NORMAN J. WAGNER

Alison Professor, University of Delaware
Unidel Robert L. Pigford Chair in Chemical and Biomolecular Engineering
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RESEARCH INTERESTS:
Manned space exploration. Rheology, neutron light and x-ray scattering, nanotechnology, thermodynamics and rheology of colloidal suspensions and self-assembled surfactant solutions, geopolymers, structured polymers, self-assembly in ionic liquids, rheo-optics, nonequilibrium statistical mechanics, parallel simulation of complex fluids and molecular transport phenomena.

EDUCATION:

Princeton University, Department of Chemical Engineering, 9-84 to 10-88
Degree: Ph.D., Advisor: Professor William B. Russel.
Thesis: "Nonequilibrium Statistical Mechanics of Concentrated Dispersions"
Proposition: "Analysis of Chemical Tracer Scavenging in the Oceans"

Carnegie Mellon University, Department of Chemical Engineering, 9-80 to 5-84
Degree: BS, Advisor: Professor E. I. Ko.
Thesis: "Strong Metal-Support Interactions in Heterogeneous Catalysis"

PROFESSIONAL EXPERIENCE:

- President, Society of Rheology (2018-2020)
- Joint Faculty, Biomedical Engineering, UD (2019-)
- Faculty Appointment, Biomechanics and Movement Science (BIOMS) Program, UD, (10/2015-)
- Unidel Robert L. Pigford Chair in Chemical & Biomolecular Engineering, 9/14-
- Affiliated Faculty, Department of Physics and Astronomy, UD, 9/14-
- Co-Founder, STF Technologies LLC, 6/2013.
- Chair, Department of Chemical and Biomolecular Engineering, UD 7/07-7/12
- Director, UD Center for Neutron Science, 9/07-present
- Alvin B. and Julia O. Stiles Named Professorship, 9/05-8/14
- Professor, UD, 5/99-9/05
- Visiting Scholar, TU Berlin Chemistry (2012), Physical Chemistry, Lund (2012)
- Visiting Scholar, Dept. of Physics, University of Rome, 6/04-12/04
- Center for Molecular and Engineering Thermodynamics, 5-95 to present
- Fulbright Senior Scholar, Guest Professor-Dept. of Physics, University of Konstanz, Konstanz, Germany (8/97-1/98)
- Guest Professor-Institute for Polymer Physics, Swiss Federal Institute of Technology (ETH), Zürich, Switzerland (1/97-6/97)
- Associate Professor, Department of Chemical Engineering, UD, 5-95 to 5-99
- Assistant Professor, Department of Chemical Engineering, UD, 1-91 to 5-95
- Collaborator, Los Alamos National Laboratory US Department of Energy, 9-86 to 9-93

- Director's Postdoc - Los Alamos National Laboratory, US Department of Energy, 1-90 to 12-90 Theoretical Chemistry and Molecular Physics, Advisor: Dr. Brad Lee Holian
- NATO Postdoctoral Fellow - Fakultät für Physik Universität Konstanz, Germany, 11-88 to 12-89 Mentor: Professor Dr. Rudolf Klein
- Los Alamos National Laboratory, US Department of Energy Grad Intern 6-85 to 8-85
- Pittsburgh Energy Technology Center, US Department of Energy Oak Ridge Associated University Graduate Research Program 6-84 to 8-85 Advisor: Dr. V. Rao
- Chemical Catalysis Laboratory, Carnegie Mellon University, 5-82 to 5-84

Foreign Languages: German, reading and conversation

HONORS, AWARDS AND FELLOWSHIPS:

- Alison Professorship, University of Delaware, 2020
- Sustained Research Prize, Neutron Scattering Society of America, 2018
- Neutron Scattering Society of America's Service Award, 2016
- Elected as Fellow of the National Academy of Inventors, 2015
- Elected to the National Academy of Engineering, 2015
- Fellow, American Association for the Advancement of Science, 2014
- Bingham Medal, Society of Rheology, 2014
- Fellow, Neutron Scattering Society of America, 2014
- AIChE Particle Technology Forum Thomas Baron Award in Fluid Particle Systems, 2013
- Dale Pearson Lectureship, UCSB, May, 2008.
- American Chemical Society Delaware Section Award, 2005.
- Paul A. Siple Memorial Award, 23rd Army Research Conf., Dec. 2002.
- Upper St. Clair HS Alumni Hall of Fame, Academics, 2002
- Robert W. Vaughan Lectureship, Cal. Inst. Tech., 1998
- Fulbright Senior Scholar Award, 1997
- DuPont Young Faculty Award 1995, 96, 97
- Delta Phi Alpha Honorary Member 1994
- Presidential Young Investigator Award 1991
- Director's Postdoctoral Fellowship, Los Alamos Nat. Lab., 1-90 to 12-90
- NATO/NSF Postdoctoral Fellowship, 11-88 to 12-89
- NSF Graduate Research Fellowship, 9-85 to 9-88
- DuPont Research Fellowship, 9-84 to 9-88
- Tau Beta PI, Lamda Sigma Society 1982
- James J. Kerrigan Scholarship, Merck Co., 9-80 to 5-84

PROFESSIONAL SOCIETIES:

- American Chemical Society
- American Physical Society
- Society of Rheology (former President)
- Materials Research Society
- American Institute of Chemical Engineers
- American Association for the Advancement of Science
- Neutron Scattering Society of America (Officer, Fellow)
- Delta Phi Alpha (National German Honor Society)
- Fulbright Society Lifetime Member

EDITORIAL BOARDS:

- Associate Editor for Soft Matter, American Institute of Chemical Engineering Journal (2015-22)
- Current Opinion in Chemical and Engineering Science (2012-21) (Issue Editor: Rheology of Nanoparticles, 2017)
- Journal of Polymer Science Part B: Polymer Physics (2002-2012)
- Journal of Rheology (2005-)
- Rheologica Acta (2001-2017)
- Section Editor "Techniques", Current Opinion in Colloid & Interface Science (2001-)
- Physics of Fluids (2018-)

PROFESSIONAL SERVICE:

- ACS 100th Colloid & Surface Science Symposium, Local Arrangements Organizer, 2026
- International Congress of Rheology (2023) Technical Program Advisory Committee
- University of Delaware Strategic Planning Co-chair for Pillar 5 (2021)
- Reviewer, ORNL SNS/HFIR Triennial review for DOE BES, August 2018
- Session co-organizer, ACS Colloids Award Symposium, NOLA, March, 2018.
- Co-Chair Engineering Conferences International "Associations in Solution IV", St Johns, Canada, July 30-Aug. 4, 2017
- ORNL Second Target Station Science Advisory Board, 2017-
- American Physical Society, Study Committee on: "Scientific Challenges to Elimination of Highly Enriched Uranium in Civilian Research Reactors", 2017-18
- Chair, SNS/HFIR SANS & Reflectometry Review, ORNL, January 2017
- Co-Chair Committee of Visitors, Scientific User Facilities Division, DOE BES August 12-14, 2016
- Reviewer, ORNL SNS/HFIR Triennial review for DOE BES, August 25-27, 2015
- Chair, UD Faculty Senate Committee on General Education (2014-15)
- Society of Rheology Executive Committee Member at Large (2007-15), Vice President 2015-7
- Neutron Scattering Society of America, Executive Committee Member at Large (2009-)
- Gordon Research Conference on "Colloidal, Macromolecular and Polyelectrolyte Solutions", 2010 Vice-Chair, 2012 Co-Chair. (elected to the GRC "Hall of Fame")
- Engineering Conferences International "Associations in Solution III", Bifrost, Iceland, 2012. Co-Chair.
- International Congress on Rheology 2012, Session Chair "Colloids and Suspensions"
- Society of Rheology Bingham Committee (2006-9)
- AIChE Area 1J Programming Committee (2008-2012)
- Univ. of Delaware, Chairs' Caucus Planning Committee (2008-2010)
- Chair, Univ. of Delaware Chairs' Caucus (2011-2012)
- Symposium Organizer, XVth International Congress of Rheology (2008)
- Session Organizer, ACS National, March 2007
- Organizing Committee for the 2nd Association in Solution Conference, Tomar, Portugal July 2009
- Local Organizing Committee, 2007 ACS Colloids Symposium.

PATENTS GRANTED:

1. **US 8088443** "EMULSIFICATION OF CONCENTRATED DISPERSIONS OF COLLOIDAL AND NANOPARTICLES" Norman J. Wagner and Caroline H. Nam, Filing date: Sep 30, 2009, Issue date: Jan 3, 2012, Application number: 12/570,664
2. **US 7825045** "ADVANCED BODY ARMOR" with Eric D. Wetzel, Filing date: Feb 13, 2009, Issue date: Nov 2, 2010, Application number: 12/370,669

3. **US 7594429** "SYSTEM AND METHOD FOR IMPROVED OPTICAL MEASUREMENT DURING RHEOMETRIC MEASUREMENTS" with Matthew Liberatore and Peter Foster, Filing date: Nov 22, 2006, Issue date: Sep 29, 2009, Application number: 11/603,087
4. **US 7500385** "SYSTEM FOR IN-SITU OPTICAL MEASUREMENT AND SAMPLE HEATING DURING RHEOMETRIC MEASUREMENTS" with Matthew Liberatore and Peter Foster, Filing date: Nov 22, 2006 Issue date: Mar 10, 2009 Application number: 11/603,086
5. **US 7498276** "ADVANCED BODY ARMOR UTILIZING SHEAR THICKENING FLUIDS" with Eric D. Wetzel, Filing date: May 18, 2004, Issue date: Mar 3, 2009, Application number: 10/557,312
6. **US 7226878 B2** "ADVANCED BODY ARMOR UTILIZING SHEAR THICKENING FLUIDS", with Eric Wetzel, Filing date: May 19, 2003, Issue date: Jun 5, 2007, Application number: 10/441,655
7. **US 8834926,**"MACROMOLECULAR DIFFUSION AND RELEASE FROM SELF-ASSEMBLED BETA-HAIRPIN PEPTIDE HYDROGELS". Inventors: Joel P. Schneider, Monica C. Branco, Darrin J. Pochan, Norman J. Wagner, Published: Sept. 14, 2014
8. **US 10,244,801 "**Movement-reactive athletic apparel and methods of making the same" Witek; Danielle Marie, Dombrowski; Richard, Wagner; Norman Joseph, assignee Reebok International Ltd., STF Technologies LLC, Issued April 2, 2019.
9. **US 10,716,338 "**Movement-reactive athletic apparel and methods of making the same" Witek; Danielle Marie, Dombrowski; Richard, Wagner; Norman Joseph, assignee Reebok International Ltd., STF Technologies LLC, Issued July 21, 2020.
10. **US 10,968,301** Stress-responsive compositions and uses thereof Gordon MB, Kloxin CJ, Wagner NJ, Epps III TH, Knappe GA, Wang S, inventors; University of Delaware, assignee. Issued April 6, 2021.

PUBLICATIONS:

Books:

1. Mass and Heat Transfer: Analysis of Mass Contactors and Heat Exchangers, with TWF Russel and AS Robinson, Cambridge University Press, Cambridge, 2008. Second printing 2012. ISBN-13: 9780521886703 www.mht.che.udel.edu
2. Colloidal Suspension Rheology, with J. Mewis (KU Leuven), Cambridge University Press, Cambridge, 2011 (hardback), 2012 (paperback). ISBN 978-0-521-51599-3 http://sites.udel.edu/csr/
3. Colloidal Suspension Rheology: Theory and Applications, ed. with J. Mewis (KU Leuven), Cambridge University Press, March, 2021 ISBN: 9781108423038

Invited Book Chapters:

1. Chapter 33, **Mentee's Sharing**, in Mentoring Mentors, Edmond Ko, City University of Hong Kong Press, 2005.
2. ***New insights from Rheo-SANS*** by Michelle A. Calabrese and Norman J. Wagner. Chapter 8 in Wormlike micelles: systems, characterization and applications, Cecile Dreiss & Yujun Feng editors, Royal Society of Chemistry, 2017.
3. ***Self-assembly of block copolymers in ionic liquids*** by Ru Chen, Carlos Lopez-Barron, and Norman J. Wagner. Ionic Liquids: Current State and Future Directions, Aaron M. Scurto and Mark B. Shiflett, ACS Books, 2017.
4. ***Colloidal Hard Spheres, Chapter 6,*** by Norman J. Wagner, In Recent Advances in Rheology: Theory, Biorheology, Suspension and Interfacial Rheology. De Kee ed. AIP Publishing, 2022.

