

# Nicolas J. Alvarez

## Associate Professor

### Department of Chemical and Biological Engineering

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## 1 Education

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- **Ph.D. in Chemical Engineering, NSF Fellow (GRFP)**,  
Carnegie Mellon University, Pittsburgh, PA, 2011  
Dissertation: "An Experimental and Theoretical Study of Surfactant Dynamics at Microscale Interfaces"  
Advisors: Professors Lynn M. Walker, Shelley L. Anna  
GPA: 4.0
- **B.S. in Chemical Engineering, Magna Cum Laude**,  
University of Florida, Gainesville, FL May 2006  
Honors Thesis: "An experimental study on the instability of elliptical liquid bridges"  
Advisor: Professor Ranga Narayanan

## 2 Professional Experience

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- Drexel University, Associate Professor, September 2020-Current
- Drexel University, Assistant Professor, September 2014-2019
- Technical University of Denmark, Visiting Professor, June 2016-August 2016
- Rheo Filament ApS, Chief Executive Officer, December 2014-present
- Technical University of Denmark, Post Doctorate Researcher, September 2011–August 2014
- Carnegie Mellon University, Research and Teaching Assistant, 2006–2011
- University of Florida - Laboratory of Prof. Narayanan, Research Assistant, 2002–2006
- University of Florida - Particle Engineering Research Center, Research Assistant, 2002–2003

## 3 Honors, Awards, and Fellowships

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### Faculty

- AIChE DVS Outstanding Faculty Award, AIChE Delaware Valley Section - 2019
- Department Service Award - CBE - Drexel University - 2016

### Graduate

- AIChE Fluid Dynamics (01J) First Place Poster Award, Annual Meeting, Pittsburgh 2012
- The Ken Meyer Award for Excellence in Graduate Research, 2011  
Awarded to one graduate student in each Chem. Eng. graduating class
- AIChE Fluid Dynamics (01J) First Place Poster Award, Annual Meeting, Salt Lake City 2010
- Geoffrey D. Parfitt Memorial Award for Best Presentation, CHEGSA Symposium, 2010  
Awarded to one graduate student at the annual graduate student association (CHEGSA) symposium
- John and Claire Bertucci Fellowship, Awarded by University, 2010-2011
- Graduate Student Fellowship, Awarded by Department, 2010-2011
- Mark Dennis Karl Outstanding Graduate Teaching Award, 2010  
Awarded to one graduate student in the Chem. Eng. department each year
- CHEGSA Symposium Award, 2009  
Awarded to two students for exceptional oral presentation at the CHEGSA symposium
- National Science Foundation Graduate Research Fellowship, 2006-2009
- Mead Fellowship, Pound Fellowship, Graduate Student Fellowship, Awarded by Department, 2006-2008

### Undergraduate

- Florida Bright Futures Scholarship, 2002-2006
- General Engineering Scholarship, 2004-2006
- Kappa Sigma Endowment Scholarship, 2004-2005
- Particle Engineering and Research Center Award, 2002-2003
- American Society of Sugar Cane Technologists Scholarship, 2002-2003

## 4 Research

### 4.1 Submitted Manuscripts

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1. Heedong Yoon, James Heinzman, Stuart E. Smith, et al. *Highly stable petroleum pitch provides access to the deep glassy state*, PRL, 2022, REVISIONS
2. ZR Hinton, **NJ Alvarez**, *Pressure Dependence of LS-36 Adsorption Isotherm Parameters and Transport Dynamics at the CO<sub>2</sub> Vapor-Solution Interface*, JCIS, REVISIONS
3. Thursch et al., The importance of Hydrophobicity, pi-pi stacking, and hydrogen bonding in the Self-Assembly of Glycine-X-Glycine Peptide Fibrils, *Soft Matter*, Revisions
4. Azimi et al., A Generalized Scaling Theory for Spontaneous Spreading of Newtonian Fluids on Solid Substrates, *POF*, Under Review
5. Ibrahim Ahmed; Mohanad Idrees; Emine Tekerek; Antonios Kontsos; Giuseppe Palmese; Nicolas Alvarez, Engineered Interleaved Glass Fiber Composites using Additive Manufacturing: Effect of Mat properties, Resin Chemistry and Resin Rich Layer Thickness, *Composites A.*, Under Review
6. Nichole O'Neill, Thamires A. Lima, Fabio Furlan Ferreira, Lavenia J Thursch, Nicolas Javier Alvarez, Reinhard Schweitzer-Stenner, Forbidden Secondary Structure Found in Gel-Forming Fibrils of Glycylphenylalanylglycine, *Journal of Physical Chemistry B*, 2022

### 4.2 Publications

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(\* Drexel Affiliation)

80. (\*) Heedong et al., The Effect of Spreading on Direct Ink Writing Additive Manufacturing, *SAMPE Journal*, 2022
79. (\*) Ibrahim et al., The Effect of Multi-Resin Domains in Spatially Resolved Additively Manufactured Parts, *SAMPE Journal*, 2022
78. (\*) Ibrahim et al., Effect of Additively Manufactured Resin Rich Layers on Mechanical Properties of Glass Fiber Reinforced Thermoset Resins, *SAMPE Journal*, 2022
77. (\*) Idrees et al. Additive manufacturing of damage tolerant continuous glass fiber reinforced thermosets, *SAMPE Journal*, 2022
76. (\*) J. M. Barakat, Z. Hinton, **N.J. Alvarez**, T.W. Walker, Surface-tension effects in oscillatory squeeze flow rheometry, *Physics of Fluids*, 33, 122112, 2022, 10.1063/5.0072869

75. (\*) M. D. Flamini, T. Lima, K. Corkum, **N. J. Alvarez**, V. Beachley, Annealing post-drawn polycaprolactone (PCL) nanofibers optimizes crystallinity and molecular alignment and enhances mechanical properties and drug release profiles, *Materials Advances*, 3, 3303, 2022, 10.1016/j.bpj.2021.11.1963
74. (\*) N. O'Neill, T. Lima, F. F. Ferreira, N. Alvarez, R. Schweitzer-Stenner, *Biophysical Journal*, 121, 151a, 2022 10.1016/j.bpj.2021.11.1963
73. (\*) M. Huang, **N. Alvarez**, G. R. Palmese, C. Abrams, The effect of network topology on material properties in vinyl-ester/styrene thermoset polymers using molecular dynamics simulations and time-temperature superposition, 207, 111264, 2022 10.1016/j.commsci.2022.111264
72. (\*) J. Tu, Y. Kashcooli, N. J. Alvarez, G. R. Palmese, A practical framework for predicting conversion profiles in vat photopolymerizations, *Additive Manufacturing*, 59, 103102, 2022 10.1016/j.addma.2022.103102
71. (\*) H Yoon, Z Hinton, J Heinzman, C Chase, M Gopinadhan, KV Edmond, S Smith, NJ Alvarez, The Effect of Pyrolysis on the Chemical, Thermal and Rheological Properties of Pitch, *Soft Matter*, ACCEPTED
70. (\*) ZR Hinton, **NJ Alvarez**, *Surface tensions at elevated pressure depend strongly on bulk phase saturation*, *Journal of Colloid and Interface Science* 594, 681-689, 2021
69. (\*) [PERSPECTIVE ARTICLE] R Schweitzer-Stenner, **NJ Alvarez**, *Short Peptides as Tunable, Switchable, and Strong Gelators*, *The Journal of Physical Chemistry B*, J. Phys. Chem. B 2021, 125, 25, 6760-6775
68. (\*) M Hesser, LJ Thursch, TR Lewis, TA Lima, **NJ Alvarez**, R Schweitzer-Stenner, *Concentration Dependence of a Hydrogel Phase Formed by the Deprotonation of the Imidazole Side Chain of Glycylhistidylglycine*, *Langmuir*, 2021, 37, 23, 6935-6946
67. (\*) LJ Thursch, TA Lima, R Schweitzer-Stenner, **NJ Alvarez**, *The impact of thermal history on the structure of glycylalanyl-glycine ethanol/water gels*, *Journal of Peptide Science* 27 (5), e3305, 2021
66. (\*) TM Idrees, AMH Ibrahim, E Tekerek, A Kontsos, GR Palmese, **NJ Alvarez**, *The effect of resin-rich layers on mechanical properties of 3D printed woven fiber-reinforced composites*, *Composites Part A: Applied Science and Manufacturing* 144, 106339, 2021
65. (\*) ZR Hinton, **NJ Alvarez**, *A molecular parameter to scale the Gibbs free energies of adsorption and micellization for nonionic surfactants*, *Colloids and Surfaces A: Physicochemical and Engineering Aspects* 609, 125622, 2021
64. (\*) TA Lima, RA Coler, GW Laub, S Sexton, L Curtin, KM Laub, **NJ Alvarez**, *A mechanism for improved talc pleurodesis via foam delivery* *Drug Delivery* 28 (1), 733-740, 2021

