

Dr. Lori Badea

Institute of Mathematics
of the Romanian Academy
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EDUCATION

- 1992* Ph.D., Pierre et Marie Curie University, Paris 6, France
1971 M.S., University of Bucharest, Faculty of Mathematics and
Mechanics
1966 High school graduation, High School no. 2 in Barlad, Romania

EMPLOYMENT

- 1996-present* Senior Researcher (Professor), Institute of Mathematics of the
Romanian Academy, Bucharest
1990-1996 Researcher, Institute of Mathematics of the Romanian
Academy, Bucharest
1975-1990 Researcher, Institute of Power Studies and Designs, Bucharest
1975-1975 Researcher, Institute of Mathematics, Bucharest
1971-1974 System Analyst, Central Institute of Informatics, Bucharest

AWARDS AND HONOURS

1. "Spiru Haret" prize of the Romanian Academy (for the year 1999), Section of
Mathematics, 2001.

RESEARCH INTERESTS

- Domain decomposition methods for PDEs
- Embedding domain methods and optimal control problems
- Free and moving boundary value problems
- Numerical methods for financial derivatives
- Numerical methods for nonlinear problems
- Parallel computation

RESEARCH AND TEACHING ABROAD

- 2009 Visiting Researcher, 2 weeks at "Laboratoire de Mécanique et d'Acoustique CNRS et Université de Provence (Aix-Marseille 1)", France
- 2009 Visiting Researcher, 1 week at Free University of Berlin, Germany
- 2009 Visiting Researcher, 1 month at "Institut de Mathématiques, Ecole Polytechnique Fédérale de Lausanne", Switzerland
- 2008 Visiting Researcher, 2 weeks at "Laboratoire de Mécanique et d'Acoustique CNRS et Université de Provence (Aix-Marseille 1)", France
- 2007 Visiting Researcher, 1 week at "Institut de Mathématiques, Ecole Polytechnique Fédérale de Lausanne", Switzerland
- 2007 Visiting Researcher, 2 weeks at Institute of Applied Mathematics, University of Bonn, Germany
- 2007 Visiting Researcher, 2 weeks at "Laboratoire de Mathématiques", Université de Savoie, France
- 2006 Visiting Researcher, 2 weeks at "Laboratoire de Mathématiques", Université de Savoie, France
- 2005 Visiting Researcher, 3 months at "Laboratoire de Mathématiques", Université de Savoie, France
- 2004 Visiting Researcher, 1 month at "Institut de Mathématiques, Ecole Polytechnique Fédérale de Lausanne", Switzerland
- 2004 Visiting Researcher, 2 weeks at "Laboratoire Jacques-Louis Lions", Pierre et Marie Curie (Paris 6) University, France
- 2003 Visiting Professor, 3 months at "Laboratoire de Mathématiques", Université Savoie, France
- 2003 Visiting Researcher, 2 weeks at the Department of Mathematics, University of Bergen, Norway
- 2002 Visiting Researcher, 1 month at "Institut de Mathématiques, Ecole Polytechnique Fédérale de Lausanne", Switzerland
- 2001 Associated Researcher at CNRS, 6 months at "Laboratoire des Propriétés Mécaniques et Thermodynamiques des Matériaux", Paris 13 University, France
- 2001 Visiting Researcher, 2 weeks at the Department of Mathematics, University of Bergen, Norway
- 2001 Visiting Professor, 1 months at "Laboratoire des Propriétés Mécaniques et Thermodynamiques des Matériaux", Paris 13 University, France
- 2000 Visiting Research Scholar, 4.5 months at Texas A&M University, Department of Mathematics, College Station, USA

