Jinzi Mac Huang

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Research Interests

Applied Mathematics and Experimental Physics
Fluid Dynamics, Geophysics and Soft Matter Physics

Education

Ph.D., Mathematics, 2018
Courant Institute, New York University

B.S., Applied Physics & Applied Mathematics, 2013
Zhiyuan College, Shanghai Jiao Tong University

Academic Positions

Assistant Professor, 2020-Now
Department of Mathematics, New York University Shanghai

Postdoctoral Scholar, 2018-2020
Department of Physics, University of California San Diego

Research Associate, 2015-2018
Joint Physics Lab, Department of Physics, New York University Shanghai

Research Assistant, 2013-2018
Applied Math Lab, Courant Institute, New York University

Undergraduate Research Assistant, 2011-2013
Zhang Group, Institute of Natural Sciences, Shanghai Jiao Tong University

Publications

Synchronization between microswimmer clocks
Li, Y., Huang, J. M., Aubret, A., & Palacci, J. (2020).
In preparation

Rayleigh-Bénard thermal convection perturbed by horizontal heat flux
Huang, J. M., & Zhang, J. (2020).
In preparation

Rayleigh-Bénard convection with side wall heating
Huang, J. M., & Zhang, J. (2020).
Submitted

A stable and accurate scheme for solving the Stefan problem coupled with natural convection using the Immersed Boundary Smooth Extension method
Huang, J. M., Shelley, M., & Stein, D. B. (2020).
Submitted
https://arxiv.org/abs/2006.04736

Decision-making at a T-junction by gradient-sensing microscopic agents
Gandhi, T., Huang, J. M., Aubret, A., Li, Y., Ramananarivo, S.,
Vergassola, M., & Palacci, J. (2020).
Physical Review Fluids, 5.
https://doi.org/10.1103/PhysRevFluids.5.104202

Ultra-sharp pinnacles sculpted by natural convective dissolution
Huang, J. M., Tong, J., Shelley, M., & Ristroph, L. (2020).
Proceedings of the National Academy of Sciences, 117.
https://doi.org/10.1073/pnas.2001524117

The role of shape-dependent flight stability in the origin of oriented meteorites
Amin, K., Huang, J. M., Hu, K. J., Zhang, J & Ristroph, L. (2019).
Proceedings of the National Academy of Sciences, 116.
https://doi.org/10.1073/pnas.1815133116

Stochastic dynamics of fluid–structure interaction in turbulent thermal convection
Huang, J. M., Mertz, L., Zhong, J. & Zhang, J. (2018).
Journal of Fluid Mechanics (Rapids), 854.
https://doi.org/10.1017/jfm.2018.683

Self-sculpting of a dissolvable body due to gravitational convection
Davies Wykes, M., Huang, J. M., Hajaar, G., & Ristroph, L. (2018).
Physical Review Fluids, 3.
https://doi.org/10.1103/PhysRevFluids.3.043801

Shape dynamics and scaling laws for a body dissolving in fluid flow
Huang, J. M., Moore, M. N., & Ristroph, L. (2015).
Journal of Fluid Mechanics (Rapids), 765.
https://doi.org/10.1017/jfm.2014.718

Invited Talks

Math in the lab: mass transfer through fluid-structure interactions
Mathematics Colloquium, University of Wisconsin, Madison, WI (Feb 2020),
Special Colloquium, Courant Institute, New York, NY (Feb 2020),
Mathematics Colloquium, Tulane University, New Orleans, LA (Jan 2020).

Heat and mass transfer in geophysical fluid-structure interactions
Fluid Mechanics Seminars, UCSD, San Diego, CA (Nov. 2018).

The reappearance of geological patterns in lab scale experiments
INS Seminar, Shanghai Jiao Tong University, Shanghai, China (May 2018).

Visible candy and invisible flow
Pineapple Awards Symposium, Zhejiang Sci. and Tech. Museum (Apr. 2017).

Sculpting of a dissolving body
ACMS Seminar, University of Wisconsin Madison, Madison, WI (Sep. 2017),
SIAM CSE Meeting, Atlanta, GA (Mar. 2017).

Sculpting of a dissolvable body through natural and forced solutal convection
GFDI Seminar, Florida State University, Tallahassee, FL (Mar. 2017).

Heat and mass transfer through fluids
NYU Shanghai math analysis / PDE seminar, Shanghai, China (Mar. 2016).

Contributed Talks

Navigating through complex networks by sniffing gradients: diffusiophoresis vs. chemotaxis
APS DFD Annual Meeting, Seattle, WA (Nov. 2019).

Solving coupled Stefan-flow problems using Immersed Boundary Smooth Extension
SOCAMS 2019, Caltech, Pasadena, CA (Apr. 2019),
APS DFD Annual Meeting, Atlanta, GA (Nov. 2018).

Solute transport by flow yields geometric shocks in shape evolution
APS DFD Annual Meeting, Atlanta, GA (Nov. 2018),
SIAM SEAS, Charlotte, NC (Apr. 2018),
AMD, Troy, NY (Mar. 2018),
APS DFD Annual Meeting, Denver, CO (Nov. 2017).

Rayleigh-Bénard convection with side wall heating
APS DFD Annual Meeting, Denver, CO (Nov. 2017).

3D shadowgraph technique visualizes thermal convection
APS DFD Annual Meeting, Portland, OR (Nov. 2016).

Sculpting of a dissolvable body by flowing water
APS DFD Annual Meeting, San Francisco, CA (Nov. 2014).

Awards and Fellowships

Thomas Tyler Bringley Fellowship, 2018
MacCracken Fellowship for Graduate Study, 2013–2018
Pineapple Science Award for Inspiring Curiosity in Science, 2015
Outstanding Student of Zhiyuan College, 2013
Speaker of Graduation Ceremony, 2013

Memberships

American Physical Society, American Mathematical Society, Society for Industrial and Applied Mathematics
Licensed amateur radio operator, call sign AC2XK