

# Jinchen Zhao

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## EDUCATION

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**Duke Kunshan University/Duke University** Dual Degree Undergraduate 2019 - Present  
B.S. in Applied Math & Computational Sciences (by Duke Kunshan) *Kunshan, China*  
B.S. in Interdisciplinary Studies: Applied Math & Computational Science (by Duke) *Durham, USA*  
GPA: 3.91/4 Major GPA: 3.95/4

## PUBLICATIONS

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- [1] **Jinchen Zhao** and Myung-Joong Hwang, *Frustrated Superradiant Phase Transition*, [Phys. Rev. Lett.](#) **128**, 163601 (2022).
- [2] **Jinchen Zhao** and Myung-Joong Hwang, *Anomalous Multicritical Phenomena and Frustration Induced by Synthetic Magnetic Fields*, [arXiv:2208.02268](#) (2022).
- [3] Stefan Köstler, **Jinchen Zhao**, Chen Lyu, Simeon Völkel and Kai Huang, *Embedded Inertial Sensor for Tracking Projectile Impact on Granular Media*, [EPJ Web Conf.](#) **Volume 249** (2021).

## RESEARCH EXPERIENCE

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**Quantum Science Group, Duke Kunshan University** May 2021 – Present  
Advisor: Dr. Myung-Joong Hwang *Kunshan, China*

- Discovered the frustration of photons during the superradiant phase transition (SPT) of a Dicke lattice model and studied its novel critical behaviors.
- Studied the multi-critical phenomena and frustration of SPT induced by synthetic magnetic fields.
- Investigated frustrated SPT in open systems and its applications in passive quantum error correction.

**Duke Quantum Center, Duke University** Jan 2022 – Apr 2022  
Advisor: Dr. Kenneth R. Brown *Durham, USA*

- Developed an auto-loading module for the trapped ion system, which tested successfully on the device and was added to the official control system.
- Conducted literature review on dynamics of trapped ions and quantum error correction.

**Collective Dynamics Lab, Duke Kunshan University** Dec 2019 – Apr 2021  
Advisor: Dr. habil. Kai Huang *Kunshan, China*

- Monitored projectile motion under opaque granular material by embedded inertial measurement unit.
- Investigated the effect of granular drag under microgravity by the trajectory-reconstruction method.

## PRESENTATIONS

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*Multicritical Phenomena in Synthetic Magnetic Fields*, DKU Summer Research Poster Session, 2022.  
*Tricritical Point in a Dicke Triangle Model*, Westlake University Summer Camp, 2022.  
*Frustrated Superradiant Phase Transition*, DKU Summer Research Poster Session, 2021.  
*Trajectory Reconstruction of Inertial Sensors*, DKU Summer Research Poster Session, 2020.

## INDUSTRY EXPERIENCE

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### World Economic Forum

Advisor: Grigory Shutko (Online)

Sep 2022 – Nov 2022

*Geneva, Switzerland*

- Investigated the current forum workstreams and future expansion plans of global quantum computing networks in Greater China by investigating the related stakeholders: public, private, and academic.
- Wrote a research report to the World Economic Forum (to appear in the forum website).

## AWARDS

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Summer Research Scholar Fellowship

2020, 2021, 2022

Dean's List with Distinction

2019, 2020, 2022

National Encouragement Scholarship

2021

Natural & Applied Science Division Award

2020

Kunshan Government Full Scholarship

2019

## COMMUNITY INVOLVEMENT

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Duke Quantum Information Society, *Member*

Jan 2022 – May 2022

DKU Creative Maker Space, *Student Volunteer*

May 2020 – Apr 2021

Duke Math Meet, *Student Volunteer*

Aug 2020

DKU Math Seminar, *Organizer*

Aug 2019 – Jan 2020

## COURSEWORK & SKILLS

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**Physics:** Quantum Mechanics, Thermal Physics, Electricity and Magnetism, Intermediate Mechanics, Optics and Modern Physics.

**Math:** Partial Differential Equations, Stochastic Modeling, Mathematical Cryptography, Real Analysis, Complex Variables, ODE and Dynamical Systems, Numerical Analysis, Probability and Statistics, Linear Algebra, Introduction to Data Science.

**Skills:** Proficient in Python, Mathematica, L<sup>A</sup>T<sub>E</sub>X.

## REFERENCES

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Dr. Myung-Joong Hwang  
Assistant Professor of Physics  
Duke Kunshan University  
myungjoong.hwang@duke.edu

Dr. Joshua Socolar  
Professor of Physics  
Duke University  
socolar@duke.edu

Dr. habil. Kai Huang  
Associate Professor of Physics  
Duke Kunshan University  
kai.huang186@duke.edu

Dr. Paul Stanley  
Associate Dean of Undergraduate Studies  
Duke Kunshan University  
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