National Position Papers

1. "Neutrons for the Nation: Discovery and Applications while Minimizing the Risk of Nuclear Proliferation" Wells, J., Phillips, J. et al., American Physical Society, Panel on Public Affairs, 2018 https://www.aps.org/policy/reports/popa-reports/heu.cfm

Editorial Overviews:

1. "Proceedings of the Boston Symposia on Experimental-Techniques", with W.R. Burghardt, Journal of Rheology 1994, 38, (4), 1069-1069.
2. "Rheology and Rheological Techniques," with R.K. Prud'homme, *Current Opinion in Coll. Int. Sci*., 6, 421-422 (2001).
3. "Techniques/scattering", L. Magid, J. Penfold, P. Schurtenberger and N. Wagner *Current Opinion in Colloid & Interface Science*, 7(3-4), 193-195, (2002)
4. "Experimental Techniques/scattering", L. Magid, J. Penfold, P. Schurtenberger and N. Wagner *Current Opinion in Colloid & Interface Science*, 8, 491-493 (2004)
5. "Experimental Techniques/scattering", L. Magid, J. Penfold, P. Schurtenberger and N. Wagner *Current Opinion in Colloid & Interface Science*, (2007)
6. "Viewpoint: How colloidal dispersions relax under stress" N. Wagner, Physics 1, 22 (2008) doi:10.1103/Physics.1.22
7. "The Future of Suspension RheoPhysics: Comments on the 2008 Workshop", N.J. Wagner and P. Coussot, *Rheologica Acta*, 48(8) 827-829 (2009).
8. "Scattering Techniques, 2012" J. Penfold, N. Wagner and P. Schurtenberger, *Current Opinion in Colloid & Interface Science* 17(1) 1-2 (2012).
9. "Editorial for 2015 X-ray, neutron and light scattering section of COCIS", Jeff Penfold, Peter Schurtenberger, Norman Wagner, *Current Opinion in Colloid & Interface Science*, 20(4) 213-214 (2014)
10. "Meeting Report: The 8th American Conference on Neutron Scattering" by Mark. D. Lumsdon, Jamie A. Fernandez-Baca, Mathew E. Helgeson, Ronald L. Jones, Jeffrey W. Lynn, Katherine Page, Gregory S. Smith, Matthew Tucker & Norman J. Wagner, Neutron News, 27(4) (2016).
11. "Nanoparticle Dispersion Rheology", Current Opinion in Chemical Engineering, (2017).

Invited Review Articles:

1. "Rheo-Optics", N.J. Wagner, *Current Opinion in Colloid and Interface Sci.*, 3(4), 391-400, 1998.
2. "The role of nanoscale forces on colloid dispersion rheology", Norman J. Wagner & Jonathan W. Bender, *MRS Bulletin* "New Developments in Colloid Science", 29(2), 100-106 (2004).
3. "Shear Thickening Fluids", with J.F. Brady, *Phys. Today*, 2009.
4. "Rheo-SANS: Gap-Resolved SANS of Shear-Induced Alignment of Wormlike Micelles", M Liberatore, F. Nettesheim, N.J. Wagner and L. Porcar, 2005 Accomplishments and Opportunities, NIST NCNR. p. 18-19.
5. "Current Trends in Suspension Rheology," Jan Mewis and Norman J. Wagner, *JNNFM*, 157:147-150, 2009, p. 42-43.
6. "Constitutive Modeling and Spatially Resolved Structure of CTAB Wormlike Micelles Through the Shear Banding Transition," M. E. Helgeson and N. J. Wagner, 2008 Accomplishments and Opportunities, NIST NCNR, p. 42-43.
7. "Dynamics and structure of semiflexible, self-assembled peptide chain networks." M.C. Branco, J.P. Schneider, D.J. Pochan, N.J. Wagner, 2009 Accomplishments and Opportunities, NIST NCNR, p. 42-43.
8. "Neutron transmission measurements of concentration profiles in non-homogeneous shear flows." M.E. Helgeson, N.J. Wagner and L. Porcar, 2010 Accomplishments and Opportunities, NIST NCNR p. 38-39.
9. "Neutron Scattering Techniques shed new light on gel formation." A.P.R. Eberle, N.J. Wagner, R. Castaneda-Priego, 2011 Accomplishments and Opportunities, NIST, NCNR p. 36-37.

10. “A shear cell designed to probe the velocity-velocity gradient (1-2) plane of shear in complex fluids.” A.K. Gurnon, P.D. Godfrin, N.J. Wagner, C. Lopez-Barron, A.P.R. Eberle, P. Butler, C. Gagnon, L. Porcar, 2013 Accomplishments and Opportunities, NIST, NCNR, p. 46.
11. “Rheology of Branched Wormlike Micelles.” Simon A. Rogers, Michelle A. Calabrese, and Norman J. Wagner “, 2014, Current Opinion in Colloid and Interface Science – Rheology, 19, pp. 530-535.
12. “Advances in measuring time-resolved neutron scattering from flowing complex fluids.“ S. A. Rogers, M. A. Calabrese and N.J. Wagner, 2015 Accomplishments and Opportunities, NIST, NCNR, p. 50
13. “Dielectric RheoSANS for the simultaneous interrogation of rheology, microstructure, and electronic properties of complex fluids.” JJ. Richards, CVL Gagnon, JR Krzywon, NJ Wagner, and PD Butler, 2016 Accomplishments and Opportunities, NIST, NCNR, p. 48

Publications in refereed journals: (ORCID: 0000-0001-9565-619X, ISI researcher ID# B-6558-2012: 385 total publications, h-index: 67, 14,756 citations (publons); Google Scholar: h-78, 23046 citations).

(1) Tein YS, Thompson BR, Majkrzak C, Maranville B, Renggli D, Vermant J, Wagner NJ. Instrument for measurement of interfacial structure-property relationships with decoupled interfacial shear and dilatational flow: "Quadrotrough". Review of Scientific Instruments. 2022;93(9).
(2) Suminski RR, Dominick GM, Wagner NJ, Obrusnikova I. Direct Observation of COVID-19 Prevention Behaviors and Physical Activity in Public Open Spaces. International Journal of Environmental Research and Public Health. 2022;19(3).
(3) Suman K, Wagner NJ. Anomalous rheological aging of a model thermoreversible colloidal gel following a thermal quench. Journal of Chemical Physics. 2022;157(2).
(4) Mills JN, Katzarova M, Wagner NJ. Comparison of lunar and Martian regolith simulant-based geopolymer cements formed by alkali-activation for in-situ resource utilization. Advances in Space Research. 2022;69(1):761-77.
(5) Mills J, Wagner N. Rheokinetic modeling of N-A-S-H gel formation related to alkali-activated aluminosilicate materials. Rheologica Acta. 2022;61(8-9):601-12.
(6) Mills J, Mondal P, Wagner N. Structure-property relationships and state behavior of alkali-activated aluminosilicate gels. Cement and Concrete Research. 2022;151.
(7) Lee YF, Luo YM, Bai TY, Brown SC, Wagner NJ. Microstructure of continuous shear thickening colloidal suspensions determined by rheo-VSANS and rheo-USANS. Soft Matter. 2022;18(22):4325-37.
(8) Koshari SHS, Shi XT, Jiang LD, Chang D, Rajagopal K, Lenhoff AM, Wagner NJ. Design of PLGA-Based Drug Delivery Systems Using a Physically-Based Sustained Release Model. Journal of Pharmaceutical Sciences. 2022;111(2):345-57.
(9) Koshari SHS, Shi X, Jiang L, Chang D, Rajagopal K, Lenhoff AM, Wagner NJ. Design of PLGA-Based Drug Delivery Systems Using a Physically-Based Sustained Release Model. Journal of Pharmaceutical Sciences. 2022;111(2):345-57.
(10) Jariwala S, Wagner NJ, Beris AN. A Thermodynamically Consistent, Microscopically-Based, Model of the Rheology of Aggregating Particles Suspensions. Entropy. 2022;24(5).
(11) Heintzelman MP, Suminski RR, Dominick GM, Wagner NJ, Saponaro M. COVID-19 TRANSMISSION BEHAVIORS IN PUBLIC OPEN SPACES AMONG PHYSICALLY ACTIVE INDIVIDUALS. Annals of Behavioral Medicine. 2022;56(SUPP 1):S247-S.

(12) Gilbert PH, Zhang ZH, Qian KK, Allen DP, Ford R, Wagner NJ, Liu Y. Aggregation Kinetics of Polysorbate 80/m-Cresol Solutions: A Small-Angle Neutron Scattering Study. Molecular Pharmaceutics. 2022;19(3):862-75.
(13) Gilbert PH, Zhang Z, Qian KK, Allen DP, Ford R, Wagner NJ, Liu Y. Aggregation Kinetics of Polysorbate 80/m-Cresol Solutions: A Small-Angle Neutron Scattering Study. Molecular Pharmaceutics. 2022.
(14) Giacomin CE, Kim K, Wagner NJ. Rheological Behavior for alpha-1,3-Glucan Derived from Enzymatic Polymerization of Sucrose. Acs Food Science & Technology. 2022;2(2):240-8.
(15) Germann N, Wagner NJ, Beris AN. English translation of Giesekus's famous article on the elasticity of liquids. Physics of Fluids. 2022;34(12).
(16) Beris AN, Jariwala S, Wagner NJ. Flux-based modeling of heat and mass transfer in multicomponent systems (vol 34, 033113, 2022). Physics of Fluids. 2022;34(5).
(17) Beris AN, Jariwala S, Wagner NJ. Flux-based modeling of heat and mass transfer in multicomponent systems. Physics of Fluids. 2022;34(3).
(18) Armstrong M, Pincot A, Jariwala S, Horner J, Wagner N, Beris A. Tensorial formulations for improved thixotropic viscoelastic modeling of human blood. Journal of Rheology. 2022;66(2):327-47.
(19) Zhang ZH, Woys AM, Hong KL, Grapentin C, Khan TA, Zarraga IE, Wagner NJ, Liu Y. Adsorption of non-ionic surfactant and monoclonal antibody on siliconized surface studied by neutron reflectometry. Journal of Colloid and Interface Science. 2021;584:429-38.
(20) Zhang Z, Marie Woys A, Hong K, Grapentin C, Khan TA, Zarraga IE, Wagner NJ, Liu Y. Adsorption of non-ionic surfactant and monoclonal antibody on siliconized surface studied by neutron reflectometry. Journal of Colloid and Interface Science. 2021;584:429-38.
(21) Yu-FanLee, YiminLuo, TianyiBai, Velez C, Brown SC, Wagner NJ. Microstructure and rheology of shear-thickening colloidal suspensions with varying interparticle friction: Comparison of experiment with theory and simulation models. Physics of Fluids. 2021;33(3):033316.
(22) Suminski RR, Dominick GM, Wagner NJ. A Direct Observation Video Method for Describing COVID-19 Transmission Factors on a Micro-Geographical Scale: Viral Transmission (VT)-Scan. International Journal of Environmental Research and Public Health. 2021;18(17):9329.
(23) Mills JN, Wagner NJ, Mondal P. Relating chemical composition, structure, and rheology in alkali-activated aluminosilicate gels. Journal of the American Ceramic Society. 2021;104(1):572-83.
(24) Lee YF, Luo YM, Bai TY, Velez C, Brown SC, Wagner NJ. Microstructure and rheology of shear-thickening colloidal suspensions with varying interparticle friction: Comparison of experiment with theory and simulation models. Physics of Fluids. 2021;33(3).
(25) Horner JS, Wagner NJ, Beris AN. A comparative study of blood rheology across species. Soft Matter. 2021;17(18):4766-74.
(26) Hipp JB, Richards JJ, Wagner NJ. Direct measurements of the microstructural origin of shear-thinning in carbon black suspensions. Journal of Rheology. 2021;65(2):145-57.
(27) Greene DG, Modla S, Sandler SI, Wagner NJ, Lenhoff AM. Nanocrystalline protein domains via salting-out. Acta Crystallographica Section F-Structural Biology Communications. 2021;77:412-9.
(28) Gordon MB, Kloxin CJ, Wagner NJ. Structural and rheological aging in model attraction-driven glasses by Rheo-SANS. Soft Matter. 2021;17(4):924-35.

