

Yuanzhao Zhang

Department of Physics & Astronomy, Northwestern University, Evanston, IL 60208

Email: yuanzhao@u.northwestern.edu

Websites: y-zhang.com · [Research Gate](#) · [Google Scholar](#) · [ORCID](#) · [Publons](#)

ACADEMIC POSITIONS

Santa Fe Institute

Omidyar Postdoctoral Fellow

starting 2020

IBM Thomas J. Watson Research Center

Research Intern

2015

EDUCATION

Northwestern University

Ph.D. Physics · Advisor: Adilson E. Motter

exp. 2020

Northwestern University

M.Sc. Applied Mathematics

2015

Zhejiang University

B.Sc. Mathematics (Honors)

2014

PUBLICATIONS

- **Y. Zhang** and A. E. Motter, *Symmetry-independent stability analysis of synchronization patterns*, to appear in *SIAM Rev.*
- 1. **Y. Zhang**, Z. G. Nicolaou, J. D. Hart, R. Roy, and A. E. Motter, *Critical switching in globally attractive chimeras*, *Phys. Rev. X* **10** 011044 (2020)
- 2. J. D. Hart*, **Y. Zhang***, R. Roy, and A. E. Motter, *Topological control of synchronization patterns: trading symmetry for stability*, *Phys. Rev. Lett.* **122** 058301 (2019) · [Quanta Magazine story](#)
- 3. **Y. Zhang** and A. E. Motter, *Identical synchronization of nonidentical oscillators: when only birds of different feathers flock together*, *Nonlinearity* **31** R1-R23 (2018)
- 4. **Y. Zhang**, T. Nishikawa and A. E. Motter, *Asymmetry-induced synchronization in oscillator networks*, *Phys. Rev. E* **95** 062215 (2017)
- 5. G. Duan*, **Y. Zhang***, B. Luan, J. K. Weber, R. W. Zhou, Z. Yang, L. Zhao, J. Xu, J. Luo and R. Zhou, *Graphene-induced pore formation on cell membranes*, *Sci. Rep.* **7** 42767 (2017)
- 6. **Y. Zhang**, J. K. Weber and R. Zhou, *Folding and stabilization of native-sequence-reversed proteins*, *Sci. Rep.* **6** 25138 (2016)
- 7. Z. Lin and **Y. Zhang**, *Stirring by multiple cylinders in potential flow*, *J. Fluid Mech.* **794** 552 (2016)
- 8. Z. Gu*, **Y. Zhang***, B. Luan and R. Zhou, *DNA translocation through single-layer boron nitride nanopores*, *Soft Matter* **12** 817 (2016)
- 9. **Y. Zhang***, C. A. Jimenez-Cruz*, J. Wang, Z. Yang, B. Zhou and R. Zhou, *Bio-mimicking of proline-rich motif applied to carbon nanotube reveals unexpected subtleties underlying nanoparticle functionalization*, *Sci. Rep.* **4** 7229 (2014)
- 10. Y. Tu, H. Lu, **Y. Zhang**, T. Huynh and R. Zhou, *Capability of charge signal conversion and transmission by water chains confined inside Y-shaped carbon nanotubes*, *J. Chem. Phys.* **138** 015104 (2013)

* equal contributions

TALKS (SELECTED)

SIAM Conference on Applications of Dynamical Systems

Contributed talk · Critical switching behavior in globally attractive chimera states

Snowbird 2019

Dynamics Days

Contributed talk · Random beats design in network synchronization

Evanston 2019

Dynamics Days

Contributed talk · Identical synchronization of nonidentical oscillators

Denver 2018

Network Frontier Workshop

Evanston 2017

Invited talk · Identical synchronization of nonidentical oscillators

SIAM Network Science Workshop

Pittsburgh 2017

Contributed talk · Asymmetry-induced synchronization in multilayer networks

TEACHING EXPERIENCE**Physics of Magic**

Northwestern University · 2016 Fall

Student assistant · Helped design and teach part of this pilot course introducing counterintuitive phenomena in physics

General Physics

Northwestern University · 2017 – 2019

Teaching assistant · Led weekly discussion sessions and weekly labs for undergrads in STEM majors

HONORS AND AWARDS**Complexity Postdoctoral Fellowship**

2020

three-year independent postdoctoral fellowship awarded by the Santa Fe Institute

SIAM Student Chapter Certificate of Recognition

2020

First Place, Northwestern Science Images Contest

2018

[Media coverage](#) (click to read) and [the winning images](#) (click to view)**Presidential Fellowship finalist**

2018

Dynamics Days Travel Award

2018

SIAM Student Travel Award

2017

Chu Kochen Innovation Scholarship

2013

awarded to 6/20,000 undergrads at Zhejiang University each year for outstanding research

PROFESSIONAL SOCIETIES**Society for Industrial and Applied Mathematics (SIAM)**

2016 –

Activity Group on Dynamical Systems

American Physical Society (APS)

2017 –

Topical Group on Statistical & Nonlinear Physics

OUTREACH**[To converge you must diverge](#)** (click to read)

Helix Magazine · 2017

Nontechnical article on how diversity can promote consensus in society

[Syncing up without sameness](#) (click to watch)

Regina Dominican High School · 2016

Dance piece developed with high school students at Regina Dominican explaining diversity-induced synchronization

SERVICE

ACADEMIC ORGANIZATIONS & EVENTS

President, Northwestern University Student Chapter of SIAM

2018 – 2020

Vice President, Northwestern University Student Chapter of SIAM

2017 – 2018

Co-organizer of a quarterly seminar series highlighting the broad applications of mathematics in diverse disciplines; co-organizer of the annual Chicago Area SIAM Student Conferences

REFEREEING FOR JOURNALS

Physical Review X, Physical Review Letters, Physical Review E, Physical Review Research, Physical Review A, Physical Review D, Nonlinearity, SIAM Journal on Applied Dynamical Systems, Chaos, The European Physical Journal B, Journal of Nonlinear Science, Journal of Physics A

MENTORING

Mentoring undergraduate student Fiona Brady on a research project extending stability analysis of cluster synchronization patterns to directed networks (2018 –)