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EDUCATION

University of California – San Francisco (2015)
Postdoc, Dept. of Cellular and Molecular Pharmacology

San Francisco, CA, USA
Mentor: Shawn M. Douglas

University of Michigan (2009 – 2015)
PhD, Applied Physics
“Using Directional Entropic Forces for Target Pattern Design”

Ann Arbor, MI, USA
Advisor: Sharon C. Glotzer, NAS

University of Sao Carlos (2005 – 2009)
B.S., Physics
“Pressure-Induced Structural Phase Transitions in 2D Systems”

São Carlos, SP, Brazil
Advisor: José P. Rino

AFFILIATIONS, AND VISITING POSITIONS

Visiting Scholar (Roderich Gross’ group). University of Sheffield, UK.	(Nov. 2014)
Visiting Scholar (Daan Frenkel’s group). Cambridge University, UK.	(Oct. 2014)
Visiting Scholar (Frank Scheffold’s group). University of Fribourg, CH.	(July 2014)
University of Michigan’s Center for the Study of Complex Systems	(2012 – 2015)
University of Michigan’s Applied Physics Program	(2009 – 2015)

PROFESSIONAL EXPERIENCE

Conference Co-Organization and Session Chair

Brazilian Materials Society Meeting Session Co-organizer	Rio de Janeiro, BR (2015)
American Physics Society Meeting Session Organizer	San Antonio, TX (2015)
Santa Fe Institute Workshop on Kinetic Networks	Santa Fe, NM (2015)
Michigan Complexity Mini-Conference	Ann Arbor, MI. (2013, 2014)
Complex Systems Multidisciplinary Workshop	Ann Arbor, MI. (2012)
Annual Undergraduate Symposium	Sao Paulo. Brazil. (2006, 07, 08, 09)

Teaching Assistant

Assembly Engineering (Graduate Level)

University of Michigan (2013)

Physics Principles for Biologists (Undergrad. Level)

University of Sao Carlos (2009)

Students Co-Mentorship:

Graduate Students: PM Dodd, Y Geng, A Karas, A Cadotte, CS Adorf (U. Michigan)

Undergraduate Students: J Berleant, S Zatzke, E Siismets

JOURNAL REFEREE (papers reviewed: 18)

PNAS (ISSN 1091-6490)

(2015 – present)

Scientific Reports (ISSN 2045-2322)

(2015 – present)

ACS Nano (ISSN 1936-0851)

(2015 – present)

Granular Matter (ISSN: 1434-5021)

(2012 – present)

HONORS, AWARDS, AND DISTINCTIONS

Grants and Fellowships

U Michigan awarded our proposal of “Symmetry” as theme semester

(Ann Arbor, 2016)

Workshop Funding: “Kinetic Networks: from Topology to Design”

(Santa Fe, 2015)

Workshop Funding: “Michigan Complexity Mini-Conference”

(Ann Arbor – 2012, 13)

U Michigan Pre-doctoral Graduate Fellowship

(2014)

Presentations, Publications and Conference Awards

Nature Materials Cover Article

Nature Materials (2015)

Article Selected for News & Views (Nature Materials)

Nature Materials (2014)

Lindau Nobel Laureate Meeting (Selected for participation)

Lindau, DE. (2014)

Poster Nomination. MRS Spring Meeting

San Francisco, CA. (2014)

Article Selected for Synopsis (PRX)

Phys. Review X, APS (2014)

Article Selected as *Hot Paper*

Angew. Chemie Int. Ed. (2013)

Poster Award (3rd). 12th Mini Stat Mech Meeting

Berkeley, CA. (2013)

Science Featured Paper + Interview

Science Magazine. (2012)

Talk of the Year: Applied Math Grad. Student Seminar

Ann Arbor, MI. (2012)

Poster Award (1st): Intern. School "Enrico Fermi"

Varenna, Italy. (2012)

Featured Illustration: (PRB)

Phys. Review B, APS. (2009)

