Gu, Y.-K. Go, G. Singhal, C. Leal, P. V. Braun, K. Patankar, R. Drumright, S. A. Rogers, C. M. Schroeder, "Designing Multicomponent Polymer Colloids for Self-stratifying Films", *Langmuir*, 38, 11160-11170 (2022).

98. P. Kafle, S. Huang, K. S. Park, F. Zhang, H. Yu, C. Kasprzak, H. Kim, C. M. Schroeder, A. van der Zande, Y. Diao, "Role of Interfacial Interactions in Graphene-Directed Assembly of Monolayer Conjugated Polymers", *Langmuir*, 38, 6984-6995 (2022).

97. H. Yu, J. Li, S. Li, Y. Liu, N. E. Jackson, J. S. Moore, C. M. Schroeder, "Efficient Intermolecular Charge Transport in pi-Stacked Pyridinium Dimers using Cucurbit[8]uril Supramolecular Complexes", *Journal of the American Chemical Society*, 144, 3162-3173 (2022).

96. C. Pan, S. K. Tabatabaei, S. M. H. Tabatabaei Yazdi, A. G. Hernandez, C. M. Schroeder*, O. Milenkovic*, "Rewritable Two-Dimensional DNA-Based Data Storage with Machine Learning Reconstruction", *Nature Communications*, 13, 2984 (2022).

95. S. Li, E. R. Jira, N. H. Angello, J. Li, H. Yu, J. S. Moore, Y. Diao, M. D. Burke, C. M. Schroeder, "Using Automated Synthesis to Understand the Role of Side Chains on Molecular Charge Transport", *Nature Communications*, 13, 2101 (2022).

94. S. K. Tabatabaei, B. Pham, C. Pan, J. Liu, S. Chandak, S. A. Shorkey, A. G. Hernandez, A. Aksimentiev, M. Chen, C. M. Schroeder*, O. Milenkovic*, "Expanding the Molecular Alphabet of DNA-Based Data Storage Systems with Neural Network Nanopore Readout Processing", *Nano Letters*, 22, 1905-1914 (2022).

    This article was covered in CNET, Phys Org, EurekAlerts, Science Daily, Electronics Weekly, Nanotechnology Now, Tech Times, Tech Register, Bioengineer.org, Nanowerk.

93. D. Kong, S. Banik, M. J. San Francisco, M. Lee, R. M. Robertson-Anderson, C. M. Schroeder, G. B. McKenna, "Rheology of Entangled Solutions of Ring-linear DNA Blends", *Macromolecules*, 55, 1205-1217 (2022).

92. A. Khandelwal, N. Athreya, M. Tu, L. Janavicius, Z. Yang, O. Milenkovic, J.-P. Leburton, C. M. Schroeder, X. Li, "Self-Assembled Microtubular Electrodes for On-Chip Low-Voltage Electrophoretic Manipulation of Charged Particles and Macromolecules", *Microsystems & Nanoengineering*, 8, 22 (2022).

91. Y. Zhou, F. Latinwo, C. M. Schroeder, "Crooks Fluctuation Theorem for Single Polymer Dynamics in Time-dependent Flows: Understanding Viscoelastic Hysteresis", *Entropy*, 24, 27 (2022).

    This article was invited as part of a special issue organized by Prof. Antony Beris.

90. M. I. Jacobs, E. R. Jira, C. M. Schroeder, "Understanding How Coacervates Drive Reversible Small Molecule Reactions to Promote Molecular Complexity", *Langmuir*, 37, 14323-14335 (2021).

89. D. Kumar and C. M. Schroeder, "Nonlinear Transient and Steady-state Stretching of Deflated Vesicles in Flow", *Langmuir*, 37, 13976-13984 (2021).

88. J. Li, S. Pudar, H. Yu, S. Li, J. S. Moore, J. Rodríguez-López, N. E. Jackson, C. M. Schroeder, "Reversible Switching of Molecular Conductance in Viologens is Controlled by the Electrochemical Environment", *Journal of Physical Chemistry C*, 125, 21862-21872 (2021).

87. S. Li, H. Yu, J. Li, N. Angello, E. R. Jira, B. Li, M. D. Burke, J. S. Moore, C. M. Schroeder, "Transition between Non-resonant and Resonant Charge Transport in Molecular Junctions", *Nano Letters*, 21, 8340-8347 (2021).

86. C. Lin, D. Kumar, C. Richter, S. Wang, C. M. Schroeder, V. Narsimhan, "Vesicle Dynamics in Large Amplitude Oscillatory Extensional Flow", *Journal of Fluid Mechanics*, 929 (2021).

85. Y. Zhou, C. D. Young, K. E. Regan, M. Lee, S. Banik, D. Kong, G. B. McKenna, R. M. Robertson-Anderson, C. E. Sing, C. M. Schroeder, "Dynamics and Rheology of Ring-Linear Blend Semidilute Solutions in Extensional Flow: Single Molecule Experiments", *Journal of Rheology*, 65, 729-744 (2021).

84. C. D. Young, Y. Zhou, C. M. Schroeder, C. E. Sing, "Dynamics and Rheology of Ring-Linear Blend Semidilute Solutions in Extensional Flow: Modeling and Molecular Simulations", *Journal of Rheology*, 65, 757-777 (2021).

83. S. Jain, S. Shukla, C. Yang, Y. Wang, X. Xiong, S. Abesteh, M. Lingamaneni, C. M. Schroeder, P. R. Selvin, H. Zhao, "TALEN Outperforms Cas9 in Editing Heterochromatin Target Sites", *Nature Communications*, 12, 606 (2021).

82. S. Patel, C. D. Young, C. E. Sing, C. M. Schroeder, "Non-monotonic Dependence of Comb Polymer Relaxation on Branch Density in Semi-dilute Solutions", *Physical Review Fluids*, 5, 121301R (2020).

81. M. Tu, M. Lee, R. M. Robertson-Anderson, C. M. Schroeder, "Direct Observation of Ring Polymer Dynamics in the Flow-Gradient Plane of Shear Flow", *Macromolecules*, 53, 9406-9419 (2020).

80. D. Mai and C. M. Schroeder, "Single Molecule Studies of Synthetic Polymers", *ACS Macro Letters*, **9**, 1332-1341 (2020).

79. S. Li, H. Yu, X. Chen, A. A. Gewirth, J. S. Moore, C. M. Schroeder, "Covalent Ag-C Bonding Contacts from Unprotected Terminal Acetylenes for Molecular Junctions", *Nano Letters*, **20**, 5490-5495 (2020).

78. D. Kumar, C. M. Richter, C. M. Schroeder, "Double-mode Relaxation of Highly Deformed Vesicles", *Physical Review E*, **102**, 010605R (2020).

77. E. R. Jira, K. Shmilovich, T. S. Kale, A. Ferguson, J. D. Tovar, C. M. Schroeder, "Effect of Core Oligomer Length on the Phase Behavior and Assembly of pi-conjugated Peptides", *ACS Applied Materials & Interfaces*, **12**, 20722-20732 (2020).

76. K. R. Peddireddy, M. Lee, C. M. Schroeder, R. M. Robertson-Anderson, "Viscoelastic Properties of Ring-linear DNA Blends Exhibit Non-monotonic Dependence on Blend Composition", *Physical Review Research*, **2**, 023213 (2020).

75. S. Li, J. Li, H. Yu, S. Pudar, B. Li, J. Rodríguez-Lopez, J. S. Moore, C. M. Schroeder, "Characterizing Intermolecular Interactions in Redox-active Pyridinium-based Molecular Junctions", *Journal of Electroanalytical Chemistry*, 85, 114070 (2020).

74. D. Kumar, A. Shenoy, J. C. Deutsch, C. M. Schroeder, "Automation and Flow Control for Particle Manipulation", *Current Opinion in Chemical Engineering*, **29**, 1-8 (2020).

73. H. Yu*, S. Li*, K. E. Schwieter, Y. Liu, B. Sun, J. S. Moore, C. M. Schroeder, "Charge Transport in Sequence-defined Conjugated Oligomers", *Journal of the American Chemical Society*, **142**, 4852-4861, (2020).

72. K. Peddireddy, M. Lee, Y. Zhou, S. Adalbert, C. M. Schroeder, R. Robertson-Anderson, "Unexpected Entanglement Dynamics in Semidilute Blends of Supercoiled and Ring DNA", *Soft Matter*, **16**, 152-161 (2020).

71. L. Cuculis*, C. Zhao*, Z. Abil, H. Zhao, D. Shukla*, C. M. Schroeder*, "Divalent Cations Enhance TALE DNA-Binding Specificity", *Nucleic Acids Research*, **48**, 1406-1422 (2020).

70. D. Kumar, C. M. Richter, C. M. Schroeder, "Conformational Dynamics and Phase Behavior of Lipid Vesicles in a Precisely Controlled Extensional Flow", *Soft Matter*, **16**, 337-347 (2020).

    This article was featured on the back cover of the January issue of *Soft Matter*. This article was also highlighted on Phys.Org, National Science Foundation social media and website, and the main University of Illinois webpage.

69. D. Kumar, A. Shenoy, S. Li, C. M. Schroeder, "Orientation Control and Nonlinear Trajectory Tracking of Colloidal Particles using Microfluidics", *Physical Review Fluids*, **4**, 114203 (2019).

68. A. Shenoy, D. Kumar, S. Hilgenfeldt, C. M. Schroeder, "Flow Topology During Multiplexed Particle Manipulation using a Stokes Trap", *Physical Review Applied*, **12**, 054010 (2019).

67. S. Li*, H. Yu*, K. E. Schwieter, K. Chen, B. Li, Y. Liu, J. S. Moore, C. M. Schroeder, "Charge Transport and Quantum Interference in Oxazole-Terminated Conjugated Oligomers", *Journal of the American Chemical Society*, **141**, 16079-16084 (2019).

