

# CURRICULUM VITAE

## Joceline Lega

Department of Mathematics  
University of Arizona  
Tucson, Arizona 85721-0089  
<http://math.arizona.edu/~lega>

## Professional Preparation

University of Paris VI, France	Physics	M.S., 1985
University of Paris VI, France	Physics	B.S., 1985
University of Nice, France	Dynamical Systems and Turbulence	Post-grad degree, 1986
University of Nice, France	Theoretical Physics	Ph.D., 1989
University of Cambridge, DAMTP	Post-doc, Applied Mathematics	Oct-Dec 1991
University of Arizona, Mathematics	Post-doc, Applied Mathematics	Jan 1990-Jun 1991

## Appointments

2006-	Professor, Department of Mathematics, University of Arizona, Tucson On leave without pay from CNRS, France
2000-2006	Associate Professor, Department of Mathematics, University of Arizona, Tucson On leave without pay from CNRS, France
1997-2000	Assistant Professor, Department of Mathematics, University of Arizona, Tucson On leave without pay from CNRS, France
1993-1997	Chargée de Recherche 1ère classe at CNRS, Institut Non Linéaire de Nice, Research Associate, Department of Physics and Applied Physics University of Strathclyde, Glasgow, UK
1989-1993	Visiting Assistant Professor, Department of Mathematics, University of Arizona Chargée de Recherche 2ème classe at CNRS (National Center for Scientific Research), Laboratoire de Physique Théorique, Nice, France

## Editorial Boards

- Member of the Editorial Board for **Nonlinearity**
- Editor of **Physica D**

## Current Grants and Contracts

- *Current problems in nonlinear dynamics: Macroscopic modeling of microscopic interactions and instability of coherent structures*, National Science Foundation, 2004-2007
- *REU supplement to above grant*, National Science Foundation, 2004-2007

## Synergistic Activities

- Co-chair, SIAM conference on *Nonlinear Waves and Coherent Structures*, University of Washington, Seattle, September 9-12, 2006.
- Secretary, SIAM Activity Group on Nonlinear Waves and Coherent Structures, 2004-06.
- Co-organizer, SIAM mini-symposium *On the Validity of Envelope Equations*, SIAM conference on Applications of Dynamical Systems, Snowbird, Utah, May 23<sup>rd</sup>, 2005.

- Co-organizer, *Workshop on Patterns in Physics*, The Fields Institute, Toronto, Canada, November 14-18, 2003 (<http://www.fields.utoronto.ca/programs/scientific/03-04/pde/physics/index.html>)
- Organizer, SIAM Mini-symposium on the *Dynamics and Stability of Coherent Structures*, Joint Mathematics Meeting, Phoenix, Arizona, January 8<sup>th</sup>, 2003.
- PI of NSF grant to support the participation of US-based junior mathematicians in the Fall 2003 activities of the Thematic Program on Partial Differential Equations, held at The Fields Institute, Toronto, Canada.

