

# Yossi (Joseph) Farjoun

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**Personal**    **Birth** March 21, 1977; Ithaca, New York  
**Citizenship** USA and Israel

**Education**    **University of California at Berkeley**  
· 2000–2006: PhD in Mathematics. Advisor: J. C. Neu. Thesis title: *Cluster Growth in Aggregation Kinetics*.  
**Hebrew University of Jerusalem**  
· 1999–2000: Master's Program in Math (unfinished). Advisor: R. Kupferman  
· 1996–1999: B.Sc. in Math and Physics (with honors)

**Positions**    **Academic**  
· 2009–Current: Post-doctoral Researcher, UC3M, Spain  
· 2006–2009: Applied Mathematics Instructor, MIT

**Visting**  
· 2011–2012: Visiting Scholar, Mathematics, MIT  
· 2009 (Summer): Visiting Scholar, Mathematics, MIT  
· 2007 (Summer): Visiting Researcher — UC3M, Spain  
· 2006 (Summer): Visiting Researcher — Mathematics, UC Berkeley  
· 2004 (Winter): Visiting Scholar — Institute of Applied Math, UBC, Canada

**Industry**  
· 2003–2006: Patent consultant, TimeBridge (Now owned by Reply.com)  
· 1997–2003: Programmer / consultant, Banter (Now owned by IBM)  
· 1995–1997: Programmer, ExLibris

**Research**    **Current Interests**  
· Charge transport in a superlattice  
· Particle methods for conservation laws  
· Homogeneous nucleation and aggregation  
· Shape optimization and other geometrical problems  
· Biological motility and chemotaxis

**Publications**  
13. with D. Schaeffer, *A thin cantilever beam in a flow* ; Proceedings of ICNAAM 2011 ; AIP Conference Proceedings **1389**, (2011) pp. 1446–1449  
12. with J. C. Neu, *Aggregation according to classical kinetics: From nucleation to coarsening* ; Phys. Rev. E **83**, (2011) p. 51607 ; arXiv:0903.0861  
11. with B. Seibold *An exact particle method for scalar conservation laws and its application to stiff reaction kinetics* ; Meshfree Methods for Partial Differential Equations V, pp. 105–124 ; arXiv:1001.2840

10. with B. Seibold, *A rarefaction-tracking method for hyperbolic conservation laws*; Journal of Engineering Mathematics **66** 1 (2010) pp. 237 ; arXiv:0901.0298
9. with R. Ehrenborg, *Asymptotics of the Euler number of bipartite graphs*; Advances in Applied Mathematics **44** (2010) pp. 155–167 ; arXiv:0704.1782
8. with B. Seibold, *An exactly conservative particle method for one dimensional scalar conservation laws*; Journal of Computational Physics **228** (2009) 5298–5215 ; arXiv:0809.0726
7. *Creation of clusters via a thermal quench* ; Progress in Industrial Mathematics at ECMI 2008 ; Mathematics in Industry **15** ; pp. 463–468 ; arXiv:0810.3249
6. with J. C. Neu, *Exhausting homogeneous nucleation in a closed system*; Physical Review E **78**, 051402 (2008) ; arXiv:cond-mat/0702372
5. with B. Seibold, *Solving one dimensional scalar conservation laws by particle management* ; Meshfree Methods for Partial Differential Equations IV (2008), Lecture Notes in Computational Science and Engineering **65** ; arXiv:0801.1495
4. with J. C. Neu, *An asymptotic solution of aggregation dynamics* ; Progress in Industrial Mathematics at ECMI 2006 pp. 368–375
3. with L. L. Bonilla, A. Carpio, and J. C. Neu, *Asymptotic and numerical studies of the Becker-Döring model for transient homogeneous nucleation* ; Markov Processes and Related Fields **12** (2006) pp. 341–365 ; arXiv:cond-mat/0603328
2. with J. C. Neu, *The tallest column—A dynamical system approach using a symmetry solution* ; Studies in Applied Math **115**:319-337 (2005) ; arXiv:0711.0730
1. with J. C. Neu, *The optimal shape of a javelin* ; Studies in Applied Math **115**:339-354 (2005) ; arXiv:0711.0734

## Submitted for Review

- with D. G. Schaeffer, *The hanging thin rod: A singularly perturbed eigenvalue problem* ; Minor revisions requested by SIAM Review ; arXiv:1008:1912

## In Progress

- *Creation of clusters via a thermal quench*
- *Charge-transport in a semiconducting super-lattice using moment-methods*
- *Solving traffic-flow problems on a large network using a particles method*
- *The motion of a slightly stiff pony-tail*
- *KAM-type solution-space in weakly non-linear wave equation*

## Invited Talks

- *The Optimal Javelin* ; Numerical Analysis Seminar, Temple University, 2011
- *A Particle Method for Conservation Laws* ; Applied Math Seminar, Duke, 2010
- *A Particle Method for Conservation Laws* ; Astrophys. Seminar, UV, Spain, 2010
- *The Shape of a Hanging Rod* ; Gregorio Millán Institute, UC3M, Spain, 2010

