

JEAN-PHILIPPE LESSARD

(Institute for Advanced Study)

Curriculum Vitae

Citizenship: Canadian
Birthdate: June 12, 1978

Languages: French, English
Email: lessard@math.rutgers.edu

Education

Ph.D. Mathematics, Georgia Institute of Technology, 2007.

DISSERTATION: *Validated Continuation for Infinite Dimensional Problems.*

Advisor: **Konstantin Mischaikow.**

Employment

NSF Mathematical Sciences Institutes Postdoctoral Fellowship. Selected by the Institute for Advanced Study (IAS) in Princeton and hosted by Rutgers University, 09/2009 - 08/2010.

Postdoctoral Associate, Rutgers University, 01/2009–08/2009.

Postdoctoral Researcher, Vrije Universiteit Amsterdam, 06/2008–12/2008.

Postdoctoral Associate, Rutgers University, 01/2008–05/2008.

Postdoctoral Researcher, Vrije Universiteit Amsterdam, 09/2007–12/2007.

Publications and Preprints

M. GAMEIRO AND J.-P. LESSARD. Existence of secondary bifurcations or isolas for PDEs, submitted, 2009.

M. GAMEIRO AND J.-P. LESSARD. Rigorous computation of smooth branches of equilibria for the three-dimensional Cahn-Hilliard equation, submitted, 2009.

M. GAMEIRO AND J.-P. LESSARD. A priori estimates and validated continuation for equilibria of high dimensional PDEs, submitted, 2009.

J.-P. LESSARD. Recent advances about the uniqueness of the slowly oscillating periodic solutions of Wright's equation, to appear in *Journal of Differential Equations*, 2009.

J. B. VAN DEN BERG, J.-P. LESSARD AND K. MISCHAIKOW. Global smooth solution curves using rigorous branch following, to appear in *Mathematics of Computation*, 2009.

J. B. VAN DEN BERG AND J.-P. LESSARD. Chaotic braided solutions via rigorous numerics: chaos in the Swift-Hohenberg equation, *SIAM Journal on Applied Dynamical Systems*, 7(3): 988-1031, 2008.

M. GAMEIRO, J.-P. LESSARD AND K. MISCHAIKOW. Validated continuation over large parameter ranges for equilibria of PDEs, *Mathematics and Computers in Simulation*, 79 (4), 1368-1382, 2008.

S. DAY, J.-P. LESSARD AND K. MISCHAIKOW. Validated continuation for equilibria of PDEs, *SIAM Journal on Numerical Analysis*, 45 (4), 1398-1424, 2007.

J.-P. LESSARD. Validated Continuation for Infinite Dimensional Problems, *Ph.D. Dissertation*, Georgia Institute of Technology, 2007.

Academic and Teaching Experience

INSTITUTE FOR ADVANCED STUDY, SCHOOL OF MATHEMATICS, PRINCETON

NSF Mathematical Sciences Institutes Postdoctoral Fellow, (hosted by Rutgers) 09/2009–07/2010.

RUTGERS UNIVERSITY, DEPARTMENT OF MATHEMATICS

(a) Postdoctoral Associate
09/2009–07/2010.
01/2008–05/2008.

(b) Lead Instructor for Math 251: Multivariable Calculus. Spring 2008 and Spring 2009.

VRIJE UNIVERSITEIT AMSTERDAM, DEPARTMENT OF MATHEMATICS

Postdoctoral Researcher
09/2007–12/2007.
06/2008–12/2008.

GEORGIA INSTITUTE OF TECHNOLOGY, SCHOOL OF MATHEMATICS

(a) Research Assistant of Konstantin Mischaikow, Fall 2004–Fall 2007.
(b) Lead Instructor for MATH 2403: Differential Equations. Spring 2004, Summer 2004.
(c) Teaching Assistant,
MATH 2403: Differential Equations, Fall 2002, Spring 2003.
MATH 2401: Calculus III, Fall 2003.

UNIVERSITÉ DE MONTRÉAL, DÉP. DE MATHÉMATIQUES ET DE STATISTIQUES

(a) M.Sc. Mathematics, Université de Montréal, Summer 2002.
DISSERTATION: *Bifurcation et chaos dans le système de Lorenz.*
Advisor: Christiane Rousseau.
(b) Teaching Assistant, Fall 2000–Spring 2002.

UNIVERSITÉ LAVAL, DÉPARTEMENT DE MATHÉMATIQUES ET DE STATISTIQUES

Research Assistant of Line Baribeau, Summer 2000.