PEER-REVIEWED PUBLICATIONS

Google Scholar Citations (01/06/16): **436**

1. **PFD**; Karas, AS; Schultz, BA; Engel, M; Glotzer, SC Phys. Rev. Lett (2015)
Controlling Chirality of Entropic Crystals
2. Shyu, TC; **PFD**; Dodd, PM; Lamoureux, A; Xu, L.; Shlian, M.; Shtein, M; Glotzer, SC; Kotov, NA Nature Materials (2015)
A Kirigami Approach to Engineering Elasticity in Nanocomposites
3. Schultz, BA; **PFD**; Engel, M; Glotzer, SC ACS Nano (2015)
Symmetry Considerations for the Targeted Assembly of ...
4. Engel, M; **PFD**; Phillips, CL; Glotzer, SC Nature Materials (2014)
Computational Discovery of a one-component Icosahedral Quasicrystal
5. Chen, ER; Klotsa, D; Engel, M; **PFD**; Glotzer, SC Phys. Rev. X (2014)
Complexity in surfaces of densest packings for families of polyhedra
6. Young, KL; Personick, ML; Engel, M; **PFD**; Barnaby, SN.; Bleher, R; Li, T; Glotzer, SC; Lee, B; Mirkin, CA Angew Chem (2013)
A Directional Entropic Force Approach to Anisotropic Nanoparticle Assembly
7. **PFD**; Engel, M; Glotzer, SC Science (2012)
Predictive Self-Assembly of Polyhedra into Complex Structures
8. **PFD**; Engel, M; Glotzer, SC ACS Nano (2012)
Crystalline Assemblies of a family ... and the Role of Directional Entropic Forces
9. **PFD**; daSilva, CJ; Rino, JP; Cândido, L. J Low Temp Phys (2010)
Temperature and Pinning Effects on Driving a 2D Electron System on a Helium Film
10. DaSilva, CJ; Rino, JP; **PFD**; Sherman, EYa; Phys Review B (2010)
Two-dimensional Coulomb solid with interaction anisotropy
11. **PFD**; Gonçalves, LGV; Rino, JP; de Oliveira, RCM Phys Review B (2009)
Pressure-induced Structural Phase Transitions in a Two-Dimensional System
12. **PFD**; Rino, JP Rev. Brasil. Ens. Fís. (2006)
Analysis of a Slingshot and Helical Plastic Springs: a Case Study

CONFERENCE / SYMPOSIUM PUBLICATIONS:

13. **PFD**; Rino, JP XV AUGM Conf. (2007)
Simulation of Physical Systems by Finite Elements Method

SUBMITTED / IN PREPARATION MANUSCRIPTS:

14. **PFD**; Phillips, CL; Engel, M; Glotzer, SC In Prep. (2015)
Self-Assembly of Complex Crystals from Simple Pair-Potentials.
15. **PFD**; Glotzer, SC In Prep. (2015)
A Potential of Mean Force Approach for Reverse Engineering Self-Assembly of Target Crystals.
16. Zhou, Y; **PFD**; (...) Glotzer, SC; Kotov, N; In Prep. (2015)
Anomalies of Mechanical Properties in Nanoparticle Hydrogels.
17. Dodd, P; **PFD**; Glotzer, SC In Prep. (2015)
Folding by Design.

TALKS (multiple co-authors)

Invited (11):