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- *A Particle Method for Conservation Law PDE* ; Math UNED, Spain, 2010
- *The Optimal Shape of a Javelin* ; Meeting on Similarity, 2008, UBC, Canada
- *Analysis, Asymptotics and Arithmetics* ; Oxford Lectureship job talk, 2009
- *The Optimal Shape of a Javelin* ; Gregorio Millán Institute, UC3M, 2008
- *Nucleation During a Thermal Quench* ; SIAM Conference (MS08)
- *Global Predictions in Aggregation, from Pure Monomer to Coarsening* ; Cal Tech Applied and Combinatorial Mathematics Special Seminar, 2006
- *Global Predictions in Aggregation, from Pure Monomer to Coarsening* ; MIT Applied Mathematics Special Seminar, 2006
- *Global Predictions in Aggregation, from Pure Monomer to Coarsening* ; Harvard DAES Special Seminar, 2006
- *Aggregation Kinetics* ; Lawrence Livermore National Labs, 2005

## Other Talks

- *A Thin Rod in a Shear Flow* ; ICNAAM (2011), Greece
- *A Particle Method for Solving Conservation Law PDE* ; SPEIC Conference 2010
- *Nucleation During a Thermal Quench* ; ECMI Conference, London, 2008
- *The Optimal Shape of a Javelin* ; APS March Meeting, 2008
- *Aggregation Kinetics—The three eras* ; Oxford Mathematical Institute, Differential Equations and Applications Seminar, 2007
- *Aggregation Kinetics—The three eras* ; UC Berkeley Applied Math Seminar, 2007
- *Asymptotics of the Euler Number of Bipartite Graphs* ; Applied Mathematics Seminar, Hebrew University, Israel, 2007
- *Global Predictions in Aggregation, from Pure Monomer to Coarsening* ; Racah Institute Seminar, Hebrew University, Israel, 2007
- *Global Predictions in Aggregation, from Pure Monomer to Coarsening* ; ECMI Conference, Spain, 2006
- *Aggregation Kinetics* ; SIAM Conference (DS05), Snowbird, 2005
- *Designing the Tallest Column*; "Cheerful Facts" Graduate Seminar, UC Berkeley, 2004

## Workshops

- Funded participant in the 2003 IPAM Summer school MAMAOS

## PhD Students

- Mario Duran Camejo (Co-advising with L. L. Bonilla)

## Referee for

- Studies in Applied Mathematics
- Journal of Computational Physics
- Communications in Applied Mathematics and Computational Science

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## Service

- Academic Commission for Aerospace Engineering, UC3M, 2010/2011
- Organized the Gregorio Millán Barbani Seminar (UC3M) during 2009-2011
- Created an introductory MATLAB course for mathematicians, 2007
- Co-organized mini-symposium (with L. L. Bonilla), *Precipitation, Deposition and Sedimentation of Particles in Fluid Flow* ECMI Conference, London, 2006

## Projects

- Developed (with B. Seibold) and released a particle method for scalar conservation equations
- Created (with B. Seibold and J. Philbrick) a video/sound art piece based on *Sculpture Flottante* and the Laplace-Beltrami operator. It was shown in the Skissernas Museum, Lund, Sweden, in 2009
- Began the development of omath (with S. Morrison), a free and open-source computer algebra system inspired by Mathematica

## Grants

- 2010–2012: Juan de la Cierva grant—Spanish Ministry of Science and Innovation
- 2007–2010: NSF Post-Doc, Applied Mathematics (DMS-0703937)
- 2000–2001: VIGRE Fellowship at University of California at Berkeley
- 1998–2000: Levi Eshkol Grant, Ministry of Science and Technology, Israel

## Awards

- 2010: Recognition of excellent teaching, UC3M
- 2006: Outstanding Graduate Student Instructor, UC Berkeley
- 1998: Dean's List, Hebrew University of Jerusalem
- 1997: Dean's List, Hebrew University of Jerusalem
- 1995: Honorable Mention, International Physics Olympiad, Australia

## Teaching

### Courses taught as Lecturer

- Modeling in Industrial Engineering (Graduate)
- Linear Algebra (Undergraduate)
- MATLAB programming ×5
- Numerical Analysis (Undergraduate) ×3

### Courses taught as Assistant

- Ordinary Differential Equations (Undergraduate) ×2
- Numerical Analysis I (Graduate)
- Numerical Analysis II (Graduate)
- Calculus I (Undergraduate) ×2
- Calculus II (Undergraduate) ×2
- Numerical Analysis (Undergraduate) ×2
- Laboratory in Mathematics (Undergraduate)

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## **Reference**

- Arthur P. Mattuck (Teaching), Massachusetts Institute of Technology
- Joseph B. Keller, Stanford
- John C. Neu, University of California at Berkeley
- Ruben R. Rosales, Massachusetts Institute of Technology
- David G. Schaeffer, Duke University
- Benjamin Seibold, Temple University

## **Languages**

- English — Fluent: reading, writing and speaking
- Hebrew — Fluent: reading, writing and speaking
- Spanish — Basic: reading, writing and speaking

## **Hobbies**

- Rock-climbing, hiking and swimming
- Pottery and ceramics