(29) Gilbert PH, Zhang ZH, Qian KK, Allen DP, Wagner NJ, Liu Y. Preservative Induced Polysorbate 80 Micelle Aggregation. Journal of Pharmaceutical Sciences. 2021;110(6):2395-404.
(30) Farnham MS, Ortved KF, Horner JS, Wagner NJ, Burris DL, Price C. Lubricant Effects on Articular Cartilage Sliding Biomechanics Under Physiological Fluid Load Support. Tribology Letters. 2021;69(2).
(31) Beris AN, Horner JS, Jariwala S, Armstrong MJ, Wagner NJ. Recent advances in blood rheology: a review. Soft Matter. 2021;17(47):10591-613.
(32) Tein YS, Zhang ZH, Wagner NJ. Competitive Surface Activity of Monoclonal Antibodies and Nonionic Surfactants at the Air-Water Interface Determined by Interfacial Rheology and Neutron Reflectometry. Langmuir. 2020;36(27):7814-23.
(33) Tein YS, Zhang Z, Wagner NJ. Competitive Surface Activity of Monoclonal Antibodies and Nonionic Surfactants at the Air–Water Interface Determined by Interfacial Rheology and Neutron Reflectometry. Langmuir. 2020;36(27):7814-23.
(34) Nayem J, Zhang ZH, Tomlinson A, Zarraga IE, Wagner NJ, Liu Y. Micellar Morphology of Polysorbate 20 and 80 and Their Ester Fractions in Solution via Small-Angle Neutron Scattering. Journal of Pharmaceutical Sciences. 2020;109(4):1498-508.
(35) Murphy RP, Hatch HW, Mahynski NA, Shen VK, Wagner NJ. Dynamic arrest of adhesive hard rod dispersions. Soft Matter. 2020;16(5):1279-86.
(36) Ma SJ, Ford EM, Sawicki LA, Sutherland BP, Halaszynski NI, Carberry BJ, Wagner NJ, Kloxin AM, Kloxin CJ. Surface Chemical Functionalization of Wrinkled Thiol-Ene Elastomers for Promoting Cellular Alignment. Acs Applied Bio Materials. 2020;3(6):3731-40.
(37) Luo YM, Lee YF, Dennis KA, Velez C, Brown SC, Furst EM, Wagner NJ. One-step, in situ jamming point measurements by immobilization cell rheometry. Rheologica Acta. 2020;59(4):209-25.
(38) Lin YJ, Horner J, Illie B, Lynch ML, Furst EM, Wagner NJ. Molecular engineering of thixotropic, sprayable fluids with yield stress using associating polysaccharides. Journal of Colloid and Interface Science. 2020;580:264-74.
(39) Lee YF, Luo YM, Brown SC, Wagner NJ. Experimental test of a frictional contact model for shear thickening in concentrated colloidal suspensions. Journal of Rheology. 2020;64(2):267-82.
(40) Jariwala S, Horner JS, Wagner NJ, Beris AN. Application of population balance-based thixotropic model to human blood. Journal of Non-Newtonian Fluid Mechanics. 2020;281.
(41) Wagner N, Naegele G, Bergenholtz J. Novel clustered state of colloidal dispersions: Transport properties of concentrated dispersions of particles with competiing interactions validated against measurements of lysozyme with application to biopharmaceuticals. Abstracts of Papers of the American Chemical Society. 2019;257.
(42) Wagner N, Dombrowski R, Katzarova M, Peters B. Development of advanced environmental protection garments containing Shear Thickening Fluid enhanced textiles (STF-ArmorTM) for puncture, MMOD, and dust mitigation for improved astronaut protection. Abstracts of Papers of the American Chemical Society. 2019;257.
(43) Shan LY, Xie R, Wagner NJ, He HS, Liu Y. Microstructure of neat and SBS modified asphalt binder by small-angle neutron scattering. Fuel. 2019;253:1589-96.
(44) Penfold J, Wagner NJ. Editorial overview Recent applications of x-ray and neutron scattering techniques in colloid and interfacial science, characterised by increasing diversity and complexity. Current Opinion in Colloid & Interface Science. 2019;42:A1-A3.

(45) Mwasame PM, Wagner NJ, Beris AN. On the macroscopic modeling of the rheology and Ostwald ripening of dilute stabilized emulsions. Physics of Fluids. 2019;31(2).
(46) Mwasame PM, Wagner NJ, Beris AN. Micro-Inertia Effects in Material Flow. Journal of Non-Equilibrium Thermodynamics. 2019;44(3):235-46.
(47) Koshari SHS, Nayak PK, Burra S, Zarraga IE, Rajagopal K, Liu Y, Wagner NJ, Lenhoff AM. In Situ Characterization of the Microstructural Evolution of Biopharmaceutical Solid-State Formulations with Implications for Protein Stability. Molecular Pharmaceutics. 2019;16(1):173-83.
(48) Koshari SHS, Chang DP, Wang NB, Zarraga IE, Rajagopal K, Lenhoff AM, Wagner NJ. Data-Driven Development of Predictive Models for Sustained Drug Release. Journal of Pharmaceutical Sciences. 2019;108(11):3582-91.
(49) Koshari S, Chang D, Zarraga I, Rajagopal K, Wagner N, Lenhoff A. Guided design of sustained release biopharmaceutical systems through model predictions. Abstracts of Papers of the American Chemical Society. 2019;257.
(50) Horner JS, Armstrong MJ, Wagner NJ, Beris AN. Measurements of human blood viscoelasticity and thixotropy under steady and transient shear and constitutive modeling thereof. Journal of Rheology. 2019;63(5):799-813.
(51) Hipp JB, Richards JJ, Wagner NJ. Structure-property relationships of sheared carbon black suspensions determined by simultaneous rheological and neutron scattering measurements. Journal of Rheology. 2019;63(3):423-36.
(52) Bergenholtz J, Wagner NJ. Waiting-time distributions of particle entrapments in clustered states generated by short-range attractive, long-range repulsive (SALR) interactions. Epl. 2019;126(3).
(53) Zhang ZH, Orski S, Woys AM, Yuan GC, Zarraga IE, Wagner NJ, Liu Y. Adsorption of polysorbate 20 and proteins on hydrophobic polystyrene surfaces studied by neutron reflectometry. Colloids and Surfaces B-Biointerfaces. 2018;168:94-102.
(54) Xie YS, Xie R, Yang HC, Chen ZW, Hou JW, Lopez-Barron CR, Wagner NJ, Gao KZ. Iono-Elastomer-Based Wearable Strain Sensor with Real-Time Thermomechanical Dual Response. Acs Applied Materials & Interfaces. 2018;10(38):32435-43.
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Conference Papers:

1. Y. S. Lee, E. D. Wetzel, R. G. Egres Jr., and N. J. Wagner, "Advanced Body Armor Utilizing Shear Thickening Fluids," in *Proceedings of the 23rd Army Science Conference*, (Orlando, FL, December 2-5, 2002).
2. R. G. Egres Jr., Y. S. Lee, J. E. Kirkwood, K. M. Kirkwood, E. D. Wetzel and N. J. Wagner, "Novel Flexible Body Armor Utilizing Shear Thickening Fluid (STF) Composites," in *Proceedings of the 14th International Conference on Composite Materials*, (San Diego, CA, July 14-18, 2003).
3. E. D. Wetzel, Y. S. Lee, R. G. Egres Jr., K. M. Kirkwood, J. E. Kirkwood, and N. J. Wagner, "The Effect of Rheological Parameters on the Ballistic Properties of Shear Thickening Fluid (STF)-Kevlar Composites," in *Proceedings of the 8th International Conference on Numerical Methods in Industrial Forming Processes*, Columbus, OH, June 13-17, 2004).
4. R. G. Egres and N. J. Wagner, "The Rheology and Rheo-SANS Microstructure Analysis of Shear Thickening Acicular Precipitated Calcium Carbonate Dispersions." in *Proceedings of the XIVth International Congress on Rheology*, (Seoul, South Korea, August 22-27, 2004).
5. R. G. Egres Jr, Y. S. Lee, J. E. Kirkwood, K. M. Kirkwood, E. D. Wetzel, N. J. Wagner, "Liquid Armor: Protective Fabrics Utilizing Shear Thickening Fluids," in *Proceedings of the 4th International Conference on Safety and Protective Fabrics*, (Pittsburgh, PA, October 26-27, 2004).
6. R. G. Egres Jr., M. J. Decker, C. J. Halbach, Y. S. Lee, J. E. Kirkwood, K. M. Kirkwood, E. D. Wetzel, N. J. Wagner, "Stab Resistance of Shear Thickening Fluid (STF)-Kevlar Composites for Body Armor Applications," in *Proceedings of the 24th Army Science Conference*, (Orlando, FL, November 29-December 2, 2004).
7. R. G. Egres, C. J. Halbach, M. J. Decker, E. D. Wetzel, and N. J. Wagner, "Stab Performance of STF-Fabric Composites for Body Armor Applications," in *Proceedings of the Society for the Advancement of Material and Process Engineering Conference*, (Long Beach, CA, May 1-5, 2004).
8. C. H. Nam, M. J. Decker, C. J. Halbach, E. D. Wetzel, and N. J. Wagner, "Ballistic and Rheological Properties of STFs Reinforced by short Discontinuous Fibers," in *Proceedings of the Society for the Advancement of Material and Process Engineering Conference*, (Long Beach, CA, May 1-5, 2004).

9. Nam, C. H., Wagner, N. J., Thixotropy and Shear-Induced Microstructure of Shear Thickening, Nanoaggregate, Fumed Silica Dispersions and Nam, C. H., Wetzel, E. D., Wagner, N. J., Ballistic and Rheological Properties of Shear Thickening Fluids Reinforced By Short Discontinuous Fibers, American Institute of Chemical Engineers Annual Meeting, Cincinnati, OH, November 2005.
10. "Ballistic and Rheological Properties of Shear Thickening Fluids Reinforced by Short Discontinuous Fibers and Stab Performance of Shear Thickening Fluid Fabric Composites for Body Armor Applications" Caroline H. Nam, Matthew J. Decker, Christopher Halbach, Eric D. Wetzel, and Norman J. Wagner Society for Advancement of Material and Process Engineering Conference, Long Beach, CA, May 2005.
11. "Protective fabrics utilizing shear thickening fluids", R. G. Egres Jr., Y.S. Lee, J. E. Kirkwood, K. M Kirkwood, E. D. Wetzel, N. J. Wagner, NDIA, 22nd International Symposium on Ballistics,Vancouver, CA, Nov. 2005.
12. "Stab Performance of Shear Thickening Fluid (STF)-Fabric Composites for Body Armor Applications" R. G. Egres Jr., C. J. Halbach, M. J. Decker, E. D. Wetzel, and N. J. Wagner, Proceedings of SAMPE 2005: New Horizons for Materials and Processing Technologies. Long Beach, CA. 1-5 May 2005.
13. "Hypodermic Needle Puncture of Shear Thickening Fluid (STF)-Treated Fabrics," by J. M. Houghton, B. A. Schiffman, D. P. Kalman, E. D. Wetzel, and N. J. Wagner, Proceedings of SAMPE, 2007, Baltimore MD.
14. "Polymer Dispersion Based Shear Thickening Fluid-Fabrics for Protective Applications." D. P. Kalman, J. B. Schein, J. M. Houghton, C. H. N. Laufer, E. D. Wetzel and N. J. Wagner, Proceedings of SAMPE, 2007, Baltimore MD.
15. "Multi-threat Performance of Kaolin-based Shear Thickening Fluid (STF)-treated fabrics." Brian A. Rosen, Caroline H. Nam Laufer, Dennis P. Kalman, Eric D. Wetzel, and Norman J. Wagner, Proceedings of SAMPE, 2007, Baltimore MD.
16. "Kinematic Studies of Polymer Electrospinning using in situ measurements." Matthew E. Helgeson, Kristie N. Grammatikos, Joseph M. Dietzel, Norman J. Wagner, Proceedings of SAMPE, 2007, Baltimore MD.
17. "Formation and Mechanics of Electrospun Polymer Jests." Matthew E. Helgeson, Kristie N. Grammatikos, Joseph M. Deitzel and Norman J. Wagner, ACS POLY Division, ACS National Meeting, Chicago, March. 2007.
18. "Simultaneous light scattering-rheology measurements for studying stress induced phase transitions," Aadil Elmoumni, Aloyse J. Franck, Matthew E. Helgeson, Matthew D. Reichert, Jason M. McMullan, Norman J. Wagner, Proceedings of the XVth International Congress of Rheology, Monterey, August, 2008.
19. "Spatially-resolved microstructure in shear banding wormlike micellar solutions", Matthew E. Helgeson, Matthew D. Reichert, Norman J. Wagner, Eric W. Kaler, Proceedings of the XVth International Congress of Rheology, Monterey, August, 2008.
20. "Effects of particle hardness on shear thickening colloidal suspension rheology", Dennis P. Kalman, Brian A. Rosen, Norman J. Wagner, Proceedings of the XVth International Congress of Rheology, Monterey, August, 2008.
21. "Measurement of Needle Puncture Resistance Using an Electrical Puncture Detection System." Richard D. Dombrowski and Norman J. Wagner, *Proceedings of SAMPE 2012*. Baltimore, MD. May 21-24, 2012
22. "MMOD puncture resistance of EVA suits with shear thickening fluid (STF) – Armor™ absorber layers," Colin D. Cwalina, Richard D. Dombrowski, Charles J. McCutcheon, Eric L. Christiansen, and Norman J. Wagner, Proceedings of the 13th Hypervelocity Impact Symposium, Denver Colorado, April, 2015.
23. "Development of Advanced Environmental Protection Garments Containing Shear Thickening Fluid Enhanced Textiles (STF-Armor ™) for Puncture Protection and Dust Mitigation" Richard