63. (\*) RM Saraka, SL Morelly, MH Tang, **NJ Alvarez**, *Correlating Processing Conditions to Short-and Long-Range Order in Coating and Drying Lithium-Ion Batteries*, ACS Applied Energy Materials 3 (12), 11681-11689, 2020
62. (\*) SL Morelly, **NJ Alvarez**, *Characterizing long-chain branching in commercial HDPE samples via linear viscoelasticity and extensional rheology*, Rheologica Acta 59 (11), 797-807, 2020
61. (\*) JR Baxter, GR Palmese, **NJ Alvarez**, *Waste to high performance materials: Self-assembly of short carbon fiber polymer composites*, Applied Materials Today 20, 100786, 2020
60. (\*) CK Henry, E Sandoz-Rosado, MR Roenbeck, DJ Magagnosc, GR Palmese, K Strawhacker, **NJ Alvarez**, *Direct measure of crystalline domain size, distribution, and orientation in polyethylene fibers*, Polymer 202, 122589, 2020
59. (\*) DM DiGuseppi, L Thursch, **NJ Alvarez**, R Schweitzer-Stenner, *Exploring the gel phase of cationic glycyalanyl-glycine in ethanol/water. II. Spectroscopic, kinetic and thermodynamic studies*, Journal of colloid and interface science 573, 123-134, 2020
58. (\*) M Carey, Z Hinton, V Natu, R Pai, M Sokol, **NJ Alvarez**, V Kalra, MW Barsoum, *Dispersion and stabilization of alkylated 2D MXene in nonpolar solvents and their pseudocapacitive behavior*, Cell Reports Physical Science, Volume 1, Issue 4, 2020
57. (\*) JR Baxter, RB Huneke, CJ Kanach, ES Reimold, **NJ Alvarez**, GW Laub *A Novel Triblock Copolymer Hydrogel Foam Delivery System To Improve Talc Pleurodesis Efficacy*, Journal of Thoracic and Cardiovascular Surgery, 2019
56. (\*) L Thursch, D DiGuseppe, TR Lewis, R Schweitzer-Stenner, **NJ Alvarez**, *Exploring the Gel Phase of Cationic Glycyalanyl-glycine in water/ethanol I. Rheology and Microscopy Studies*, Journal of Colloid and Interface Science, 2019
55. (\*) D DiGuseppi, J Kraus, SE Toal, **NJ Alvarez**, R Schweitzer-Stenner, *Exploring the thermal reversibility and tunability of a low molecular weight gelator using vibrational and electronic spectroscopy and rheology*, Soft Matter, (15), 3418-3431, 2019, DOI: 10.1039/c9sm00104b
54. (\*) JM Deitzel, M Kubota, JW Gillespie Jr., ZR Hinton, L Thursch, **NJ Alvarez**, G Palmese, JJ Fallon, M Bortner, R Zhang, RM Joseph, T Schumaker, J Riffle, S Lukubira, S Kanhere, MC Tang, and A Ogal, *Surface Treatment of TUFF Pitch-based Carbon Fiber for Adhesion Promotion in High TG Thermoplastic Composites*, SAMPE Journal, 2019, <https://doi.org/10.33599/nasampe/s.19.1613>
53. (\*) TN Beck, AY Deneka, L Chai, C Kanach, P Johal, **NJ Alvarez**, Y Boumber, EA Golemis, GW Laub, *An improved method of delivering a sclerosing agent for the treatment of malignant pleural effusion*, BMC Cancer, 2019, (1), 614

52. (\*) M Carey, Z Hinton, M Sokol, **NJ Alvarez**, MW Barsoum, *Nylon-6/Ti<sub>3</sub>C<sub>2</sub>Tz MXene Nanocomposites Synthesized by In Situ Ring Opening Polymerization of  $\epsilon$ -caprolactam and their Water Transport Properties*, ACS applied materials and interfaces, 2019, 11, 22, 20425-20436
51. (\*) ZR Hinton, **NJ Alvarez**, *The Trade-off Between Processability and Performance in Commercial Ionomers*, Rheol Acta, 58: 499, 2019, <https://doi.org/10.1007/s00397-019-01159-7>
50. (\*) ZR Hinton, M Kubota, L Thursch, J Deitzel, GR Palmese, and **NJ Alvarez**, *High Throughput Carbon Fiber Surface Modification*, SAMPE Journal, 2019, DOI: 10.33599/nasampe/s.19.1528
49. (\*) ZR Hinton, J Baxter, C Ngantsan, M Diaz-Acevedo, S Uzun, PD Patel, L Thursch, GR Palmese, and **NJ Alvarez**, *Multiscale Approaches to Formation of Thermoplastic Prepreg Short Carbon Fiber*, SAMPE Journal, 2019, DOI: 10.33599/nasampe/s.19.1530
48. (\*) D DiGuseppi, J Kraus, SE Toal, **NJ Alvarez**, and R Schweitzer-Stenner, *Investigating the Formation of a Repulsive Hydrogel of a Cationic 16mer Peptide at Low Ionic Strength in Water by Vibrational Spectroscopy and Rheology*, The Journal of Physical Chemistry B, 120 (38), 10079-10090, 2016 DOI: 10.1021/acs.jpccb.6b07673
47. (\*) ZR Hinton, A Shabbir, **NJ Alvarez**, *Dynamics of Supramolecular Self-Healing Recovery in Extension*, Macromolecules, 52 (6), 2231-2242, 2019, DOI: 10.1021/acs.macromol.8b02423
46. (\*) DM DiGuseppi, L Thursch, **NJ Alvarez**, R Schweitzer-Stenner, *Tuning and Exploring the Reformation Process of a Cationic Tripeptide Hydrogel*, Biophysical Journal 116 (3), 348a 2019
45. (\*) M Hesser, DM DiGuseppi, L Thursch, **NJ Alvarez**, R Schweitzer-Stenner, *Exploring the Unexpected pH Triggered Self-assembly and Gelation of the GHG Tripeptide in Water*, Biophysical Journal 116 (3), 350a 2019
44. (\*) L Thursch, **NJ Alvarez**, David DiGuseppi, Reinhard Schweitzer-Stenner, *Exploring the Tunability of the Aggregation and Gelation Process of the Tripeptide GAG*, Biophysical Journal 116 (3), 349a 2019
43. (\*) SL Morelly, L Palmese, H Watanabe, **NJ Alvarez**, *Effect of Finite Extensibility on Nonlinear Extensional Rheology of Polymer Melts*, Macromolecules, 52 (3), 915-922, 2019
42. (\*) ZR Hinton, **NJ Alvarez**, *Accounting for Optical Errors in Microtensiometry*, Journal of colloid and interface science 526, 392-399 2018
41. (\*) SL Morelly, J Gelb, F Iacoviello, PR Shearing, SJ Harris, **NJ Alvarez**, MH Tang, *Three-Dimensional Visualization of Conductive Domains in Battery Electrodes with Contrast-Enhancing Nanoparticles*, ACS Applied Energy Materials 1 (9), 4479-4484 2018

