

Ling-Wei Kong

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Education

2019 - Present Arizona State University, Tempe, Arizona, US.

- Advisor: [Dr. Ying-Cheng Lai](#)
- Ph.D. Candidate in Electrical Engineering

2017 - 2018 Arizona State University, Tempe, Arizona, US.

- Teaching Assistant at the Department of Physics

2013 - 2017 University of Science and Technology of China, Hefei, China.

- B.S. in Theoretical Physics
- Experimental Class for the Sciences, School of the Gifted Young
- Undergraduate Research Student at Prof. Bing-Hong Wang's Group

Peer-Reviewed Publications

- J9. H. Fan, **L.-W. Kong**, X. Wang, A. Hastings, and Y.-C. Lai. Synchronization within synchronization: transients and intermittency in ecological networks. *National Science Review*, 8 (10), nwaa269 (2021).
- J8. B. Wallace, **L.-W. Kong**, A. Rodriguez, Y.-C. Lai. Synchronous transition in complex object control. *Physical Review Applied*, 16 (3), 034012 (2021).
- J7. R. Xiao, **L.-W. Kong**, Z.-K. Sun, and Y.-C. Lai. Predicting amplitude death with machine learning. *Physical Review E*, 104 (1), 014205 (2021).
- J6. **L.-W. Kong**, H. Fan, C. Grebogi, and Y.-C. Lai. Emergence of transient chaos and intermittency in machine learning. *Journal of Physics: Complexity* 2 (3), 035014 (2021).
- J5. C.-Z. Wang, **L.-W. Kong**, J. Jiang, and Y.-C. Lai. Machine learning-based approach to GPS antijamming. *GPS Solutions*, 25 (3), 1-12 (2021).

- J4. H. Fan, **L.-W. Kong**, Y.-C. Lai, and X. Wang. Anticipating synchronization with machine learning. *Physical Review Research*, 3 (2), 023237 (2021).
- J3. **L.-W. Kong**, H. Fan, C. Grebogi, and Y.-C. Lai. Machine learning prediction of critical transition and system collapse. *Physical Review Research*, 3 (1), 013090 (2021).
- J2. **L.-W. Kong** and Y.-C. Lai. Scaling law of transient lifetime of chimera states under dimension-augmenting perturbations. *Physical Review Research*, 2 (2), 023196 (2020).
- J1. **L.-W. Kong**, L. Li, R.-R. Liu, and B.-H. Wang. Percolation on networks with weak and heterogeneous dependency. *Physical Review E*, 95 (3), 032301 (2017).

Available Manuscripts

- M3. Z.-M. Zhai, M. Moradi, **L.-W. Kong**, and Y.-C. Lai. Detecting weak physical signal from noise: A machine-learning approach with applications to magnetic-anomaly-guided navigation. (Under Review)
- M2. Z.-M. Zhai, **L.-W. Kong**, and Y.-C. Lai. Stochastic resonance in machine learning. (Under Review)
- M1. **L.-W. Kong**, Y. Weng, B. Glaz, M Haile, and Y.-C. Lai. Digital Twins of nonlinear dynamical systems. (Under Review)

Papers in Preparation

- P4. **L.-W. Kong**, J. Jiang, and Y.-C. Lai. Dynamics of machine-learning based long-term memory.
- P3. Z.-M. Zhai, M. Moradi, **L.-W. Kong**, and Y.-C. Lai. Model-free tracking control of regular and chaotic trajectories with machine learning
- P2. **L.-W. Kong**, W. Shi, X.-J. Tian, and Y.-C. Lai. Growth feedback and gene network topologies: failure mechanisms and scaling law.
- P1. **L.-W. Kong**, and Y.-C. Lai. Machine learning predictions of tipping points with noisy data.

Service

Journal Reviewer: *Physical Review E*; *Physical Review Research*; *SIAM Journal on Applied Dynamical Systems*; *Chaos, Solitons and Fractals*.

Teaching and Student Supervision

2019-2022

Co-Advisor of Two Undergraduate Research Projects

- Part of results published in *Physical Review Applied* [J8], with several media coverages

2017 Fall & 2018 Spring

PHY 122: University Physics Laboratory I

- Teaching assistant for three undergraduate weekly lab sessions for each semester
- Includes 30 min lecturing for each session, instructing physics experiments, grading of lab reports, and office hours

Media Coverage

- Machine learning prediction of critical transition and system collapse [J3]:

[Quanta Magazine \(Sept. 2022\): Chaos Researchers Can Now Predict Perilous Points of No Return](#)

- Synchronous transition in complex object control [J8]:

[Forbes \(Sept. 2021\): The Mind-Bending Physics Of Walking With Coffee May Save Humanity, For Now](#)

[The Science Times \(Sept. 2021\): Physics Behind Walking With Cup of Coffee on Hand Without Spillage; Can It Be Applied to Soft Robotics?](#)

[Popular Mechanics \(Sept. 2021\): The Surprisingly Complicated Physics of Carrying a Cup of Coffee — Without Spilling](#)

[Physics World \(Sept. 2021\): Physics explains why humans can walk through crowded places and not spill their coffee](#)

[Food & Wine \(Sept. 2021\): How Humans Walk and Carry a Cup of Coffee Is a Bit of a Physics Mystery](#)

[EurekAlert! \(AAAS\) \(Sept. 2021\): Walking with coffee is a little-understood feat of physics also at PHYS.ORG, ASU News, and News Wise](#)

- Synchronization within synchronization: transients and intermittency in ecological networks [J9]:

[EurekAlert! \(AAAS\) \(Dec. 2020\): Transients and synchronization are unified in ecological networks also at PHYS.ORG](#)