

Qin Xu

Assistant Professor

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Research Areas:

Surface Mechanics of soft materials, advanced optical microscopy, rheology of complex fluids, Jamming.

Academic Appointments

Assistant Professor, HKUST , Hong Kong SAR, China <i>Department of Physics</i>	2020-present
Postdoctoral Scholar, ETH Zurich , Zurich, Switzerland <i>Department of Materials</i>	2016-2020
Postdoctoral Associate, Yale University , New Haven, CT, USA <i>Department of Mechanical Engineering and Materials Science</i>	2015-2016

Education

Ph.D. in Physics, University of Chicago , Chicago, IL, USA	2010-2015
M.S. in Physics, New York University , New York, NY, USA	2008-2010
B.S. in Physics, Fudan University , Shanghai, China	2004-2008

Honors and Awards

<i>ETH Zurich Seed Award</i> Arts & Research Commission, ETH Zurich	2019
<i>Arts&Science Graduate Collaboration Grants</i> Featured on <i>Uchicago news</i> Arts & Science Initiative, University of Chicago	2014

<p><i>Prize of Important Optical Achievements in China</i> For the research of the paper, "Gradient-index meta-surfaces as a bridge linking propagating waves and surface waves", published in Nature Materials (Feb. 2012) Optics Frontier, China</p>	2013
<p><i>Sachs Fellowship</i> Department of Physics, University of Chicago</p>	2011
<p><i>McCormick Fellowship</i> It is awarded by the Admissions Committee to the highest rated applicants to the Ph.D. program of the Department of Physics Department of Physics, University of Chicago</p>	2010
<p><i>McCracken Fellowship</i> Department of Physics, New York University</p>	2009
<p><i>People's Scholarship</i> Department of Physics, Fudan University</p>	2005 - 2007

Publications

1. Qin Xu, Lawrence Wilen, Katharine E. Jensen, Robert W. Style, and Eric R. Dufresne
Interplay of viscoelastic and poroelastic relaxations on surfaces of soft solids
In final preparation.
2. Qin Xu, Abhinendra Singh, and Heinrich M. Jaeger
Stress fluctuations and shear thickening in dense granular suspensions
Journal of Rheology, 64, 321 (2020)
3. Zezhou Liu, Katharine E. Jensen, Qin Xu, Robert W. Style, Eric R. Dufresne, Anand Jagota and Chung-Yuen Hui
Effects of Strain-dependent Surface Stress on the Adhesive Contact of a Rigid Sphere to a Compliant Substrate
Soft Matter, 15, 2223-2231 (2019).
4. Justin D. Berman, Manjari Randeria, Robert W. Style, **Qin Xu**, James R. Nichols, Aidan J. Duncan, Michael Loewenberg, Eric R. Dufresne, and Katharine E. Jensen
Singular dynamics in the failure of soft adhesive contacts
Soft Matter, 15, 1327-1334 (2019).