D. Dombrowski, Norman J. Wagner, Maria Katzarova, and Benjamin J. Peters, 48th International Conference on Environmental Systems, 8-12 July, Albuquerque, New Mexico, ICES-2018-183

24. "Shear Thickening Fluid Treated Space Suit Layups: Terrestrial and MISSE-9 Low-Earth Orbit" Katzarova, Maria, Wagner, Norman, Dombrowski, Richard, Finckenor, Miria, Gray, Perry, The 50th International Conference on Environmental Systems ICES-2021-278 https://hdl.handle.net/2346/87233
25. "Improved Shear Thickening Fluid Treated Space Suit Layups: Terrestrial and ISS MISSE-10 Low-Earth Orbit Studies" Maria Katzarova, Erin Hogan, Elaine Stewart, Jacob Hewes, Norman J. Wagner, Richard D. Dombrowski, Erik Hobbs, Miria M. Finckenor, 51st International Conference on Environmental Systems, 10-14 July 2022, St. Paul, Minnesota ICES-2022-236
26. "Shear Thickening Fluid Treated Vectran Space Suit Layups: ISS MISSE-13 Low-Earth Orbit Studies" Erik Hobbs, Richard Dombrowski, Norman Wagner, Maria Katzarova, Natalia Markiewicz and Miria Finckenor, 51st International Conference on Environmental Systems, 10-14 July 2022, St. Paul, Minnesota ICES-2022-213
27. "Advanced Nanocomposites for Exploration Extravehicular Mobility Unit (xEMU) Suits using STF-Armor™ for Lunar Regolith Dust Mitigation" Richard D. Dombrowski, Erik A. Hobbs, Shane Jacobs, Norman J. Wagner, Maria Katzarova, and Richard A. Rhodes, 51st International Conference on Environmental Systems, 10-14 July 2022, St. Paul, Minnesota ICES-2022-212

INVITED NAMED LECTURES AND PLENARY CONFERENCE PRESENTATIONS:

1. European Colloid and Interface Science (ECIS97), Keynote Lecture on *Colloidal Rheology,* Sept. 1997 (Lunteren Netherlands).
2. 1998 Vaughan Lecturer, California Institute of Technology, April, 1998.
3. 13th US National Congress of Applied Mechanics, Gainsville, FL, *Suspension Rheology,* June, 1998.
4. 13th European Colloid and Interface Society Meeting, Dublin Ireland, *Rheology of Concentrated Colloidal Dispersions,* Sept.,1999.
5. Particles 2001, ACS, "The Rheology of Dense Colloidal Dispersions: Shear Thickening, Dilatancy and the Effects of Adsorbed Polymer", Feb. 2001, Orlando FL.
6. PPG Lecture, School of Engineering and Applied Science, Harvard, Oct. 2001
7. American Conference on Neutron Scattering (ACNS), "RHEO-SANS Nonequilibrium Microstructure of Shearing Colloidal Dispersions,", Knoxville, TN, June 2002.
8. PSA2003, Particle Systems Analysis 2003, Harrogate, England, Sept. 2003. "Concentrated Dispersion Rheology: Engineering Colloidal Interactions to Control Reversible Shear Thickening."
9. AIChE National Meeting, San Francisco 2003 "Modeling Configurational Diffusion in Polymers Confined in Nanoporous Media and Nanoporous Carbons"
10. APS National March, Montreal, 2004, DCP special session on multiscale modeling. "Modeling Configurational Diffusion in Polymers Confined in Nanoporous Media and Nanoporous Carbons"
11. Gordon Research Conference on Granular Materials, June 2004, "The Rheology of Dense Particle Suspensions"
12. Juelich Condensed Matter School, "Shear Thickening and The Rheology of Dense Particle Suspensions", Netherlands, Nov. 2004.
13. North American Lectures in Chemical Engineering and Materials Science, Univ. Autonoma de San Luis Potosi and Universidad de Guanajuato, , Jan. 06.
14. ICSCS 12th International Conference on Surface and Colloid Science, Keynote Lecture: "Shear Thickening Colloidal Dispersions", Beijing, China, Oct. 2006.

15. AIChE National Meeting, Area 1A, Novel Flows, "Shear Thickening Colloidal Dispersions, Flow Jamming at High Stresses & Applications in Ballistic, Stab & Puncture Threat Mitigation" San Francisco, Nov. 2006.
16. Society of Plastics Engineers, ANTEC 2007m, Plenary Lecture: "'STF Armor': Nanoparticle Composite Textiles and Performance Plastics for Flexible Ballistic & Puncture-Protective Materials", Cincinnati OH, May 2007.
17. 8th International Symposium on Applied Rheology, "Shear Thickening Colloidal Dispersions", Korea University Applied Rheology Center, Seoul, Korea, May, 2007
18. SOCOBIM, Soft, Complex, and Biological Matter Conference, Satellite Conference of IUPAP Statphys 23, "Shear-induced organization in colloidal dispersions: The hydrocluster microstructure in shear thickened colloidal suspensions," Palermo, Sicily, July 2007.
19. Workshop on Rheophysics, "Shear-induced organization in colloidal dispersions: The hydrocluster microstructure in shear thickened colloidal suspensions." Ecole Polytechnique, Ecole des Ponts, Paris, Jan., 2008
20. 2008 Dale Pearson Lectureship, "The Rheology of Colloidal & Nanoparticle Dispersions: 'STF-Armor- Nanoparticle Composites for Flexible Ballistic Materials." And "A Tale of Two Surfactants: Structure and Rheology of Shear-banding Wormlike Micellar Solutions." UCSB, May 2008.
21. Society of Rheology Annual Meeting, Plenary Lecture "Microstructure and rheology relationships for concentrated colloidal dispersions: Shear thickening fluids and their applications." Madison, WI, Oct. 2009.
22. American Conference on Neutron Scattering, Keynote Lecture: "Understanding Viscoelastic Self-Assembled Surfactant Micelles and Peptide Hydrogels by Rheo-SANS and NSE.", Ottawa, CA 2010.
23. AERC (Annual European Rheology Conference), Plenary Lecture: "Microstructure & rheology of shear banding and shear induced phase separating wormlike micellar solutions" Suzdal, Russia, 2010.
24. Canadian Society of Rheology Annual Meeting, Keynote Lecture: "Microstructure & rheology of shear banding and shear induced phase separating wormlike micellar solutions." Montreal, June 2011.
25. 86th ACS Colloid and Surface Science Symposium, Keynote Lecture: "Development of microstructure/rheology relationships for complex fluids: Rheo-SALS, time resolved flow-SANS in the 1-2 plane, & tOR-SANS applied to understand steady and transient flows in polymer-like micelles." Johns Hopkins Univ. June, 2012.
26. Brazilian Society of Rheology Plenary Lecture: " How do Gels Shear?" Rio de Janeiro, Brazil, July 2013.
27. White House Office of Science and Technology Policy "We the Geeks: The Stuff Superheroes are Made Of" Google Hangout online: http://youtu.be/aAOzXYRr8io, Sept. 2013
28. AIChE National Meeting, Thomas Baron Award Lecture: "Shear Thickening & Gelation in Colloidal Dispersions - Nonequilibrium States and Their Applications in Personal Protective Equipment", San Francisco, Nov. 2013.
29. Smithsonian Associates: "Going to Extremes: The Protective Powers of High Tech Materials", Washington D.C., January 2014
30. Lindsay Lecture, Texas A&M University, February 2014.
31. American Conference on Neutron Scattering (ACNS), "Spatiotemporal SANS measurements of microstructure evolution in dynamically sheared polymer-like micellar solutions." Knoxville, TN June 2014.
32. Bingham Medal Lecture, 86th Society of Rheology Meeting, Philadelphia, PA, October, 2014.
33. Bird/Stewart/Lightfoot Lecture, "How do Gels Form and Flow", University of Wisconsin, Madison, WI, May, 2015.

34. American Physical Society March Meeting, "Material properties of the shear-thickened state in concentrated near hard-sphere colloidal dispersions." San Antonio, TX, March, 2015
35. IACIS & 47th Conference of the German Colloid Society, "Shear thickening fluids and their application in personal protective equipment and space exploration." Mainz, Germany, May, 2015.
36. International Conference on Small Angle Scattering (www.sas2015.org) "Understanding the rheology of complex fluids through flow and rheo-SANS," Berlin, Germany, 13.-18. September 2015.
37. RHEO-SAS Workshop, "Insights into the flow of Complex Fluids using Rheo-SANS" Institut-Laue Langevin, Grenoble, FR. Sept. 2017.
38. Distinguished Chemical Engineering Lecturer, School for Engineering of Matter, Transport and Energy, Arizona State University, "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, football players, astronauts and spacecraft." March 27, 2017, Phoenix AZ.
39. NSSA Sustained Research Prize, Plenary Award Lecture, American Conference on Neutron Scattering, College Park, MD, June 2019
40. "Rigidity percolation, gelation, and glass transitions of spherical & anisotropic colloidal suspensions with thermoreversible short-range attractions." Plenary lecture at the ICCFM 2018, International Conference on Complex and Functional Materials, S.N. Bose National Centre for Basic Science, Dec. 2018.
41. Keynote lecture at the Bunsen-Tagung 2021 - Multi-Scale Modelling & Physical Chemistry of Colloids (virtual) "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, athletes, and astronauts." German Colloid Society May 10-12, 2021
42. James L. White Memorial Lectureship: "Molecular Design of Complex Fluids: branching polymerlike micelles, equilibrium colloidal gels, and associating polysaccharides" & "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, athletes, and astronauts." Department of Polymer Engineering in the College of Polymer Science and Polymer Engineering, University of Akron, November 2021.
43. Inaugural Prof. Meyer H. Birnboim Lecture, Rennselear Polytechnic Institute, "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, athletes, and astronauts." Troy NY, Sept. 2022
44. Fluids Distinguished Lecture, University of Florida, Department of Chemical Engineering, "Shear thickening fluids and their application as protective materials for first responders, athletes, and astronauts (and some recent work on "planetopolymers")". April 18, 2023.
45. Plenary Lecture: 2023 SNS/HFIR User Group (SHUG) User Meeting, Oak Ridge National Laboratory, "Monocolonal Antibody Structure & Stability", June 2023.
46. Plenary Lecture, UK Colloids Meeting, "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, athletes, and astronauts." Liverpool, England, July 2023.

INVITED LECTURES:

Universities, Institutes and Conferences

1. Los Alamos Condensed Matter and Materials Colloquium, *The Rheology of Polydisperse Charged Colloids from Light Scattering and Small Angle Neutron Scattering,* Los Alamos National Laboratory, 1990.
2. Univ. Konstanz, Physics, *Flow of Granular Materials*, and *New Results for the Viscosity of Brownian Suspensions,* Konstanz, Germany, 1990.
3. ETH Institute for Polymeres, *Rheology of Complex Fluids,* Eidgenoessische