66. L. Valverde, B. Li, C. M. Schroeder, W. Wilson, "In Situ Photophysical Characterization of π-conjugated Oligopeptides Assembled via Continuous Flow Processing", *Langmuir*, **35**, 10947-10957 (2019).

65. C. Boucher-Jacobs, B. Li, C. M. Schroeder, and D. Guironnet, "Solubility and Activity of a Phosphinosulfonate Palladium Catalyst in Water with Different Surfactants", *Polymer Chemistry*, **10**, 1988-1992 (2019).

64. Y. Zhou, K. W. Hsiao, K. E. Regan, D. Kong, G. B. McKenna, R. M. Robertson-Anderson, C. M. Schroeder, "Effect of Molecular Architecture on Ring Polymer Dynamics in Semidilute Linear Polymer Solutions", *Nature Communications*, **10**, 1753, DOI: 10.1038/s41467-019-09627 (2019).

63. B. Li, H. Yu, E. C. Montoto, Y. Liu, S. Li, K. Schwieter, J. Rodriquez-Lopez, J. S. Moore, C. M. Schroeder, "Intrachain Charge Transport through Conjugated Donor-Acceptor Oligomers", *ACS Applied Electronic Materials*, **1**, 7-12 (2019).

62. Y. Zhou and C. M. Schroeder, "Dynamically Heterogeneous Relaxation of Entangled Polymer Chains", *Physical Review Letters*, **120**, 267801 (2018).

    This work was covered in the press by several news articles (EurekAlert and Phys.org), and it was also featured on the main NSF Homepage.

61. S. Li and C. M. Schroeder, "Synthesis and Single Molecule Studies of Thermo-responsive DNA Copolymers", *ACS Macro Letters*, **7**, 281-286 (2018).

60. D. J. Mai, A. Sadaat, B. Khomami, C. M. Schroeder, "Stretching Dynamics of Single Comb Polymers in Extensional Flow", *Macromolecules*, **51**, 1507-1517 (2018).

59. C. M. Schroeder, "Single Polymer Dynamics for Molecular Rheology", *Journal of Rheology*, **62**, 371-403 (2018).

    This article was awarded the 2019 Publication Award from the Society of Rheology. The articles was the inaugural review article for the *Journal of Rheology* and appeared on the cover for the Jan-Feb 2018 issue.

58. S. Kumar, J. S. Katz, C. M. Schroeder, "Heterogeneous Drying and Non-monotonic Contact Angle Dynamics in Concentrated, Film-forming Latex Drops", *Physical Review Fluids*, **2**, 114304 (2017).

57. B. Li, L. R. Valverde, F. Zhang, Y. Zhou, S. Li, Y. Diao, W. L. Wilson, C. M. Schroeder, "Macroscopic Alignment and Assembly of π-conjugated Oligopeptides using Colloidal Microchannels", *ACS Applied Materials & Interfaces*, **9**, 41586-41593 (2017).

56. J. P. Berezney, A. B. Marciel, C. M. Schroeder, O. A. Saleh, "Scale-dependent Stiffness and Internal Tension of a Model Brush Polymer", *Physical Review Letters*, **116**, 127801 (2017).

55. K. W. Hsiao, J. Dinic, Y. Ren, V. Sharma, C. M. Schroeder, "Passive Non-linear Microrheology for Determining Extensional Viscosity", *Physics of Fluids*, **29** 121603 (2017).

54. Y. Zhou, B. Li, S. Li, H. A. M. Ardoena, W. L. Wilson, J. D. Tovar, C. M. Schroeder, "Concentration-Driven Assembly and Sol-Gel Transition π-Conjugated Oligopeptides", *ACS Central Science*, **3**, 986-994 (2017).

53. L. W. Cuculis and C. M. Schroeder, "Molecular Mechanisms for Genome Editing Proteins: Single Molecule Studies of TALEs and CRISPR/Cas9", *Annual Review of Chemical and Biomolecular Engineering*, **8**, 577-597 (2017).

52. B. Li, S. Li, Y. Zhou, H. A. M. Ardona, L. R. Valverde, W. L. Wilson, J. D. Tovar, C. M. Schroeder, "Non-equilibrium Self-assembly of pi-conjugated Oligopeptides in Solution", *ACS Applied Materials & Interfaces*, **9**, 3977-3984 (2017).

51. K. Hsiao, C. Sasmal, J. R. Prakash, C. M. Schroeder, "Direct Observation of DNA Dynamics in Semi-dilute Solutions in Extensional Flow", *Journal of Rheology*, **61**, 151-167 (2017).

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50. C. Sasmal, K. Hsiao, C. M. Schroeder, J. R. Prakash, "Parameter-free Prediction of DNA Dynamics in Planar Extensional Flow of Semi-dilute Solutions", *Journal of Rheology*, **61**, 169-186 (2017).

49. Y. Zhou and C. M. Schroeder, "Transient and Average Unsteady Dynamics of Single Polymers in Large-amplitude Oscillatory Extension", *Macromolecules*, **49**, 8018-8030 (2016).

48. D. J. Mai and C. M. Schroeder, "Single Polymer Dynamics of Topologically Complex DNA", *Current Opinion in Colloid and Interface Science*, **26**, 28-40 (2016).

47. Y. Zhou and C. M. Schroeder, "Single Polymer Dynamics Under Large Amplitude Oscillatory Extension", *Physical Review Fluids*, **1**, 053301 (2016).

46. L. W. Cuculis, Z. Abil, H. Zhao, C. M. Schroeder, "TALE Proteins Search DNA using a Rotationally Decoupled Mechanism", *Nature Chemical Biology*, **12**, 831-837 (2016).

    See also: Front cover commentary & News and Views, *Nature Chemical Biology*, October 2016.

45. C. M. Schroeder, S. Köster, Y. Huang, "Emerging Investigators 2016: Discovery Science Meets Technology", *Lab on a Chip*, **16**, 2974-2976 (2016).

44. A. Shenoy, C. V. Rao, C. M. Schroeder, "Stokes Trap for Multiplexed Particle Manipulation and Assembly Using Fluidics", *Proceedings of the National Academy of Sciences*, **113**, 3976-3981 (2016).

    News: This article was highlighted in the May 2016 issue of *Nature Physics* and other outlets.

43. K. Hsiao, C. M. Schroeder, C. E. Sing, "Ring Polymer Dynamics Are Governed by a Coupling between Architecture and Hydrodynamic Interactions", *Macromolecules*, **49**, 1961-1971 (2016).

42. D. T. Reilly, S. H. Kim, J. A. Katzenellenbogen, C. M. Schroeder, "Fluorescent Nanoconjugate Derivatives with Enhanced Photostability for Single Molecule Imaging", *Analytical Chemistry*, **87**, 11048-11057 (2015).

41. Y. Li, K. Hsiao, C.A. Brockman, D.Y. Yates, R.M. Robertson-Anderson, J.A. Kornfield, M.J. San Francisco, C. M. Schroeder, G. B. McKenna, "When Ends Meet: Circular DNA Stretches Differently in Elongational Flows", *Macromolecules*, **48**, 5997-6001 (2015).

40. X. Li, C. M. Schroeder, K. D. Dorfman, "Modeling the Stretching of Wormlike Chains in the Presence of Excluded Volume", *Soft Matter*, **11**, 5947-5954 (2015).

39. L. W. Cuculis, Z. Abil, H. Zhao, C. M. Schroeder, "Direct Observation of TALE Protein Dynamics Reveals a Two-state Search Mechanism", *Nature Communications*, **6**, 7277, DOI: 10.1038/ncomms8277 (2015).

38. R. Mohan, C. Sanpitakseree, A. V. Desai, S. E. Sevgen, C. M. Schroeder, P. J. A. Kenis, "A Microfluidic Approach to Study the Effect of Bacterial Interactions on Antimicrobial Susceptibility in Polymicrobial Cultures", *RSC Advances*, **5**, 35211-35223 (2015).

37. D. Mai, A. B. Marciel, C. E. Sing, C. M. Schroeder, "Topology-Controlled Relaxation Dynamics of Single Branched Polymers", *ACS Macro Letters*, **4**, 446-452 (2015).

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Patents

1. O. Milenkovic, N. Athreya, A. Khandelwal, J.-P. LeBurton, X. Li, C. M. Schroeder, K. Tabatabaei, B. Li, "On-Chip Nanoscale Storage System Using Chimeric DNA", United States Non-Provisional Patent, 19-1227-US, 16/593,450, Awarded 2023.

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Invited Lectures

102. C. M. Schroeder, "Ladder-type Molecules as Robust and Switchable Molecular Electronic Devices", 2024 ACS Spring Meeting, New Orleans, LA, April 2024.

101. C. M. Schroeder, "Automated Synthesis for Closed-Loop Discovery of Organic Light-Harvesting Molecules", 2024 ACS Spring Meeting, New Orleans, LA, April 2024.

100. C. M. Schroeder, "Electron Transport in Self-Assembled Peptides and Metalloproteins ", Dillon Medal Award Session (DPOLY), 2024 March APS Meeting, Minneapolis, MN, March 2024.

99. C. M. Schroeder, "Closed-loop Discovery of Photostable Light-harvesting Molecules", Department of Macromolecular Science & Engineering, Case Western University, February 2024.

98. C. M. Schroeder, "Understanding Lipid Vesicle Dynamics using a Stokes Trap", Department of Physics, University of Illinois at Urbana-Champaign, January 2024.

97. C. M. Schroeder, "Closed-loop Discovery of Photostable Light-harvesting Molecules", Department of Chemical and Biological Engineering, Princeton University, January 2024.