5. Robert W. Style and **Qin Xu**, *The mechanical equilibrium of soft solids with surface elasticity*
Soft Matter, **14**, 4569-4576 (2018).
6. Robert W. Style, Tianqi Sai, Nicolo Fanelli, Katrina Smith-Mannschott, **Qin Xu**, Larry A. Willen and Eric R. Dufresne, *Liquid-Liquid phase separation in an elastic matrix creates uniform droplets of tunable size*
Phys. Rev. X, **8**, 011028 (2018).
7. **Qin Xu**, Robert W. Style and Eric R. Dufresne, *Surface Elastic Constants of a Soft Solid*.
Soft Matter **14**, 916-920 (2018).
8. Katharine E. Jensen, Robert Style, **Qin Xu** and Eric R. Dufresne, *Strain-dependent solid surface stress and the stiffness of soft contacts*
Phys. Rev. X, **7**, 041031 (2017).
9. **Qin Xu**, Katharine E. Jensen, Rostislav Boltyanskiy, Raphael Sarfati, Robert Style, and Eric R. Dufresne, *Direct measurements of surface stress of stretched soft solids*
Nat. Comm. **8**, 55(2017).
**** Highlighted in ETH Materials News**
10. **Qin Xu**, Sayantan Majumdar, Eric Brown and Heinrich M. Jaeger, *Shear thickening in highly viscous granular suspensions*
Europhys. Lett. **107**, 68004 (2014)
11. Luuk A. Lubbers, **Qin Xu**, Sam Wilken, Wendy W. Zhang and Heinrich M. Jaeger, *Dense Suspension Splat: Monolayer Spreading and Hole Formation after Impact*
Phys. Rev. Lett. **113**, 044502 (2014)
****Highlighted in APS News**.
12. Qiong He, Shiyi Xiao, Xin Li, Che Qu, **Qin Xu**, Shulin Sun and Lei Zhou, *Controlling electromagnetic waves with meta-surfaces*
SPIE Newsroom: Optical Design & Engineering 10.1117/2.1201402.005337 (2014)
13. **Qin Xu**, Ivo R. Peters, Sam Wilken, Eric Brown, Heinrich M. Jaeger, *Fast Imaging Technique to Study Drop Impact Dynamics of Non-Newtonian Fluids*
Journal of Visualized Experiments, **85**, e51249 (2014)
14. Ivo R. Peters, **Qin Xu** and Heinrich M. Jaeger, *Splashing onset in dense suspension droplets*
Phys. Rev. Lett., **111**, 028301 (2013)
15. **Qin Xu**, Eric Brown and Heinrich M. Jaeger, *Impact Dynamics of Oxidized Liquid Metal Drops*
Phys. Rev. E, **87**, 043012 (2013)
16. Lang Feng, Joy Romulus, Minfeng Li, Ruojie Sha, John Royer, Kun-Ta Wu, **Qin Xu**, Nadrian Seeman, Marcus Weck and Paul Chaikin, *Cinnamate-based DNA photolithography*
Nature Materials, **12**, 747–753 (2013)

17. Shulin Sun, Qiong He, Shiyi Xiao, **Qin Xu**, Xin Li, Che Qu, and Lei Zhou, *Research progress on gradient meta-surfaces (In Chinese)*
Laser & Optoelectronic Progress, 50, 080009 (2013)
18. **Qin Xu**, Nikolai Oudalov, Qiti Guo, Heinrich M. Jaeger and Eric Brown, *Effect of oxidation on the mechanical properties of liquid gallium and eutectic gallium-indium*
Physics of Fluids, 24, 063101 (2012)
19. Shulin Sun, Qiong He, Shiyi Xiao, **Qin Xu**, Xin Li and Lei Zhou, *Gradient-index meta-surfaces as a bridge linking propagating waves and surface waves*
Nature Materials, 11, 426–431 (2012)
****Awarded for the Prize of Important Optical Achievements in China (2013)**
20. **Qin Xu**, Lang Feng, Ruojie Sha, Nadrian C. Seeman and Paul M. Chaikin, *Subdiffusion of a Sticky Particle on a Surface*
Phys. Rev. Lett., 106, 228102 (2011)

In the News

Direct Measurement of Strain-dependent Solid Surface Stress
ETH Materials News (Sept.15, 2017)

Breaking Ice: Music.Video.Dance. & the Environment
Indigogo (Sept 18, 2014)

Synopsis: Dense Suspensions Spread Best
APS NEWS (July 23, 2014)

Arts|Science Initiative collaborations inspire new directions, approaches to research.
UChicago News (June 16th, 2014)

UChicago Arts|Science Initiative awards five graduate collaboration grants.
UChicago News (March 4th, 2014)

