

Lilo D. Pozzo

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A. Educational Preparation

- Ph.D. Chemical Engineering, Carnegie Mellon Pittsburgh, PA (5/2006)
Thesis Title: "Templating Nanoparticles using Thermo-reversible Soft Crystals"
Thesis Advisor: Prof. Lynn M. Walker
MS Colloids Polymers and Surfaces, Carnegie Mellon Pittsburgh, PA (5/2006)
B.S. Chemical Engineering, University of Puerto Rico Mayagüez, PR (5/2001)

B. Professional Appointments

2013-present, Associate Professor, Chemical Engineering, UW, Seattle, WA
2007-2013, Assistant Professor, Chemical Engineering, UW, Seattle, WA
2013-present, co-Founder and Technical Director, PolyDrop Additives, Seattle, WA
2013-present, Independent Technical Consultant
2006-2007, Postdoctoral Associate, NIST Center for Neutron Research, Gaithersburg, MD
2002-2006, Research Assistant Carnegie Mellon University Pittsburgh, PA
2001-2002, Teaching Assistant Carnegie Mellon University Pittsburgh, PA
Summer 2000 Internship Eastman Chemical Company TED Kingsport, TN
Summer 1999 Internship Union Carbide Corporation Bound Brook, NJ

C. Awards and Honors

Department of Energy Early Career Award 2013 (UW)
Outstanding Undergraduate Research Mentor Award 2013 (UW)
Certificate of Recognition, Hispanic Engineer National Achievement Awards Corp. (UW)
Petroleum Research Fund Doctoral New Investigator Award 2008 (UW)
Geoffrey D. Parfitt Award in ChEGSA Symposium 2005 (CMU)
Lubrizol Graduate Fellowship (CMU)
PPG Graduate Fellowship (CMU)
Luis A. Monzón medal for highest GPA in the graduating Chemical Engineering Class (UPR)
Merck award for outstanding engineering graduate (UPR)
Institute of Chemical Engineers of P.R. award for best graduate (UPR)
Eastman Chemical Co. Engineering Scholarship (UPR)

D. Peer Reviewed Publications

1. "Nonlinear Contrast Enhancement in Photoacoustic Molecular Imaging with Gold Nanosphere Encapsulated Nanoemulsions" C-W Wei, M. Lombardo, K. Larson-Smith, I.M. Pelivanov, C. Perez, J. Xia, T.J. Matula, D.C. Pozzo, and M. O'Donnell, Appl. Phys. Lett. 104, 033701 (2014)
2. "Alterations in Fibrin Clot Structure and Mechanics Attributed to Specific Oxidation of Methionine Residues in Fibrinogen" K. Weigandt¹, N. White, D. Chung, E. Ellingson, Y. Wang, X Fu, D.C. Pozzo, Biophysical Journal, 103(11), 2399 (2013)
3. "Nonlinear Photoacoustic Contrast Enhancement with Gold Nanospheres Coated Emulsion Beads" C-W Wei, M. Lombardo, K. Larson-Smith, I.M. Pelivanov, C. Perez, J. Xia, D.C. Pozzo, T.J. Matula, and M. O'Donnell, Proceedings of the 2013 IEEE Ultrasonics Symposium IUS-UFFC2013-000469, 124 (2013)
4. "Inertial Cavitation Manipulation in Nanoemulsion Induced by Low Frequency Acoustic Wave with Laser Irradiation for Potential Therapeutic Applications" J. Xia, C-W Wei, B. Arnal, I.M. Pelivanov, M. Lombardo, C. Perez, J. Xia, T.J. Matula, D.C. Pozzo, and M.

O'Donnell, Proceedings of the 2013 IEEE Ultrasonics Symposium IUS-UFFC2013-001109, 128 (2013)