96. C. M. Schroeder, "Self-assembled Bioelectronics and Data-driven Discovery of Bioelectronic Materials", Army Center for Synthetic Biology (Predictive Design of Materials, PreMaDe), Austin, TX, January 2024.

95. C. M. Schroeder, "Closed-loop Discovery of Photostable Light-harvesting Molecules", Area 8A Plenary, American Institute of Chemical Engineers Annual Meeting, Orlando FL, November 2023.

94. C. M. Schroeder (speaker) and M. Q. Tu, "Unexpected Slow Relaxation Dynamics of Pure Ring Polymers", CECAM Workshop on Ring Polymers, Prato, Italy, June 2023.

93. C. M. Schroeder, "Unexpected Slow Relaxation of Pure High MW Ring Polymers", Institute for Non-Newtonian Fluid Mechanics (INNFM), British Society of Rheology, Lake Vyrnwy, Wales, UK, April 2023.

92. C. M. Schroeder, "Single Polymer Dynamics in 3D Flows", Dillon Medal Award Session (DPOLY), 2023 March APS Meeting, Las Vegas, NV, March 2023.

91. C. M. Schroeder, "Non-equilibrium Dynamics of Ring Polymers using Single Molecule Techniques", 2023 March APS Meeting, Las Vegas, NV, March 2023.

90. C. M. Schroeder, "Non-equilibrium Dynamics of Lipid Vesicles in Precisely Controlled Flows", Department of Chemical & Biological Engineering, Northwestern University, March 2023.

89. C. M. Schroeder, "Single Polymer Dynamics for Molecular Rheology: Unexpected Behavior of Rings", Department of Chemical & Biomolecular Engineering, University of Delaware, December 2022.

88. C. M. Schroeder, "Dynamics of Vesicles and Membranes in Non-equilbrium Flows using a Stokes Trap", Department of Materials Science and Engineering, Drexel University, September 2022.

87. C. M. Schroeder, "Dynamics of Ring Polymers in Dilute and Concentrated Solutions", Plenary Talk, International Symposium on Applied Rheology, May 2022.

86. C. M. Schroeder, Oliver Martinez-Rodriquez, Joaquin Rodriquez-Lopez, Michael Pence, Hung Nguyen, Edward Jira, Inkyu Oh, "The ElectroLab: an integrated platform for high-throughput characterization of redox-active materials", Invited Talk, Materials Research Society, May 2022.

85. C. M. Schroeder, "Single Polymer Dynamics for Molecular Rheology: Dynamics of Rings in Dilute and Concentrated Solutions", Chemical, Materials, and Biological Engineering, University of Oklahoma, April 2022.

84. C. M. Schroeder, "Molecular Electronics: Understanding Charge Transport in Sequence-defined Materials using Automated Chemical Synthesis", Department of Chemical Engineering, University of California-Irvine, October 2021.

83. C. M. Schroeder, "Non-equilibrium Dynamics of Vesicles in Flow using a Stokes Trap", Keynote Talk, Society of Rheology Annual Meeting, October 2021.

82. C. M. Schroeder, "Molecular Electronics: Understanding Charge Transport in Sequence-defined Materials using Automated Chemical Synthesis", Department of Chemical Engineering, Penn State University, September 2021.

81. C. M. Schroeder (speaker), Olgica Milenkovic, "Expanding the Molecular Alphabet of DNA Data Storage Systems with Nanopore Readouts", NSF SemiSynbio Virtual Workshop, August 2021.

80. C. M. Schroeder, "Understanding Charge Transport at Electrode Interfaces using Single Molecule Techniques", Materials Research Society (MRS Spring Meeting), April 2021.

79. C. M. Schroeder, "Single Polymer Dynamics for Molecular Rheology: Rings, Branches, and Entanglements", School of Polymer Science and Engineering, University of Akron, Akron, OH, February 2021.

78. C. M. Schroeder, "Automated Flow Control for Colloidal and Molecular Rheology", Keynote Lecture, British Society of Rheology, Mid-Winter Meeting, January 2021.

77. C. M. Schroeder, "Single Polymer Dynamics for Molecular Rheology: Rings, Branches, and Entanglements", Plenary Lecture, International Congress on Rheology (ICR), Rio de Janeiro, Brazil, December 2020. (Virtual)

76. C. M. Schroeder, "Watching the Molecular Dance of Rings and Branched Polymers using Single Molecule Imaging", Platinum Seminar, Monash University, Melbourne, Australia (virtual), November 2020.

75. C. M. Schroeder, "Single Polymer Dynamics and Molecular Rheology of Ring Polymers", Department of Polymer Engineering, University of Akron, Akron, OH, March 2020. Canceled due to COVID.

74. C. M. Schroeder, "Single Polymer Dynamics and Molecular Rheology of Ring Polymers", Department of Chemical Engineering, University of Oklahoma, Norman, OK, March 2020. Canceled due to COVID.

73. C. M. Schroeder, "Self-assembly and Single Molecule Charge Transport in Conjugated Organic Materials", Department of Chemical and Biomolecular Engineering, University of California-Los Angeles, Los Angeles, CA, September 2019.

72. C. M. Schroeder, "Self-assembly and Single Molecule Charge Transport in Conjugated Organic Materials", Department of Chemical Engineering, University of Illinois at Chicago, Chicago, IL, September 2019.

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70. C. M. Schroeder, "Non-equilibrium Dynamics of Vesicles in Flow using a Stokes Trap", Future Faculty Workshop, Princeton University, Princeton, NJ, August 2019.

69. C. M. Schroeder, "Dynamic Heterogeneity in Ring-Linear Polymers Revealed by Single Molecule Techniques", SoftComp Workshop, Capri Workshop on Polymers in Fast Flows, Capri, Italy, July 2019.

68. C. M. Schroeder, "Recent Advances in Ring Polymer Dynamics: Development of New Chemistries for Pure Ring Systems", Telluride Science Research Conference, Polymer Physics, Telluride, CO, July 2019.

67. C. M. Schroeder, "Self-assembly and Single Molecule Electronics of pi-conjugated Peptides", Department of Chemical and Biomolecular Engineering, University of Delaware, Newark, DE, May 2019.

66. C. M. Schroeder, "Non-equilibrium Dynamics of Vesicles in Precisely Controlled Flows using a Stokes Trap", Institute of Non-Newtonian Fluid Mechanics, Lake Vyrnwy, Wales, April 2019.

65. C. M. Schroeder, "Optically and Electronically Active Self-assembled pi-conjugated Peptides", American Physical Society, APS March Meeting, DPOLY, Boston, MA, March 2019.

64. C. M. Schroeder, "Dynamic Heterogeneity in Single Polymer Dynamics and TALE Protein Search on DNA", Department of Physics, McGill University, Montreal, Canada, November 2018.

63. C. M. Schroeder, "Design and Engineering of Materials for Bioorganic Electronics: Supramolecular Assembly and Single Molecule Charge Transport", School of Chemical Engineering, Purdue University, West Layfayette, IN, November 2018.

62. C. M. Schroeder (speaker), X. Li, J.-P. Leburton, O. Milenkovic, "An On-Chip Nanoscale Storage System Using Chimeric DNA", SemiSynBio Meeting, NSF/SRC, Alexandria, VA, November 2018.

61. C. M. Schroeder, "Design and Engineering of Biohybrid Materials for Organic Electronics: From Supramolecular Assembly to Single Molecule Charge Transport", AIChE Area 22BA Plenary Talk, Bionanotechnology, American Institute of Chemical Engineers Annual Meeting, Pittsburgh, October, 2018.

60. C. M. Schroeder (with R. Priestly, J. Kalow, M. El-Jeffries), "The Interview and Negotiation Process", Future Faculty Workshop: Developing Diverse Leaders for Tomorrow, University of Delaware, July 2018.

59. C. M. Schroeder, "Direct Observation of TALE Protein Dynamics on DNA: Non-specific Search and Specific Binding", Department of Molecular Biology, Microbiology, and Biochemistry, Southern Illinois University-Carbondale, March 2018.

58. C. M. Schroeder, "Single Polymer Dynamics of Architecturally Complex Materials: Combs, Rings, Entanglements, Oh My!", Gordon Research Conference on Colloids, Macromolecular, and Polyelectrolyte Solutions, Ventura, CA, February 2018.

57. C. M. Schroeder, "Direct Observation of TALE(N) Protein Dynamics on DNA", International Workshop on Protein-DNA Interactions: From Biophysics to Cancer Biology, Rice University, December 2017.

56. C. M. Schroeder, "Single Polymer Dynamics of Architecturally Complex Materials: Combs, Entanglements, and Self-Assembly", Department of Chemical Engineering, University of Texas at Austin, October, 2017.

55. C. M. Schroeder, "Single Polymer Dynamics in Semi-dilute Unentangled Solutions: From Molecular Conformation to Normal Stress", Department of Chemical Engineering, University of California-Santa Barbara, May 2017.

54. C. M. Schroeder, "Stokes Trap: Applications to Colloids, Vesicles, and Single Polymer Dynamics", Center for Interdisciplinary Research on Fluids, University of California-Santa Barbara, May 2017.

53. C. M. Schroeder, "Single Polymer Dynamics of Comb, Ring, and Entangled Polymers", Plenary Talk, Institute of Non-Newtonian Fluid Mechanics, Lake Vyrnwy, Wales, April 2017.

52. C. M. Schroeder, "Single Polymer Dynamics and Applications of the Stokes Trap", Department of Mechanical Engineering (Fluids Group), University of Liverpool, April 2017.

51. C. M. Schroeder, "Directed Assembly and Microrheology of Synthetic π-conjugated Oligopeptides", Keynote Talk, Annual European Rheology Conference, Copenhagen, Denmark, April 2017.