1. “Computer Simulation Insights into the Physics of Life”. *Brazilian Materials Research Society Meeting*. Rio de Janeiro. Brazil (2015)
2. “Towards a Thermodynamic Emergence of Artificial Life”. *Omidyar Fellowship Colloquium*. Santa Fe Institute. New Mexico. USA (2015)
3. “Self-Assembly across length scales”. *Colloquium*. University of Sheffield. UK. (2014)
4. “What the Bees Know and What They Don’t Know. Meanders on Shape, Packing and Self-Assembly in Nature”. *Cambridge’s Biological and Statistical Physics Discussion Group*. Cambridge. UK. (2014)
5. “Predictive self-assembly of polyhedra into complex structures”. *Colloquium*. University of Twente. Enschede. Netherlands. (2012)
6. “What do the bees know and what they do not know”. *Complex Systems Advanced Academic Workshop (CSAAW)*. Ann Arbor. USA. (2012)
7. “Auto-organização: Usando as leis do universo em favor da nanociência (e além)”. *Brazilian Research Network in Nanotechnology, Society and Environment*. São Paulo. Brazil (2012)
8. “A Física da Automontagem (*The Physics of Self-Assembly*). *VII Semana da Física da UFSCar*”. Sao Carlos. Brazil. (2011)
9. “Ciências, cientistas e outras profissões” (Science, Scientists and other jobs). *Instituto Dom Barreto High School*. Teresina. Brazil. (2011)
10. “Minha Trajetória como um Físico” (My Path as a Physicist). *Instituto Dom Barreto High School*. Teresina. Brazil. (2011)
11. “Scaling Up your Research with Computer Simulations” *Physics Graduate Student Symposium*. Ann Arbor. USA. (2011)

Contributed (21):

12. “Using Machine Learning for Soft-Matter Crystal Discovery and Design”. MRS Meeting. Boston (2015)
13. “A Directional Entropic Force Approach for Self-Assembly of 3-Dimensional Enantioselective Crystals”. AIChE Meeting. Salt Lake City (2015)
14. “Anomalies of Mechanical Properties in Nanoparticle Hydrogels”. AIChE Meeting. Salt Lake City (2015)
15. “A Kirigami Approach to Engineering Elasticity in Nanocomposites”. *Brazilian Materials Research Society Meeting*. Rio de Janeiro. Brazil (2015)
16. “In search of Global Icosahedral Order”. *Unifying Concepts in Glass Physics*. Aspen. (2015)
17. “Entropic Utopia: Shaping disorder for targeted self-assembly across length scales”. Colloquium. *Theoretical Chemistry Seminar*. Cambridge. UK. (2014)
18. “Packing, Folding, Assembling, and Jamming”. *Stat. Mech. Colloquium*. Berkeley. USA. (2014)
19. “More disordered than disorder: self-organization, microstates and why entropy might not be what you think”. *Santa Fe Institute (SFI) Seminar*. Santa Fe. USA. (2014)
20. “What the Bees Know and What They Don’t Know. Meanders on Shape, Packing and Self-Assembly”. *Ecole Thématique du CNRS: Waves and Disorder*. Cargèse. FR. (2014)
21. “Lego: a Toy Model for Self-Assembly”. *3rd Michigan Complexity Mini-Conference*. Ann Arbor. USA. (2014)
22. “Folding by Design”. *MRS Spring Meeting*. San Francisco. USA. (2014)
23. “Cutting and Folding for Tunable Materials Properties”. *APS March Meeting*. Denver. USA. (2014)
24. “Bio-Inspired Materials with Tunable Mechanical Properties”. *AIChE Annual Meeting*. San Francisco. USA. (2013)
25. “The Role of Anisotropy for the Assembly of Hard Colloidal Nanoparticles”. *AIChE Annual Meeting*. San Francisco. USA. (2013)
26. “Self-Assembly of Complex Crystals Through Building Block Design”. *International Soft Matter Conference*. Rome. Italy. (2013)
27. “Crystallographic Tailoring: Self-Assembling Complex Crystals Through Building Block Design”. *APS March Meeting*. Baltimore. USA. (2013)
28. “Packing versus Assembly in Systems of Hard Polyhedra”. *MRS Fall Meeting*. Boston. USA. (2012)
29. “Packing, Jamming, Assembly and Folding: (some) Mathematics Behind Materials Design”. *Applied Interdisciplinary Math Department*. Ann Arbor. USA (2012) – *Awarded
30. “Self-Assembly of non-Spherical Colloids”. *2nd International Workshop on Complex Physical Phenomena in Materials*. Porto de Galinhas. Brazil. (2012)
31. “Crystalline Assembly of Hard Polyhedra via Directional Entropic Forces”. *APS March Meeting*. Boston. USA. (2012)
32. “Modelagem por Dinâmica Molecular de Transições de Fase Estruturais em Sistemas Bidimensionais”. (Molecular Dynamics Simulation of Structural Phase Transition in 2D systems). *Brazilian Young Researchers Symposium*. São Carlos. Brazil. (2008)