5. "Modification of PCBM crystallization via incorporation of C₆₀ in polymer/fullerene solar cells" J. Richards¹, A. Rice, R. Nelson, F. Kim, S.A. Jenekhe, C.K. Luscombe, D.C. Pozzo, *Advanced Functional Materials*, 23(4), 514 (2013)
6. "Structural Analysis of Protein Denaturation with Alkyl Perfluorinated Sulfonates" M. Ospinal¹ and D.C. Pozzo, *Langmuir*, 28(51): 17749 (2012)
7. "Competitive Adsorption of Thiolated Polyethylene Glycol and Alkane-thiols on Gold Nanoparticles" K. Larson-Smith¹, D.C. Pozzo, *Langmuir*, 28(37):13157 (2012)
8. "Numerical validation of IFT in the analysis of protein-surfactant complexes with SAXS and SANS" J. M. Franklin², L.N. Surampudi, H.S. Ashbaugh, and D.C. Pozzo, *Langmuir*, 28(34):12593 (2012)
9. "Pickering Emulsions Stabilized by Nanoparticle Surfactants", K. Larson-Smith¹, D.C. Pozzo, *Langmuir*, 28(32): 11725 (2012)
10. "Structure and Property Development of Poly(3-hexyl-thiophene) Organogels Probed with Combined Rheology, Conductivity and Small Angle Neutron Scattering" G. Newbloom¹, K. Weigandt¹, D.C. Pozzo, *Soft Matter*, 8: 8854 (2012)
11. "Bioinspired templates for the synthesis of silica nanostructures" N. Hassan, A. Soltero, D.C. Pozzo, P.V. Messina, J.M. Ruso, *Soft Matter*, 8:9553 (2012)
12. "Electrical, Mechanical and Structural Characterization of Self-Assembly in Poly(3-hexylthiophene) Organogel Networks." G. Newbloom¹, K. Weigandt¹ and D.C. Pozzo, *Macromolecules*, 45(8): 3452 (2012)
13. "SANS and SAXS Analysis of Charged Nanoparticle Adsorption at Oil-Water Interfaces" K. Larson-Smith¹, A. Jackson and D.C. Pozzo, *Langmuir*, 28: 2493 (2012)
14. "The Conformation of Poly(ethylene glycol) Chains in Mono-PEGylated Lysozyme and Mono-PEGylated Human Growth Hormone" S.S. Pai, B. Hammouda, K. Hong, D.C. Pozzo, T.M. Przybycien, R.D. Tilton, *Bioconjugate Chemistry*, 22: 2317 (2011)
15. "Aqueous Dispersions of Colloidal Poly(3-hexylthiophene) Gel Particles with High Internal Porosity" J. Richards¹, K. Weigandt¹ and D.C. Pozzo, *J. Colloid and Interface Science*, 364: 341 (2011)
16. "In situ neutron scattering study of structural transitions in fibrin networks under shear deformation" K. Weigandt¹, L. Porcar and D.C. Pozzo, *Soft Matter* 7: 9992 (2011)
17. "Rheo-SANS at the NIST Center for Neutron Research" L. Porcar, D.C. Pozzo, G. Langenbacher, J. Moyer, and P. Butler, *Review of Scientific Instruments*, 82, 083902 (2011)
18. "Mesoscale Morphology and Charge Transport in Colloidal Networks of Poly(3-hexylthiophene)" G.M. Newbloom¹, F.S. Kim, S.A. Jenekhe and D.C. Pozzo, *Macromolecules*, 44, 3801 (2011)
19. "Scalable Synthesis of Self-Assembling Nanoparticle Clusters Based on Controlled Steric Interactions" K. Larson-Smith¹ and D.C. Pozzo, *Soft Matter*, 7, 5339 (2011)
20. "Structural Analysis of Protein Complexes with Sodium Alkyl Sulfates by Small-Angle Scattering and Polyacrylamide Gel Electrophoresis" M. Ospinal¹ and D.C. Pozzo, *Langmuir*, 27(3): 928 (2011)
21. "Small Angle Scattering Model for Pickering Emulsions and Raspberry Particles" K. Larson-Smith¹, A.J. Jackson and D.C. Pozzo, *J. Colloid and Interface Science*, 343: 36 (2010)
22. "Structure of high density fibrin networks probed with neutron scattering and rheology" K. Weigandt¹, L. Porcar and D.C. Pozzo, *Soft Matter*, 5(21): 4321 (2009)
23. "Neutron-Scattering Probe of Complexes of Sodium Dodecyl Sulfate and Serum Albumin during Polyacrylamide Gel Electrophoresis" D.C. Pozzo, *Langmuir*, 25(3): 1558-1565 (2009)

24. "Macroscopic alignment of nanoparticle arrays in soft crystals of cubic and cylindrical polymer micelles." D.C. Pozzo and L. M. Walker, *European Physical Journal E*, 26(1-2): 183 (2008)
25. "Shear orientation of nanoparticle arrays templated in PEO-PPO-PEO soft crystals" D.C. Pozzo, L. M. Walker, *Macromolecules*, 40(16): 5801-5811 (2007)
26. "Small angle neutron scattering of silica nanoparticles templated in PEO-PPO-PEO cubic crystals" D. C. Pozzo, L. M. Walker, *Colloids & Surfaces A* 294: 117 (2007)
27. "Rheology and Phase Behavior of Copolymer Templated Nanocomposite Materials" D.C. Pozzo, K. R. Hollabaugh, L. M. Walker, *Journal of Rheology* 49-3:759-782 (2005)
28. "Three-dimensional nanoparticle arrays templated by self-assembled block-copolymer gels" D.C. Pozzo, L. M. Walker, *Macromolecular Symposia* 227-1:203-210 (2005)
29. "Reversible Shear Gelation of Clay-Polymer Dispersions" D. C. Pozzo and L. M. Walker *Colloids & Surfaces A* 240:187-198 (2004)