Technische Hochschule, Zurich Switzerland, 1992.
4. MPI for Polymer Research, *Dynamics and Rheology of Brownian Suspensions,* Max-Planck-Institute Mainz, Germany, 1992.
5. Los Alamos Condensed Matter and Materials Colloquium, *Massively Parallel Brownian Dynamics,* Los Alamos National Laboratory, 1993.
6. Uni. Konstanz, Physics, *Shear Induced Structures by Massively Parallel Computing,* Konstanz, Germany, 1993.
7. Dept. of Physics, Univ. of Delaware, *Generalized Hydrodynamics of Colloidal Suspensions,* Delaware 1993.
8. NATO Parallel Computing Workshop CECAM, *Simulations of Fracture Mechanics and Brownian Suspension Rheology,* Orsay, France, July 1993.
9. Uni. Konstanz, Physics, *New Developments in Suspensions Mechanics,* Konstanz, Germany, 1994.
10. Univ. Naples, Chemical Engineering Seminar, *LCP Rheology and LCP Blend Rheology,* University of Naples, Italy, 1994.
11. CRS4 Research Colloquium, *Parallel Comutational Methods,* CRS4, Sardinia, Italy, 1994.
12. UC Berkeley, Chemical Engineering, *Advances in Fundamental Suspension Rheology,* Berkeley, 1994.
13. Univ. Illinois, Chemical Engineering, *Advances in Fundamental Suspension Rheology,* Illinois, 1994.
14. ASME Chicago National Meeting, *Rheology and Shear-Ordering in Suspensions by Massively Parallel Nonequilibrium Molecular Dynamics,* Chicago 1994.
15. Brooklyn Polytech, Chemical Engineering, *Advances in Fundamental Colloid Rheology,* Brooklyn NY, March 1995.
16. NIST, Reactor Division, *Liquid Crystalline Polymers* NIST, Gaithersburg, MD Nov., 1995.
17. City College, Chemical Engineering, *The Rheology of Concentrated Dispersions* NY, NY October, 1995.
18. Cornell Univ. Chemical Engineering, *Rheology of Concentrated Dispersions* Ithaca NY, Sept., 1995.
19. Univ. Freiburg, Dept. of Macromol. Chemistry, *Liquid Crystalline Polymers* Univ. Freiburg, Germany, Dec., 1996.
20. Georgia Tech., Chemical Engineering, *Rheology of Concentrated Colloidal Dispersions* Atlanta, Feb., 1996.
21. CRS4 Research Colloquium, *Simulation of Diffusion In Polymers,* CRS4, Italy, June, 1996.
22. ETH Institute for Polymers, *Role of Attractive Interactions in Colloid Rheology,* ETH Zurich, Switzerland, June, 1996.
23. Chemical Engineering of Santa Barbara, *Shear Thickening,* Jan. 1997.
24. Chemical Engineering at UCLA *Shear Thickening,* Jan. 1997.
25. ETH Zurich, Institute for Polymers, *Polymer Blends,* Feb. 1997.
26. Chemical Engineering at Univ. of Pennsylvania, *Shear Thickening* March 1997.
27. *Frontiers of Science,* National Academy of Science and Max-Planck Society, Munich, Germany, June, 1998 (invited participant)
28. Van't Hoff Laboratory, Utrecht Netherlands, *Attractive Interactions in Colloidal Systems,* Sept. 1997.
29. Gesellschaft Österreicherischer Chemiker, Graz Austria, *Colloid Rheology* Oct. 1997.
30. FORUM-INFM Workshop on Polyelectrolytes, Pisa Italy, *Adsorption of Polyelectrolytes* Oct., 1997
31. University of Karlsruhe, Macromolecular Chemistry, Karlsruhe, Germany, *Colloid Rheology* Nov., 1997.
32. Universität Düsseldorf, Physik, Germany, *Colloid Rheology,* January, 1998.
33. Gordon Conference on Colloidal, Macromolecular, and Polyelectrolyte Solutions, Ventura CA. *Suspensions Rheology* Feb., 1998.
34. 7th Annual NSF Workshop on Particulate/Multiphase Flow, Santa Barbara, Feb. 1998 *Rheo-optical Methods for Colloids.*
35. American Crystallographic Association National Meeting, Colloidal Gels, July, 1998.
36. University of Mainz, Physical Chemistry, *Colloid Rheology,* Mainz, SFB seminar series, July, 1998.

37. Chemical Engineering at SUNY Buffalo, *Liquid Crystalline Polymers and LCP Containing Blends,* Oct., 1998.
38. Materials Research Society Spring National Meeting, *Liquid Crystalline Polymers and LCP Containing Blends, Structure and Rheology* San Francisco, April, 1999.
39. Chemical Engineering at Brooklyn Polytech., *Hydrodynamic and Colloidal Interactions in Concentrated Dispersions,* Brooklyn, NY Sept., 1999.
40. Chemical Engineering at Princeton, *Developing Thermodynamically Consistent Transport Equations: Examples for Complex Fluids & Multiphase Flow,* Princeton, Nov. 1999.
41. ACS MARM, *Rheological and Optical Characterization of Concentrated Colloidal Dispersions*, Newark, DE, May, 2000.
42. ACS MARM, *Rheology and Microstructure of Hyperbranched & Dendritic Polymers and Blends with Linear Polymers*, Newark, DE May, 2000.
43. Chemical Engineering at the University of Illinois, *Polyampholyte & Polymer stabilization of colloidal dispersions and the rheological consequences,* Champaign, IL, Sept. 2000.
44. Chemical Engineering, City College, NY, *Polyampholyte & Polymer stabilization of colloidal dispersions and the rheological consequences,* New York, NY, Oct. 2000
45. Condensed Matter Physics Seminar, University of Pennsylvania, *Engineering Colloidal Surfaces to Control High Shear Rheology,* January, 2001.
46. Macromolecular Science & Engineering Colloquium, Case Western Reserve University, *Rheology of Concentrated Colloidal Dispersions and Shear Thickening,* Cleveland*,* March, 2001.
47. Rheology Research Center, University of Wisconsin & Mechanical Engineering, "Charles Lindbergh Lectures", *Rheology of Concentrated Colloidal Dispersions*, Madison, WI, March, 2001.
48. Chemical Engineering, Carnegie Mellon University, *Rheology of Concentrated Colloidal Dispersions*, Pittsburgh, PA, April, 2001
49. Hellenic Society of Rheology 3rd Interntaional Conference, *Mechanism of Reversible Shear Thickening in Colloidal Dispersions*, Patras, Greece, June 2001.
50. Polymer Colloids Gordon Research Conference, *Engineering Colloidal Surfaces to Control High Shear Rheology*, Tilton School, New Hampshire, July, 2001.
51. PPG Lecture, Harvard University, Engineering and Applied Science, *Engineering Colloidal Surfaces to Control High Shear Rheology*, Cambridge, MA, Sept. 2001.
52. University of Pittsburgh, Chemical Engineering, *Engineering Colloidal Surfaces to Control High Shear Rheology*, Pittsburgh, PA, October, 2001.
53. Chemical Engineering, University of Virginia, *Rheology of Concentrated Colloidal Dispersions*, Charlotte, VA, April, 2002
54. Polymer Science and Engineering, Univ. Mass. *Structure-Property Relations of Dendrimers, Blends, and Dendrimer Hybrid Copolymers,* Amherst, , May 2002
55. ACS National Meeting, Division of Polymeric Materials Science and Engineering, *Electrosteric Stabilization of Colloidal Dispersions*, Boston, Aug. 2002.
56. Chemical Engineering, Worcester Polytechnical Institute, *Engineering Colloidal Surfaces to Control High Shear Rheology*, Worcester, MA, Nov. 2002.
57. Chemical Engineering, University of Minnesota, *Engineering Colloidal Surfaces to Control High Shear Rheology,* Dec. 2003
58. NIST, Gaithersburg, MD. Dec. 2003. *Engineering Colloidal Surfaces to Control High Shear Rheology*
59. Nanoparticles 2004, Orlando FL, ""Liquid Armor": Nanoparticle Composites for Flexible Ballistic Materials & the Rheology of Anisometric Particle Dispersions"
60. Leeds University, England, Sept. 2004, Frontiers in Particle Science Series: "Concentrated Dispersion Rheology".
61. Dept. of Physics, La Sapienza, Uni. Rome, Italy, Nov. 2004 "Shear Thickening in Colloidal Dispersions"

62. Jülich Soft Condensed Matter Symposium, Kerkrade, Netherlands, Nov. 2004, "Shear Thickening in Colloidal Dispersions"
63. EPFL, Lausanne, Switzerland, Jan. 2005, "The Rheology of Anisometric Particle Dispersions & 'Liquid Armor'."
64. American Chemical Society Spring National Meeting, San Diego, California on March 13-17, 2005. "Rheo-SANS"
65. "Modeling the Transfer of Polymers through Chara corallina Cell Walls", Symposium in Honor of John Boyer, UD, June, 2005.
66. American Chemical Society National Meeting, Washington DC, Aug. 2005 "Rheo-SANS"
67. Univ. Florida, Chemical Engineering, "Shear Thickening in Colloidal Suspensions" Dec. 2005.
68. Temple University, Physics, "Dynamics of Concentrated Colloids: Approach to the Glass Transition and Shear Thickening", April, 2006.
69. Princeton University PRISM, " Colloid Rheology, Shear Thickening, and Novel Energy Adsorbing Materials for Ballistic and Stab Protection", April, 2006.
70. North Carolina State University, Chemical Engineering, "The Rheology of Colloidal and Nanoparticle Dispersions: Nanoparticle Composites for Flexible Ballistic Materials", April 2006.
71. Institute for Defense and Government Advancement (IDGA), Military Armor Protection, "STF-Armor", Washington DC, May 2006.
72. Delaware Economic Development Office Chemical Industry Subcommittee, "STF-Armor", Newark, DE May, 2006.
73. GaTech, PTE, "The Rheology of Colloidal & Nanoparticle Dispersions: "STF Armor"-Nanoparticle Composites for Flexible Ballistic Materials", Sept. 2006, Atlanta, GA.
74. UT Austin, Chem. Eng. "The Rheology Of Colloidal & Nanoparticle Dispersions: 'STF Armor' - Nanoparticle Composites For Flexible Ballistic Materials", Nov. 2006, Austin TX.
75. UPenn, Physics and Astronomy, Condensed Matter Colloquium, "Dynamics of Concentrated Colloids: Approach to the Glass Transition and Shear Thickening. April, 2007, Philadelphia, PA.
76. University of Erlangen, Germany "Dynamics and Rheology of Concentrated Colloidal Dispersions: Part I: Approach to the Glass Transition and Effects of Weak Attractive Interactions; Part II: Shear Thickening & Applications in Ballistic and Stab Protection", Dept. of Chemical Engineering, April, 2007.
77. Tulane Univ. "The Rheology of Colloidal and Nanoparticle Dispersions: "STF ARMOR"- Nanoparticle Composites for Flexible Ballistic Materials", Dept. Chem. Eng., Nov. 2007.
78. UC Riverside, "The Rheology of Colloidal and Nanoparticle Dispersions: "STF ARMOR"- Nanoparticle Composites for Flexible Ballistic Materials", Dept. Chem. Eng., Feb. 2008.
79. Purdue University, "The Rheology of Colloidal and Nanoparticle Dispersions: "STF ARMOR"- Nanoparticle Composites for Flexible Ballistic Materials", Dept. Chem. Eng., Feb. 2008.
80. NCNR NIST, "Rheo-SANS", NRC Assessment Council Meeting, March, 2008, Gaithersburg, MD.
81. American Conference on Neutron Scattering, 2008, "A Tale of Two Surfactants: Structure and Rheology of Shear-Banding Wormlike Micellar Solutions" May, 2008.
82. ISPAC "STF-Armor, Nanoparticle Composite Textiles and Performance Plastics for Flexible Ballistic & Puncture Protective Materials," Newark, DE, June, 2008.
83. Mid Atlantic Soft Matter Workshop (MARM), "Microstructure of Shear Thickening Colloidal Dispersions," U. Penn, June 2008.
84. University of Konstanz, Physics Dept. "Microstructure of Shear Thickening Colloidal Dispersions," Konstanz, Germany, July 2008.
85. Institute for Mathematics and Its Applications, "Flowing Complex Fluids: Fluid Mechanics-Interaction of Microstructure and Flow", Minneapolis, Minn. Oct. 2009.