POSTER PRESENTATIONS AT CONFERENCES (multiple co-authors) (22):

1. Shaping Assembly: Exploring the Role of Building Block Geometry for Molecular Design. *In: DNA21*. Harvard (2015)

2. Experimental Investigation of Emergent Collective Phenomena in Systems of 3D-Printed Particles. *In: International Conference on Intelligent Robots and Systems*. Chicago (2014)
3. Predictive Assembly of Complex Phases via Interaction Design. *In: Transformational Technologies in Molecular Simulations*. Madison (2014)
4. Cutting and Folding for Tunable Materials Properties. *In: MRS Spring Meeting*. San Francisco (2014) – *Poster Nomination Award
5. Probing the Photonic Properties of Disordered, Quasicrystalline and Ordered Materials. *In: Michigan – Purdue Photonics Workshop*. West Lafayette (2014)
6. Computer Simulation Studies of Self-Assembly and Nano Material Design. *In: Cyberinfrastructure (CI) Days*. Ann Arbor (2013)
7. Ordered and Disordered Systems of Hard Convex Polyhedra. *In: Geometry and Physics of Spatial Random Systems*. Freudenstadt. Germany (2013)
8. Emergence of Structural Complexity in Systems of Entropic Agents. *In: Michigan Complexity Mini-Conference*. Ann Arbor (2013)
9. Assembling Complex Structures from Simple Building Blocks. *In: "12th Berkeley Mini Stat Mech Meeting"*. Berkeley. (2013) – *Best Poster Award (3rd Place)
10. Self-assembly of Anisotropic Polyhedra. *In: International School of Physics "Enrico Fermi"*. Varenna. Italy. (2012) – *Best Poster Award (1st Place)
11. Self-assembly of Imperfect tetrahedra. *In: Advances in Percolation and Related Topics MCTP Workshop*. Ann Arbor (2012)
12. Self-assembly of non-spherical shapes. *In: 12th Experimental Chaos and Complexity Conference*. Ann Arbor. (2012)
13. Self-assembly of Anisotropic Polyhedra into Complex Crystals. *In: Cyberinfrastructure (CI) Days*. Ann Arbor. (2012)
14. Self-Assembly of Imperfect Tetrahedra. *In: AiChE Annual Meeting*. Minneapolis. (2011)
15. The Role of Shape for the Crystallization of Nanotetrahedra. *In: Workshop on Sphere Packing and Amorphous Materials*. ICTP. Trieste. Italy. (2011)
16. The Role of Shape, Polydispersity and Softness for the Crystallization of Nanotetrahedra. *In: Black Forest Focus on Soft Matter 5: Self-Assembly on all Scales*. Saig. Germany. (2011)
17. Self-assembly of superchiral and quasicrystalline structures for photonic and negative index materials. *In: AFOSR metamaterial review*. Virginia Beach (2010)
18. Metal-Insulator transition of electrons on Helium film at finite temperature. *In: XI Escola brasileira de estrutura eletrônica*, Uberlândia (2008).
19. Transições de fase em sistemas bidimensionais usando um potencial de poço duplo. *In: XXXI Encontro Nacional de Física da Matéria Condensada*. (2008).
20. Pressure-induced structural phase transition in two-dimensional systems. *In: Conference on Computational Physics*. Ouro Preto (2008)
21. Simulação de sistemas físicos pelo método dos elementos finitos. *In: 7a Jornada Científica da UFSCar*. (2007)
22. Análise de estabilidades de redes bidimensionais. *In: XIV Congresso de Iniciação Científica* (2006)