40. (\*) MH Wagner, SL Wingstrandt, **NJ Alvarez**, E Narimissa, *The Peculiar Elongational Viscosity of Concentrated Solutions of Monodisperse PMMA in Oligomeric MMA*, *Rheologica Acta* 57 (8-9), 591-601 2018
39. (\*) TC O'Connor, **NJ Alvarez**, MO Robbins, *Relating Chain Conformations to Extensional Stress in Entangled Polymer Melts*, *Physical review letters*, 121 (4), 047801 2018
38. (\*) SL Morelly, **NJ Alvarez**, MH Tang, *Short-range Contacts Govern the Performance of Industry-relevant Battery Cathodes*, *Journal of Power Sources*, 387, 49-56 2018
37. (\*) B Akuzum, K Maleski, B Anasori, P Lelyukh, **NJ Alvarez**, EC Kumbur, Y Gogotsi, *Rheological Characteristics of 2D Titanium Carbide (MXene) Dispersions: A Guide for Processing MXenes*, *ACS nano* 12 (3), 2685-2694 2018
36. (\*) JA Weaver, SL Morelly, **NJ Alvarez**, AJD Magenau, *Grafting-through ROMP for Gels with Tailorable Moduli and Crosslink Densities*, *Polymer Chemistry*, 9 (42), 5173-5178
35. (\*) CK Henry, GR Palmese, **NJ Alvarez**, *The Evolution of Crystalline Structures During Gel Spinning of Ultra-high Molecular Weight Polyethylene Fibers*, *Soft matter*, 14 (44), 8974-8985 2018
34. (\*) A Shabbir, Q Huang, GP Baeza, D Vlassopoulos, Q Chen, RH Colby, **NJ Alvarez**, O Hassager, *Nonlinear Shear and Uniaxial Extensional Rheology of Polyether-ester-sulfonate Copolymer Ionomer Melts*, *Journal of Rheology*, 61 (6), 1279-1289 2017
33. (\*) SL Morelly, MH Tang, **NJ Alvarez**, *The Impotence of Non-Brownian Particles on the Gel Transition of Colloidal Suspensions*, *Polymers* 2017, 9(9), 461, DOI:10.3390/polym9090461
32. (\*) KB Hatzell, J Eller, SL Morelly, MH Tang, **NJ Alvarez**, Y Gogotsi, *Direct Observation of Active Material Interactions in Flowable Electrodes Using X-ray Tomography.*, *Faraday Discussions*, 199, 511-524, DOI:10.1039/C6FD00243A
31. (\*) A Shabbir, Q Huang, GP Baeza, D Vlassopoulos, Q Chen, RH Colby, **NJ Alvarez**, O Hassager, *Non-linear Shear and Uniaxial Extensional Rheology of Polyether-Ester-Sulfonate Copolymer Ionomer Melts*, *Journal of Rheology*, 61, 1279 (2017), DOI:10.1122/1.4998158
30. (\*) D DiGuseppi, J Kraus, SE Toal, **NJ Alvarez**, R Schweitzer-Stenner, *Investigating the Formation of a Repulsive Hydrogel of a Cationic 16mer Peptide at Low Ionic Strength in Water by Vibrational Spectroscopy and Rheology*, *The Journal of Physical Chemistry B*, 120 (38), 10079-10090, DOI: 10.1021/acs.jpccb.6b076732016
29. (\*) CK Henry, GR Palmese, **NJ Alvarez**, *Novel Processing Apparatus to Control Multi-Scale Morphology in Ultra High Molecular Weight Polyethylene Fibers*, *SAMPE Journal*, 2016

28. (\*) Q Huang, S Agostini, L Hengeller, M Shivokhin, **NJ Alvarez**, LR Hutchings, O Hassager, *Dynamics of Star Polymers in Fast Extensional Flow and Stress Relaxation*, *Macromolecules* 49 (17), 6694-6699 2016
27. (\*) Q Huang, **NJ Alvarez**, A Shabbir, O Hassager, *Multiple Cracks Propagate Simultaneously in Polymer Liquids in Tension*, *Physical Review Letters* 117 (8), 087801 3, 2016
26. (\*) A Shabbir, I Javakhishvili, S Cervený, S Hvilsted, AL Skov, O Hassager, **NJ Alvarez**, *Linear Viscoelastic and Dielectric Relaxation Response of Unentangled UPy-Based Supramolecular Networks*, *Macromolecules*, 2, 2016
25. (\*) SL Wingstrand, **NJ Alvarez**, O Hassager, JM Dealy, *Oscillatory Squeeze Flow for the Study of Linear Viscoelastic Behavior*, *Journal of Rheology (1978-present)* 60 (3), 407-418, 1, 2016
24. (\*) Q Huang, M Mangnus, **NJ Alvarez**, R Koopmans, O Hassager, *A New Look at Extensional Rheology of Low-density Polyethylene*, *Rheologica Acta* 55 (5), 343-350, 2, 2016
23. (\*) L Hengeller, Q Huang, A Dorokhin, **NJ Alvarez**, K Almdal, O Hassager, *Stress Relaxation of Bi-disperse Polystyrene Melts*, *Rheologica Acta* 55 (4), 303-314, 2, 2016
22. (\*) A Shabbir, Q Huang, Q Chen, RH Colby, **NJ Alvarez**, O Hassager, *Brittle Fracture in Associative Polymers: The Case of Ionomer Melts*, *Soft Matter* 12 (36), 7606-7612, 2016
21. (\*) S Farrell, D DiGuseppi, **NJ Alvarez**, R Schweitzer-Stenner, *The Interplay of Aggregation, Fibrillization and Gelation of an Unexpected Low Molecular Weight Gelator: Glycylalanylglycine in Ethanol/Water*, *Soft Matter* 12 (28), 6096-6110, 2016
20. (\*) SL Wingstrand, **NJ Alvarez**, Q Huang, O Hassager, *Linear and Nonlinear Universality in the Rheology of Polymer Melts and Solutions* *Physical review letters* 115 (7), 078302 2015
19. (\*) A Shabbir, H Goldansaz, O Hassager, EO van Ruymbeke, **NJ Alvarez**, *Effect of Hydrogen Bonding on Linear and Nonlinear Rheology of Entangled Polymer Melts*, *Macromolecules*, 48 (16), 5988-5996
18. (\*) Q Huang, L Hengeller, **NJ Alvarez**, O Hassager, *Bridging the Gap between Polymer Melts and Solutions in Extensional Rheology*, *Macromolecules* 48 (12), 4158-4163
17. (\*) M Reichert, **NJ Alvarez**, SL Anna, LM Walker, *Interfacial Rheology and the Importance of Curvature on Diffusion-limited Surfactant Systems*, *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 467, 135-142 2015
16. Q Huang, **NJ Alvarez**, Y Matsumiya, HK Rasmussen, H Watanabe, O Hassager, *Extensional Rheology of Entangled Polystyrene Solutions Suggests Importance of Nematic Interactions*. *ACS Macro Letters*, 2(8), 741-744 2013



15. Q Huang, O Mednova, HK Rasmussen, **NJ Alvarez**, AL Skov, K Almdal, O Hassager, *Concentrated Polymer Solutions are Different from Melts: Role of Entanglement Molecular Weight*. *Macromolecules*, 46, 5026-5035, 2013
14. **NJ Alvarez**, JMR Marin, Q Huang, O Hassager, *Creep Measurements Confirm Existence of Steady State after Maximum in Extension of Branched Polymers*, *Physical Review Letters*, 2013
13. **NJ Alvarez**, C Jeppesen, K Yvind, NA Mortensen, O Hassager, *The Chromatographic Separation of Particles on the Basis of Their Polarizability Using Optical Electric Fields*, *Lab on a Chip*, 2013
12. JMR Marin, JK Huusom, **NJ Alvarez**, Q Huang, HK Rasmussen, A Bach, AL Skov, O Hassager, *A Control Scheme for Filament Stretching Rheometers with Application to Polymer Melts*, *Journal of Non-Newtonian Fluid Mechanics*, 2013
11. **NJ Alvarez**, AK Uguz, *The Impact of Deformable Interfaces and Poiseuille Flow on the Thermocapillary Instability of Three Immiscible Phases Confined in a Channel*, *Physics of Fluids*, 2013
10. J Aho, **NJ Alvarez**, M Papsoea, O Hassager, *Influence of High Shear Rates on the Microstructure of Injection Molded POM/PDMS Compounds*, *Proceedings of the Polymer Processing Society*, 2012
9. **NJ Alvarez**, LM Walker, SL Anna, *A Criterion to Assess the Impact of Confined Volumes on Surfactant Transport to Liquid-fluid Interfaces*, *Soft Matter*, vol. 8, no. 34, p. 8917, 2012.
8. **NJ Alvarez**, SL Anna, T Saigal, RD Tilton, LM Walker, *Interfacial Dynamics and Rheology of Polymer-grafted Nanoparticles at Air-water and Xylene-water Interfaces*, *Langmuir : the ACS Journal of Surfaces and Colloids*, vol. 28, no. 21, pp. 8052, May 2012.
7. **NJ Alvarez**, DR Vogus, LM Walker, SL Anna, *Using Bulk Convection in a Microtensiometer to Approach Kinetic-limited Surfactant Dynamics at Fluid-fluid Interfaces*, *Journal of Colloid and Interface Science*, vol. 372, no. 1, pp. 183, Apr. 2012.
6. **NJ Alvarez**, LM Walker, SL Anna, *The Effect of Alkane Tail Length of CiE8 Surfactants on Transport to the Silicone Oil-Water Interface*, *Journal of Colloid and Interface Science* 2011, 355, 231-236.
5. **NJ Alvarez**, LM Walker, SL Anna, *A Microtensiometer to Probe the Effect of Radius of Curvature on Surfactant Transport to a Spherical Interface*, *Langmuir*, 2010, 26, (16), 13310
4. **NJ Alvarez**, LM Walker, SL Anna, *Diffusion-limited Adsorption to a Spherical Geometry: The Impact of Curvature and Competitive Timescales*, *Physical Review E*, 2010, 82, (1).