Conferences and Presentations

Invited Talks

Physics Seminar, IST Austria, Vienna, Austria	November 2019
<i>Direct observations of dewetting relaxation at the interface of soft gels</i>	
D-MATL Colloquium, ETH Zurich, Zurich, Switzerland	September 2019
<i>Direct observations of dewetting relaxation at the interface of soft gels</i>	
2019 APS March Meeting, Soft Interface Session, Boston USA	March 2019
<i>Direct observations of dewetting relaxation at the interface of soft gels</i>	

Biomechanics and biomaterials workshop, Chinese Association of Science and Technology in Switzerland, Zurich, Switzerland	June 2018
<i>Soft materials as ideal model systems to understand the mechanics of biological materials.</i>	
Colloquium in State Key Lab of Soft Matter, Chinese Academy of Science, Beijing, China	May 2018
<i>Surface tension and surface elasticity of soft solids</i>	
Seminar at Mechanical Engineering Department, Beihang University, Beijing, China	May 2018
<i>Surface tension and surface elasticity of soft solids</i>	
The 4th Vision Forum, Beijing, China	May 2018
<i>Why Soft is great?</i>	
Physics Department Colloquium, Brandeis University, Waltham, USA	January 2018
<i>Surface tension and surface elasticity of soft solids</i>	
Soft matter interfaces: from biology to engineering applications, Monte Verita, Switzerland	November 2017
<i>Direct Measurements of surface tension of strained soft solids</i>	
Guanghua Forum, Fudan University, Shanghai, China	Decemeber 2016
<i>Why soft is great?</i>	
Shenzhen Forum, Sun Yat-sen University, Guangzhou, China	Decemeber 2016
<i>Direct measurements of surface stress of stretched soft solids</i>	
Physics Seminar, University of Fribourg, Fribourg, Switzerland	November 2016
<i>Wetting on Soft Solids: Role of Solid Surface Stress</i>	
Physics Seminar, University of Chicago, Chicago, USA	June 2016
<i>Direct measurements of surface stress of stretched soft solids</i>	
Squishy Physics, Harvard University, Boston, MA, USA	March 2015
<i>New understandings of complex dynamics of granular suspensions</i>	
Journal Club Seminar, Yale University, New Haven, CT, USA	January 2015
<i>Friction and viscous interactions in dense granular materials</i>	
Humanities Day: Chicago, IL, USA	October 2014
<i>Breaking Ice: A Panel on the Arts Science Initiative</i>	
Bag lunch Seminar: JFI, Chicago, IL, USA	January 2014
<i>Shear thickening in highly viscous suspensions.</i>	

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Professional Service

Session chair of APS March Meeting: Soft Interface Mechanics
Los Angeles, United States (2018).

Session chair of Soft Matter Interfaces: from Biology to Engineering Applications
Monte Verita, Ascona, Switzerland (2017).

Organizer of ETH Material Science Journal Club
ETH Zurich, Zurich, Switzerland (2016- 2019).

Organization Assistant of 66th New England Complex Fluids Workshop
Yale University, New Haven, CT, United States (2016).

Referee for ACS Macro Letters, Tribology Letters, Transactions on Biomedical Engineering, and CMSE 2014.

Vice president of Fudan Alumni Association in Switzerland (2018).

Outreach: Physics with Bang (Dec. 2013 & 2014, Chicago, USA); Art and Science Collaboration Project (2014-2015, Chicago, USA); ETH Materials Day (Sept. 2017, Zurich, Switzerland) .

Member of American Physical Society (since 2012), American Chemical Society (since 2016)

Teaching

Materials for Mechanical Engineers, Spring 2019, ETH Zurich

General Physics II (PHYS 132 (B)), Spring 2011, University of Chicago

General Physics II (PHYS 122), Winter 2011, University of Chicago

Modern Physics (PHYS 154), Fall 2010, University of Chicago

Quantum Mechanics I (Graduate Level), Fall 2009, New York University

Light and Color, Spring 2009, New York University

General Physics I, Fall 2008, New York University