CONFERENCES, SYMPOSIUMS AND SUMMER SCHOOLS ATTENDED:

International:

1. Brazilian Materials Research Society Meeting (SBPMat). Rio de Janeiro. (2015)
2. International Conference on Intelligent Robots and Systems. Chicago. (2014)
3. Lindau Nobel Laureate Meeting. Germany. (2014)
4. Waves and Disorder Summer School. France. (2014)
5. International Soft Matter Conference. Italy. (2013)
6. Geometry and Physics of Spatial Random Systems. Germany. (2013)
7. Intern. Workshop on Complex Physical Phenomena. Brazil. (2012)
8. Intern. School of Physics “Enrico Fermi”. Italy. (2012)
9. Workshop on Sphere Packing and Amorphous Materials. ICTP. Italy. (2011)
10. Black Forest Focus on Self-Assembly on all Scales. Germany. (2011)
11. Summer school in High Performance Computing. Italy. (2010)
12. Conference on Computational Physics. Brazil. (2008)
13. XV Symposium for Young Researchers. Paraguay. (2007)

National:

13. MRS Fall Meeting. Boston MA. (2015)
14. AIChE Annual Meeting. Salt Lake City. (2015)
15. Santa Fe Institute Workshop: “Kinetic Networks: From Topology to Design”. Santa Fe NM. (2015)
16. DNA21. Harvard MA. (2015)
17. MRS Spring Meeting. San Francisco CA. (2015)
18. Transformational Technologies in Molecular Simulations. Madison. MI. (2014)
19. 3rd Michigan Complexity Mini-Conference. Ann Arbor MI. (2014)
20. MRS Spring Meeting. San Francisco CA. (2014)
21. Michigan – Purdue Photonics Workshop. Lafayette IN. (2014)
22. APS March Meeting. Denver CO. (2014)
23. CyberInfrastructure Days. Ann Arbor MI. (2013)
24. AIChE Annual Meeting. San Francisco CA. (2013)
25. The Evolution of Cooperation & The Framing of Peace. Ann Arbor MI. (2013)
26. Modeling the Dynamics of Norms and Culture. Ann Arbor MI. (2013)
27. APS March Meeting. Boston MA. (2013)
28. 2nd Michigan Complexity Mini-Conference. Ann Arbor MI. (2013)
29. APS March Meeting. Boston MA. (2012)
30. Advances in Percolation and Related Topics. Ann Arbor MI. (2012)
31. MRS Fall Meeting. Boston MA. (2012)
32. 12th Experimental Chaos and Complexity Conf. Ann Arbor MI. (2012)
33. CyberInfrastructure Days. Ann Arbor MI. (2012)
34. AIChE Annual Meeting. Minneapolis MN. (2011)
35. Petascale Programming, Environments and Tools. Urbana IL. (2010)
36. Proven Algorithmic Techniques for Many-core Proc. Ann Arbor MI. (2010)
37. AFOSR metamaterial review. Virginia Beach VA. (2010)
38. XVI Congress for Young Researchers. Brazil. (2008)
39. XXXI National Meeting on Condensed Matter Physics. Brazil. (2008)

40. XI Brazilian School of Electronic Structure. Brazil. (2008)
41. I Winter School (IFGW - Unicamp). Brazil. (2008)
42. III Physics week. Brazil. (2007)
43. XXII Theoretical Physics Journey. Brazil. (2007)
44. XVII Scientific Journey Brazil. (2007)
45. I Escola de Física Computacional Moderna. Brazil. (2006)
46. II Physics week. Brazil. (2006)
47. XIV Congress for Young Researchers. Brazil. (2006)

PROFESSIONAL REFERENCES:**Sharon C. Glotzer**

John Werner Cahn Distinguished Professor
 Stuart W. Churchill professor
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