UNIVERSITÉ DE SHERBROOKE, DÉPARTEMENT DE MATHÉMATIQUES

(a) B.Sc. Mathematics, Université de Sherbrooke, Spring 2000.
(b) Research Assistant of Tomasz Kaczynski, Summer 1999.

Talks in International Conferences and Research Seminars

41. *A priori estimates and validated continuation for equilibria of high dimensional PDEs.* George Mason University, VA, USA, 11/2009.

40. *Forcing theorems in differential equations.* University of Texas at Austin, Texas, USA, 11/2009.

39. *Computer-assisted proofs for delay differential equations.* State-Dependent Delay Equations International Workshop. Max-Planck Institute, Dresden, Germany, 10/2009.

38. *Rigorous computation of smooth branches of periodic solutions of delay equations.* Invited speaker. Dynamics, Topology and Computations 2009. Bedlewo, Poland. 06/2009.

37. *Rigorous path-following techniques for periodic solutions of delay equations*. SIAM Conference on Applications of Dynamical Systems. Snowbird, Utah, USA. 05/2009.
36. *Méthodes numériques validées pour les équations aux dérivées partielles*. Université Laval, Canada. 01/2009.
35. *Computing global smooth curves of periodic solutions of delay equations using rigorous branch following*. University of Szeged, Hungary. 12/2008.
34. *Rigorous continuation techniques for periodic solutions of delay equations*. Universität Giessen, Germany. 12/2008.
33. *Chaotic dynamics, braids and rigorous numerics*. Kyoto University, Japan. 10/2008.
32. *Rigorous computation of global smooth branches of periodic solutions of delay equations*. Kyoto University, Japan. 10/2008.
31. *A general fixed point method for the study of dynamical systems*. Conference on Boundary Value Problems. Santiago de Compostela, Spain. 09/2008.
30. *Validated continuation for infinite dimensional problems*. McGill University, Canada. 09/2008.
29. *Forcing theorems in dynamics: a computational approach*. Structural Dynamical Systems 2008: Computational Aspects. Capitolo, Monopoli, Italy. 06/2008.
28. *Topological methods and rigorous numerics for the study of pattern formation models*. Vrije Universiteit Amsterdam, The Netherlands. 06/2008.
27. *Recent advances about the uniqueness of the slowly oscillating periodic solutions of Wright's equation*. 7th International Conference on Dynamical Systems, Differential Equations and Applications. Arlington, Texas, USA. 05/2008.
26. *About the uniqueness of the slowly oscillating periodic solutions of Wright's equation*. Rutgers University, USA. 04/2008.
25. *Récents progrès sur l'unicité des solutions périodiques à oscillations lentes de l'équation différentielle avec retard de Wright*. Université de Montréal, Canada. 04/2008.
24. *Chaos, braids and rigorous numerics*. Hiroshima University, Japan. 03/2008.
23. *Chaotic braided solutions via rigorous numerics: chaos in the Swift-Hohenberg equation*. Universitat de Barcelona, Spain. 11/2007.
22. *Recent advances about the uniqueness of the slowly oscillating periodic solutions of Wright's equation*. Joint AARMS-CRM Workshop: Recent Advances in Functional and Delay Differential Equations. Halifax, Canada. 11/2007.
21. *Toward a computer-assisted proof of an old conjecture in delay equations*. Vrije Universiteit Amsterdam, The Netherlands. 09/2007.
20. *Validated continuation for infinite dimensional problems*. 6th International Congress on Industrial and Applied Mathematics. Zürich, Switzerland. 07/2007.
19. *Chaotic braided solutions via rigorous numerics*. SIAM Conference on Applications of Dynamical Systems. Snowbird, Utah, USA. 05/2007.
18. *Solutions chaotiques tressées pour l'équation de Swift-Hohenberg*. Université de Sherbrooke, Canada. 01/2007.
17. *Solutions chaotiques tressées pour l'équation de Swift-Hohenberg*. Université de Montréal, Canada. 01/2007.
16. *Toward rigorous computation of global dynamics of gradient PDEs*. 4th International Workshop on Taylor Methods. Boca Raton, Florida, USA. 12/2006.
15. *Validated continuation for equilibria of PDEs*. Imperial College, London, UK. 10/2006.