**Highlighted: Virtual Journal of Nanoscale Science and Technology, August 2, 2010**

3. AK Uguz, **NJ Alvarez**, R Narayanan, *An Experimental Study of the Stability of Liquid Bridges Subject to Shear-induced Closed-flow*, Journal of Colloid and Interface Science 2010, 346, (2), 464-469
2. **NJ Alvarez**, LM Walker, and SL Anna, *A Non-Gradient Based Algorithm for the Determination of Surface Tension from a Pendant Drop: Application to Low Bond Number Drop Shapes*, Journal of Colloid and Interface Science 333 (2009), pp. 557-562
1. A Kerem Uguz, **NJ Alvarez**, and R Narayanan, *An Experimental Study on the Instability of Elliptical Liquid Bridges*, Physics of Fluids, Vol. 17, 078106.

### 4.3 Scientific Software

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(\* Drexel Affiliation)

- o A Graphical User Interface (SURFTEN) for the determination of surface tension from Low Bond number shapes, based on algorithm from publication *A non-gradient based algorithm for the determination of surface tension from a pendant drop: Application to low Bond number drop shapes* published in JCIS 2009. Distributed as Freeware.

### 4.4 Invited and Conference Presentations

#### Invited Talks

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(\* Drexel Affiliation)

30. (\*) **NJ Alvarez**, Spreading dynamics of thermoset polymer resins in direct ink writing additive manufacturing, TechConnect, National Harbor, MD 2022
29. (\*) **NJ Alvarez**, *Predicting the Spreading of Filaments in Direct Ink Writing Additive Manufacturing of High Performance Thermoset Polymers*, Georgetown Physics Colloquium, 2022
28. (\*) **NJ Alvarez**, *Predicting the Spreading of Thermoset Resins in Direct Ink Writing Additive Manufacturing*, Northeast Complex Fluids and Soft Matter Meeting, Stevens Institute of Technology, 2022
27. (\*) **NJ Alvarez** *The Fundamentals of Extensional Rheology: Applications to Polymer Melts and Solutions*, Eastman Corporation, Seminar, 2021
26. (\*) **NJ Alvarez**, *Self-Healing Recovery and Dynamics of Associating Polymers under Uniaxial Extension*, Session: Revealing the Microscopic Dynamics Driving Nonlinear Polymer Flows, APS DPoly 2021

25. (\*) **NJ Alvarez**, *Introduction to Extensional Rheology with Emphasis on Low Viscosity Fluids*, Sherwin Williams, Research and Development Symposium Series, 2021
24. (\*) **NJ Alvarez**, *The Role of Polymer Binder in Colloidal Battery Processing and Electrode Performance*, GRC, Ventura CA 2020
23. (\*) **NJ Alvarez**, *Workshop on Polymers in Fast Flows*, Dodynet, Capri Italy 2019
22. (\*) **NJ Alvarez**, *Extensional Rheology: Theory and Experimental Practice*, Nagoya University, Japan 2019
21. (\*) **NJ Alvarez**, *Untitled: Additive Manufacturing Panelist*, SAMPE New Jersey Additive Manufacturing Symposium, NJ 2019
20. (\*) **NJ Alvarez**, *Young Researchers Conference: The Physics of UHMWPE Drawn Fibers* Drexel University, PA 2019
19. (\*) **NJ Alvarez**, *The Physics of Supramolecular Networks: A Time Scale Analysis*, Benjamin Levich Institute, City College of New York, NY 2018
18. (\*) **NJ Alvarez**, *Correlating Electrode Slurry Microstructure to Final Electrode Performance: A Rheological Approach*, Department of Chemical Engineering, City College of New York, NY 2018
17. (\*) **NJ Alvarez**, *Correlation between processing and mechanical properties of UHMWPE fibers*, ARL - Polymer Division, 2018
16. (\*) **NJ Alvarez**, *Extensional Rheology: Theory and Experimental Practice*, DuPont, DE 2018
15. (\*) **NJ Alvarez**, *Extensional Rheology: Theory and Experimental Practice*, Annual Meeting of the Society of Rheology, Denver CO 2017
14. (\*) **NJ Alvarez**, *The Effect of Chemistry on Rheology in Supramolecular Polymers*, Universite Catholique Louvain-le-neuf, Belgium 2017
13. (\*) **NJ Alvarez**, *The Effect of Chemistry on Rheology in Supramolecular Polymers*, Pennsylvania State University PA 2017
12. (\*) **NJ Alvarez**, *The Effect of Chemistry on Rheology in Supramolecular Polymers*, SUPOLEN Final Meeting, University of Crete FORTH, Greece 2017
11. (\*) **NJ Alvarez**, *The Effect of Chemistry on Rheology in Supramolecular Polymers*, Lehigh PA 2017
10. (\*) **NJ Alvarez**, *The Effect of Chemistry on Rheology in Supramolecular Polymers*, MIT Cambridge MA 2016
9. (\*) **NJ Alvarez**, *The Importance of Chemical Structure in Extensional Rheology of Branched and Linear Polymer Melts*, Exxon Chemical Corporation, Houston TX 2016

8. (\*) **NJ Alvarez**, *The Importance of Chemical Structure (Hydrogen Bonding) in Extensional Rheology of Polymer Melts*, NIST, Gaithersburg MD 2016
7. (\*) **NJ Alvarez**, *The importance of chemical structure (hydrogen bonding) in extensional rheology of polymer melts*. Dow Chemical, Jan. 2015
6. (\*) **NJ Alvarez**, *Short course Intermediate Module – Extensional Rheology*, Copenhagen Denmark
5. (\*) **NJ Alvarez** *Extensional rheology of supramolecular polymers: rheology or solid mechanics*, Capri, Italy
4. **NJ Alvarez**, *Putting the Tube Model to the Test: Role of Entanglements and Chemical Structure*, FORTH, Crete, Greece, Department of Chemical Engineering 2014
3. **NJ Alvarez**, *Direct Measurements of Surfactant Kinetics at Air-Water and Oil-Water Interfaces*, K. U. Leuven, Department of Chemical Engineering 2011
2. **NJ Alvarez**, *The Importance of Surfactant Kinetics at Air-Water and Oil-Water Interfaces*, University of Michigan, Department of Chemical Engineering, Ann Arbor, 2011
1. **NJ Alvarez**, *A New Methodology for Analyzing Surfactant Dynamics*, Carnegie Mellon University CPS Summer Seminar Series 2010

## Conference Presentations

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(\* Drexel Affiliation)

108. (\*) M. Idrees et al, Additive manufacturing of damage tolerant continuous glass fiber reinforced thermosets, SAMPE 2022, Charlotte, NC
107. (\*) A. Ibrahim et al., Effect of Additively Manufactured Resin Rich Layers on Mechanical Properties of Glass Fiber Reinforced Thermoset Resins, SAMPE 2022, Charlotte, NC
106. (\*) A. Ibrahim et al., THE EFFECT OF MULTI-RESIN DOMAINS IN SPATIALLY RESOLVED ADDITIVELY MANUFACTURED PARTS, SAMPE 2022, Charlotte, NC
105. (\*) Yoon et al., THE EFFECT OF SPREADING ON DIRECT INK WRITING ADDITIVE MANUFACTURING OF PHOTOCURED RESINS, SAMPE 2022, Charlotte, NC
104. (\*) Z Hinton, **NJ Alvarez**, *Interfacial Phenomena in Short Carbon Fiber Prepreg Manufacturing*, AIChE, Orlando FL, 2019
103. (\*) Z Hinton, **NJ Alvarez**, *Balancing Processing and Performance in Commercial Ionomers*, AIChE, Orlando FL, 2019

