

## RYAN BRADLEY JADRICH

The University of Texas at Austin

McKetta Department of Chemical Engineering, Austin, TX 78712-1589

(585)-490-6971 | work: [rjadrich@utexas.edu](mailto:rjadrich@utexas.edu) | personal: [rjadrich@gmail.com](mailto:rjadrich@gmail.com) | [LinkedIn](#)

### EDUCATION

#### **Ph.D., Chemistry, 2009-2014**

##### **University of Illinois at Urbana - Champaign**

Research: Statistical Mechanics of Soft Condensed Matter, Liquid State Theory, Glassy and Disordered Systems

Thesis: [Structure, Slow Dynamics, Kinetic Arrest, and Massively Reconfigurable Assembly in Colloidal Suspensions](#)

Advisor: [Kenneth S. Schweizer](#)

#### **B.S., Chemistry, Highest Honors, 2005-2009**

##### **Rochester Institute of Technology**

Focus: Theoretical and Physical Chemistry

Minor: Mathematics

### PROFESSIONAL CERTIFICATION

#### **Data Science, 2015-2016**

##### **General Assembly of Austin, TX**

Course Material: Supervised and Unsupervised Machine Learning Techniques

Coding: SciKit-Learn, Numpy and Pandas Python Packages

Capstone Project: [Disaster detection via Twitter \(Python Notebook on GitHub\)](#)

Instructor: [Kevin Safford](#)

### PROFESSIONAL EXPERIENCE

#### **Postdoctoral Fellow, 2014-Present**

##### **The University of Texas at Austin, McKetta Department of Chemical Engineering**

Research: Computational Inverse Design and Optimization of Liquid and Solid State Statistical Mechanics Models

Advisor: [Thomas M. Truskett](#)

#### **Analytical Chemistry Cooperative Education with Rochester Institute of Technology, 2007-2008**

##### **Xerox Analytical Services**

Overview: Provided Technical Support to Various Divisions in Xerox both Local and Foreign

Responsibilities: Routine Chemical Measurements and Troubleshooting, Presenting and Communicating Findings

Techniques: X-Ray Fluorescence Spectroscopy, Inductively Coupled Optical Emission Spectroscopy,

Light Microscopy, Gas, Gel and Ion Chromatography

Supervisor: [Kevin Marcell](#)

### PUBLICATIONS

(1) B. A. Lindquist, **R. B. Jadrich** and T. M. Truskett, [\(In Preparation\)](#); "Equilibrium Gels via a Macroscopic Bond Limitation"

(2) **R. B. Jadrich**, B. A. Lindquist, J. A. Bollinger and T. M. Truskett, *Molecular Physics*, [Invited Article \(In Press\)](#); "Consequences of Minimizing Pair Correlations in Fluids for Dynamics Thermodynamics and Structure" [\[GitHub\]](#)

(3) B. A. Lindquist, **R. B. Jadrich** and T. M. Truskett, *Soft Matter (Communication)*, DOI: 10.1039/C5SM03068D (2016); "Assembly of Nothing: Equilibrium Fluids with Designed Structured Porosity" [\[Journal\]](#), [\[GitHub\]](#)