50. C. M. Schroeder, "Single Polymer Dynamics of Comb, Ring, and Entangled Polymers", March Meeting 2017, American Physical Society, New Orleans, LA, March 2017.

49. C. M. Schroeder, "A Molecular View of Soft Matter Dynamics", Packard Fellows Annual Meeting, Monterey, CA, September 2016.

48. C. M. Schroeder, "Single Polymer Dynamics in Large Amplitude Oscillatory Extension", 2016 International Congress on Rheology, Kyoto, Japan, August 2016.

47. C. M. Schroeder, "Single Molecule Studies of Topologically Complex Polymers", Department of Chemical & Biochemical Engineering, Missouri University of Science & Technology, March 2016.

46. C. M. Schroeder, "Single Molecule Studies of Topologically Complex Polymers", Department of Physics, University of Ottawa, Ontario, Canada, February 2016.

45. C. M. Schroeder, "Stokes Trap: Multiplexed Particle Manipulation and Assembly using Fluidics", Department of Mechanical Engineering, TU Eindhoven, Eindhoven, Netherlands, January 2016.

44. C. M. Schroeder, "Single Molecule Studies of Topologically Complex Polymers", Materials Science & Technology, University of Crete, Crete, Greece, January 2016.

43. C. M. Schroeder, "Single Molecule Studies of Topologically Complex Polymers", School of Engineering, Brown University, Providence, RI, November 2015.

42. C. M. Schroeder, "Stokes Trap: Multiplexed Trapping of Particles and Molecules", Physics and Chemistry of Microfluidics, Gordon Research Conference, Mt. Snow, VT, June 2015.

41. C. M. Schroeder, "New Frontiers in Single Polymer Dynamics: Branched Polymers, Complex Topologies, and Semi-dilute Solutions", APS March Meeting, San Antonio, TX, March 5, 2015.

40. C. M. Schroeder, "New Frontiers in Single Polymer Dynamics and Fluidic-directed Assembly", Department of Chemical Engineering, CU Boulder, Boulder, CO, September 30, 2014.

39. C. M. Schroeder, "Non-equilibrium Work Relations for Polymer Dynamics", Keynote Lecture, 6th Pacific Rim Conference on Rheology, Melbourne, Australia, July 22, 2014.

38. C. M. Schroeder, "Non-equilibrium Work Relations for Polymer Physics: A Tutorial for Practical Use in Polymer Dynamics", Gordon Research Conference on Polymer Physics, South Hadley, MA, July 16, 2014.

37. C. M. Schroeder, "New Frontiers in Single Polymer Dynamics and Fluidic-directed Assembly of Soft Materials", Department of Chemical Engineering, Stanford University, April 10, 2014.

36. C. M. Schroeder, "New Frontiers in Single Polymer Dynamics and Microfluidic Assembly of Soft Materials", Department of Chemical Engineering, Rice University, Houston, TX, March 20, 2014.

35. C. M. Schroeder, "Advanced in Fluorescent Probes and Microfluidic Systems for Molecular Biophysics", Department of Biochemistry, University of Missouri, Columbia, MO, February 21, 2014.

34. C. M. Schroeder, "New Frontiers in Single Polymer Dynamics and Microfluidic Assembly of Soft Materials", Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, November 21, 2013.

33. C. M. Schroeder, "New Frontiers in Single Polymer Dynamics and Microfluidic Assembly of Soft Materials", Department of Chemical Engineering, University of Florida, Gainsville, FL, October 28, 2013.

32. C. M. Schroeder, "New Frontiers in Single Polymer Dynamics and Microfluidic Assembly of Soft Materials", Department of Chemical & Biomolecular Engineering, University of Pennsylvania, Philadelphia, PA, October 9, 2013.

31. C. M. Schroeder, "New Frontiers in Single Polymer Dynamics and Microfluidic Assembly of Soft Materials", Soft Materials Seminar, Department of Materials Science & Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, September 3, 2013.

30. C. M. Schroeder, "Advances in Molecular Probes and Microfluidic Systems for Molecular Biophysics", Center for Physics of Living Cells, Biophysics, University of Illinois at Urbana-Champaign, Urbana, IL, August 30, 2013.

29. C. M. Schroeder, "Advanced Molecular Probes for Super-resolution Imaging", Abbott Laboratories, Abbott Park, IL, June 14, 2013.

28. C. M. Schroeder, "New Frontiers in Single Polymer Dynamics and Molecular Probe Engineering for Super-resolution Imaging", Department of Chemical and Biomolecular Engineering, Cornell University, Ithaca, NY, February 25, 2013.

27. C. M. Schroeder, "New Directions in Single Polymer Dynamics: Hybrid Biomaterials, Microfluidic Trapping, and Molecular Rheology", Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, February 21, 2013.

26. C. M. Schroeder, "New Directions in Single Polymer Dynamics: Molecular Rheology, Hybrid Biomaterials, and Microfluidic Trapping", Metzner Award Lecture, Society of Rheology, 84th Annual Meeting, Pasadena, CA, February 14, 2013.

25. C. M. Schroeder, "New Directions in Single Polymer Dynamics: Hybrid Biomaterials, Microfluidic Trapping, and Molecular Rheology", Fluids Seminar Series, Department of Mechanical Science & Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, November 9, 2012.

24. C. M. Schroeder, "Single Cell Analysis via Microfluidic Trapping and Advances in Biological Imaging", Department of Agricultural & Biological Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, October 12, 2012.

23. C. M. Schroeder, "New Directions in Single Polymer Dynamics: Hybrid Biomaterials, Microfluidic Trapping, and Molecular Rheology", Department of Biomedical Engineering, Northwestern University, Evanston, IL, October 9, 2012.

22. C. M. Schroeder, "New Frontiers in Single Polymer Dynamics and Molecular Probe Engineering for Super-resolution Imaging", Department of Chemical Engineering, Caltech, Pasadena, CA, October 4, 2012.

21. C. M. Schroeder, "New Frontiers in Single Polymer Dynamics and Molecular Probe Engineering for Super-resolution Imaging", Department of Chemical Engineering, Stanford University, Stanford, CA, October 2, 2012.

20. C. M. Schroeder, "Molecular Engineering for Advanced Biological Imaging and Soft Materials Dynamics", Packard Fellows Meeting, David and Lucile Packard Foundation, Monterey, CA, September 6, 2012.

19. C. M. Schroeder, "A Molecular Engineering Approach to Biological Imaging: From Polymers to Fluorescent Proteins to New Fluorescent Probes", Department of Bioengineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, November 10, 2011.

18. C. M. Schroeder, "Single Cell & Single Molecule Studies in Engineering: From Polymer Dynamics to Biological Systems", Department of Chemical Engineering, Lehigh University, Bethlehem, Pennsylvania, March 16, 2011.

17. C. M. Schroeder, "Single Cell & Single Molecule Studies in Engineering: From Polymer Dynamics to Biological Systems", Department of Chemical & Biological Engineering, Northwestern University, Evanston, Illinois, January 13, 2011.

16. C. M. Schroeder, "Single Cell & Single Molecule Studies in Engineering: From Polymer Dynamics to Biological Systems", Department of Chemical Engineering, RPI, Troy, New York, November 17, 2010.

15. C. M. Schroeder, "Polymer Dynamics at the Single Molecule Level", Department of Mathematical Sciences and Department of Mechanical Engineering, New Jersey Institute of Technology, Newark, NJ, November 2, 2009.

14. C. M. Schroeder, "Single Molecule Studies of HIV-1 Reverse Transcriptase and Nucleic Acid Interactions", Department of Physics, Physics of Living Cells Seminar, University of Illinois at Urbana-Champaign, Urbana, IL, September 12, 2008.

13. C. M. Schroeder, "Single Molecule Studies of HIV-1 Reverse Transcriptase and Nucleic Acid Interactions", Department of Biochemistry, University of Illinois at Urbana-Champaign, Urbana, IL, August 29, 2008.

12. C. M. Schroeder, "Single Molecule Studies of Protein Collisions & HIV-1 Reverse Transcriptase", Department of Chemical and Biological Engineering, University of Wisconsin-Madison, September 4, 2007.

11. C. M. Schroeder, "Single Molecule Studies in Polymer Physics and Biology", Courant Institute of Mathematical Sciences, New York University, New York, NY, April 12, 2007.

10. C. M. Schroeder, "Single Molecule Studies of DNA Replication and Polymer Physics", Department of Chemical and Biological Engineering, University of Wisconsin-Madison, March 7, 2006.

9. C. M. Schroeder, "Single Molecule Studies of DNA Replication and Polymer Physics", Department of Chemical Engineering, University of Delaware, February 21, 2006.

8. C. M. Schroeder, "Single Molecule Studies of DNA Replication and Polymer Physics", Department of Chemical Engineering, University of Texas at Austin, February 14, 2006.

7. C. M. Schroeder, "Single Molecule Studies of DNA Replication and Polymer Physics", Department of Chemical Engineering, Princeton University, February 8, 2006.

6. C. M. Schroeder, "Single Molecule Studies of DNA Replication and Polymer Physics", Department of Chemical Engineering, University of California-Santa Barbara, February 2, 2006.

5. C. M. Schroeder, "Single Molecule Studies of DNA Replication", Department of Chemical Engineering, Stanford University, January 31, 2006.

4. C. M. Schroeder, "Single Molecule Studies of DNA Replication and Polymer Physics", Department of Chemical and Biomolecular Engineering, University of Illinois, Urbana-Champaign, January 26, 2006.

3. C. M. Schroeder, "Single Molecule Studies of DNA Replication and Polymer Physics", Department of Chemistry, Massachusetts Institute of Technology, January 9, 2006.

