

## Manas Rachh

---

AKW 109, 51 Propsect St,  
New Haven CT - 06511

Email: manas.rachh@yale.edu  
<http://gauss.math.yale.edu/~mr2245>

---

### Positions

Jul 2015 - present    Gibbs Assistant Professor, Applied Mathematics Program, Yale University

---

### Education

- 08/2011 - 05/2015    Ph.D. Mathematics, Courant Institute of Mathematical Sciences, New York University, *Integral equation methods for problems in electrostatics, elastostics and viscous flow*  
Thesis advisor: Leslie Greengard
- 08/2006 - 08/2011    B.Tech and M.Tech Aeropsace Engineering, Indian Institute of Technology, Bombay

---

### Publications

1. M. Rachh, and K. Serkh, “On the solution of Stokes equation on regions with corners”, Technical report YALEU/DCS/TR-1536 (Yale University, New Haven, CT).
2. Y. Bao, M. Rachh, E. Keaveny, L. Greengard, and A. Donev, “A fluctuating boundary integral method for Brownian suspensions”, arXiv preprint arXiv:1709.01480 (2017), submitted to Journal of Computational Physics.
3. M. Rachh, and T. Askham, “Integral equation formulation of the biharmonic Dirichlet problem”, Journal of Scientific Computing (2017). <https://doi.org/10.1007/s10915-017-0559-8>.
4. F. Pausinger, M. Rachh, and S. Steinerberger, “Optimal Jittered Sampling for two points in the unit square”, (to appear in) Statistics and Probability Letters.
5. X. Cheng, M. Rachh, and S. Steinerberger, “On the Diffusion Geometry of Graph Laplacians and Applications”, submitted to Applied Computational Harmonic Analysis.
6. M. Rachh, and S. Steinerberger, “On the location of maxima of solutions of Schrödinger’s equation”, (to appear in) Communications in Pure and Applied Mathematics.
7. S. Jiang, M. Rachh, and Y. Xiang, “An efficient high order method for dislocation climb in two dimensions”, SIAM Journal on Multiscale Modeling and Simulation 15.1 (2017): 235:253.
8. E. Corona, L. Greengard, M. Rachh, S. Veerapaneni, “An integral equation formulation for rigid bodies in Stokes flow in three dimensions”, Journal of Computational Physics 332 (2017): 504-519.
9. J. Pulupa, M. Rachh, M. Tomasini, J. Mincer, and S. Simon, “ A Coarse-Grained Computational Model of the Nuclear Pore Complex predicts Phe-Gly Nucleoporin Dynamics”, Journal of General Physiology 149.10 (2017).

10. M. Rachh, A. Klöckner, and M. O’Neil, “Fast algorithms for Quadrature by Expansion I: Globally valid expansions”, *Journal of Computational Physics* 345 (2017): 706-731.
11. L. Ricketson, A. Cerfon, M. Rachh, and J. Freidberg, “Accurate derivative evaluation for any Grad-Shafranov solver”, *Journal of Computational Physics* 305 (2016): 744-757.
12. M. Rachh, and L. Greengard, “Integral equation methods for elastance and mobility problems in two dimensions”, *SIAM Journal on Numerical Analysis* 54.5 (2016) 2889-2909.

## Awards and Fellowships

---

2017	Office of Naval Research, N00014-17S-B001, award amount \$10000 Funding support for Modern Advances in Computational and Applied Mathematics, Yale University
2015	Wilhelm Magnus Prize, New York University
2011 - 2015	Henry M. MacCracken Fellowship, New York University
2011	Institute Gold Medal, IIT Bombay
2011	Department Silver Medal, IIT Bombay
2011, 2009	Boeing Student Scholarship

## Conference and Invited talks

---

Jun 2017	High order layer potential evaluation using Quadrature by Expansion. Frontiers in Applied and Computational Mathematics, NJIT
Apr 2017	Solution of biharmonic equation on regions with corners. IDeAS seminar, Princeton University
Mar 2017	Accurate Derivative Evaluation for Grad-Shafranov Solvers using Quadrature by Expansion. SIAM Conference on Computational Science and Engineering, Atlanta
Jan 2017	Integral equation methods for the mobility problem. Department of Computational and Data Sciences Seminar series, Indian Institute of Science, Bangalore
Jan 2017	The biharmonic equation with natural boundary conditions. Mathematics Department Colloquium, Indian Institute of Technology Bombay
Jan 2017	Integral equation methods for the mobility problem. Department Colloquium, Aerospace Engineering Department, Indian Institute of Technology Bombay
Jul 2016	Recent developments in fast and robust algorithms for quadrature by expansion. SIAM Annual Meeting, Boston
Jan 2016	Quadrature by expansion: high order robust quadrature rules for evaluating singular integrals in potential theory. Mathematics Department Colloquium, Indian Institute of Technology Bombay
Jul 2015	Fast and robust implementation of quadrature by expansion. Numerical Methods Seminar, Department of Computer Science, UIUC
Mar 2015	A fast and robust implementation of quadrature by expansion. SIAM Conference on Computational Science and Engineering, Salt Lake City
Dec 2014	Integral equations elastance and mobility problems in 2D. PDE Seminar, Indian Institute of Technology Bombay
Dec 2013	New integral equations for elastance and mobility problems. Integral equation methods: fast algorithms and applications, BIRS. Banff, Alberta

## Teaching Experience

---

Spring 2017	<b>Course Instructor</b> , Partial Differential Equations, Yale University
Fall 2016	<b>Course Instructor</b> , Ordinary Differential Equations, Yale University
Spring 2016	<b>Course Instructor</b> , Integral equations and fast algorithms (Graduate course), Yale University
Fall 2015	<b>Course Instructor</b> , Linear Algebra with Applications, Yale University
Spring 2015	<b>Recitation Leader</b> , Introduction to Computer Simulations, Courant Institute of Mathematical Sciences
Fall 2014	<b>Recitation Leader</b> , Differential equations, Courant Institute of Mathematical Sciences
Spring 2014	<b>Recitation Leader</b> , Functions of one complex variable, Courant Institute of Mathematical Sciences
Fall 2013	<b>Recitation Leader</b> , Calculus I, Courant Institute of Mathematical Sciences
Spring 2011	<b>Teaching Assistant</b> , Flight Mechanics II, Indian Institute of Technology Bombay
Fall 2010	<b>Teaching Assistant</b> , Control Theory, Indian Institute of Technology Bombay
Spring 2010	<b>Teaching Assistant</b> , Introduction to Statistics, Indian Institute of Technology Bombay

## Other Professional activities

---

Referee:	Journal of Computational Physics, Advances in Computational Mathematics, Computational and Applied Mathematics, Science Advances
----------	--