- (4) A. Singh, B. A. Lindquist, G. K. Ong, **R. B. Jadrich**, A. Singh, H. Ha, C. J. Ellison, T. M. Truskett and D. J. Milliron, *Angewandte Chemie* **54**, 14840–14844 (2015); “Linking Semiconductor Nanocrystals into Gel Networks through all Inorganic Bridges” [[Journal](#), [GitHub](#)]
- (5) **R. B. Jadrich**, J. A. Bollinger, B. A. Lindquist and T. M. Truskett, *Soft Matter* **11**, 9342-9354 (2015); “Equilibrium Cluster Fluids: Pair Interactions via Inverse Design” [[Journal](#), [GitHub](#)]
- (6) **R. B. Jadrich**, J. A. Bollinger, K. P. Johnston and T. M. Truskett, *Physical Review E* **91**, 042312 (2015); “Origin and Detection of Microstructural Clustering in Fluids with Spatial-Range Competitive Interactions” [[Journal](#), [GitHub](#)]
- (7) **R. B. Jadrich** and K. S. Schweizer, *Physical Review Letters* **113**, 208302 (2014); “Directing Colloidal Assembly and a Metal-Insulator Transition Using a Quench-Disordered Porous Rod Template” [[Journal](#), [GitHub](#)]
- (8) **R. Jadrich** and K. S. Schweizer, *Journal of Chemical Physics* **139**, 054502 (2013); “Equilibrium Theory of the Hard Sphere Fluid and Glasses in the Metastable Regime up to Jamming. II. Structure and Application to Hopping Dynamics” [[Journal](#), [GitHub](#)]
- (9) **R. Jadrich** and K. S. Schweizer, *Journal of Chemical Physics* **139**, 054501 (2013); “Equilibrium Theory of the Hard Sphere Fluid and Glasses in the Metastable Regime up to Jamming. I. Thermodynamics” [[Journal](#), [GitHub](#)]
- (10) **R. Jadrich** and K. S. Schweizer, *Physical Review E* **86**, 061503 (2012); “Theory of Kinetic Arrest, Elasticity, and Yielding in Dense Binary Mixtures of Rods and Spheres” [[Journal](#), [GitHub](#)]
- (11) **R. Jadrich** and K. S. Schweizer, *Journal of Chemical Physics* **135**, 234902 (2011); “Percolation, Phase Separation, and Gelation in Fluids and Mixtures of Spheres and Rods” [[Journal](#), [GitHub](#)]

## AWARDS

### **List of Teachers Ranked as Excellent by Their Students (With Designation of Outstanding)**

University of Illinois Center for Teaching Excellence, Spring Semester 2010

### **List of Teachers Ranked as Excellent by Their Students**

University of Illinois Center for Teaching Excellence, Fall Semester 2009

### **Undergraduate Senior Achievement Award**

American Chemical Society (Rochester NY Region), May 2009

### **Outstanding Student in Physical Chemistry Award**

Chemistry Department, Rochester Institute of Technology, May 2009

### **Outstanding Undergraduate Scholar Nominee**

Rochester Institute of Technology, November 2008

## COMPUTING EXPERIENCE

### **Programming Languages**

- C/C++, Python

### **Coding**

- Monte Carlo and Molecular Dynamics Simulations
- Relative Entropy Maximization
- Integral Equation Solvers
- Simulated Annealing Optimization
- Stochastic Integration

### **Statistical Packages**

- SciKit-Learn [Python]
- Gensim for Natural Language Processing and Topic Modeling [Python]

### **Mathematical Packages**

- MATLAB and Mathematica
- GSL Mathematical Library [C/C++]
- KINSOL Optimization Code (Part of Sandia National Labs SUNDIALS suite) [C/C++]

### **Molecular Simulation Packages**

- Groningen Machine for Chemical Simulations (GROMACS)

### **Statistical Mechanics Molecular Optimization Packages**

- Versatile Object-oriented Toolkit for Coarse-graining Applications (VOTCA)

### **Supercomputing Experience**

- Texas Advanced Computing Center (TACC)

### **Relevant Graduate Coursework**

Fall 2010

#### Atomic Scale Simulations

- Monte Carlo and Molecular Dynamic Simulation
- Genetic Algorithms and Simulated Annealing
- C/C++ and Python Coding of Monte Carlo and Molecular Dynamics Simulations

## ORAL PRESENTATIONS

### **“The Origin of and Conditions for Clustering in Fluids with Competing Interactions”**

American Physical Society March Meeting, San Antonio Convention Center  
San Antonio, Texas (March 2-6, 2015)

### **“Directing Colloidal Structure Using a Quench-Disordered Large Mesh Fiber Network”**

American Physical Society March Meeting, Colorado Convention Center  
Denver, Colorado (March 3-7, 2014)

### **“Kinetic Arrest, Mechanical Response and Massively Reconfigurable Assembly in Rod-Sphere Nanoparticle Mixtures”**

Theoretical Chemistry Institute Seminar Series, University of Wisconsin-Madison  
Madison, Wisconsin (February 17, 2014)