86. RPI, Chemical Engineering, “Microstructure and rheology relationships for concentrated colloidal dispersions: Shear thickening fluids and their applications.” Troy, NY 2009.
87. Johns Hopkins, Depart. Physics & Astronomy, “Microstructure and rheology relationships for concentrated colloidal dispersions: Shear thickening fluids and their applications.” Baltimore, MD, Sept. 20010.
88. Wayne St. University, Chemical Engineering, “Microstructure and rheology relationships for concentrated colloidal dispersions: Shear thickening fluids and their applications.” Detroit, MI, Sept. 2010.
89. University of Washington, Chemical and Biomolecular Engineering, “Microstructure and rheology relationships for concentrated colloidal dispersions: Shear thickening fluids and their applications.” Seattle, WA, Nov. 2011.
90. University of Michigan, “Microstructure and rheology relationships for concentrated colloidal dispersions: Shear thickening fluids and their applications.”Chemical Engineering, Ann Arbor, Dec., 2011.
91. Univ. Chicago. Physics, “Microstructure and rheology relationships for concentrated colloidal dispersions: Shear thickening fluids and their applications.”, Chicago, May, 2012.
92. UIUC, Chemical and Biomolecular Engineering, “Microstructure and rheology relationships for concentrated colloidal dispersions: Shear thickening fluids and their applications.” Urbana-Champagne, May, 2012.
93. Swedish Neutron Scattering Society, “*Understanding the nonlinear dynamics of polymer-like micelles by combined time-resolved small angle neutron scattering (SANS) and large amplitude oscillatory shear (LAOS) rheology”* Stockholm, Sweden, August, 2012.
94. Lund University & European Spallation Source, “New Methods to Understand Steady and Transient Flows in Complex Fluids.” Lund, Sweden, August, 2012.
95. Ostwald Kolloquium Humbolt University, "tOr-SANS time resolved oscillatory rheology and SANS on concentrated colloidal dispersions." Potsdam, Germany, Sept. 2012.
96. Leipzig University, Institute for Theoretical Physics, “New Methods to Understand Steady and Transient Flows in Complex Fluids.”, Lund, Sweden, August, 2012.
97. University of Connecticut, “Microstructure and rheology relationships for concentrated colloidal dispersions: Shear thickening fluids and their applications.” Chemical Engineering, Oct. 2012.
98. IIT Madras, 2 lectures Chemical Engineering & Physics, “Development of microstructure/rheology relationships for complex fluids: Understanding shear-banding in polymer-like micelles.” & “Shear thickening fluids and their applications.” Chennai, India, Nov. 2012.
99. IIT Gandhinagar, “Shear thickening fluids and their applications.” Ahmedabad, India, Nov. 2012.
100. Bose Institute, “Shear thickening fluids and their applications.” Kolkata India, Nov. 2012.
101. ETH-Zurich, Food Science, “Rheo-SANS: Development of microstructure/rheology relationships for complex fluids: Understanding shear-banding in polymer-like micelles.” Zurich, Switzerland, Dec. 2012.
102. Karlsruhe Institute of Technology, “Rheo-SANS: Development of microstructure/rheology relationships for complex fluids: Understanding shear-banding in polymer-like micelles.” Karlsruhe, Germany, Dec. 2012.
103. Cornell University, “Development of microstructure/rheology relationships for complex fluids: Understanding shear-banding in polymer-like micelles.” Ithaca, NY March 2013.
104. Levich Institute and City University New York, “Development of microstructure/rheology relationships for complex fluids: Understanding shear-banding in polymer-like micelles.” NY, NY March 2013.
105. University of Indiana, Physics, “How to Gels Form and Flow?” Bloomington IN, Dec. 2013.
106. Michigan State University: Science at the Edge, “ STF Fluids and their Applications, January, 2014.

107. University of Toronto: Lectures at the Leading Edge, "STF Fluids and their Applications," Toronto, CA, March 2014.
108. Oak Ridge National Laboratory, 4th Nanomaterials and Neutrons Research Forum, "How do colloidal gels form and flow?", ORNL, TN, April 2014.
109. Lehigh University, Dept. of Chemical Engineering, "How do Gels Form and Flow?" Lehigh, PA, April 2014.
110. NCNR NIST Workshop, Plenary Lecture, "Probing the Dynamics of Soft Matter with Neutrons." Gaithersburg, MD. August 2014.
111. Case Western Reserve University, Dept. of Macromolecular Science and Engineering, "How do Gels Form and Flow?" Cleveland, OH, Sept. 2014.
112. APS March Meeting, "Field responsive shear thickening fluids for personal protective equipment and MMOD shielding for spacecraft and astronauts", San Antonio, TX, March 2015.
113. Georgetown University Physics Dept. "Shear thickening fluids and their applications as field-responsive protective materials.", Georgetown, March, 2015.
114. Syracuse University, Department of Biomedical and Chemical Engineering, "How do Gels Form and Flow?", Syracuse, NY, April 2015.
115. Int. Assoc. of Colloid and Interface Sci. "Shear thickening fluids and their application in personal protective equipment and space exploration.", Mainz, Germany, May 2015.
116. Carnegie Mellon University Graduate Student Association, "The Micromechanics of Shear Thickening Fluids and Their Applications as Field-responsive Protective Materials and Shielding for Spacecraft and Astronauts." Pittsburgh, PA October 22-23, 2015.
117. Materials Research Society, "SANS and Rheo-SANS study of particle dispersion and block copolymer and surfactant self-assembly in ionic liquids." Boston, MA, Nov. Nov. 29-Dec. 4, 2015.
118. University of Oklahoma, Dept. of Chemical, Biological and Materials Engineering, "The micromechanics of shear thickening fluids and their applications as field-responsive protective materials and shielding for spacecraft and astronauts.", Norman, OK, Feb. 24-25, 2016.
119. Widener University Science Seminar, "The micromechanics of shear thickening fluids and their applications as field-responsive protective materials and shielding for spacecraft and astronauts", Chester PA, April 11, 2016.
120. NCNR/LENS Workshop on Neutron Probes of Hierarchical Materials: "Challenges in complex fluids and soft matter to be solved by neutron scattering", Sept. 2016, NCNR NIST, Gaithersburg, MD.
121. SUNY Buffalo, Chemical Engineering, "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, football players, astronauts and spacecraft." Oct. 5, 2016, Buffalo NY.
122. U. Minnesota, Chemical Engineering, "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, football players, astronauts and spacecraft." Oct. 18, 2016, Minneapolis, MN.
123. U. Houston, Chemical Engineering, "How do colloidal gels form and flow?", Oct. 28th 2016 Houston, TX
124. University of Delaware, Inaugural Ceremony for President Assanis, "Solving Engineering's Grand Challenges with Neutrons", December, 2016.
125. University of Maine, "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, football players, astronauts and spacecraft." April 28, 2017. Bangor, Maine.
126. LSU, "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, football players, astronauts and spacecraft." November 20, 2017. Baton Rouge, LA.
127. Notre Dame, "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, football

players, astronauts and spacecraft." March 2018. South Bend, IN.
128. Institut fuer Materialphysik in Weltraum, DLR, Deutsches-Zentrum fuer Luft- and Raumfarht,"The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, football players, astronauts and spacecraft." Koeln, Germany, July, 2018.
129. Drexel University, Chemical and Biological Engineering, "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, protective materials for athletes, astronauts and spacecraft", Philadelphia, PA, Nov. 2018.
130. IUTAM Symposium on Dynamics of Complex Fluids and Interfaces, "Rigidity percolation, gelation, and glass transitions of spherical & anisotropic colloidal suspensions with thermoreversible short-range attractions." IIT Kanpur, India Dec. 2018.
131. Temple University, Dept. of Physics, , "Rigidity percolation, gelation, and glass transitions of spherical & anisotropic colloidal suspensions with thermoreversible short-range attractions." Philadelphia, PA, March, 2019.
132. UMASS-Amherst, Department of Chemical Engineering, "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, protective materials for athletes, astronauts and spacecraft." April, 2019.
133. American Chemical Society National Meeting, PMSE AGILITY Team Innovation Award Program: "Advanced Environmental Protection Garments for Human Space Exploration using Shear Thickening Fluid Armor ™ ." (virtual) April, 2021.
134. ICNAN 19, Centre for Nanotechnology Research, VIT, Vellore India "Applications of Neutron Scattering Measurements to Biopharmaceutical Formulations." November, 2019.
135. CompFlu-2019, "Gelation in colloidal suspensions of rod-like particles of low to moderate aspect ratio." IISER, Bhopal, India, Nov. 2019.
136. IIT Madras, Institute Lecture, "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, athletes, and astronauts," December, 2019, Chennai, India.
137. IIT Kanpur, Institute Lecture, "The micromechanics of shear thickening fluids and their application as protective materials for medical professionals, first responders, athletes, and astronauts," Kanpur, India, December, 2019.
138. CHESS 2030 Workshop, Soft Matter Far from Equilibrium, "Kinetics of Structuration & Rheology Development in Soft Matter: Protein, Colloidal, and Aluminosilicate Gels." Virtual, June 2021.
139. APS March 2022 Session: Constraint-based rheology of dense suspensions. "How nanoscale surface physics affects emergent material properties in colloidal suspensions" Chicago, March 2022.
140. ORNL SNS/HFIR Sample Environment Group, "New Sample Environments for Neutron Small Angle Scattering and Reflectometry to study Soft Matter and Biology." February, 2023.

Industrial

1. Exxon Res. And Dev., *Dynamics and Rheology of Brownian Suspensions,* Annandale NJ, 1991.
2. Eastman Kodak, *Suspension Rheology,* Kodak Park., Rochester, 1993.
3. Unilever, *Rheology and Dynamics of Surfactant Systems,* Unilever, Edgewood, NJ, 1993.
4. Alcoa, *Flow of Suspensions,* ALCOA Tech. Center, Pittsburgh, 1994.
5. BASF AG, *Suspension Rheology,* Ludwigshafen, Germany, 1994
6. DuPont CR & D Research Colloquium, *The Interesting Rheology and Microstructure of*

Liquid Crystalline Polymers, Wilmington, Feb., 1995.
7. DuPont Marshall Lab, *Advances in Fundamental Colloid Rheology,* Philadelphia, March, 1995.
8. DuPont Coatings Symposium, *Shear Thickening Rheology of Dispersions* Newark, DE, Oct. 1995.
9. Rohm and Haas, *Shear Thickening,* March 1997.
10. BASF AG, *Shear Stability,* Ludwigshafen Germany, June, 1997.
11. SPARK97, Unilever Research Internal Conference, *Rheology of Complex Fluids* Englewood NJ, Nov., 1997.
12. Rohm & Haas, *Colloidal Microstructure, Rheology and Characterization*, Springhouse PA, May, 1999.
13. Merck Research Labs, *Rheology of Concentrated Colloidal Dispersions*, West Point, PA, Oct., 1999.
14. Eastman Kodak, *Shear Stability,* Kodak Park, Rochester, June, 1998.
15. Cabot Corp., *SANS Methods to Study Particles,* Mass., planned for Sept., 1998.
16. Rohm and Haas, *Colloidal Microstructure, Rheology, and Characterization,* Spring House PA, May, 1999.
17. J.M. Huber, *Rheology of Concentrated Colloidal Dispersions,* Havre de Grace, MD, Oct. 2000
18. Rhodia, *Engineering Colloidal Surfaces to Control High Shear Rheology,* Cranbury, NJ, Jan. 2001.
19. Hercules, Inc., *Engineering Colloidal Surfaces to Control High Shear Rheology,* Wilmington, Feb. 2001.
20. Elan Pharmaceutical Technologies, *Engineering Colloidal Surfaces to Control High Shear Rheology,* April, 2001.
21. DuPont, Rheology Seminar, *Engineering Colloidal Surfaces to Control High Shear Rheology,* Wilmington, DE, May, 2001
22. Elan Pharmaceuticals, *Engineering Colloidal Surfaces to Control High Shear Rheology,* King of Prussia, PA, May, 2001
23. Bayer AG, Physics Group, *Engineering Colloidal Surfaces to Control High Shear Rheology,* Leverkusen, Germany, June, 2001
24. BASF AG, Polymer Physics, *Shear Thickening of Colloidal Dispersions,* Ludwigshafen, Germany, June, 2001
25. 11th Nisshin Engineering Particle Technology International Seminar (NEPTIS-11), *Shear Thickening of Colloidal Dispersions,* Dec. 8-10, Kyoto, Japan, 2002.
26. ExxonMobil, *Nonequilibrium Thermodynamics of Complex Fluids: Engineering Colloidal Interactions to Control Reversible Shear Thickening in Concentrated Dispersion,* Annandale, NJ, April, 2003.
27. DuPont CR&D UD Seminar Series, *Engineering Colloidal Interactions to Control Reversible Shear Thickening in Concentrated Dispersions*, Wilmington, DE, Jan, 2004.
28. W.L. Gore, "Liquid Armor": Nanoparticle Composites for Flexible Ballistic Materials and the Rheology of nanoparticle & Anisometric Particle Dispersions, Elk Mills, MD, April, 2004.
29. Unilever, Wormlike Micelle Solutions: mixed cationic-anionic systems, rheology and microstructure relationships , Edgewater, NJ, June 2004.
30. Hercules Inc. "Liquid Armor": Nanoparticle Composites for Flexible Ballistic Materials and the Rheology of nanoparticle & Anisometric Particle Dispersions, Wilmington, DE, July, 2004.
31. Institute for Defense and Government Advancement, Lightweight Materials for Defense, "Shear Thickening Fluids: Applications in Flexible Ballistic and Puncture-Resistant Materials." Washington D.C., March 2005. (with Eric Wetzel).
32. Eastman Kodak, "Polymer Stabilized Colloidal Dispersions: Rheology, Phase Behavior and Microstructure", Rochester, Nov. 2005.
33. Rohm & Haas Electronic Materials, "Nanoscale Directed Self Assembly in Electrical and Optical Fields", Newark, DE, June 2006.
34. Invista, "Shear Thickening Fluids: Applications in Flexible Ballistic and Puncture-Resistant Materials.", Newark, DE Jan. 2007.