102. (\*) Z Hinton, **NJ Alvarez**, *Extensional Flow of Associating Polymers: From Processing to Performance*, AIChE, Orlando FL, 2019
101. (\*) Z Hinton, **NJ Alvarez**, *Thermodynamic Scaling Laws for Surfactant Interfacial Properties*, AIChE, Orlando FL, 2019
100. (\*) Z Hinton, **NJ Alvarez**, *Associating Polymers in Extensional Flows: Processing to Performance to Self-Healing*, Dodynet Polymer Workshop, Anacapri, Italy 2019
99. (\*) LJ Thursch, D DiGuseppi, R Schweitzer-Stenner, **NJ Alvarez**, *Glycine-Alanine-Glycine Hydrogels: Understanding Self-assembly and Stability*, ACS Colloids, Atlanta GA, 2019
98. (\*) Z Hinton, **NJ Alvarez**, *Interfacial Dynamics and Rheology of Supramolecular Self-Healing*, ACS Colloids, Atlanta GA, 2019
97. (\*) Z Hinton, **NJ Alvarez**, *Impact of Surface Wetting and Processing Technique on High Aspect Ratio Particle Coatings*, ACS Colloids, Atlanta GA, 2019
96. (\*) Z Hinton, **NJ Alvarez**, *Equilibrium Surfactant Thermodynamics as a Function of Pressure*, ACS Colloids, Atlanta GA, 2019
95. (\*) C Henry, GR Palmese, **NJ Alvarez**, *The Complex Role of Crystalline Structure in the Mechanical Properties of UHMWPE Fibers*, American Physics Society, Boston MA, 2019
94. (\*) C Henry, GR Palmese, **NJ Alvarez**, *The critical Role of Polymer Relaxation in Post-drawing of UHMWPE fibers*, SAMPE, Charlotte NC, 2019
93. (\*) Z Hinton, **NJ Alvarez**, *High Throughput Carbon Fiber Surface Modification*, SAMPE, Charlotte NC, 2019
92. (\*) Z Hinton, **NJ Alvarez**, *Multiscale Approaches to Formation of Thermoplastic Prepreg Short Carbon Fiber*, SAMPE, Charlotte NC, 2019
91. (\*) JR Baxter, GW Laub, **NJ Alvarez**, *Formation and Stability of Foams in Pluronic Solutions for Biomedical Applications*, AIChE Annual Meeting, Pittsburgh, PA, 2018
90. (\*) SL Morelly, MH Tang, **NJ Alvarez**, *Impact of Polymer Depletant on Battery Slurry Performance*, 92nd ACS Colloid and Surface Science Symposium, State College PA, 2018
89. (\*) SL Morelly, MH Tang, **NJ Alvarez**, *Impact of Polymer Binder Molecular Weight on Battery Slurry Rheology and Electrode Performance*, Society of Rheology 90th Annual Meeting, Houston TX, 2018
88. (\*) SL Morelly, MH Tang, **NJ Alvarez**, *Impact of Polymer Binder Molecular Weight on Battery Slurry Rheology and Electrode Performance*, 2018 AIChE Annual Meeting, Pittsburgh PA, 2018

87. (\*) ZR Hinton, **NJ Alvarez**, *The Effect of Pressure on Equilibrium Surfactant Thermodynamics*, AIChE Annual Meeting, Pittsburgh, PA, 2018
86. (\*) ZR Hinton, A Shabbir, **NJ Alvarez**, *The Complex Role of Entanglements and Associations in Supramolecular Self-Healing*, AIChE Annual Meeting, Pittsburgh, PA, 2018
85. (\*) ZR Hinton, A Shabbir, **NJ Alvarez** *The Role of Extensional Kinematic Flow Fields in the Study of Supramolecular Stress Recovery*, Society of Rheology Annual Meeting, Houston, TX, 2018
84. (\*) ZR Hinton, **NJ Alvarez** *The Impact of Elevated Pressure on Surfactant Transport to Fluid-Fluid Interfaces*, Society of Rheology Annual Meeting, Houston, TX, 2018
83. (\*) LJ Thursch, **NJ Alvarez**, D DiGuseppi, R Schweitzer-Stenner *Assembly of Novel Tripeptides Hydrogels*, 92nd ACS Colloid and Surface Science Symposium, State College PA, 2018
82. (\*) LJ Thursch, **NJ Alvarez**, D DiGuseppi, R Schweitzer-Stenner *Assembly of Novel Tripeptides Hydrogels*, 2018 AIChE Annual Meeting, Pittsburgh PA, 2018
81. (\*) CK Henry, GR Palmese, **NJ Alvarez**, *Tuning the Draw-ability of Ultra-high Molecular Weight Polyethylene Fibers*, American Institute of Chemical Engineers Fall Conference, Pittsburgh, PA, 2018
80. (\*) CK Henry, GR Palmese, **NJ Alvarez**, *Impact of Molecular Weight Distribution on Crystalline Morphology of Gel-spun Polyethylene Fibers*, American Chemical Society: Colloids and Surfaces Conference, State College, PA, 2018
79. (\*) SL Morelly, **NJ Alvarez**, MH Tang *The Effect of Carbon Black Aggregation on Lithium Ion Cathode Performance*, 232nd ECS Meeting, National Harbor, MD, 2017
78. (\*) ZR Hinton, **NJ Alvarez** *A Simple Unifying Relationship for Interfacial Properties of Alkyl-Polyoxide Surfactants*, 92nd ACS Colloid and Surface Science Symposium, State College, PA, 2017
77. (\*) ZR Hinton, **NJ Alvarez** *Assessing Equilibrium Surfactant Thermodynamics at Elevated Pressure*, 92nd ACS Colloid and Surface Science Symposium, State College, PA, 2017
76. (\*) ZR Hinton, **NJ Alvarez** *Elevated Pressure Interfacial Dynamics of LS Surfactants at the Water-CO<sub>2</sub> Interface*, AIChE Annual Meeting, Minneapolis, MN, 2017
75. (\*) ZR Hinton, **NJ Alvarez** *A Unified Structure-Property Relationship for Alkyl-Polyoxide Surfactants*, AIChE Annual Meeting, Minneapolis, MN, 2017
74. (\*) Q Huang, **NJ Alvarez**, A Shabbir, O Hassager, *High-speed Imaging of Fracture in Polymer Liquids under Extensional Flow*, SOR meeting, Denver CO 2017

73. (\*) ZR Hinton and **NJ Alvarez**, *Relaxation Times and "Self-healing" Recovery of Entangled and Unentangled Supramolecular Systems*, SOR meeting, Denver CO 2017
72. (\*) SL Morelly, MH Tang, and **NJ Alvarez**, *The Impact of Colloidal Suspension Rheology on Battery Performance*, SOR meeting, Denver CO 2017
71. (\*) SL Morelly, MH Tang, **NJ Alvarez**, *The Effect of Free Carbon on Battery Slurry Microstructures*, ACS Colloids, New York City NY, 2017
70. (\*) M Cimorelli, **NJ Alvarez**, S. Wrenn, *Experimental Study of Interfacial Dynamics and Isotherm Parameters for Perfluoropentane Systems with Soluble and Polymeric Surfactants*, ACS Colloids, New York City NY, 2017
69. (\*) ZR Hinton, A Shabbir, **NJ Alvarez** *Relaxation Times and "Self-Healing" Recovery of Entangled and Unentangled Supramolecular Systems*, Society of Rheology Annual Meeting, Denver, CO, 2017
68. (\*) ZR Hinton, **NJ Alvarez**, *Effect of Elevated Pressures on the Interfacial Dynamics of LS-36 Surfactant at the Water-CO<sub>2</sub> Interface*, ACS Colloids, New York City NY, 2017
67. (\*) CK Henry, GR Palmese, **NJ Alvarez**, *The Importance of Crystalline Structure on the Tensile Properties of UHMWPE Fibers*, ACS Colloids, New York City NY, 2017
66. (\*) ZR Hinton, **NJ Alvarez**, *The Effect of Tilt Angle Orientation on the Measurement of Interfacial Tension at the Microscale*, ACS Colloids, New York City NY, 2017
65. (\*) CK Henry, GR Palmese, **NJ Alvarez**, *Modulus Increase and Crystallization Evolution During Gel Spinning and Post Drawing of UHMWPE Fibers*, AERC, Copenhagen DK, 2017
64. (\*) CK Henry, GR Palmese, **NJ Alvarez**, *Modulus Increase and Crystallization Evolution During Gel Spinning and Post Drawing of UHMWPE Fibers*, SOR Tampa FL, 2017
63. (\*) CK Henry, GR Palmese, **NJ Alvarez**, *The Evolution and Importance of Crystalline Structure during Spinning and Drawing of Polyethylene Fibers*, American Institute of Chemical Engineers Annual Conference, Minneapolis, MN, 2017
62. (\*) CK Henry, GR Palmese, **NJ Alvarez**, *Modulus Increase and Crystallization Evolution During Spinning and Post Drawing of UHMWPE Fibers*, American Chemical Society: Colloids and Surfaces Conference, New York, NY, 2017
61. (\*) CK Henry, GR Palmese, **NJ Alvarez**, *Modulus Increase and Crystallization Evolution During Spinning and Post Drawing of UHMWPE Fibers*, SAMPE, Seattle, WA, 2017
60. (\*) CK Henry, GR Palmese, **NJ Alvarez**, *Modulus Increase and Crystallization Evolution During Spinning and Post Drawing of UHMWPE Fibers*, MACH Conference, Annapolis, MD, 2017