E. Chapters in Edited Books

K. Weigandt and D.C. Pozzo. Protein Gel Rheology. In "*Proteins in solution and at interfaces: Methods and Applications in Biotechnology and Materials Science*" J.M. Ruso & A. Piñero. Wiley book series, ISBN: 9780470952511, Published March 2013

F. Patents

1. Contrast Enhancement by Simultaneous Ultrasound/Laser Pulse Probing of Metal Nanoparticle Encapsulated Emulsion Beads, Patent Application 61/708,205, (2012)
2. Method for the production of networked composite films via combined solution processing and atmospheric plasma deposition, Patent Application 61/623,017 (2012)
3. Composites incorporating a conductive polymer nanofiber network, US and International Patent Application, 61/618,126 (2012)

G. Synergistic Activities

-Member of the Beamtime Allocation Committee (BTAC) at the NIST Center for Neutron Research (2011-present).

-Neutron Scattering Workshops and Related Activities

Invited lecturer for the annual NIST- Neutron Scattering Summer School (2008).

Invited Talk SHUG Users Group Meeting (2007)

NIST-Center for Neutron Research Facilities Expansion Workshop (2006)

NNI-NSET Neutrons and X-rays: Essential tools for Nanoscience Research (2005)

Reviewer NIST CNR Beamtime Allocation Proposals (ongoing)

-Organized and taught 1st UW SAXS summer short course to introduce the basics of neutron and x-ray scattering in the analysis of nano-scale systems. Seventeen students and faculty participated from the UW and the University of Puerto Rico.

-Curriculum reform through modernization of experimental modules:

- UO Bioenergy Laboratory Experience: PI of a CCLI project to create a realistic biofuel plant experience incorporating all experimental stations under this topic. Complete restructuring of the laboratory course to improve student learning.
- Rheology module: The thermo-reversible phase transitions of block-copolymers is used to introduce non-Newtonian fluid behavior. ChemE 455 - Colloids
- SAXS module: SAXS is used to track block copolymer self-assembly and correlate nano-scale structure with macro-scale properties (rheology). ChemE 455 – Colloids

-Organized and chaired the first graduate student symposium in the Department of Chemical Engineering at the University of Washington (2008). Graduate students used this forum to present their latest results to industrial representatives, faculty and to their peers.

H. Invited Seminars (>60 Contributed Conference Presentations)

Outside the University of Washington

1. Department of Chemical and Biological Engineering Princeton University, Princeton NJ, *Self-Assembly of Conjugated Polymers for Organic Electronics* (February 2014)
2. American Conference on Neutron Scattering, Washington DC, *Structure-Property Relationships of Semiconductor Organogels Developed through in-situ Rheology, Dielectric Spectroscopy and Small Angle Neutron Scattering*. (June 2012)
3. Dept. of Chemical and Biological Engineering Colorado School of Mines, Golden CO, *Structure Property Relationships of Fiber Networks*, (April 2012)
4. Boeing Research and Technology, Seattle WA, *Structure-Property Relationships in Conjugated Polymer Networks*, (November 2011)
5. Dept. Chemical and Biomolecular Engineering Tulane University, New Orleans LA, *Structure-property relationships of fiber networks*, (September 2011)
6. Dept. Chemical and Biomolecular Engineering Clemson University, Clemson SC, *Structure-property relationships of fiber networks*, (April 2011)
7. School of Chemical, Biological and Environmental Engineering, Oregon State University, Corvallis OR, *Structure Property Relationships of Fiber Networks*, (February 2011)
8. PR-LSAMP Transdisciplinary Research Conference, San Juan PR, Plenary, *Neutron and X-ray Scattering: Unique Structural Probes for Soft Matter Research*, (May 2010)
9. Dept. of Chemical Engineering University of Missouri Columbia, Columbia MO, *Small Angle Neutron Scattering for Structural Analysis of Soft Matter*, (March 2010)
10. Puget Sound AIChE Local Chapter, Seattle WA, *Small angle Scattering: A unique structural probe for soft condensed matter*, (April 2009)
11. NIST CNR Summer School, Gaithersburg MD, *SANS as an in-situ probe for nano-structure evolution in real-world processes*, (June 2008)
12. ORNL users meeting, Oak Ridge TN, *Relating the structure and mechanical properties of fibrin clots using neutrons*, (Oct. 2007)
13. NSTI Nanotech Conference, Santa Clara CA, *Inorganic and Organic Nanoparticle Arrays Templated in thermoreversible Block Copolymers*, (May 2007)
14. NIH Tissue Biophysics and Biomimetics, Bethesda MD, *Composite Nanostructures: Proteins and nanoparticle arrays templated in block-copolymer mesophases*, (Jan. 2006)

