Rundong Zhou

Curriculum Vitae

Contact Information

Email: rundongz@chalmers.se / r.zhou@student.utwente.nl **Website:** rundong-zhou.github.io

Office: Meander 211, De Horst 2, 7522 NB Enschede, The Netherlands **Phone:** +46 734809317

Research Interests

Turbulence, Statistical physics, Dynamical systems, Computational physics, Stochastic process, Numerical analysis, Spectral methods, and Physical oceanography

EDUCATION

Candidate for **Master of Science** expected June 2024
Chalmers University of Technology Gothenburg, Sweden
Joint with the **University of Gothenburg, Department of Physics** cGPA 4.75/5
Major in Complex Adaptive Systems

Erasmus+ Exchange Program August 2023 - June 2024
University of Twente Enschede, The Netherlands
Placement in the **Physics of Fluids group**
Master's thesis supervisor: Dr. Christopher J. Howland and Prof. Detlef Lohse

Bachelor of Applied Science in Engineering Science June 2021
University of Toronto Toronto, Canada
Major in Engineering Physics cGPA 3.28/4
Bachelor's thesis supervisor: Prof. Nicolas Grisouard

Experiences & Summer Schools

Summer School in Mathematics June 2023
Université Grenoble Alpes, **Institut Fourier** Grenoble, France
Topics in new trends in mathematical fluid mechanics

LIST OF PUBLICATION

Zhou, R. and Grisouard, N. *Spectral solver for Cauchy problems in polar coordinates using discrete Hankel transforms.* Preprint, 2023. arXiv:2210.09736

HONOURS AND AWARDS

Avancez Scholarship 2022 - 2024
Chalmers University of Technology
75% tuition fee reduction, increased to 85% reduction in the second year for excellency.

Erasmus+ Exchange Travel Grant 2023 - 2024
Chalmers University of Technology & **University of Twente**

Undergraduate Research Fellowship 2018
Canadian Institute for Theoretical Astrophysics
C$ 2000 per month for four months.

Dean's Honor List 2015 Fall, 2016 Fall
University of Toronto 2020 Fall, 2021 Winter
Pass with honor, >80% average.

RESEARCH EXPERIENCE

Master's Thesis June 2023 - June 2024
Physics of Fluids group, **University of Twente** Enschede, The Netherlands
Supervisor: Dr. Christopher J. Howlan and Prof. Detlef Lohse

Swirling Kolmogorov flow, modelling ocean turbulent mixing driven by near-inertial waves. Performing instability analysis and direct numerical simulation using Dedalus spectral method library. Understanding the fundamental physical process and the fluid structures via turbulence theory, statistical mechanics, and dynamical systems approaches.

Bachelor's Thesis September 2020 - April 2021
Division of Engineering Science, **University of Toronto** Toronto, Canada
Supervisor: Prof. Nicolas Grisouard

Developing a novel spectral method for solving the Gross-Pitaevskii equation for Bose-Einstein condensates in polar coordinates. Improving the accuracy of the method and experimenting the method on annulus domains. Experience with computational physics.

Research Assistant[1] April 2021 - October 2022
Department of Physics, **University of Toronto**
Supervisor: Prof. Nicolas Grisouard

Applying the novel Fourier-Bessel based spectral method using the discrete Hankel transform to various kinds of PDEs under Dirichlet boundary conditions in polar coordinates. Analyzing the boundary-dependent convergence rate of the method and validating the theory. Experience with numerical analysis and spectral theorems.

Research Assistant January - April 2022
Department of Mechanical Engineering, **University of Ottawa**
Supervisor: Prof. Natalie Baddour

Developing a new type of 2-D discrete Fourier transform under Neumann boundary conditions in polar coordinates using Dini series. Validating the discrete orthogonality relation with Hankel-Schläfli integral. Experiences with complex analysis.

Summer Undergraduate Research Program May - September 2018
Canadian Institute for Theoretical Astrophysics Toronto, Canada

Experience with data analysis on Galactic Legacy Infrared Midplane Survey Extraordinaire (GLIMPSE) database.

PROFESSIONAL EXPERIENCE

Intern Technical Interpreter October - December 2019
Baoshan Iron & Steel Co., Ltd. & **PMC-Colinet Industries** Shanghai, China

Interpretation between English and Mandarin. RPP07-3 CNC pipe finishing machine bearing replacement and refurbishment project at Baoshan Iron & Steel Co., Ltd..

Featured Courses

Toronto: Continuum Mechanics, Computational Physics, Nonlinear Physics, Statistical Mechanics, Groups and Symmetries
Chalmers: Dynamical Systems, Non-equilibrium Processes in Physics Chemistry and Biology, Quantum Field Theory, Artificial Neural Networks
Twente: Advanced Fluid Mechanics, Turbulence, Granular Matter, Advanced Colloids and Interfaces, Physics of Bubbles, Fluids and Elasticity

Programming Skills

Python, Matlab, LaTeX, Mathematica: Advanced
C, Dedalus Libraries: Intermediate

Latest Update: September 4, 2023

[1] As the continuation of the bachelor's thesis.