59. (\*) CK Henry, GR Palmese, **NJ Alvarez**, *Novel Processing Apparatus for Control of Multi-Scale Morphology to Strengthen UHMWPE Fibers*, MACH Conference, Annapolis, MD, 2016
58. (\*) C Henry, G Palmese, **NJ Alvarez**, *Fabrication and Processing: Production of Drawn UHMWPE Fibers*, MACH Conference, Annapolis MD, 2016
57. (\*) C Henry, G. Palmese, **NJ Alvarez**, *Novel Processing Apparatus to Control Multi-scale Morphology in Ultra High Molecular Weight Polyethylene Fibers*, SAMPE Long Beach CA, 2016
56. (\*) S Morelly, M Tang, **NJ Alvarez**, *Formation of Percolating Carbon Networks in Battery Processing and Their Effects on Electrode Performance*, PRiME Pacific Rim Meeting, Honolulu, Hawaii 2016
55. (\*) MH Tang, **NJ Alvarez**, S Morelly, *Formation of Percolating Carbon Networks in Battery Processing and Their Effects on Electrode Performance*, AIChE Annual Meeting 2016
54. (\*) L Palmese, S Morelly, H Watanabe, and **NJ Alvarez**, *Effect of Chain Flexibility on Non-linear Extensional Response of Linear Polymer Melts*, AIChE Annual Meeting 2016
53. (\*) S Morelly, **NJ Alvarez**, M Tang, *Battery Slurry Microstructure as a Function of Formulation*, ACS Fall Meeting, Philadelphia PA 2016
52. (\*) Z Hinton, **NJ Alvarez**, *Effects of Constituent Block Size on the Interfacial Dynamics of  $C_i(EO)_n(PO)_m$  Block Copolymer*, ACS Fall Meeting, Philadelphia PA 2016
51. (\*) S Morelly, L Palmese, H Watanabe, **NJ Alvarez**, *Effect of Chain Flexibility on Non-linear Extensional Response of Linear Polymer Melts*, International Congress on Rheology, Kyoto, JP 2016
50. (\*) H Goldansaz, LGD Hawke, M Ahmadi, A Jangizehi, A Shabbir, O Hassager, **NJ Alvarez**, E van Ruymbeke, *Correlating Dynamics and Microstructure of Entangled Supramolecular Networks*, International Congress on Rheology, Kyoto, JP 2016
49. (\*) Q Huang, **NJ Alvarez**, L Hengeller, A Shabbir, SL Wingstrand, and O Hassager, *Polymer Melts and Solutions in Extensional Flow: From Steady State to Fracture*, International Congress on Rheology, Kyoto, JP 2016
48. (\*) L Hengeller, Q Huang, A Dorokhi, **NJ Alvarez**, JJK Kirkensgaard, O Hassager, K Mortensen, K Almdal, *Stress Relaxation in Binary Polymer Blends Investigated by Filament Stretching Rheometry and Small Angle Neutron Scattering*, International Congress on Rheology, Kyoto, JP 2016
47. (\*) A Shabbir, **NJ Alvarez**, Q Huang, Q Chen, RH Colby, O Hassager, *Combining Extensional Rheology and Fracture Mechanics to Probe Brittle Fracture in Ionomer Melts*, International Congress on Rheology, Kyoto, JP 2016



46. (\*) **NJ Alvarez**, Q Huang, S Wingstrand, L Hengeller, A Shabbir, and O Hassager, *Recent Developments in Extensional Rheology*, SOR Baltimore MD 2015
45. (\*) Q Huang, S Agostini, L Hengeller, M Shivokhin, **NJ Alvarez**, LR Hutchings, O Hassager, *Exploring the Dynamics of Star Polymers in Fast Extensional Flow and Stress Relaxation*, SOR Baltimore MD 2015
44. (\*) S Wingstrand, Q Huang, O Hassager, and **NJ Alvarez**, *The Long-awaited Universality in Polymer Physics*, SOR Baltimore MD 2015
43. (\*) L Hengeller, Q Huang, A Dorokhin, **NJ Alvarez**, K Almdal, J Kirkensgaard, K Mortensen, O Hassager, *Relaxation Mechanism and Molecular Structure Study of Polymer Blends by Rheological and SANS Experiments* SOR Baltimore MD 2015
42. (\*) **NJ Alvarez**, GR Palmese, C Henry, *Connection Between Melt Flow Dynamics and Fiber Spinning of UHMWPE*, AIChE Annual Meeting (227ai) (ISBN: 978-0-8169-1094-6) (2015)
41. (\*) **NJ Alvarez**, SL Wingstrand, Q Huang, O Hassager, *The Long-awaited Universality in Polymer Physics*, AIChE Annual Meeting (342b) (ISBN: 978-0-8169-1094-6) 2015
40. (\*) H Goldansaz, C-A Fustin, M Wubbenhorst, A Shabbir, **NJ Alvarez**, O Hassager, E van Ruymbeke, *Equilibrium Dynamics of Entangled Supramolecular Polymers Based of Poly (n-butyl acrylate)*, 10th Annual European Rheology Conference, April 14-17 2015
39. (\*) A Shabbir, Q Huang, Q Chen, RH Colby, O Hassager, **NJ Alvarez**, *Uniaxial Extensional Rheology of Polyether-ester-sulfonate Ionomers*, 10th Annual European Rheology Conference, April 14-17 2015
38. (\*) Q Huang, L Hengeller, **NJ Alvarez**, O Hassager, *The Influence of Concentration on Extensional Rheology of Polymer Solutions*, Society of Rheology Meeting, Oct 5-9 2014
37. (\*) A Shabbir, S Goldansaz, E van Ruymbeke, O Hassager, **NJ Alvarez**, *The Influence of Hydrogen Bonding on Nonlinear Extensional Rheology of Supramolecular Poly(n-butyl Acrylate)*, Society of Rheology Meeting, Oct 5-9 2014
36. (\*) SL Wingstrand, **NJ Alvarez**, O Hassager, *Linear Viscoelastic Characterization from Filament Stretching Rheometry*, 10th Annual European Rheology Conference, April 14-17 2015
35. Q Huang, **NJ Alvarez**, Y Matsumiya, HK Rasmussen, H Watanabe, O Hassager, *Ex-tensional Rheology of Entangled Polystyrene Solutions Suggests Importance of Nematic Interactions*, Society of Rheology, Montreal, Quebec Canada 2013

