

Yuanzhao Zhang

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CURRENT POSITION

Northwestern University
Graduate Student

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**, Z. G. Nicolaou, J. D. Hart, R. Roy, and A. E. Motter, *Critical switching in globally attractive chimeras*, [arXiv:1911.07871](#)
- **Y. Zhang** and A. E. Motter, *Symmetry-independent stability analysis of synchronization patterns*, under review
- **Y. Zhang**, J. L. Ocampo Espindola, I. Z. Kiss, and A. E. Motter, *Disorder beats design in network synchronization*, in preparation
- 1. 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)
- 2. **Y. Zhang** and A. E. Motter, *Identical synchronization of nonidentical oscillators: when only birds of different feathers flock together*, [Nonlinearity](#) **31** R1-R23 (2018)
- 3. **Y. Zhang**, T. Nishikawa and A. E. Motter, *Asymmetry-induced synchronization in oscillator networks*, [Phys. Rev. E](#) **95** 062215 (2017)
- 4. 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)
- 5. **Y. Zhang**, J. K. Weber and R. Zhou, *Folding and stabilization of native-sequence-reversed proteins*, [Sci. Rep.](#) **6** 25138 (2016)
- 6. Z. Lin and **Y. Zhang**, *Stirring by multiple cylinders in potential flow*, [J. Fluid Mech.](#) **794** 552 (2016)
- 7. Z. Gu*, **Y. Zhang***, B. Luan and R. Zhou, *DNA translocation through single-layer boron nitride nanopores*, [Soft Matter](#) **12** 817 (2016)
- 8. **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)
- 9. 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

RESEARCH EXPERIENCE

Northwestern University
Advisor: Adilson E. Motter · Topics: networks dynamics, complex systems, synchronization, symmetry breaking

2015 –

IBM Thomas J. Watson Research Center
Advisor: Ruhong Zhou · Topics: molecular dynamics simulation, protein folding, nanotechnology

2015

Zhejiang University
Advisor: Zhi Lin · Topics: fluid dynamics, mixing

2013 – 2014

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 Invited talk · Identical synchronization of nonidentical oscillators	Evanston 2017
SIAM Network Science Workshop Contributed talk · Asymmetry-induced synchronization in multilayer networks	Pittsburgh 2017
Brown Bag Seminar Invited talk · Asymmetry-induced synchronization in oscillator networks	Evanston 2017

TEACHING EXPERIENCE

Physics of Magic Student assistant · Helped design and teach part of this pilot course introducing counterintuitive phenomena in physics	Northwestern University · 2016 Fall
General Physics Teaching assistant · Led weekly discussion sessions and weekly labs for undergrads in STEM majors	Northwestern University · 2017 – 2019

AWARDS

First Place, Northwestern Science Images Contest the winning images (click to view)	2018
Presidential Fellowship finalist 12 students are selected as finalists from the entire graduate school each year at Northwestern	2018
Dynamics Days Travel Award awarded to rising early-career scientists attending this international conference on nonlinear dynamics	2018
SIAM Student Travel Award awarded to exceptional students presenting at the SIAM Annual Meeting	2017
Chu Kochen Innovation Scholarship awarded to 6/20,000 undergrads at Zhejiang University each year for outstanding research	2013

PROFESSIONAL SOCIETIES

Society for Industrial and Applied Mathematics (SIAM) Activity Group on Dynamical Systems	2016 –
American Physical Society (APS) Topical Group on Statistical & Nonlinear Physics	2017 –

OUTREACH

To converge you must diverge (click to read) Nontechnical article on how diversity can promote consensus in society	Helix Magazine · 2017
Network, synchronization, and the paradox of heterogeneity (click to watch) Broad audience talk developed as part of the Seven Minutes of Science Symposium	Northwestern · 2016
Syncing up without sameness (click to watch) Dance piece developed with high school students at Regina Dominican explaining diversity-induced synchronization	Regina Dominican High School · 2016

SERVICE

ACADEMIC ORGANIZATIONS & EVENTS

President, Northwestern University Student Chapter of SIAM

2018 –

Organizer of quarterly seminars highlighting the broad applications of mathematics in diverse disciplines

Vice President, Northwestern University Student Chapter of SIAM

2017 – 2018

Co-organizer of the Chicago Area SIAM Student Conference (approx. 100 participants)

REFEREEING FOR JOURNALS

Physical Review X, Physical Review Letters, Physical Review E, Physical Review Research, Physical Review A, 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 –)