YUANXUN BILL BAO

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EDUCATION

Courant Institute, New York University 2012 - Present
Ph.D. Candidate in Applied Mathematics (expected Spring 2018)
Advisors: Dr. Aleksandar Donev & Dr. Leslie Greengard (co-advisor)
Dissertation topic: "*Efficient and accurate numerical methods for simulating fluid-structure interactions*"

Simon Fraser University, Canada 2006 - 2012
Honors B.Sc., M.Sc. in Applied and Computational Mathematics
Supervisor: Dr. David J. Muraki
Thesis: "*On the parametric instabilities of gravity waves in a density-stratified fluid*" [link]

RESEARCH INTERESTS

Numerical methods for PDEs and integral equations
Fast algorithms
Fluid-structure interactions
Computational fluid dynamics
Multiscale modeling
High performance computing

PAPERS AND PREPRINTS

1. **Y. Bao**, M. Rachh, E.E. Keaveny, L. Greengard and A. Donev. A fluctuating boundary integral method for Brownian suspensions. Submitted to *J. Comput. Phys.*, 2017 [arXiv:1709.01480]

2. **Y. Bao**, A. Donev, B.E. Griffith, D.M. McQueen and C.S. Peskin. An immersed boundary method with divergence-free velocity interpolation and force spreading. *J. Comput. Phys.*, **347**, 183 (2017) [doi, arXiv:1701.07169]

3. **Y. Bao**, J. Kaye and C.S. Peskin. A Gaussian-like immersed-boundary kernel with three continuous derivatives and improved translational invariance. *J. Comput. Phys.*, **316**, 139 (2016) [doi, arXiv:1505.07529]

4. **Y. Bao**, D.J. Muraki, An Unravelling of the Resonant Instabilities of a Stratified Gravity Wave. (In preparation, 2018)

PROCEEDINGS

1. D. Muraki and **Y. Bao**. An Unravelling of the Resonant Instabilities of a Stratified Gravity Wave. *EGU General Assembly Conference Abstracts 2013*, p.13433.

2. **Y. Bao**, D. Muraki. Unravelling the resonant instabilities of a stratified gravity wave, *Proceedings of the 10th International Conference on the Mathematical and Numerical Aspects of Waves (WAVES 2011)*.

PRESENTATIONS

1. “Thermal Fluctuations in Colloidal Suspensions and Reactive Liquid Mixture” (poster), Exxon Mobil Poster Reception, NYU, December 7, 2017.
2. “A fluctuating boundary integral method for Brownian suspensions of rigid particles of complex shape”, BIRS-CMO workshop on “Complex Creeping Fluids: Numerical Methods and Theory”, Oaxaca, Mexico, October 2017.
3. “A fluctuating boundary integral method for Brownian suspensions”, Minisymposium on “Hydrodynamics at Small Scales: Passive and Active Fluctuations”, SIAM Conference on Computational Science and Engineering, Atlanta, Georgia, March 2017.
4. “A fluctuating boundary integral method for Brownian suspensions”, (with A. Donev), Numerical Analysis and Scientific Computing Seminar, Courant Institute, November 4, 2016.
5. “An immersed boundary method with divergence-free velocity interpolation”, Advanced topics in numerical analysis: Immersed Boundary Method, Courant Institute, May 11, 2015.
6. "Floquet theory for internal gravity waves in a density-stratified fluid", M.Sc. thesis defense, Simon Fraser University, August 3, 2012
7. “Unraveling the resonant instabilities of a stratified gravity wave” (poster), the 7th International Congress on Industrial and Applied Mathematics - ICIAM 2011, Vancouver, July 18-22, 2011.
8. “Instabilities of a wave in a density-stratified fluid”, Canadian Undergraduate Mathematics Conference (CUMC 2010), University of Waterloo, August, 2010.
9. “Visualizing systems of differential equations in three dimensions”, Canadian Undergraduate Mathematics Conference (CUMC 2009), Carleton University, Ottawa, 2009.

AWARDS AND SCHOLARSHIPS

San Diego Supercomputer Center Summer Institute (Travel Award) 2017

The Henry M. MacCracken Fellowship (Doctoral) 2012-2017

Natural Sciences and Engineering Research Council of Canada (NSERC)

· Canada Graduate Scholarship (Master) 2011
· Undergraduate Summer Research Award 2010
· Undergraduate Summer Research Award 2009

Simon Fraser University

· Provost’s Prize of Distinction 2011 - 2012
· Best Poster Award (runner-up), Computational Mathematics Day August 2010
· Best Poster Award (1st prize), Computational Mathematics Day August 2009
· Dean’s Honor Roll in Science 2008 - 2010

TEACHING EXPERIENCE

Courant Institute, NYU
Adjunct Instructor

· Math for Economics I/II — Fall 2015, Spring/Fall 2016, Fall 2017
· Calculus I — Fall 2014, Spring 2015

Graduate course grader/TA

· High Performance Computing — Spring 2017
· Numerical Methods II — Spring 2017
· Linear Algebra I — Spring 2014
· Scientific Computing — Fall 2013

Simon Fraser University
Teaching Assistant

· Calculus I, II, III and Introduction to ODEs. — 2008-2011

SERVICES

Reviewer, Journal of Computational Physics (x1) — 2017

Mentor for first-year Courant math PhD students — 2015-present

President, Simon Fraser University Chapter of SIAM — 2011-2012

Organizer for SFU applied math graduate student seminars/problem solving sessions — 2011-2012

TECHNICAL STRENGTHS

Proficient	C, Matlab, Maple
Familiar	Java, Python, parallel programming (MPI/OpenMP)
Tools	svn, vim, git, Linux tools

REFERENCES

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