34. **NJ Alvarez**, JMR Marin, Q Huang, O Hassager, *A Control Scheme for Filament Stretching Rheometers with Application to Polymer Melts*, Society of Rheology, Pasadena, California USA 2013
33. **NJ Alvarez**, JMR Marin, Q Huang, O Hassager, *Creep Measurements Confirm Steady Flow After Stress Maximum in Extension of Branched Polymer Melts*, Society of Rheology, Pasadena, California USA 2013
32. **NJ Alvarez**, JMR Marin, Q Huang, O Hassager, *Creep Measurements Confirm Steady Flow After Stress Maximum in Extension of Branched Polymer Melts*, Nordic Rheology Conference, Copenhagen, Denmark 2013
31. **NJ Alvarez**, C Jeppesen, K Yvind, NA Mortensen, I Teraoka, O Hassager, *Separation of Macromolecules by Photonic Crystal Defects Chromatography (PCDC)*, AIChE Annual Meeting, Pittsburgh, PA 2012
30. **NJ Alvarez**, JMR Marin, Q Huang, HK Rasmussen, O Hassager, *Constant Elongational Stress Measurements of LD-PE and PS Using a Filament Stretching Rheometer*, AIChE Annual Meeting, Pittsburgh, PA 2012: **First Place Fluid Mechanics Poster Award**
29. **NJ Alvarez**, C Jeppesen, K Yvind, I Teraoka, NA Mortensen, and O Hassager, *The Continuous Chromatographic Separation of Molecules/Particles Using Optical Electric Fields*, AIChE Annual Meeting, Pittsburgh, PA 2012
28. **NJ Alvarez**, C Jeppesen, K Yvind, NA Mortensen, I Teraoka, O Hassager, *The Continuous Separation of Molecules on the Basis of Their Polarizability Using Optical Electric Fields*, IMA 6, Haifa, Israel 2012
27. **NJ Alvarez**, K Uguz, *Thermocapillary Instability of Three Immiscible Phases Flowing Through a Channel*, IMA 6, Haifa, Israel 2012
26. **NJ Alvarez**, C Jeppesen, K Yvind, NA Mortensen, I Teraoka, O Hassager, *The Continuous Separation of Molecules on the Basis of Their Polarizability Using Optical Electric Fields*, ICR, Lisbon, Portugal 2012
25. **NJ Alvarez**, T Saigal, RD Tilton, LM Walker, SL Anna, *Dynamic Interfacial Tension and Interfacial Rheology of Polymer Grafted Nanoparticles at the Air-water and Xylene-water Interface*, ACS Colloids Symposium, Montreal, Canada 2011
24. **NJ Alvarez**, T Moyle, W Lee, LM Walker, SL Anna, *Kinetic Limited Transport of Soluble Surfactants in Microscale Tipstreaming*, ACS Colloids Symposium, Montreal, Canada 2011
23. **NJ Alvarez**, D Vogus, LM Walker, SL Anna, *Measuring Kinetic-limited Surfactant Dynamics Using Bulk Convection Around Microscale Interfaces*, ACS Colloids Symposium, Montreal, Canada 2011

22. MD Reichert, **NJ Alvarez**, CF Brooks, AM Grillet, LA Mondy, LM Walker, *Interfacial Rheology of Diffusion-limited Surfactant Systems and Dependence on Curvature*, ACS Colloids Symposium, Montreal, Canada 2011
21. **NJ Alvarez**, RD Tilton, SL Anna, LM Walker, *Interfacial Rheology and Dynamic Behavior of Polymer Grafted Nanoparticles at the Air-water Interface*, ACS March Meeting (2011) Anaheim, CA
20. **NJ Alvarez**, W Lee, LM Walker, SL Anna, *Surfactant Adsorption Timescales in Microfluidic Droplet Formation*, ACS March Meeting (2011) Anaheim, CA
19. **NJ Alvarez**, LM Walker, SL Anna, *Using Convective Flow to Reach the Kinetic Limit of Surfactant Transport to a Stationary Microbubble*, APS Division of Fluid Dynamics (2010) Long Beach, CA
18. SL Anna, **NJ Alvarez**, W Lee, LM Walker, *The Onset of Microscale Tipstreaming with Soluble Nonionic Surfactants*, APS Division of Fluid Dynamics (2010) Long Beach, CA
17. **NJ Alvarez**, LM Walker, SL Anna, *Effect of Low-Reynolds Number Flow On Surfactant Transport to a Stationary Spherical Cap: Experiments and Theory*, AIChE (2010) Salt Lake City, UT: **First Place Fluid Mechanics Poster Award**
16. **NJ Alvarez**, LM Walker, SL Anna, *The Role of Diffusion in Dynamic Interfacial Tension Data: The Transition From Diffusion-Limited to Kinetic-Limited Dynamic*, AIChE (2010) Salt Lake City, UT
15. **NJ Alvarez**, LM Walker, SL Anna, *Low Concentration Dynamic Surface Tension Measurements of Macromolecular Systems*, AIChE (2010) Salt Lake City, UT
14. W. Lee, **NJ Alvarez**, LM Walker, SL Anna, *The Role of Surfactant Mass Transport in the Formation of Microscale Droplets*, AIChE (2010) Salt Lake City, UT
13. **NJ Alvarez**, LM Walker, SL Anna, *The Diffusion-Limited Transport Timescale: Effect of Curvature and Finite Bulk Solution Volume*, ACS Colloids Meeting 2010 Akron, Ohio
12. M. D. Reichert, **NJ Alvarez**, CF Brooks, AM Grillet, LA Mondy, LM Walker, *Connecting Surface Dilatational Rheology with Surfactant Diffusion to and from the Air-Liquid Interface*, ACS Colloids Meeting 2010 Akron, Ohio
11. **NJ Alvarez**, W Lee, LM Walker, SL Anna, *A Comparison of Nonionic Surfactant Dynamics at the Oil-Water and the Air-Water Interface*, ACS Colloids Meeting 2010 Akron, Ohio
10. W Lee, **NJ Alvarez**, LM Walker, SL Anna, *Role of Surfactant Mass Transport in the Formation of Microscale Droplets*, ACS Colloids Meeting 2010 Akron, Ohio
9. **NJ Alvarez**, LM Walker, SL Anna, *Diffusion Limited Adsorption to a Spherical Geometry: The Impact of Curvature and Competitive Timescales*, GRC Gordon Conference Colloidal, Macromolecular & Polyelectrolyte Solutions, Ventura California 2009

8. **NJ Alvarez**, LM Walker, SL Anna, *Microtensiometer to Directly Probe Kinetic Adsorption Constants*, American Institute of Chemical Engineers Annual Meeting November 2009
7. **NJ Alvarez**, LM Walker, SL Anna, *Microtensiometer to Directly Probe Kinetic Adsorption Constants*, 31st Annual chemical engineering graduate student association symposium, October 2nd 2009
6. **NJ Alvarez**, LM Walker, SL Anna, *Kinetically Controlled Adsorption to Freshly Formed Interfaces*, 13th International Conference and Surface and Colloid Science Poster Session June 2009
5. **NJ Alvarez**, LM Walker, SL Anna, *Kinetically Controlled Adsorption to Freshly Formed Interfaces*, American Physical Society General Meeting March 2009
4. **NJ Alvarez**, LM Walker, SL Anna, *A Robust Non-gradient Based Algorithm For the Determination of Surface Tension From a Pendant Drop*, 4th International Marangoni Association Meeting, Tokyo, Japan 2009
3. **NJ Alvarez**, LM Walker, SL Anna, *Effect of Residence Time on the Synthesis of Gold Nanoparticles in a Microfluidic Network*, 82nd Colloid and Surface Science Symposium, Raleigh Durham, NC June 2008
2. **NJ Alvarez**, A Kerem Uguz, R Narayanan, *The Stability of Liquid Bridges Subject to Shear-Induced Closed-Flow*, 3rd International Marangoni Association Meeting, Gainesville, Florida October 2006
1. **NJ Alvarez**, A Kerem Uguz, R Narayanan, *An Experimental Study of Elliptical Liquid Bridges*, AIChE 2005

#### 4.5 Postdoctoral Researchers Advised

Joy Baxter  
Heedong Yoon  
Maria Mercedes Diaz  
Thamires Lima  
Rondes Torin  
Ganesh Narayanan

#### 4.6 PhD Students Advised

Samantha Morelly, 2019  
Christopher Henry, 2019  
Zachary R. Hinton, 2020  
Lavenia Thursch, 2021  
Anh Huynh  
Mohanad Idrees

Ahmed Ibrahim  
Yao Zhou  
Michael Carey  
Amir Azimi  
Ann Sitarz  
Jesse Starger  
Matthew Cordia  
Shihao Pan  
Emre Baburoglu  
Nichole O'Neill  
Rachel Coler