## Publications

- 41 refereed publications (see <http://math.arizona.edu/~lega> for a complete list of publications)
- 11 articles in books
- **Refereed publications in the last 10 years:**
  1. S. Laforune and J. Lega, *Spectral stability of local deformations of an elastic rod: Hamiltonian formalism*, SIAM J. Math. Anal. **36**, 1726-1741 (2005).
  2. J. Lega and T. Passot, *Hydrodynamics of bacterial colonies: phase diagrams*, Chaos **14**, 562-570 (2004).
  3. J. Lega and T. Passot, *Inverse cascade and energy transfer in forced low-Reynolds number two-dimensional turbulence*, Fluid Dynamics Research **34**, 289-297 (2004).
  4. S. Laforune and J. Lega, *Instability of local deformations of an elastic rod*, Physica **D 182**, 103-124 (2003).
  5. J. Lega and T. Passot, *Hydrodynamics of bacterial colonies: a model*, Phys. Rev. **E 67**, 031906 1-18 (2003).
  6. B.R. Schöne, J. Lega, K.W. Flessa, D.H. Goodwin and D.L. Dettman, *Reconstructing daily temperatures from growth rates of the intertidal bivalve mollusk *Chione cortezi* (northern Gulf of California, Mexico)*, Palaeogeography, Palaeoclimatology, Palaeoecology **184**, 131-146 (2002).
  7. T.A. Christensen, G. D'Alessandro, J. Lega and J.G. Hildebrand, *Morphometric modeling of olfactory circuits in the insect antennal lobe: I. Simulations of spiking local interneurons*, Biosystems **61**, 143-153 (2001).
  8. J. Lega, *Traveling hole solutions of the complex Ginzburg-Landau equation: a review*, Physica **D 152-153**, 269-287 (2001).
  9. J. Lega and A. Goriely, *Pulses, fronts and oscillations of an elastic rod*, Physica **D 132**, 374-392 (1999).
  10. J. Lega and N. Mendelson, *A control-parameter dependent Swift-Hohenberg equation as a model for bioconvection patterns*, Phys. Rev. **E 59**, 6267-6274 (1999).
  11. N. Mendelson and J. Lega, *A complex pattern of traveling stripes is produced by swimming cells of *Bacillus subtilis**, Journal of Bacteriology **180**, 3285-3294 (1998).
  12. S. Bottin and J. Lega, *Pulses of tunable size near a subcritical bifurcation*, Eur. Phys. J. **B 5**, 299-308 (1998).
  13. O. G. Calderón, V. M. Pérez-García, J. Lega, and J. M. Guerra, *Loss-induced transverse effects in lasers*, Opt. Comm. **143**, 315-321 (1997).
  14. D. Hochheiser, J.V. Moloney and J. Lega, *Controlling optical turbulence*, Phys. Rev. **A 55**, 4011-4014 (1997).
  15. J. Lega and S. Fauve, *Traveling hole solutions to the complex Ginzburg-Landau equation as perturbations of Nonlinear Schrödinger dark solitons*, Physica **102 D**, 234-252 (1997).

16. J. Lega and J.M. Vince, *Temporal forcing of traveling wave patterns*, J. Phys. I France **6**, 1417-1434 (1996).
17. G.K. Harkness, J. Lega, and G.L. Oppo, *Measuring disorder with correlation functions of averaged patterns*, Physica D **96**, 26-29 (1996).

### Invited Scholarly Presentations

- 67 invited scholarly presentations
- **Invited presentations in the last 5 years:**
  1. *Pulses, fronts and oscillations of an elastic rod* (in French); Service de Physique de l'Etat Condensé (**Condensed Matter Physics Department**), **L'Orme des Merisiers**, France, June 26th, 2000.
  2. *Traveling holes in weak turbulence*; **Department of Mathematics, McMaster University**, Hamilton, Canada, February 5, 2001.
  3. *Hydrodynamics of bacterial colonies: a model*; **The Fields Institute**, Toronto, Canada, February 7, 2001.
  4. *Hydrodynamics of bacterial colonies: a model*; **Center for Nonlinear Science, Georgia Tech**, Atlanta, March 12, 2001.
  5. *Hydrodynamics of bacterial colonies: a model*; **Department of Mathematics, University of North Carolina, Chapel Hill**, March 27, 2001.
  6. *Patterns and their dynamics*; Workshop on *Partial Differential Equations in Mathematical Physics*, **The Fields Institute**, Toronto, Canada, April 16-20, 2001.
  7. *Hydrodynamics of bacterial colonies*; **Arizona Applied Math Fest**, Tucson, Arizona, November 2-4, 2001.
  8. *A Swift-Hohenberg model for bioconvection*; **Euromech Colloquium 422 on Pattern Formation by Swimming Micro-Organisms and Cells**, **University of Leeds**, UK, December 3-5, 2001.
  9. *Instability of local deformations of an elastic rod*; **CKP Meeting, Pattern Formation for the Next Millenium: Where do we go from here**, **La Foux d'Allos**, France, June 10-15, 2002.
  10. *Instability of local deformations of an elastic rod* (in French); **Institut Non-Linéaire de Nice**, Sophia-Antipolis, France, June 25, 2002.
  11. *Dynamics and growth of bacterial colonies*; **2003 Clifford Lectures on Theoretical Fluid Mechanics in Biology**, **Tulane University**, New-Orleans, Louisiana, March 24-28, 2003.
  12. *Mathematical aspects of optical vortices*; **The Rank Prize Funds Mini-symposium on Orbital Angular Momentum of Photons, Helical Beams and Optical Vortices**, **Grasmere**, UK, May 12-15, 2003.
  13. *Phase Diffusion and Weak Turbulence*; Rocky Mountain Workshop on *Dynamics and Bifurcation of Patterns in Dissipative Systems*, **Colorado State University**, Fort-Collins, Colorado, May 19-22, 2003.
  14. *Instability of Local Deformations of an Elastic Rod*; mini-symposium on *Stability, Dynamics, and Asymptotics of Hamiltonian Nonlinear Partial Differential Equations*, **2003 SIAM Conference on Applications of Dynamical Systems**, Snowbird, Utah, May 26-31, 2003.
  15. *Traveling Hole Solutions of the Complex Ginzburg-Landau Equation*, mini-symposium on *Defects in Experiment and Theory*, **2003 SIAM Conference on Applications of Dynamical Systems**, Snowbird, Utah, May 26-31, 2003.
  16. *Dynamics and growth of bacterial colonies*; workshop on *Dynamics, Growth and Singularities of Continuous Media*, **Institut Henri Poincaré**, Paris, France, July 7-13, 2003. *A hydrodynamic model for the growth of bacterial colonies*; KITP Conference: *Pattern*