35. RatnerPrestia, "Shear Thickening Fluids: Applications in Flexible Ballistic and Puncture-Resistant Materials.", Valley Forge, PA, June 2007.
36. Semiconductor Research Corporation, Directed Self-Assembly in Electrical and Optical Fields, Amherst, MA, Nov. 2008.
37. TA Instruments Users Meeting, Invited Lecture: "Development of microstructure/rheology relationships for complex fluids: Rheo-SALS, Rheo-Microscopy & tOR-SANS." New Orleans, May, 2012.
38. DuPont, Experimental Station, "New methods to combine Small Angle Neutron Scattering with rheology to develop structure-property relationships for polymer solutions and concentrated colloidal dispersions.", Wilmington, DE, May 2012.
39. General Electric Global Research, "Microstructure and rheology relationships for concentrated colloidal dispersions: Shear thickening fluids and their applications." Niskayuna, NY, May 2012.
40. ExxonMobil Research and Engineering, "Rheo-SANS Applied to Soft Matter" Clinton NJ June 2013.
41. Evonik North America, "Dynamic Rheology and Microstructure of Wormlike Micelles", Atlantic City, Sept. 2013.
42. ExxonMobil Chemical, "Dynamic Rheology and Microstructure of Wormlike Micelles" Baytown Texas, Feb. 2014.
43. Syngenta, "How do Gels Form and Flow?" Jealott's Hill, England, June, 2014.
44. Solvay, "How do Gels Form and Flow?",Bristol PA, January 2015.
45. TA Instruments User Meeting, "How do Gels Form and Flow?" February, 2015.

Short Courses

1. *Phase Equilibria* (with M. Paulaitis), Jan 28-30th 1996 Midland, MI. Sponsored by the local AIChE section.
2. *Suspensions and Complex Fluids Lectures* (4 lectures), BASF AG, Ludwigshafen, Germany, June 1995.
3. *Rheo-Optics* invited lecture at the *Complex Fluid Materials* Materials Sci. Summer Institute, Lakewood NJ, July 1998.
4. *Colloidal Dispersions*, CMET Short Course, University of Delaware, Spring 1999.
5. *Colloid Rheology*, 25th Annual Short Course on Rheological Measurements, University of Minnesota, Minneapolis, June 4-9, 2000.
6. *Particle Design and Processing* (with J. Litster & F. Doyle), University of Delaware, January, 2001.
7. *Particle Design and Processing* (with J. Litster & F. Doyle), Merck, West Point, PA, January, 2001
8. *Rheology of Colloidal Dispersions* Short Course (with W.B. Russel), Society of Rheology National Meeting, Hilton Head Island, February, 2001.
9. *Particle Design and Processing* (with J. Litster & E. Kaler), University of Delaware, Feb., 2002.
10. *Particle Design and Processing* (with J. Litster & G. Tardos), Merck, West Point, PA, Feb., 2002
11. *Colloid Rheology* (with J. Mewis), Paar Physica Rheology Class, UofD, Feb. 2004.
12. *Directed Self Assembly* (with E.W. Kaler, E.M. Furst, J. F. Brady, and O. Velev), Univ. of Delaware, June 2007.
13. *Rheo-SANS: Structure-Property Relations under Flow and Dynamics*, SANS tutorial, ACNS, Santa Fe, May 2008.
14. *Colloidal Suspension Rheology* (with J. Mewis), XVth Int. Congress of Rheology, Monterey, CA, Aug. 2008.
15. *Colloidal Suspension Rheology* (with J. Mewis), Society of Rheology, Santa Fe NM, Oct. 2010
16. *Colloidal Suspension Rheology* (with J. Mewis), University of Delaware Outreach and TA Instruments, New Castle DE, May 2012.
17. *Colloidal Suspension Rheology* Technical University of Berlin, Berlin, Sept. 2012.
18. *Colloidal Suspension Rheology* (with J. Mewis), XVIth Int. Congress of Rheology, Lisbon, Portugal, Aug. 2012.
19. *Colloidal Suspension Rheology* (with E.M. Furst), DuPont Experimental Station, June, 2013.

20. *Colloidal Suspension Rheology* (with Jan Mewis), Society of Rheology National Meeting, Philadelphia, 2014.
21. *Colloidal Suspension* Rheology (with Jan Mewis), ETHZ, Switzerland, June 2015.
22. *Rheology Boot Camp*, UD Jan. 2017
23. *Rheology Boot Camp,* UD, Jan. 2018
24. *Rheology Boot Camp,* UD, Jan. 2019
25. *Rheology of Colloidal Gels and Glasses,* w. George Petekedis AERC Annual European Conference on Rheology, (virtual) April, 2021
26. *Rheology Boot Camp, UD, Jan 2022*
27. *Intro to Rheology and Rheology of Gels and Glasses*, w George Petekidis, Society of Rheology Annual Meeting, Chicago, IL, October 2022.

Webinars:

08/27/2014 TA Instruments: "An Introduction to Colloidal Suspension Rheology" **https://www.youtube.com/watch?v=3vcMkC-voLc&list=PLyFxSNY0W6tqAVrYdoqXsVPwgeILu8y4d&index=25**

07/19/2015 White House Office of Science and Technology Policy "We the Geeks: The Stuff Superheroes Are Made Of." Liquid Armor https://obamawhitehouse.archives.gov/blog/2013/07/17/we-geeks-stuff-superheroes-are-made

09/02/2016 American Chemical Society Webinar: Materials Science Series, Future Protective Materials for First Responders, Football Players, and Astronauts: Shear Thickening Fluids – American Chemical Society

2/21/2017 American Chemical Society, "Chemistry in a box" series: Chemistry of Sports https://www.acs.org/content/acs/en/acs-webinars/program-in-a-box/pib-on-demand/sports.html

8/30/2017 AIChE Academy "Protective Materials for First Responders, Football Players, and Astronauts: Shear Thickening Fluids" https://www.aiche.org/academy/webinars/protective-materials-first-responders-football-players-and-astronauts-shear-thickening-fluids

POSTDOCS, PHD, MCHE AND SENIOR THESES:

Postdoctoral Students Mentored (36):

1. Michael Kotelyanskii (95-96) (Penn State)
2. Adriana de Silva (98, Dow)
3. Igor Bodnar (98-99, DSM)
4. Leo Hanus (99-00, AZ Electronics)
5. Markus Banerjee (98-99, Rohde & Schwarz, Germany)
6. Young Sil Lee (2004, Samsong, Korea)
7. Stacey Elliot (2002, DuPont, Philadelphia)
8. Raphael Pesche (2002, Freiburg, Germany)
9. Gerhard Fritz (2002, Graz, Austria)
10. Matthew Liberatore (2004-5, Col. School. Mines)
11. Emily Pollauf (2005,.U. Colorado)
12. Carline Nam (2006, Infineon)
13. Jeff Rimer (2007, U. Houston)
14. Rich Dombrowski (2008-9)
15. Florian Nettesheim (2004-7, Alexander von Humbolt Fellow, DuPont)
16. Manish Kelkar (2008-2009, DuPont)
17. Aaron Eberle (2008-2010, ExxonMobil)
18. Carlos Lopez-Barron (2010-12, ExxonMobil)
19. Prachi Thareja (2008-2011, IIT Gandhinagar, India)
20. Basa Madivala (2008-2010, IIT Madras, India)
21. Rose Ndong (2011-2012, Solvay)
22. Simon Rogers (2012-14, Assistant Professor, UIUC)
23. Kevin Whitcomb (2014-17, TA Instruments)
24. Jeffrey Richards (2014, NRC NIST, 2018 Assistant Professor, Northwestern U.)
25. John Riley (2015, NRC Postdoc NCNR, NIST, 2019 DOW)
26. Michael Zhang (2016-2021, joint with Yun Liu, Cabot)
27. Maria Katzarova (2016-17)
28. Yimin Luo (2018-2020, UCSB)
29. Yu-Juin (Nate) Lin (2018-2020, Merck)
30. Peter Gilbert (2019-2021, joint with Yun Liu, NRC Postdoc, NIST)
31. Rachel Ford (2020-2021, Joint with Yun Liu, NRC Postdoc, NIST)
32. Kuo-Chih Shih (2021, Malvern)
33. Benjamin Thompson (2020-)
34. Khushboo Suman (2020-)
35. Nathan Alexander (2021)
36. Qi Li (2022-)

Research Scientists and Engineers (3)

1. Richard Dombrowski (2008-2013)
2. Kathy Zetune (2008-11, 12-13)
3. Maria Katzarova (2017-)

PhD Students Mentored (50):

1. Jonathan W. Bender, Delaware, 1995
   RheoOptical Investigations of the Microstructure of Model Colloidal Suspensions
2. Lynn M. Walker (Carnegie Mellon Univ.), Delaware, 1995.
   Rheology and Rheo-Optics of Liquid Crystal Polymers Under Flow
3. Sanjeev R. Rastogi (Union Carbide), Delaware, 1995
   Nonequilibrium Brownian Dynamics of Colloidal Suspensions

4. Johan Bergenholtz[1] (Univ. Goteborg, Sweden), Delaware 1996
   Statics and Dynamics of Colloidal Suspensions with Attractive Interactions
5. Maria de Jesus van Eijndhoven Rivera (GE, Netherlands), Delaware, 1997
   Flow Induced Morphological Transitions in Polymer Blends Containing Liquid Crystalline Polymers
6. William A. Kernick III (General Electric Plastics), Delaware, 1998
   Rheology and Morphology of Polymer Blends Containing Liquid Crystalline Polymers
7. Thomas R Cuthbert, (Union Carbide/DOW), Delaware 1998
   Transport of Small Penetrants in Polymer Glasses: Investigations via Simulation and Experiment
8. Konstantin Abraham Vaynberg (Hercules), Delaware, 1999
   Rheology and Shear Aggregation of Gelatin Stabilized Colloids
9. Eleni Dokou (Merck), Delaware, 2001 (with Mark Barteau and Abraham Lenhoff)
   Scanning probe microscopy studies of chemical and physical properties of particulate systems
10. Brent J. Maranzano (Pfizer), Delaware, 2001
    Rheology and Microstructure of Concentrated Near Hard Sphere Colloidal Dispersions at the Shear Thickening Transition
11. Brian M. Tande (Univ. North Dakota), Delaware, 2002
    The Rheology, Microstructure, and Phase Behavior of Dendritic and Hyperbranched Polymers
12. Sudhir S. Shenoy (Schlumberger), Delaware, 2003
    Electric Field Effects on the Rheology of Shear Thickening Colloidal Dispersions
13. Beth A. Schubert (P&G), Delaware, 2003 (with E.W. Kaler)
    The Rheology and Microstructure of Charged, Wormlike Micelles
14. Jan. H.D. Boshoff (Sasol), Delaware, 2004 (Joint with R. Lobo)
    Configurational Diffusion in Glassy, Amorphous Polymers: Effects of Polymer Structure and Dynamics on Permeation via Molecular Simulation
15. Lakshmi Narasimhan Krishnamurthy (DuPont), Delaware, 2005
    Microstructure and Rheology of Polymer-Colloid Mixtures
16. Ronald G. Egres, Jr.[2] (DuPont), Delaware, 2005
    The Effects of Particle Anisotropy on the Rheology and Microstructure of Concentrated Colloidal Suspensions through the Shear Thickening Transition
17. Armin Opitz (Genzyme), Delaware, 2008.
    Structural and Functional Investigations of a Molecular Imaging Nanoparticle for Magnetic Resonance Imaging of Oncogene Expression in the Pancreas,
18. Monica C. Branco (GSK) (Delaware 2009, Joint with Joel Schneider)
    Understanding the Structure, Dynamics, and Mass Transport Properties of Self- Assembling Peptide Hydrogels for Injectable Drug Delivery Applications
19. Matthew E. Helgeson[3] (UCSB), Delaware 2009
    Structure, Rheology, and Thermodynamics of Wormlike Micelle-Nanoparticle Mixtures
20. Jason McMullan (ExxonMobil), Delaware, 2010
    Directed Self-Assembly of Colloidal Crystals with Electric and Shear Fields
21. Dennis P. Kalman (Solvay), Delaware, 2010
    Microstructure and Rheology of Concentrated Suspensions of Near Hard-Spheres
22. Amit Kumar (IIT Gurawati, India) Delaware, 2010 (with Raul Lobo)
    Configurational diffusion of small gas molecules in nanostructured materials: a computational and experimental study

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[1] Colburn Award 1996, Univ. of Delaware
[2] Roy L. McCullough Scholars Award, CCM 2005
[3] Victor K. LaMer Dissertation Award, American Chemical Society Division of Colloid and Interface Science, 2011