### **“Percolation, Structure, Kinetic Arrest, and Mechanical Response in Dense Mixtures of Rods and Nanospheres”**

Midwest Theoretical Chemistry Conference, University of Illinois at Urbana - Champaign  
Urbana, Illinois (May 29-31, 2013)

**“Microscopic Theories of the Structure and Glassy Dynamics of Ultra-Dense Hard Sphere Fluids”**

American Physical Society March Meeting, Baltimore Convention Center  
Baltimore, Maryland (March 18-22, 2013)

**“Dynamical Phases and Rheology of Rod-Sphere Nanoparticle Mixtures”**

American Physical Society March Meeting, Boston Convention Center  
Boston, Massachusetts (February 27 – March 2, 2012)

**“Percolation, Structure, Kinetic Arrest, and Mechanical Response in Dense Mixtures of Rods and Nanospheres”**

83<sup>rd</sup> Annual Society of Rheology Meeting, InterContinental Hotel and Conference Center  
Cleveland, Ohio (October 9-13, 2011)

## TEACHING EXPERIENCE

**University of Illinois at Urbana-Champaign****Spring 2010**Teaching Assistant for CHEM 315: Instrumental Chemical Systems Lab

- Taught Fundamentals of Nuclear Magnetic Resonance (NMR) Spectroscopy
- Demonstrated and Assisted in Using the NMR Spectrometer
- Taught Analysis of NMR Data with NUTS Software
- Graded Weekly NMR Lab Reports

Chemistry Learning Center Tutor

- Provided Homework and Studying Support to Students from all Chemistry Courses

**University of Illinois at Urbana-Champaign****Fall 2009**Teaching Assistant for CHEM 102: General Chemistry I

- Held Six Weekly 50 minute Discussion Sections
- Graded Quizzes and Administered Examinations

**Rochester Institute of Technology****Winter 2008-2009**Teaching Assistant for 1008 - 261: Quantitative Analysis

- Helped Construct and Grade Quizzes and Exams
- Provided Tutoring Outside of Class

**Rochester Institute of Technology****Fall 2008-2009**Teaching Assistant for 1014 - 447: Chemical Kinetics Lab

- Helped Teach and Assist With the Various Chemical Measurement Techniques

**Rochester Institute of Technology****Winter 2006-2007**Teaching Assistant for 1008 - 265: Quantitative Analysis Lab

- Aided Students in Deploying a Wide Variety of Wet Lab Chemical Techniques as Well as Lab Safety
- Helped Students Develop Lab Writing Skills

## MEMBERSHIPS

American Physical Society

REFERENCES

**Professor Thomas M. Truskett**

The University of Texas at Austin  
 Department of Chemical Engineering  
 200 E Dean Keeton St. Stop C0400, Austin, TX 78712-1589  
 E-mail: [truskett@che.utexas.edu](mailto:truskett@che.utexas.edu) Phone: (217)-333-1624

**Professor Kenneth S. Schweizer**

University of Illinois at Urbana – Champaign  
 Departments of Materials Science, Chemistry, and Chemical and Bio molecular Engineering  
 1304 W. Green Street. Urbana, IL 61801  
 E-mail: [kschweiz@illinois.edu](mailto:kschweiz@illinois.edu) Phone: (217)-333-6440

**Professor Steve Granick**

University of Illinois at Urbana – Champaign  
 Departments of Materials Science, Chemistry, and Physics  
 1304 W. Green Street. Urbana, IL 61801  
 E-mail: [sgranick@illinois.edu](mailto:sgranick@illinois.edu) Phone: (217)-333-5720

**Professor Martin Gruebele**

University of Illinois at Urbana – Champaign  
 Departments of Chemistry, Physics and Center for Biophysics and Computational Biology  
 600 South Mathews Avenue, Urbana, IL 61801  
 E-mail: [gruebele@scs.illinois.edu](mailto:gruebele@scs.illinois.edu) Phone: (217)-333-1624