Zhe Chen

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Education

Courant Institute of Mathematical Sciences, New York University — New York, NY
Ph.D. in Mathematics, the Henry M. MacCracken Fellowship — 09/18–05/23

- Advisor: Prof. Charles S. Peskin

Peking University — Beijing, CN
B.S. in Mathematics, with Honors — 09/14–06/18
B.S. in Physics (double major)

Experience

Courant Institute of Mathematical Sciences, NYU — New York, NY
Research Assistant, supervised by Prof. Charles S. Peskin — 06/21–09/21

- Proposed a new Fourier Spectral Immersed Boundary method for fluid-structure interaction in incompressible viscous Navier-Stokes flow
- Proved the volume conservation, momentum conservation, energy conservation, and translation invariance of the new method, verified these properties numerically, and studied its convergence speed and boundary resolution
- Simulated various numerical experiments for the Stokes equations and the Navier-Stokes equations in two and three dimensions with efficient algorithmic implementation in Matlab and Python

Materials Research Science and Engineering Center (MRSEC), NYU — New York, NY
Research Assistant, supervised by Prof. Aleksandar Donev — 01/20–08/20

- Simulated massive number of colloidal particles on an inclined plane and quantitatively measured the shock wave by the nonlinear Burger's equation
- Implemented a fast numerical solver of the particle system in Matlab and Python

Courant Institute of Mathematical Sciences, NYU — New York, NY
Research Intern, supervised by Prof. Aleksandar Donev — 06/17–09/17

- Studied collective diffusion of colloidal particles in quasi-2D above a no-slip boundary
- Simulated large numbers of particles $\sim 10^3$ by the stochastic method Monte Carlo Markov Chain

School of Mathematical Sciences, Peking University — Beijing, CN
Undergraduate Researcher, supervised by Prof. Pingwen Zhang — 02/16–02/18

- Simulated the chemical and physical process of the forming, transforming, and diffusion of haze with the whether research and forecasting model: WRF
- Post-processed the data gained from WRF, mainly using statistic regression methods and machine learning, to predict the future weather and the concentration of pollution gas such as PM2.5 and PM10 (Haze)

Publications

[1] **Z. Chen** and C. Peskin, "A fourier spectral immersed boundary method with exact translation invariance, improved boundary resolution, and a divergence-free velocity field", *Manuscript submitted to Physical Review Fluids*,

[2] B. Sprinkle, S. Wilken, S. Karapetyan, M. Tanaka, **Z. Chen**, J. R. Cruise, B. Delmotte, M. M. Driscoll, P. Chaikin, and A. Donev, "Sedimentation of a colloidal monolayer down an inclined plane", *Physical Review Fluids*, vol. 6, no. 3, p. 034 202, Mar. 11, 2021.

Teaching

- **Instructor** at New York University — Summer 2022
  Calculus I (MATH-UA 121)
- **Recitation Instructor** at New York University — Spring 2022
  Mathematics For Economics III (MATH-UA 213)
- **Teaching Assistant/Grader** at New York University — Fall 2021
  Complex Variables (One-Term) (MATH-GA 2451)
- **Teaching Assistant/Grader** at New York University — Fall 2020
  Complex Variables I (MATH-GA 2450)
- **Teaching Assistant/Grader** at New York University — Spring 2020
  Complex Variables II (MATH-GA 2460)
- **Teaching Assistant/Grader** at New York University — Fall 2019
  Complex Variables I (MATH-GA 2450)

Scholarships and Awards

- Thomas Tyler Bringley Fellowship Prize — 09/22
- Henry M. MacCracken Fellowship — 09/18–05/23
- Top Talent in Applied Mathematics Fellowship — 09/17–06/18
- Excellent Student Leader, Peking University (3/715) — 11/16
- Samsung Scholarship, Peking University (Top 5%) — 11/16
- Meritorious Winner, Mathematical Contest in Modeling — 05/16
- First Prize, Chinese Mathematics Competition (rank 4th of all) — 12/15
- First Prize, National College Student Physics Competition, — 12/15
- Pacemaker to Merit Student, Peking University (10/715) — 11/15
- Kwang-Hua Scholarship, Peking University (Top 5%) — 11/15
- First Prize, National High School Physics Competition (rank 13th in Sichuan Province) — 09/13