23. Carrie B. Street (Valspar) Delaware 2012
    Rheophysics of Thixotropic Pastes: The Rheology and Microstructure of Systems Containing Surfactants and a Crystallizing Fatty Acids
24. Mark Pancyzk (Ingredion) Delaware, 2013 (with E. Furst)
    Directed Assembly and Dynamics of Anisotropic Particles
25. Jung Min Kim (Pepsico) Delaware 2013
    Effect of the Range of Attraction on the Rheology, Microstructure and Thermodynamics of Thermoreversible Gels with Adhesive Hard Sphere Interactions
26. Dongcui Li (Lubrizol) Delaware 2013
    Toward the Rational Design of Polyelectrolyte Surfactant Complexes: Thermodynamics, Microstructure and Property
27. A. Kate Gurnon[4] (GE Global Research) Delaware 2014
    Nonlinear Oscillatory Rheology and Structure of Wormlike Micellar Solutions and Colloidal Suspensions
28. P. Doug Godfrin[5] (MIT, postdoc) Delaware 2015
    Thermodynamic and material properties of reversible cluster formation - Application to concentrated protein solutions
29. Colin Cwalina (DOW, Collegeville, PA) Delaware 2015
    Shear thickening fluids for enhanced protection from micrometeoroids and orbital debris
30. Jingsi Gao (Monsanto) Delaware 2017
    Rheology and microstructure of stable concentrated ionic liquid colloidal suspensions
31. Dan Greene (joint with A. Lenhoff, AMGEN) Delaware 2016
    The formation and structure of precipitated protein phases
32. Melissa Gordon (AssociateProfessor, Lafayette College, PA, NSF Fellow, joint with C. Kloxin) Delaware, 2017
    The Development and Characterization of Stimuli-Responsive Systems for Performance Materials
33. Lt. Col. Matthew Armstrong (joint with A. Beris, Assistant Professor, West Point Academy) Delaware 2015
    Investigating and modeling the thixotropic behavior, microstructure, and rheology of complex material
34. Michelle Calabrese (MIT Postdoc, UMN Assistant Professor) Delaware 2017
    Developing Structure-Property Relationships in Branched Wormlike Micelles via Advanced Rheological and Neutron Scattering Techniques
35. Paul Mwasame (DOW, joint with A. Beris) Delaware 2017
    Multiscale investigation of fundamental rheological phenomena in particulate suspensionsbased on flow-microstructure interactions
36. Ryan Murphy (NIST, NRC Postdoc) Delaware 2017
    The nature of anisotropic particles with short-range interactions
37. Stephan Ma (2016, NSF Fellow, joint with C. Kloxin, Intel) Delaware 2017
    Controlling surface properties of polymer materials through photodirected thiol-ene wrinkle formation.
38. Stijn Koshari (2019, joint with A. Lenhoff, GSK)
    The Microstructure of Dense Protein Systems in Biopharmaceutical Applications
39. Ru (Chen) Xie (2018, NSF Fellow, DESGC Fellow, Exxon Mobil Chemical)
    Toward hierarchical material design via block copolymers in a protic ionic liquid: self-assembly, functionalization, device fabrication and commercialization
40. Jannat Nayem(2020, NSF Fellow, joint with Yun Liu, Sloan Kettering) *Biophysical Characterization of Critical Physiochemical properties of Therapeutic Monoclonal Antibody*

[4] Allan P. Colburn Dissertation Award, University of Delaware, 2015.
[5] 2016 Prize for Outstanding Student Research, Neutron Scattering Society of America.

Formulation

41. Julie Hipp (2020, P&G) *Structure, Rheology and Electrical Conductivity of High-Structured Carbon Black Suspensions*
42. Ying-heng "Summer" Tein (2022, Janssen Parma) *Novel Method for Investigating Structure and Rheology of Complex Fluid Interfaces with Biotherapeutic Applications*
43. Yu-Fan Lee (2022, postdoc, Delft) *Microstructure and Rheology of Concentrated Colloidal Suspensions with Varying Nanotribological Interactions*
44. Jennifer Mills (2022, Joint with Paramita Mondal, DOW) *Chemical Structure-Property Relationships of Alkali-Activated Aluminosilicate Polymeric Materials for the Development of Sustainable Construction Materials*
45. Soham Jariwali (2023, joint with Antony Beris, W.L. Gore)
46. Quent Hartt (2025)
47. Ted Egnaczyk (2025)
48. Keit Pham (2025)
49. Sean Farrington (2025, Joint with Antony Beris)
50. Jack Rooks (2026)

Doctoral Students at Foreign Institutions (1):

1. Marc Sommer, Erlangen, 2007(co-supervised Uni. Erlangen, Prof. Wolfgang Peukert) *Mechanical Production of nanoparticles in Stirred Media Mills*

MCHE (12):

1. Richard Pittman Delaware, (Primary Advisor: Nily Dan) Delaware 1998 *Colloidal Stabilization by Polyelectrolyte Adsorption*
2. Joseph Amante (Proctor & Gamble) Delaware 1998 *Investigation of Shear Thickening Colloidal Dispersions*
3. Kenneth D. Smith (UMass., PhD) Delaware 2003 (Joint with Eric Kaler) *Microstructure, Rheology, and Dynamics of Colloidal Particles in a Model, Self- Assembled Surfactant Solution*
4. Vikram Kumar Daga (UMass PHD) Delaware 2006 *Rheology and Electrospinnng of Neat and Laponite-Filled Poly(ehtylene oxide) Solutions*
5. Kate Hollabaugh (Dow, Joint with Eric Kaler), Delaware 2008 *Microstructure and Rheology of Mixed Ionic Surfactants*.
6. Stijn Khoshari (KU Leuven Dual MCHE, Joint with A. Lenhoff), Delaware 2014 *Characterization of Lysozyme Adsorption in Cellulosic Chromatographic Particles using Small-Angle Neutron Scattering*.
7. Yun Soo Kim (LG, Korea) Delaware 2015 *Effect of particle anisotropy on suspension rheology and phase behavior with tunable attractive strength.*
8. Sai Prasad Ganesh (2018, Joint with Abraham Lenhoff) *Gel-Like Behavior in Amorphous Protein Dense Phases: Phase Behavior, Neutron Scattering, and Rheology*
9. Tim Van de Vyer (2019, Joint with Antony Beris, KU Leuven Dual MCHE) *Development of a Numerical Model for Blood Rheology Subjected to Pulsating Poiseuille Flow in a Cylindrical Vessel.*
10. Xutai (Steve) Shi (2018, Joint with Abraham Lenhoff) *Modeling the Sustained Release of PLGA-Based Drug Delivery Systems with a Physically-Based Sustained Release Model and Pore Space Characterization*
11. Haesoo Lee (2021, Dual Degree Program with KU Leuven, Prof. Erin Koos) *Capillary Suspensions of Colloidal Rods*.
12. Jihyuk Kim (2022) *Understanding Structure-Dynamics-Property Relationship of Polymer Nanocomposites: Effect of Size*

Undergraduate Senior Theses & Honors Theses (36):

1. Aldo Romagnoli III (Fugi, Japan) Delaware, 1994
   Stability and Flocculation of Colloidal Organic Dyes used in Film Emulsion
2. Patricia Wu, Delaware 1994
   Modified Monte-Carlo Simulation of the Square-well Fluid
3. Kristina Abiles, Delaware 1995
   Stability of Photographic Dye Dispersions
4. Tara M Kaszowicz, Delaware 1996 (Degree with Distinction)
   Characterization of Hyperbranched Polyphenylenes
5. James Jariwala, Delaware 1998
   Effect of Hyperbranched Polymers on the Viscosity of Industrial Polymers
6. Ashley E. Cooper[6] (Exxon Mobil), Delaware 1999 (Degree with Distinction)
   Microstructure and Properties of Hyperbranched Polymers for Rheology Modification
7. Robert W. Deitcher, Jr. (Merck), Delaware 2000 (Degree with Distinction)
   Application of Group Contribution Predictive Theory to Dendrimer Thermodynamics
8. Jonathan Davis (Princeton, PhD), Delaware 2000 (Degree with Distinction)
   Nonequilibrium Thermodynamics of Multiphase Flow
9. Lisa Dietrich (Merck), Delaware 2001 (Degree with Distinction)
10. Martin Convey, Delaware 2003 (with Steve Dentel, Civil Engineering)
    The Effect of Shear on the Compression of Flocculated Suspensions: Application to Belt- Filter Press Dewatering
11. Cory C. Mulcahy, Delaware 2003 (Joint with John S. Boyer)
    Delivery of Polymers to the Cell Walls of Chara corallina
12. John Kirkwood[7], Delaware 2004 (Degree with Distinction)
    Shear Thickening Fluid Containment in Polymer Composites
13. Keith Kirkwood[8] Delaware 2004 (Degree with Distinction)
    Carbon Nanotube Dispersions
14. Philip Matthews[9], Delaware 2004
    Advanced Shear Thickening Fluid Applications
15. Jessica Penetar, Delaware 2005
    The Integration of Silver Nanoparticles into Poly(ethylene oxide) Fibers
16. Holly Schaeffer, Delaware, 2005 (coadvised Ismat Shah)
17. Andrew Klein, Delaware 2006
    Rheo-SALS Study of Wormlike Micellar Surfactant Solutions Including Silica Particles
18. Matthew Decker[10], Delaware 2006 (Degree with Distinction)
    The Influence of Adsorbed Polymer on the Rheology and Shear Stability of Concentrated Colloidal Dispersions
19. Joe Houghton[11] , Delaware 2007 (Degree with Distinction)
    Effect of Particle Hardness in Shear Thickening Fluids
20. Kristie Grammatikos Delaware 2007
    Anisotropic Particles and Polymer Electrospinning
21. Brian Rosen, Delaware 2008 (Degree with Distinction)
    Effect of Colloidal Shape on Fluid Flow and STF Material Performance
22. Matthew Reichert, Delaware, 2008 (Degree with Distinction)

[6] UD Undergraduate Thesis Award, UD
[7] CCM Undergraduate Research Award, 2003
[8] CCM Undergraduate Research Award, 2003
[9] CCM Undergraduate Research Award, 2004
[10] CCM Undergraduate Research Award, 2005
[11] CCM Undergraduate Research Award, 2006

Using Rheo-SALS to Investigate Shear Banding and Isotropic to Nematic Phase Transitions

23. Benjamin Schiffman, Delaware, 2008
    Rheomicroscope for the Study of Complex Fluids under Shear
24. Jeffrey Knopf, Delaware, 2009 (Honors Degree with Distinction).
    Electrospinning
25. Leo DeRita (2013)
    Self-assembly of Surfactant Systems in Ionic Liquids: Structural and Rheological Analysis.
26. Keyi Xu (2015)
    Dynamic Rheological Properties of Field Responsive Nanomaterials for Application in Transtibial Prosthesis
27. Charles McCutcheon (2016) Degree with Distinction
    Synthesis and Rheological Study of Calcium Fluoride Colloidal Dispersions
28. Koty McAllister (2017) Degree with Distinction
    INVESTIGATING CONDUCTIVE DISPERSIONS IN POISEUILLE FLOW: APPLICATIONS FOR SEMI-SOLID FLOW BATTERIES
29. Roxana Mitrut (2017)
    Effect of Specific Ion Binding and Solution Physicochemistry on the Apparent Charge of Proteins and Monoclonal Antibodies with Application to BioPharma
30. Jacob Lawton (2018) Degree with Distinction (in progress)
    The Rheology of Plate-like Nanoparticles Suspended in Shear-Thickening Fluids
31. Elaine Stewart (2018)
    Optimization of Shear Thickening Fluid (STF) Technology for Space Suit Applications
32. Cameron Mertz (2019)
    Product design of a microfluidic lab-on-a-chip device capable of accurately measuring viscosities of fluids given low volume samples.
33. Laura Smith (2019) *Investigating Pore Formation in Sustained Release Biopharmaceutical Rods*
34. Erin Hogan (2021) Degree with Distinction, *Optimization of Shear-Thickening Fluids for Space Suit Application*
35. Peter Diaz (2022, Joint with Huantian Cao) *Impact Resistant Football Glove*
36. Vasu Tangry (2023) *Formulation Stability of Acylated Peptides*

<u>Diplomarbeit (4):</u>

1. Ricarda Ziegler (BASF AG) FH Albstadt-Sigmaringen, Germany, 2001 (Erster Prüfer: Dr. Armin Wolff)
   Structure and Rheology of Xanthan Gum Solutions: Effect on Ultrafiltration
2. Tessa N. Paschke, Ludwig-Maximilian-University of Munich, Germany , 2002 (with: S. Sandler, Prof. T. Bein)
   Vapor-liquid equilibria of dendrimer-alcohol systems and their comparison to group contribution predictive theory.
3. Kerstin Weiss, TU Aachen, 2008. Praktikum:
   Wormlike Micelles.
4. Peter Roozemond (Eindhoven) 2008 (co-advised with Pam Cook)
   Numerical Study of Shear Banding WLMs