2. C. M. Schroeder (speaker), S. Chu, E. S. G. Shaqfeh, "DNA Manipulation at the Single Molecule Level", Applied Biosystems, Foster City, CA, September 2003.

1. C. M. Schroeder (speaker), E. S. G. Shaqfeh, S. Chu, "Configuration Hysteresis in Polymer Extension", Department Seminar, Department of Chemical Engineering, Stanford University, Stanford, CA, May 2003.

Symposia or Conference Proceedings

1. C. M. Schroeder, E. S. G. Shaqfeh, R. E. Teixeira, S. Chu,"Non-equilibrium Behavior of DNA Molecules in Flows of Dilute and Concentrated Solutions", Proceedings of the XIVth International Congress on Rheology, Edited by The Korean Society of Rheology, Seoul, Korea, August 2004.

2. B. R. Schudel, M. Tanyeri, C. M. Schroeder, P. J. A. Kenis, "Fluorescence Microscopy for Detection of Molecular Beacons in a Multiplexed Microfluidic Device", Miniaturized Systems for Chemistry and Life Sciences (MicroTAS), Jeju, Korea, November 2009.

3. C. M. Schroeder, C. A. Brockman, F. Latinwo, "New Directions in Single Polymer Dynamics: Designer Macromolecules and Jarzynski Analysis for Materials Properties", International Congress on Rheology, Lisbon, Portugal, August 2012.

4. C. M. Schroeder, D. J. Mai, Y. Zhou "Single Molecule Studies of Branched Polymers and Large Amplitude Oscillatory Extension (LAOE)", International Congress on Rheology, Kyoto, Japan, August 2016.

Professional Service (Leadership and Major Service, Off Campus)

1. Member, Advisory Board, Soft Matter Association of the Americas (SMAA) & liaison to APS DSOFT, 2023-present

2. Member, APS DPOLY Programming Committee, 2023-present

3. Member, Metzner Award Committee, Society of Rheology, 2022-2025

4. Meeting Co-Organizer, CECAM Workshop on Ring Polymers, Prato, Italy, June 2023

5. Technical Co-Chair (overall meeting), 2022 Annual Meeting of the Society of Rheology, Chicago, IL, October 2022

6. Faculty Mentor, Future Faculty Workshop in Soft Materials; University of Delaware 2018, Princeton 2019, University of Delaware 2022

7. Area Chair, Area 1J (Fluid Dynamics), American Institute of Chemical Engineers, 2018-2020

8. Organizer, Shaqfeh Symposium, Stanford University, August 2019

9. Area Co-Chair, Area 1J (Fluid Dynamics), American Institute of Chemical Engineers, 2016-2018

10. Member, Floor Planning Committee, Area 1J, American Institute of Chemical Engineers, 2012-2022

11. Meeting Programming Chair (MPC), Area 1J, American Institute of Chemical Engineers, AIChE Annual Meeting 2014

12. Membership Committee, Society of Rheology, 2013-2020

Professional Service (Editorship)

1. Guest Editor, *Journal of Rheology*, 2019-2023.

2. Member, Editorial Board, *Journal of Rheology*, 2022-present.

3. Member, Editorial Board, *Scientific Reports*, 2019-present.

4. Guest Editor, *Lab on a Chip*, 2016.

Present Professional Activities & Leadership (On Campus)

1. Associate Head, Department of Materials Science & Engineering

2. Group Leader, AI for Materials (AIM) Group, Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, 2022-present

3. Member, Executive Committee, Beckman Institute, University of Illinois at Urbana-Champaign, 2017-present

4. Chair, Awards Committee, Department of Materials Science & Engineering, University of Illinois at Urbana-Champaign

5. Member, Teaching Evaluation Committee, Department of Materials Science & Engineering, University of Illinois at Urbana-Champaign
6. Member, Awards Committee, Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign
7. Member, Advising Committee, Undergraduates, Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign

Past Professional Activities (On Campus)

1. Co-Chair, Molecular Science and Engineering (MSE) Theme, Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, 2018-2024
2. Member, Faculty Development Committee, Department of Materials Science & Engineering, University of Illinois at Urbana-Champaign, 2021-2023
3. Member, Faculty Search Committee, Department of Materials Science & Engineering, University of Illinois at Urbana-Champaign, 2022-2023
4. Chair, Faculty Advisory Committee, Department of Materials Science & Engineering, University of Illinois at Urbana-Champaign, 2022-2023
5. Chair, Faculty Search Committee, Department of Materials Science & Engineering, University of Illinois at Urbana-Champaign, 2021-2022
6. Group Leader, Molecular Design and Engineering (MDE) Group, Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, 2018-2022
7. Chair, Soft Materials Committee, Department of Materials Science & Engineering, University of Illinois at Urbana-Champaign, 2020-2022
8. Member, Curriculum Committee, Department of Materials Science & Engineering, University of Illinois at Urbana-Champaign, 2020-2021
9. Associate Head, Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, 2020
10. Associate Vice Chair, College of Engineering Executive Committee, University of Illinois at Urbana-Champaign, 2019
11. Reporting Officer, College of Engineering, University of Illinois at Urbana-Champaign, 2019
12. Member, Executive Committee, College of Engineering, University of Illinois at Urbana-Champaign, 2018-2020
13. Member, Awards Committee, College of Engineering, University of Illinois at Urbana-Champaign, 2017-2019
14. Member, Faculty Advisory Committee, Roy J. Carver Biotechnology Center, University of Illinois at Urbana-Champaign, 2015-2019
15. Member, Executive Committee, Center for Biophysics and Quantitative Biology, University of Illinois at Urbana-Champaign, 2015-2018
16. Engineering Faculty Leadership Forum, College of Engineering, University of Illinois at Urbana-Champaign, 2017-2018
17. Director of Graduate Admissions, Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, 2014-2016
18. Member, Graduate Affairs & Recruiting Committee, Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, 2008-2016

19. Member, Department Head Review Committee, Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, 2015-2016

20. Chair, Biophysics Qualifying Exam Committee, Center for Biophysics and Computational Biology, University of Illinois at Urbana-Champaign, 2014-2015; 2018-2019

21. Chair, Faculty Recruiting Committee, Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, Spring 2014

22. Member, Chancellor and Provost Committee on LGBTQ Concerns Committee, University of Illinois at Urbana-Champaign, 2014-2015, 2017-2018

23. Fellowship Coordinator, Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, 2008-2013

24. Member, Safety Committee, Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, 2008-2013

25. Member, SURGE/MERGE Advisory Committee, Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, 2008-2013

26. Member, Biophysics Qualifying Exam Committee, Center for Biophysics and Computational Biology, University of Illinois at Urbana-Champaign, 2010-2012

27. Member, Biophysics Courses & Curriculum Committee, Center for Biophysics and Computational Biology, University of Illinois at Urbana-Champaign, 2012-2013

28. Member, Department Head Search Committee, Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, 2010-2011

29. Member, Organizing Committee, Annual Workshop, Center for Nanoscale Science and Technology, University of Illinois at Urbana-Champaign, 2010

Professional Service (Session Chairs)

1. Session Chair, International Congress on Rheology (ICR), Rio de Janeiro, Brazil, December 2020. (Virtual).

2. Session Chair, "Microrheology and Microfluidics", Society of Rheology Annual Meeting, Denver, CO, October 2017.

3. Session Chair, "Biosensors, Bionanotechnology, and Bioelectronics", International Conference on Biomolecular Engineering, San Diego, CA, January 2017.

4. Session Chair, "Rheology and Dynamics of Complex Fluids", Workshop on New Aspects on Micro- and Macroscopic Flows in Soft Matter, Okinawa Institute of Science and Technology, Okinawa, Japan, August 2016.

5. Session Chair, "Micro and Nanofluidics", Society of Rheology Annual Meeting, Baltimore, MD, October 2015.

6. Discussion Leader, Gordon Research Conference on Macromolecular Materials, Ventura, CA, January 2015.

7. Session co-Chair, "Bio-Fluid Dynamics", American Institute of Chemical Engineers Annual Meeting, San Francisco, CA, November 2013.

8. Session Chair, "Rheology in Biological Systems", Society of Rheology Annual Meeting, Pasadena, CA, February 2013.

9. Poster Session Judge, Student/Postdoc Poster Session, American Institute of Chemical Engineers (Area 1J), Pittsburgh, PA, October 2012.

10. Session Chair, "Bio-Fluid Dynamics", American Institute of Chemical Engineers Annual Meeting, Pittsburgh, PA, October 2012.

11. Session Chair, "Bio-Fluid Dynamics", American Institute of Chemical Engineers Annual Meeting, Minneapolis, MN, October 2011.

12. Session Chair, "Non-Newtownian Flows and Nonlinear Hydrodynamics", American Institute of Chemical Engineers Annual Meeting, Salt Lake City, UT, November 2010.

13. Session Judge, Student/Postdoc Poster Session, Society of Rheology Annual Meeting, Santa Fe, NM, October 2010.

14. Discussion Leader, Gordon Research Conference on Colloids, Macromolecules and Polyelectrolytes, Ventura, CA, February 2010.

15. Session Chair, "Complex and Bio-Fluid Dynamics II", American Institute of Chemical Engineers Annual Meeting, Nashville, TN, November 2009.

16. Session Co-Chair, "Complex and Bio-Fluid Dynamics I", American Institute of Chemical Engineers Annual Meeting, Nashville, TN, November 2009.

17. Session Chair, "Energy & Sustainability", American Institute of Chemical Engineers Chicago Meeting, Chicago, IL, October 2009.