- Formation in Physics and Biology*, **Kavli Institute for Theoretical Physics**, Santa Barbara, August 17-21, 2003.
17. *Instability of local deformations of an elastic filament*, Applied Mathematics Colloquium, **The Fields Institute**, Toronto, Canada, September 15, 2003.
  18. *Hydrodynamics of bacterial colonies: a model*; Applied Mathematics Seminar, **Department of Mathematics, University of Toronto**, Canada, November 7, 2003.
  19. *Instability of local deformations of an elastic filament*; **Department of Mathematics, University of Southampton**, UK, 19 April 2004.
  20. *Instability of local deformations of an elastic filament*; **Department of Physics, University of Strathclyde**, UK, 28 April 2004.
  21. *Instability of local deformations of an elastic filament*; **Department of Applied Mathematics and Theoretical Physics, University of Cambridge**, UK, 4 May 2004.
  22. *Instability of local deformations of an elastic filament*, **Department of Mathematics, Ohio State University**, 20 May 2004.
  23. *Instability of local deformations of an elastic filament*, **Department of Engineering Sciences and Applied Mathematics, Northwestern University**, 28 May 2004.
  24. *A hydrodynamic model for the growth of bacterial colonies*, **Mathematics Colloquium, University of Notre Dame**, 1 December 2004.
  25. *Instability of local deformations of an elastic filament*; **Department of Mathematics, College of Charleston**, 17 February 2005.
  26. *A hydrodynamic model for the growth of bacterial colonies*, **Mathematics Colloquium, College of Charleston**, 18 February 2005.
  27. *New results on the stability of pulse-like solutions to a coupled nonlinear Klein-Gordon system*; mini-symposium on *Patterns in Extended Systems*, **2005 SIAM Conference on Applications of Dynamical Systems**, Snowbird, Utah, May 22-26, 2005.
  28. *On the stability of local deformations of an elastic filament*, **Nonlinearity Scientific Meeting**, London, UK, 9 September 2005.
  29. *Dynamics and growth of bacterial colonies*, Workshop on *Theoretical Aspects of Pattern Formation*, **University of Surrey**, Guildford, UK, 19-23 September 2005.
  30. *A hydrodynamic model for the growth and dynamics of bacterial colonies*; mini-symposium on *Numerical and Computational Aspects of Interface Problems and Applications*, **7<sup>th</sup> World Congress on Computational Mechanics**, Los Angeles, California, 16-22 July 2006.