

# 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*, in preparation
- **Y. Zhang** and A. E. Motter, *Fast, unified, and symmetry-independent approach to network synchronization*, in preparation
- **Y. Zhang** 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 · Nonlinear dynamics · Networks · Synchronization · Chaos · Symmetry

2015 –

**IBM Thomas J. Watson Research Center**

Advisor: Ruhong Zhou · Molecular dynamics simulation · Protein folding · Nanotechnology

2015

**Zhejiang University**

Advisor: Zhi Lin · Fluid dynamics · Mixing

2013 – 2014

## TALKS / PRESENTATIONS (SELECTED)

<b>SIAM Conference on Applications of Dynamical Systems</b> Contributed talk · Critical switching behavior in globally attractive chimera states	Snowbird 2019
<b>Dynamics Days</b> Contributed talk · Random beats design in network synchronization	Evanston 2019
<b>Dynamics Days</b> Contributed talk · Identical synchronization of nonidentical oscillators	Denver 2018
<b>Network Frontier Workshop</b> Invited talk · Identical synchronization of nonidentical oscillators	Evanston 2017
<b>SIAM Network Science Workshop</b> Contributed talk · Asymmetry-induced synchronization in multilayer networks	Pittsburgh 2017
<b>Brown Bag Seminar</b> Invited talk · Asymmetry-induced synchronization in oscillator networks	Evanston 2017

## TEACHING EXPERIENCE

<b>Physics of Magic</b> Student assistant · Helped design and teach part of this pilot course introducing counterintuitive phenomena in physics	Northwestern University · 2016 Fall
<b>College Physics</b> Teaching assistant · Led weekly discussion sessions and weekly labs	Northwestern University · 2017 Winter, 2018 Winter, 2019 Spring

## HONORS / AWARDS

<b>First Place, Science Images Contest</b> <a href="#">Media coverage</a> (click to read) and <a href="#">the winning images</a> (click to view)	2018
<b>Presidential Fellowship finalist</b> 12 students are selected as finalists from the entire graduate school each year at Northwestern	2018
<b>Dynamics Days Travel Award</b>	2018
<b>SIAM Student Travel Award</b>	2017
<b>Chu Kochen Innovation Scholarship</b> awarded to 6/20,000 undergraduates at Zhejiang University each year for outstanding research	2013

## PROFESSIONAL SOCIETIES

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

## OUTREACH

<b>To converge you must diverge</b> (click to read) Nontechnical article on how diversity can promote consensus in society	Helix Magazine · 2017
<b>Network, synchronization, and the paradox of heterogeneity</b> (click to watch) Broad audience talk developed as part of the Seven Minutes of Science Symposium	Northwestern · 2016
<b>Syncing up without sameness</b> (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

<b>Northwestern University Student Chapter of SIAM</b> President · organizer of quarterly seminars highlighting the broad applications of mathematics in diverse disciplines	2018 –
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**Northwestern University Student Chapter of SIAM**

2017 – 2018

Vice President · organizer of the Chicago Area SIAM Student Conference (approx. 100 participants)

**INVITED REFEREE FOR JOURNALS**

Physical Review X; Physical Review E; Physical Review A; Nonlinearity; SIAM Journal on Applied Dynamical Systems;  
Chaos; The European Physical Journal B; Journal of Nonlinear Science