Professional Service (Reviewer)

1. Reviewer, Molecular Foundry, Lawrence Berkeley National Laboratory, 2012-2014

2. Reviewer, NASA, 2013

3. Reviewer, National Science Foundation, Spring 2009, Spring 2010, Fall 2010, Fall 2011, Spring 2012, Fall 2013, Spring 2015, Spring 2016, Spring 2018

4. Reviewer, Graduate Women in Science Fellowships, 2011

5. Reviewer, ACS Petroleum Research Fund, 2014, 2016, 2020, 2023

6. Reviewer, Wellcome Trust, 2016

7. Reviewer, Deutsche Forschungsgemeinschaft, 2016

8. Reviewer, Natural Sciences and Engineering Research Council of Canada, 2016

9. Reviewer, Swiss National Science Foundation, 2017

10. Reviewer, Department of Energy, 2018, 2022

11. Reviewer, Arnold O. Beckman Postdoctoral Fellowship, Arnold and Mabel Beckman Foundation, 2023

Professional Associations

1. American Institute of Chemical Engineers, 1995-present

2. Society of Rheology, 2001-present

3. Protein Society, 2005

4. American Association for the Advancement of Science (AAAS)

5. American Physical Society (DSOFT, DPOLY)

6. Materials Research Society (MRS)

Peer Review

Science, Nature, Physical Review Letters, Proceedings of the National Academy of the Sciences, Nature Structural & Molecular Biology, Journal of the American Chemical Society, Journal of Rheology, Physical Review E, Macromolecules, Soft Matter, Biophysical Journal, Biomacromolecules, Lab on a Chip, Nano Letters, Journal of Non-Newtownian Fluid Mechanics, Nanoscale, ACS Nano, Langmuir, IEEE Control Systems, ACS Catalysis, Bioconjugate Chemistry, Journal of Virological Methods, Biomedical Microdevices, Microfluidics and Nanofluidics, Sensors & Actuators: B. Chemical, PLoS Computational Biology, ACS Macro Letters, Analytical Chemistry, Biosystems Engineering, Journal of Biomedical Optics, Small, Advanced Healthcare Materials, Protein Science, BMC Systems Biology, Particle and Particle Systems Characterization, Analyst, Journal of Heat and Mass Transfer, Journal of Chemical Physics, Analytical Methods, FEBS Letters, Journal of Physical Chemistry, Molecular Biosystems, ACS Synthetic Biology, Advanced Materials, Journal of Polymer Science Part B: Polymer Physics, Physics of Fluids, Advanced Functional Materials, Biomicrofluidics, Rheological Acta, Physics Letters A, Colloids & Surfaces A, Physical Review X, Journal of Molecular Biology, and several other journals.

Teaching

1. Instructor, *Macromolecular Solids*, Course 455, Department of Materials Science & Engineering, University of Illinois. Spring 2021, Spring 2022, Spring 2023.
2. Co-organizer, *Soft Materials Seminar*, Department of Materials Science & Engineering, University of Illinois. Fall 2020, Spring 2021, Fall 2021, Spring 2022.
3. Instructor, *Microhydrodynamics of Soft Materials*, Course 598X, Department of Materials Science & Engineering, University of Illinois. Fall 2021, Fall 2023.
4. Instructor, *Dynamics of Complex Liquids*, Course 594cms, Department of Chemical & Biomolecular Engineering, University of Illinois. Spring 2018.
5. Instructor, *Fluid Dynamics*, Course 522, Department of Chemical & Biomolecular Engineering, University of Illinois. Spring 2014, Spring 2015, Spring 2019, Spring 2020.
6. Instructor, *Applied Mathematics in Chemical Engineering*, Course 521, Department of Chemical & Biomolecular Engineering, University of Illinois. Spring 2012, Fall 2012, Fall 2015, Fall 2017, Fall 2018, Fall 2020, Fall 2022
7. Instructor, *Polymer Science & Engineering*, Course 456/594, Department of Chemical & Biomolecular Engineering, University of Illinois. Fall 2008, Fall 2009, Fall 2010, Fall 2011, Spring 2013, Fall 2013.
8. Instructor, *Bioenergy & Biofuels Technology*, Course 494/594CMS, Department of Chemical & Biomolecular Engineering, University of Illinois. Spring 2010, Spring 2011.
9. Teaching Assistant, *Fluid Mechanics*, Course 120A, Department of Chemical Engineering, Stanford University. Winter 2001.
10. Teaching Assistant, *Microscale Transport*, Course 310A, Department of Chemical Engineering, Stanford University. Winter 2002.

Short Courses

1. C. M. Schroeder, with Anubhav Tripathi and Annie Colin, *Microfluidics and Applications*, Society of Rheology Annual Meeting, Pasadena, CA, February 2013.

Ph.D. Students Supervised

1. Christopher Brockman, Ph.D, ChBE, 2013, "Single Molecule Studies of Flexible Polymer Systems". Current position: Research Engineer, Intel, Portland OR.
2. Arnab Mukherjee, Ph.D., ChBE, 2014, "New Directions in Biological Imaging: Engineering, Characterization, and Discovery of LOV-based Fluorescent Proteins". Current position: Assistant Professor, Department of Chemical Engineering and Department of Biological Engineering, University of California-Santa Barbara.

3. Folarin Latinwo, Ph.D., ChBE, 2014, "Fluctuation Theorems and Work Relations for Single Polymer Rheology". Current position: Research Engineer, Synopsys. Prior: Postdoctoral Fellow, Princeton University (Debenedetti Group).

4. Eric Johnson-Chavarria, Ph.D., Biophysics, 2014, "Automated Hydrodynamic Trap for Single Cell Analysis in Free Solution". Current position: Program Director at National Institutes of Health, NIH/NCI.

5. Utsav Agrawal, Ph.D., ChBE, 2015, "Probing Surface Protein Patterning in Biological Systems using Fluorescence Nanoscopy". Current position: Research Engineer, Intel, Portland, OR.

6. Amanda Marciel, Ph.D., Biophysics, 2015, "Synthesis and Supramolecular Assembly of Biomimetic Polymers". Current position: Assistant Professor, Rice University, Department of Chemical and Biomolecular Engineering.

7. Daniel Reilly, Ph.D., ChBE, 2016, "Advances in Single Molecule Spectroscopy and Microscopy for Biological Imaging and Polymer Characterization". Current position: Research Engineer, AbbVie.

8. Luke Cuculis, Ph.D., Chemistry, 2016, "Single Molecule Investigation of Transcription Activator-like Effector Search Dynamics". Current position: Director, Strategy, The Hershey Company. Past position: Consultant, Boston Consulting Group (BCG).

9. Danielle Mai, Ph.D., ChBE, 2016, "Single Molecule Studies of Branched Polymer Dynamics". Current position: Assistant Professor, Department of Chemical Engineering, Stanford University.

10. Kai-Wen Hsiao, Ph.D. ChBE, 2017, "Single Polymer Dynamics in Semi-dilute Solutions: Linear and Ring Polymers", Current position: Assistant Professor, Department of Materials Science and Engineering, Texas A&M. Past positions: Postdoc, DeSimone Group, Stanford University; Research Engineer at Apple, Cupertino, CA.

11. Anish Shenoy, Ph.D., MechSE, 2017, "Development and Application of the Stokes Trap for Measurement of Interparticle Interactions", Current position: Senior Software Engineer, Google. Past position: Research Engineer at Intel, Portland, OR.

12. Yuecheng (Peter) Zhou, Ph.D., MatSE, 2019, "Single Molecule Studies of Polymers and Self-Assembling Materials: Effects of Chain Topology and Entanglements", Current position: Postdoctoral Fellow, Stanford University (Cui Group, Chemistry). Starting as Assistant Professor in the Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Fall 2024.

13. Songsong Li, Ph.D., MatSE, 2020, "Single Molecule Studies of Molecular Electronics and Biohybrid Materials", Current position: Postdoctoral Researcher, University of Chicago.

14. Shivani Patel, Ph.D., ChBE, 2020, "Single Molecule Studies of Branched Polymer Dynamics in Non-Dilute Solutions", Current position: Research Engineer, Intel, Portland OR.

15. Dinesh Kumar, Ph.D., ChBE, 2021, "Shape Dynamics of Anisotropic Lipid Vesicles using Automated Flow Control", Current position: Research Engineer at Dow.

16. Hao Yu, Ph.D., ChBE (co-advised with Jeff Moore), 2021 "Investigation of Sequence-Property Correlations in Precisely Defined Synthetic Macromolecules", Current position: Postdoctoral Fellow, University of California-Berkeley (Ting Xu).

17. Michael Tu, Ph.D., ChBE, 2022, "Ring Polymer Dynamics in Dilute and Concentrated Solutions with Advances in Automated Flow Control", Current position: Research Engineer, Intel, Portland OR.

18. Kasra Tabatabaei, Ph.D., Biophysics, 2022, "Next-Generation DNA-Based Data Recorders". Current position: Research Scientist at New England Biolabs, Ipswitch, MA.

19. Edward Jira, ChBE, 2022, "Automated Chemical Synthesis for Accelerated Discovery of Organic Electronic Materials". Current position: Research Scientist, Dow Chemical, TX.