At the University of Washington

1. Department of Chemical Engineering, University of Washington, *Self-Assembly of Nanoparticle Surfactants*, (May 2012)
2. Center for Nanotechnology University of Washington, *Self-assembly of 'colloidal-molecules' based on controlled steric stabilization*, (February 2012)
3. AMGEN Scholars University of Washington, *Neutron Scattering Analysis of Biological Systems*, (August 2011)
4. Physical Chemistry Dept. of Chemistry University of Washington, *Synthesis of self-assembling 'colloidal-molecules' based on controlled steric stabilization*, (March 2011)
5. Materials Science and Engineering Departmental Seminar, University of Washington, *Small angle Scattering: A unique structural probe for soft condensed matter*, (May 2009)
6. CMA Seminar Series UW Physics, *Small angle neutron scattering: A unique structural probe for soft condensed matter*, (Dec 2008)
7. Center for Nanotechnology University of Washington, *Neutron Scattering Techniques in the Characterization of Nanostructured Materials*, (Nov. 2007)

I. Collaborations (Last five years)

Prof. David Baker (UW BioChemistry, Seattle WA), Prof. Daniel Schwartz (UW Chemical Engineering, Seattle WA), Prof. Francois Baneyx (UW Chemical Engineering, Seattle WA),

Prof. Jim Pfaendtner (UW Chemical Engineering, Seattle WA), Prof. Sam Jenekhe (UW Chemical Engineering, Seattle WA), Dr. Lionel Porcar (ILL, France), Prof. Christine Luscombe (UW Materials Science, Seattle WA), Dean Matt O'Donnell (UW Bioengineering), Prof. Tom Matula (UW Advanced Physics Laboratory), Prof. David Masiello (UW Chemistry, Seattle WA), Dr. Nathan White (UW Emergency Medicine, Seattle WA), Prof. Dominic Chung (UW Biochemistry, Seattle WA), Prof. Robert Tilton (CMU Chemical Engineering, Pittsburg PA), Prof. Todd Przybycien (CMU Chemical Engineering, Pittsburg PA), Prof. Hank Ashbaugh (Tulane Chemical Engineering, New Orleans LA), Dr. Andrew Jackson (NIST CNR, Gaithersburg MD), Prof. David Suleiman (UPR Chemical Engineering, Mayaguez PR), Dr. William Hamilton (ANSTO, Lucas Heights Australia), Dr. Paul Butler (NIST CNR, Gaithersburg MD).

J. Graduate and Postdoctoral Advisors

Doctorate: Prof. Lynn M. Walker (Chemical Engineering Carnegie Mellon University)

Postdoctoral: Dr. Dan Neumann (NIST Center for Neutron Research)

K. Students Advised Since September 2007

Ph.D. Thesis Research:

Michael Lombardo (Ph.D. Expected 2017) – Self-assembly of nanoparticle clusters.

Pablo de la Iglesia (Ph.D. Expected 2015) – Structure of conductive organogels.

Jeff Richards (Ph.D. Expected 2014) – Structure control in polymer solar-cells.

Greg Newbloom (Ph.D. Expected 2014) – Percolation in conjugated polymer networks.

Graduated Ph.D. Students:

Kathleen Weigandt (Ph.D. 2012) – Structure and rheology of fiber networks.

Kjersta Larson-Smith (Ph.D. 2012) – Nanoparticle self-assembly in dispersion.

Monica Ospinal (Ph.D. 2013) – Adv. nanostructures for protein separations

Undergraduate Researchers:

Have advised over 30 undergraduate researchers in 6 years, 4 partly funded by industrial sponsors (Amgen). One student was named 2009 Rhode Scholar (Anya Yermakova). Among these there are 4 students from underrepresented groups and 12 females.