14. *Validated continuation for smooth zeros of infinite dimensional operators*. CWI, Amsterdam, The Netherlands. 10/2006.
13. *Computer-assisted proofs in dynamics*. Vrije Universiteit Amsterdam, The Netherlands. 10/2006.
12. *Continuing the equilibria of nonlinear PDEs defined on rectangular spacial domains*. Gilles Fournier Memorial Conference. Bishop University, QC, Canada. 09/2006.
11. *Validated continuation for equilibria of PDEs*. Rutgers University, USA. 09/2006.
10. *Validated continuation for equilibria of PDEs*. Structural Dynamical Systems 2006: Computational Aspects. Capitolo, Italy. 06/2006.
9. *Validated continuation for equilibria of PDEs*. Dynamics, Topology and Computations 2006. Stephan Banach International Math Center, Bedlewo, Poland. 06/2006.
8. *Validated continuation for equilibria of PDEs defined on rectangular spacial domains*. RWTH, Aachen, Germany. 05/2006.
7. *Getting a rigorous skeleton of equilibria of nonlinear PDEs using path-following techniques*. Computational and Topological Aspect of Dynamics. Leiden, The Netherlands. 05/2006.
6. *Parallel continuation for equilibria of PDEs*. Cornell University, Ithaca, USA. 01/2006.
5. *Continuation validée des équilibres des EDPs*. Université de Sherbrooke, Canada. 01/2006.
4. *Rigorous pseudo-arclength continuation for PDEs*. Montana State University, USA. 07/2005.
3. *Rigorous numerics for continuation methods in infinite dimensions*. SIAM Dynamical Systems Meeting. Snowbird, USA. 05/2005.
2. *Rigorous numerics for continuation methods in infinite dimensions*. Osaka, Japan. 12/2004.
1. *Rigorous numerics for continuation methods in infinite dimensions*. Summer School on Conley-Index Theory and Computational Homology. Pappenheim, Germany. 09/2004.

Professional Activities

Co-organizer of the special session *Topological and Computational Dynamics* at the 2010 Spring Eastern Sectional AMS Meeting, Newark, NJ, 2010.

Co-organizer of the mini-symposium *Topology and Computations in Dynamics* (MS9) at the SIAM Conference on Applications of Dynamical Systems, Snowbird, 2009.

Refereeing for *SIAM Journal on Applied Dynamical Systems*, *Foundations of Computational Mathematics* and *Journal of Differential Equations*.

Organizer of the *Research Horizons Seminar*, Georgia Institute of Technology, 2005–2006.

Honors & Awards

NSF Mathematical Sciences Institutes Postdoctoral Fellowship. 2009–2010.

ICIAM Travel Award, Summer 2007.

NSERC postgraduate scholarship, Fall 2002–Summer 2004.

FQRNT Ph.D. Scholarship, Fall 2002–Summer 2005.

John Festa Fellowship, Georgia Institute of Technology, 2004.

FQRNT M.Sc. Scholarship, Fall 2000–Summer 2002.

NSERC Undergraduate Student Research Award, Summer 2000.

NSERC Undergraduate Student Research Award, Summer 1999.

Médaille du Lieutenant Gouverneur du Québec, 1995.

Visits

Kyoto University, Japan. November 2009. Invited by Hiroshi Kokubu.
 George Mason University, USA. November 2009. Invited by Thomas Wanner.
 University of Texas at Austin, USA. November 2009. Invited by Rafael de la Llave.
 Vrije Universiteit Amsterdam, The Netherlands. October 2009. Invited by J. B. van den Berg.
 Max Planck Institute, Dresden, Germany. October 2009.
 University of Szeged, Hungary. December 2008. Invited by Tibor Krisztin.
 Universität Giessen, Germany. December 2008. Invited by Hans-Otto Walther.
 Kyoto University, Japan. October 2008. Invited by Hiroshi Kokubu.
 Universidad de Vigo, Spain. September 2008. Invited by Eduardo Liz.
 Hiroshima University, Japan. March 2008. Invited by Yasuaki Hiraoka.
 Universitat de Barcelona, Spain. November 2007. Invited by Carles Simó.
 Imperial College London, UK. October 2006. Invited by Rob Beardmore.
 Vrije Universiteit Amsterdam, The Netherlands. October 2006. Invited by Rob van der Vorst.
 RWTH Aachen, Germany. May 2006. Invited by Stani Maier-Paape.
 Cornell University, USA. January 2006. Invited by Sarah Day.

References

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Roger Nussbaum
 Professor of Mathematics
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Rena Brakebill (teaching)
 Assistant Undergraduate Coordinator
 Georgia Institute of Technology
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