20. Caroline Li, ChBE, 2023, "Single Molecule Studies of Charge Transport in Organic Redox-Active Materials". Current position: Research Scientist, 3M, Minneapolis, MN.
21. Jonathan Deutsch, Biophysics
22. Seungjoo Yi, MatSE
23. Hao (Alvin) Yang, MatSE
24. Hung Nguyen, MatSE
25. Seongon Jang, MatSE (co-advised with Chris Evans)
26. Seonghwan Kim, MatSE (co-advised with Nick Jackson)
27. Sagar Chaudhary, MechSE
28. Rajarshi (Reeju) Samajdar, ChBE
29. Brittany Prempin, Chemistry (co-advised with Jeff Moore)
30. Elli Williamson, Biophysics
31. Tiara Torres-Flores, ChBE (co-advised with Ying Diao)
32. Jitong Ren, ChBE
33. Eden (Yiding) Li, MatSE
34. Jason Wu, Chemistry (co-advised with Nick Jackson)

M.S. Students Supervised

1. Abiodun Oki, M.S., ChBE, 2014.
2. Sun Ju Kim, M.S., ChBE, 2010 "Single Molecule Force Extension Measurement on Semi-Flexible Biopolymers using Magnetic Tweezers". Current position: Research Engineer at Amore Pacific.
3. Kyle Trenshaw, M.S., ChBE, 2011, "Tuning DNA Binding and Gene Expression using Zinc Finger Proteins and Engineered Promoters". Current position: Educational Development Specialist, Center for Excellence in Teaching and Learning, Natural Sciences and Engineering, University of Rochester.
4. Jin Yu, M.S., MatSE, 2018.
5. Wei Ge, M.S. (3+2 Tsinghua Univ.), 2017-19

Postdoctoral Fellows & Research Associates Supervised

1. Melikhan Tanyeri, Ph.D. University of California-Davis, 9/2008-7/2013. Current position: Assistant Professor, Duquesne University, Department of Biomedical Engineering.
2. Younghoon Kim, Ph.D. University of Pennsylvania, 1/2009-6/2012. Current position: Staff Scientist, Genzyme.
3. Kejia Chen, Ph.D. University of Illinois at Urbana-Champaign, 10/2015-2/2017. Current position: Research Engineer at Google.
4. Subhalakshmi Kumar, Ph.D. University of Illinois at Urbana-Champaign, 11/2014-10/2017. Current position: Senior Research Engineer at Inprentus.
5. Bo Li, Ph.D. Georgia Tech, 7/2015-8/2020. Current position: Assistant Professor, Kennesaw State University.

6. Piyush Singh, Ph.D. University of Illinois at Urbana-Champaign, 5/2019-6/2022. Current position: Research Scientist, Dow Chemical, TX.
7. Michael Jacobs, Ph.D. University of California, Berkeley, 6/2019-7/2022. Current position: Assistant Professor, Department of Chemistry, Texas State University.
8. Saadia Chaudhry, Ph.D. Purdue University, 8/2021-4/2022. Current position: Eagleton Science and Policy Fellow, Rutgers University.
9. Gabriel Burks, Ph.D. Drexel University, 9/2020-2/2023. Current position: Assistant Professor, Department of Chemical and Biomolecular Engineering, University of Notre Dame.
10. Inkyu Oh, Ph.D University of Illinois at Urbana-Champaign, 8/2021-8/2023. Current position: Research Engineer, Caterpillar.

Undergraduate Students Supervised

1. Mikhil Ranka, ChBE, Spring 2009-Spring 2011, Senior Honors Thesis. Ph.D. MIT.
2. Natawan Sittipolkul, ChBE, Spring 2009-Spring 2011, Senior Honors Thesis
3. Nathan Yee, ChBE, Fall 2009-Spring 2011, Senior Honors Thesis. Ph.D. MIT.
4. Kevin Weyant, ChBE, Fall 2010-Spring 2014, Senior Honors Thesis. Ph.D. Cornell.
5. Joshua Walker, ChBE, Fall 2010-Spring 2013, Senior Honors Thesis. Ph.D. Cornell.
6. Dean Ferracane, ChBE, Fall 2010-Spring 2012, Senior Honors Thesis
7. Nicolette Iatropoulos, ChBE, Fall 2010-Fall 2011, Research project
8. Cassie Schneider, ChBE, Fall 2009-Spring 2011, Research project
9. Cameron Butler, ChBE, Fall 2010-Spring 2013, Research project
10. Parul Koul, MatSE, Fall 2010-Spring 2012, Research project
11. Patrick Corona, ChBE, Fall 2010-Fall 2014, Senior Honors Thesis. Ph.D. UCSB.
12. Anthony Abbonato, Chemistry, Fall 2012-Fall 2013, Research project
13. Joshua Moller, ChBE, Fall 2012-Spring 2015, Senior Honors Thesis. Ph.D. UChicago (IME).
14. Sarah Kuhl, ChBE, Fall 2012-Spring 2014, Research Project
15. Lily Chen, ChBE, Fall 2013-Spring 2015, Senior Honors Thesis
16. Matthew Fischer, ChBE, Fall 2013-Spring 2014, Research Project
17. Andrew Wegner, ChBE, Fall 2013-Spring 2016, Research Project
18. Elijah Karvalis, ChBE, Fall 2014-Fall 2015, Research Project. Ph.D. MIT.
19. Shuijing Liu, Fall 2015-Spring 2016, Research Project
20. Yi Ren, Fall 2015-Spring 2016, Research Project.
21. Zhiwei Zhang, Fall 2015-Spring 2016, Research Project
22. Zijie Wu, ChBE, Fall 2015-Fall 2017, Research Project. Ph.D. Univ. Delaware.
23. Eugene Yoon, ChBE, Fall 2017, Research Project
24. Channing Richter, ChBE, Fall 2017-Spring 2020. Ph.D Univ. Delaware.
25. Christopher Rudolphi, ChBE, Summer 2018-Spring 2020, Research Project

26. Aaron Merlin, ChBE, Summer 2018-2020, Research Project
27. Noah Hopkins, ChBE, Fall 2018-2020, Research Project
28. Luke (Shuai) Yu, ChBE/Physics, Spring 2019-2021, Research Project
29. Eddie Kosinsky, ChBE, 2019-2021, Research Project.
30. Kyle Gray, ChBE, 2021-2023, Research Project.
31. Nikita Lukhanin, MechSE, 2021-2023, Research Project.
32. Neil Moghe, ChBE, 2023-present, Research Project.
33. Timothy Njuguna, Physics, 2023-present, Research Project.

Current and Pending Funding

1. National Science Foundation (NSF), CBET
   NSF 2030537 / Schroeder (Co-PI; Lead Illinois PI) / 2020-2024
   - *Micromechanics of Meniscus-bound Particle Clusters*
   - $218,000 (total to Schroeder)
   - Co-PI: Charles Schroeder (Illinois); Co-PI: Sachin Velankar (UPitt)
2. Investment for Growth Initiative / University of Illinois at Urbana-Champaign
   UIUC-Campus (Provost) / Schroeder (co-PI) / 2019-2024
   - *Development of a Molecular Maker Lab*
   - $900,000 (total - equipment)
   - PI: Martin Burke (Illinois); Co-PI: Charles Schroeder (Illinois)
3. National Science Foundation / NSF Artificial Intelligence Institute (AI Institute)
   NSF 2019897 / Schroeder (Co-PI) / 2020-2025
   - *Molecule Maker Lab Institute (MMLI), an Artificial Intelligence Driven Ecosystem for NextGen Molecule Discovery and Manufacturing*
   - $800,000 (appx total to Schroeder)
   - Co-PIs: Approximately 12 co-PIs; Lead PI: Huimin Zhao (Illinois)
4. IBM-Illinois Discovery Accelerator Institute
   IBM / Schroeder (Co-PI) / 2023-2024
   - *A Multi-Task Foundation Model for Polymeric Materials Design via the Open Macromolecular Genome*
   - $110,000 (appx total)
   - Co-PIs: Nick Jackson (Illinois), Charles Schroeder (Illinois)
5. National Science Foundation / Growing Convergence Research (GCR)
   NSF 2121003 / Schroeder (Co-PI) / 2021-2026
   - *Synthetic Neurocomputers for Cognitive Information Processing*
   - $681,400 (total to Schroeder)
   - PI: Qing Cao (Illinois); Co-PIs: Charles Schroeder (Illinois), Hua Wang (Illinois), Kai Zhang (Illinois)
6. National Science Foundation (NSF) / Particulate and Multi-phase Processes
   NSF 2147560 / Schroeder (co-PI; lead Illinois PI) / 2022-2025
   - *Dynamics and Stability of Multi-Component Lipid Vesicles in Flow*
   - $250,542 (total to Schroeder)
   - Co-PIs: Charles Schroeder (Illinois), Vivek Narsimhan (Purdue)
7. Department of Energy (DOE) / BES
   DOE SC0022035 / Schroeder (Co-PI) / 2021-2024
   - *Multi-Metalloporphyrin Synthetic Polymers for Long-Range Charge Transport*
   - $375,000 (total to Schroeder)
   - PI: Jeff Moore (Illinois); Co-PIs: Charles Schroeder (Illinois), Qian Chen (Illinois), Emad Tajkhorshid (Illinois)

8. National Institutes of Health (NIH) / R01
NIH 1R01GM143723-01A1 / Schroeder (co-PI) / 2022-2027

    - *Endosomal Escape of Lipid-based Nanoparticles Comprising Gaussian Curvature Lipids*
    - $625,937 (total to Schroeder)
    - PI: Cecilia Leal (Illinois); Co-PIs: Charles Schroeder (Illinois), Markus DeSerno (CMU)

9. National Science Foundation (NSF) / SemiSynBio-III
NSF 2227399 / Schroeder (co-PI; Lead Illinois PI) / 2022-2025

    - *SemiSynBio-III: Precision assembly and electronic properties of protein nanowire circuits using DNA origami*
    - $500,000 (total to Schroeder)
    - PI: Andrew Ellington (UT Austin); Co-PIs: Charles Schroeder (Illinois), Yonggang Ke (Emory)

10. Army Research Office (ARO) / Center for Synthetic Biology
ARO W911NF-22-2-0246 / Schroeder (Co-PI) / 2022-2025

    - *The Army Synthetic Biology Center for Predictive Materials Design (PreMaDe)*
    - $1,500,000 (total to Schroeder & Shukla at Illinois)
    - Co-PIs: Approximately 12 Co-PIs; Lead PI: Michael Jewett (Stanford)