#### **4.7 Masters Students Advised**

Thamer Rawah 2018  
Moein Taghvaei 2019  
Renee Saraka 2021  
Sebastian Brunhart

#### **4.8 Undergraduate Students Advised**

Adil Zeinullayev, STAR, 2021  
Hannah Downey  
Livia Cilleruelo Fernand, STAR, 2021  
Tavian Cooks, REU, 2021  
Anna Gargano, Co-op, 2021  
Tran Thu  
Yen La  
Clayton Francis, Co-op 2021  
Mohamed Ahmed  
Glen Nieman  
Andrew McBride, REU, 2020  
Julian Adams, Co-op 2019  
Todd Lewis, 2019, Temple Student  
Emma Saloaky, 2019  
Ian Narewski, STAR 2019  
Joshua Baboff, Co-op 2019  
Timofey Averianov, Co-op 2019  
Jonathan Wacker, Undergraduate Researcher, 2019  
James Heinzmann, Co-op 2019, Undergraduate Researcher  
Shayaan Husain, 2019  
Kyle Moynahan, STAR 2018  
Thiha Thway, Undergraduate Researcher  
Renee Saraka, STAR 2017, Masters Thesis  
Kevin Mercedes, Co-op 2018

Brianna Ogilvie, Co-op 2018  
Brianna Kelly, Undergraduate Researcher  
Evelyn Kamuyu, Undergraduate Researcher  
Jason Wilson, Co-op 2017  
Jonathan Korolyk, Co-op 2017  
Heath Majewski, Co-op 2017  
Edgar Koby, Undergraduate Researcher  
Matthew Friend, Undergraduate Researcher  
Ryan Light, STAR  
Debjoti Ghosh, Undergraduate Researcher  
Abdul Ayoub, Undergraduate Researcher  
Eric Kirchgessner, Freshman Design  
Samantha Fong, Freshman Design  
Greg Davis, Undergraduate Researcher  
Farhan Rizvi, STAR 2016  
John Deibler, Undergraduate Researcher  
Seamus Kelly, Undergraduate Researcher  
Prem N. Patel, Undergraduate Researcher  
Prem P. Patel, STAR 2016  
Luisa Palmese, Undergraduate Researcher

## **5 Teaching**

### **5.1 Courses Taught**

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### **5.2 Courses Developed**

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| <i>Year/Term</i> | <i>Course</i>  | <i># Credits/# Students</i> |
|------------------|--|-----------------------------|
| 2014-15 Winter   | CHE 302 Process Fluid Mechanics                          | 4/61                        |
| 2014-15 Spring   | ENGR 103 Freshman Design III                             | 1/18                        |
| 2015-16 Fall     | CHE 303 Process Heat Transfer                            | 3/61                        |
| 2015-16 Winter   | CHE 302 Process Fluid Mechanics                          | 4/66                        |
| 2015-16 Spring   | CHE 303 Process Heat Transfer                            | 3/32                        |
| 2016-17 Fall     | CHE 303 Process Heat Transfer                            | 3/50                        |
| 2016-17 Winter   | CHE 303 Process Heat Transfer                            | 3/32                        |
| 2016-17 Spring   | CHE 303 Process Heat Transfer                            | 3/32                        |
| 2017-18 Fall     | CHE T480-580 Introduction to Rheology                    | 3/11                        |
| 2017-18 Winter   | CHE 525 Transport Phenomena I                            | 3/21                        |
|                  | CHE 302 Process Fluid Mechanics                          | 4/51                        |
| 2017-18 Summer   | CHE T480 Computation Methods II                          | 3/14                        |
| 2018-19 Winter   | CHE 320 Computational Methods in Chemical Engineering II | 3/44                        |
| 2018-19 Spring   | CHE 341 Fluid Mechanics                                  | 4/40                        |
| 2018-19 Summer   | CHE 320 Computational Methods in Chemical Engineering II | 3/33                        |
| 2019-2020 Fall   | Introduction to Rheology                                 | 3/15                        |
| 2019-2020 Winter | Computational Methods in Chemical Engineering II         | 3/33                        |
| 2021-2022 Fall   | Computational Methods in Chemical Engineering II         | 3/33                        |
| 2021-2022 Winter | Transport Phenomena I                                    | 3/14                        |
| 2021-2022 Spring | Fluid Mechanics  | 4/30                        |

| <i>Year/Term</i> | <i>Course</i>                                |
|------------------|--|
| 2014-15 Winter   | CHE 302 Process Fluid Mechanics              |
| 2014-15 Spring   | ENGR 103 Freshman Design III                 |
| 2015-16 Fall     | CHE 303 Process Heat Transfer                |
| 2017-18 Fall     | CHE 433: Introduction to Rheology (elective) |
| 2017-18 Winter   | CHE 525: Transport Phenomena I               |
| 2017-18 Summer   | CHE 320: Computational Methods II            |

## 6 Service

### 6.1 University/College Level

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| <b>Dates</b> | <b>Description</b>                                | <b>Position</b> |
|--------------|---|-----------------|
| 2021-22      | FCOI University Committee                         | Member          |
| 2021-22      | Department Faculty Search Committee               | Member          |
| 2020-22      | Drexel Solutions Institute                        | Provost Fellow  |
| 2020-21      | CBE CAT Lab Space Committee                       | Member          |
| 2021         | FCOI Oversight Committee                          | Voting Member   |
| 2018-Current | Dean's Diversity Committee                        | Representative  |
| 2015-18      | SHPE - Society of Hispanic Professional Engineers | Faculty Advisor |
| 2015-16      | NEW F-lot Building Planning Committee             | Member          |
| 2015-19      | CAT Building Lab Renovation Committee             | Member          |

## 6.2 Department Level

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| Dates         | Description   | Position       |
|---------------|---|----------------|
| 2017-Current  | Seminar Series Coordinator                            |                |
| 2015-present  | PhD Open Houses                                       | Representative |
| 2015-present  | Alumni Event  | Representative |
| 2016          | Undergraduate Curriculum Committee: Transport Classes | Member         |
| July-Aug 2016 | Remodel/Design of Undergraduate Lounge                | Chair          |
| July-Oct 2016 | Remodel/Design of Conference Room                     | Chair          |
| July-Dec 2016 | Remodel/Design of Faculty Lounge/Kitchen              | Chair          |
| July-Dec 2016 | Remodel/Design of Graduate Student Lounge             | Chair          |
| Dec-Jan 2017  | Remodel/Design of Staff and Department Head offices   | Chair          |
| Dec-Jan 2017  | Remodel/Design of CBE reception area and entrance     | Chair          |

## 6.3 Professional Service

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- **Member:** American Institute of Chemical Engineers, American Physical Society, American Chemical Society, Society of Rheology, European Society of Rheology
- **Proposal Reviewer:** National Science Foundation, Polish Research Council, ACS Petroleum Fund
- **Journal Reviewer:** Advances in Space Research, Colloid and Polymer Science, Colloids and Surfaces A: Physicochemical and Engineering Aspects, European Physical Journal, Journal of Colloid and Interface Science, Journal of Fluid Mechanics, Journal of Non-Newtonian Fluid Mechanics, Journal of Rheology, Langmuir, Macromolecular Rapid Communication, Macromolecules, Journal of Molecular Liquids, Physics of Fluids, Journal of Applied Research, RSC Advances, Soft Matter
- **Session Chair**

| Year | Meeting              | Session Name                   |
|------|----------------------|--------------------------------|
| 2015 | AIChE Annual Meeting | 01J02 Complex Fluids I         |
| 2015 | AIChE Annual Meeting | 01J02 Complex Fluids II        |
| 2015 | SOR Annual Meeting   | Poster Session                 |
| 2016 | SOR Spring Meeting   | Polymer Melts and Solutions    |
| 2017 | SOR Annual Meeting   | Short Course                   |
| 2018 | SOR Annual Meeting   | Polymer Melts and Solutions    |
| 2018 | AIChE Annual Meeting | Complex Fluids: Macromolecules |
| 2019 | AIChE Annual Meeting | Turbulent Flows                |
| 2019 | SOR Meeting          | Complex Fluids                 |

- **Editorial Advisory Board:** Technology (2014-2018)



◦ **Short Courses:**

| <b>Year</b> | <b>Meeting</b>              | <b>Short Course</b>   |
|-------------|-----------------------------|---|
| 2014        | SUPOLEN Short Course        | Extensional Rheology Module I   |
| 2015        | SUPOLEN Summer School       | Extensional Rheology of Supramolecular Molecules: Rheology or Solid Mechanics |
| 2017        | AERC Annual Meeting         | AERC Short Course: Extensional Rheology                                       |
| 2017        | SOR Annual Meeting (Denver) | Short Course: Extensional Rheology  |