11. Department of Energy (DOE) / Earthshot Initiative
DOE / Schroeder (Co-PI) / 2021-2024

    - *Harnessing Electrostatics for the Conversion of Organics, Water and Air: Driving Redox on Particulate Liquids Earthshot (DROPLETS)*
    - $6,000,000 (total)
    - PI: Joaquin Rodriguez-Lopez (Illinois); Co-PIs: Charles Schroeder (Illinois) + 8 additional

12. National Science Foundation (NSF) / Major Research Instrumentation (MRI)
NSF MRI / Schroeder (PI) / 2023-2026

    - *MRI: Track 2: Acquisition of an Automated High-Throughput System for Combinatorial Design and Development of Complex Polymer Systems*
    - $3,600,000 (total)
    - PI: Charles Schroeder; Co-PIs: 18 co-PIs at Illinois

13. National Science Foundation (NSF) / Center for Chemical Innovation (CCI)
NSF CCI / Schroeder (co-PI) / 2024-2027 (PENDING)

    - *CCI Phase I: NSF Center for the Creation of Abiotic Replicating Materials and Assemblies (CARMA)*
    - $1,800,000 (total)
    - PI: Eric Anslyn (UT Austin); Co-PIs: Charles Schroeder (Illinois), Andrew Ellington (UT Austin), Emily Davidson (Princeton), Michael Webb (Princeton)

14. Department of Energy (DOE) / BES
DOE BES / Schroeder (Co-PI) / 2024-2027 (PENDING)

    - *Light-harvesting Liposomes for Photoelectrochemical Energy Conversion*
    - $1,800,000 (total)
    - PI: Jeff Moore (Illinois); Co-PIs: Charles Schroeder (Illinois), Qian Chen (Illinois), Cecilia Leal (Illinois), Emad Tajkhorshid (Illinois)

15. National Science Foundation (NSF) / Major Research Instrumentation (MRI)
NSF MRI / Schroeder (Co-PI) / 2024-2027 (PENDING)

- *MRI: Track 1: Acquisition of a Time of Flight Secondary Ion Mass Spectrometer with Tandem Mass Spectrometry Imaging and Depth Profiling Capabilities*
- $1,399,900 (total)
- PI: Mary Kraft; Co-PI: Charles Schroeder + many co-PIs at Illinois

Prior Funding (reverse chronological order)

1. Army Research Office (ARO), Multi-University Research Initiative (MURI)
   MURI-ARO / W911NF-16-1-0372 / Schroeder (Co-PI) / 2016-2023
   - *Engineering the Translation Apparatus for Synthesis of Electronically Active Sequence-defined Polymers*
   - $1,200,000 (appx total to Schroeder)
   - PI: Michael Jewett (Northwestern); Co-PIs: Charles Schroeder (Illinois), Jeff Moore (Illinois), Andrew Ellington (UT Austin), Eric Anslyn (UT Austin)
2. Dow Chemical Company / University Partnership Initiative
   Dow / UPI Project / Schroeder (PI) / 2019-2023
   - *Achieving a Fundamental Understanding of Self-Stratifying Coatings for Materials Design*
   - $427,000 (total to Schroeder)
   - PI: Charles Schroeder (Illinois); Co-PIs: Paul Braun (Illinois), Simon Rogers (Illinois), Charles Sing (Illinois)
3. Army Research Office (ARO), Multi-University Research Initiative (MURI)
   MURI / W911NF-20-10195 / Schroeder (Co-PI) / 2020-2024
   - *Endosymbiotic Control and Enhancement of Leafhopper Brochosomes*
   - $1,000,000 (total to Schroeder)
   - PI: Jeff Barrick (UT Austin); Co-PIs: Charles Schroeder (Illinois), Nancy Moran (UT Austin), Delia Milliron (UT Austin), Benny Freeman (UT Austin), Michael Jewett (Northwestern)
4. IBM-Illinois Discovery Accelerator Institute
   IBM / Schroeder (Co-PI) / 2021-2023
   - *Automation and AI for Organic and Polymeric Materials Discovery*
   - $225,000 (appx total)
   - Co-PIs: Nick Jackson (Illinois), Huimin Zhao (Illinois), Ying Diao (Illinois)
5. Department of Energy (DOE)
   DOE / JCESR / Schroeder (Co-PI) / 2018-2023
   - *Joint Center for Energy Storage Research (JCESR 2.0)*
   - $1,350,000 (appx total to Schroeder)
   - Co-PIs: Nearly 100 Co-PIs; Lead Illinois PI: Jeff Moore (Illinois)
6. Centre Européen de Calcul Atomique et Moléculaire (CECAM)
   CECAM / Schroeder (Co-PI) / 2020-2023
   - *Workshop on Ring Polymer Dynamics (Funds to plan and host workshop in Prato, Italy, June 2023)*
   - $26,704 (total)
   - Co-PIs: Charles Schroeder (Illinois), Burkhard Duenweg (Mainz), Ravi Prakash (Monash University)

7. Army Research Office (ARO) / MURI Add-on
   W911NF-16-1-0372/Sup / Schroeder (Co-PI) / 2018-2022
   - *Engineering the Translation Apparatus for Synthesis of Electronically Active Sequence-defined Polymers*
   - $450,000 (appx. total for multiple supplemental or add-on awards)
8. Sandia Academic Alliance (SAA) University Partnership
   Sandia SNL 2193959/AH652 / Schroeder (PI) / 2020-2021
   - *Understanding the Nonequilibrium Flow of Pure Ring Polymers Using New Recyclable Chemistries and Single-Molecule Techniques*
   - $121,000 (total to Schroeder)
   - Co-PI: Thomas OConnor (Sandia/CMU)
9. Department of Energy (DOE) / BES
   DOE DE-FG02-07ER46471 / Schroeder (Co-PI) / 2020-2021
   - *Programming Function via Soft Materials*
   - $100,000 (total to Schroeder)
   - Lead PI: Paul Braun (Illinois)
10. Defense Advanced Research Projects Agency (DARPA)
    DARPA / Schroeder (Co-PI) / 2019-2021
    - *Advanced Methods for DNA Data Storage and Computation*
    - $211,500 (total to Schroeder)
11. Applied Research Institute / University of Illinois at Urbana-Champaign
    No Number (UIUC / ARI) / Schroeder (PI) / 2019-2020
    - *Planning and Development of an NSF STC: Center for the Design and Engineering of Emergent Functional Materials*
    - $75,000 (total to team)
12. National Science Foundation / SemiSynBio-I / Semiconductor Research Corp (SRC)
    NSF 1807526 / Schroeder (Co-PI) / 2018-2021
    - *An On-chip Nanoscale Storage System based on Synthetically Modified Native DNA*
    - $500,000 (total to Schroeder)
13. National Science Foundation (NSF), MRSEC Seed Grant
    NSF 1720633 / Schroeder (PI, seed proposal) / 2018-2022
    - *MRSEC: Illinois Materials Research Center: Printed 2D Nanostructured Bioactive Electronics for Seamless Integration with Functional Biomaterial*
    - $90,000 (total)
    - Co-PI: Ying Diao; Lead MRSEC PI: Nadya Mason (Illinois)
14. National Science Foundation (NSF) / CBET
    NSF 1704668 / Schroeder (PI) / 2017-2021
    - *Direct Observation of Vesicle Dynamics, Collision, and Adhesion*
    - $300,000 (total to Schroeder)
15. National Science Foundation (NSF) / CBET
    NSF 1604038 / Schroeder (co-PI) / 2016-2020

- *Dynamics of Circular Macromolecules (DNA): From Single Molecule to Highly Entangled States*
- $175,000 (total to Schroeder)
- Co-PIs: Gregory McKenna (TTU), Rae Robertson-Anderson (University of San Diego)

16. Spirit Aerosystems
082208 / Schroeder (co-PI) / 2013-2015
    - $75,000 (total)
    - Gift funds for research

17. Camille and Henry Dreyfus Foundation / Camille Dreyfus Teacher-Scholar Award
Dreyfus Foundation / Schroeder (PI) / 2013-2016
    - *Template-Directed Synthesis of Sequence-Defined Polymers*
    - $75,000 (total to Schroeder)

18. Department of Energy (DOE) / BES
DOE 11292595 / Schroeder (Co-PI) / 2012-2015
    - *Directed Assembly of Bio-Inspired Supramolecular Materials for Transport and Energy Capture*
    - $400,000 (appx. total to Schroeder)

19. National Science Foundation (NSF) / CAREER Award / CBET, Fluid Dynamics
NSF 1254340 / Schroeder (PI) / 2012-2017
    - *CAREER: Molecular Rheology of Architecturally Complex Polymers*
    - $400,000 (total)

20. David and Lucile Packard Foundation, Packard Fellowship in Science and Engineering
Packard 2011-037158 / Schroeder (PI) / 2011-2016
    - *Ultra-Resolution Imaging of Dynamic Cell Processes Using Novel Photochemical Probes*
    - $875,000 (total to Schroeder)

21. Energy Biosciences Institute (EBI) / UC Berkeley
Energy Biosciences Institute (EBI) / OO7G19 / Schroeder (co-PI) / 2011-2012
    - *Discovery and Characterization of Hydrolytic Enzymes to Improve Biocatalysis and Conversion of Plant Cell Wall Polysaccharides to Biofuels*
    - $594,000 (total)
    - Lead PI: Isaac Cann

22. National Institutes of Health (NIH) / K99/R00 / Pathway to Independence Award
NIH R00 HG004183-03 / Schroeder (PI) / 2008-2011
    - *Single Molecule Technology for Genome-wide Association Studies*
    - $806,000 (total to Schroeder)

Contributed Presentations

Available upon request (2001-present)