- 1999 Visiting Professor, 1 months at "Laboratoire des Propriétés Mécaniques et Thermodynamiques des Matériaux", Paris 13 University, France
- 1999 Visiting Professor, 1 month at "Ecole Nationale Supérieure d'Informatique et de Mathématiques Appliquées de Grenoble" National Polytechnic Institute of Grenoble, France
- 1998 Visiting Professor, 2 months at "Laboratoire des Propriétés Mécaniques et Thermodynamiques des Matériaux", Paris 13 University, France
- 1998 Visiting Professor (Associated Professor), 4.5 months at Texas A&M University, Department of Mathematics, College Station, USA
- 1997 Visiting Professor, 1 month at "Laboratoire des Propriétés Mécaniques et Thermodynamiques des Matériaux", Paris 13 University, France
- 1997 Visiting Professor, 1 month at "Laboratoire de Mathématiques", Université de Savoie, France
- 1997 Visiting Professor, 2 months at "Ecole Nationale Supérieure d'Informatique et de Mathématiques Appliquées de Grenoble", National Polytechnic Institute of Grenoble, France
- 1996 Researcher with a Postdoctoral grant for 6 months of the French Government at "Laboratoire de Mécanique et Technologie", ENS Cachan, Paris 6 University, France
- 1995 Visiting Professor, 6 months at "Ecole Nationale Supérieure d'Informatique et de Mathématiques Appliquées de Grenoble", National Polytechnic Institute of Grenoble, France
- 1993 Researcher with a Postdoctoral grant for 8 months at "Centre de Mise en Forme des Matériaux", "Ecole Normale Supérieure des Mines de Paris" in Sophia Antipolis, France
- 1990-1992 Scholar of the French Government for 3 years at "Laboratoire de Mécanique et Technologie", ENS Cachan, Paris 6 University, France

PH.D. THESIS

- Title:* On the parallel computing in elasto-plasticity by the Schwarz domain decomposition method
- Advisor:* Professor M. Predeleanu
- Board of examiners:* G. Duvaut (Chairman), P. Le Tallec (Referee), Q. S. Nguyen (Referee), P. Ladevèze (Examiner), P. L. Lions (Examiner), J. F. Maitre (Examiner), M. Predeleanu (Examiner)

PROFESSIONAL AFFILIATION AND OTHER ACTIVITIES

- 1992-1994 **Member** of the *Society for Industrial and Applied Mathematics (SIAM)*
- 1997-present **Member** of the *AMS*
- 1997 **Member** of the *International Program Committee* of the Third IMACS International Symposium on Iterative Methods in Scientific Computation, Jackson, Wyoming, USA, July 9-12, 1997.
- 2001-2004 **Cooperation** in Joint Research Group on *Domain Decomposition Methods for Nonlinear Problems. Applications in Applied Sciences and Engineering* with Department of Mathematics, University of Bergen, Norway, under the contract nr. ICA1-CT-2000-70022 with the European Commission.
- 2003 **Referee** at the *funding proposals of NSF*
- 2005 **Referee** at the *funding grants of the Romanian Academy of Sciences*
- 2003 **Reviewer** at *Zentralblatt für Mathematik*
- 2005-present **Expert** of *Romanian Education and Research Ministry* (included in *National Register of Experts in higher education and research*)
- 2008-2009 **Responsible of project** of the *Laboratoire Européen Associé CNRS Franco-Roumain (LEA Math-Mode)* cooperation with Laboratoire de Mécanique et d'Acoustique CNRS et Université de Provence (Aix-Marseille 1) for the project "Méthodes de Décomposition de Domaine pour les Problèmes de Contact avec Frottement"
- 2009 **Member** of the *International Program Committee* of the First International Conference on Parallel, Distributed and Grid Computing for Engineering, Pecs, Hungary, 6-8 April 2009.

SYMPOSIUMS AND CONFERENCES

1. On a domain decomposition method for parallel computing in elasto - plasticity, *The First European Conference on Numerical Methods in Engineering*, September 7-11, 1992, Brussels, Belgium.
2. Sur une méthode de décomposition des domaines en élasto - plasticité, *Seminar of the Laboratory of Mechanics and Technology, Paris 6 University*, November 11, 1992, Paris, France.
3. Calcul parallèle dans des problèmes de mécanique des solides et de mécanique des fluides par décomposition de domaines, *Seminar of Numerical Analysis Lyon - Saint-Etienne Universities*, May 18, 1993, Saint-Etienne, France.
4. Damage and buckling in elasto-plastic bars, *Conference of Mechanics of Solids*, June 9-11, 1994, Constanta, Romania.
5. Finite element solution for a seepage flow problem through a non-homogeneous multiply-connected dam, *The 5th International Conference on Boundary and Finite Element*, 27-29 April, 1995, Constanta, Romania.

6. Calcul parallèle en élasto-plasticité en utilisant la méthode de Schwarz, *Seminar of the Laboratory of Applied Mathematics, University of Savoie*, January 24, 1996, Chambéry, France.
7. Quelques méthodes pour le calcul parallèle, *Seminar of the Laboratory of Mechanics and Technology, Paris 6 University*, February 6, 1996, Cachan, France.
8. Cavitation et endommagement dans les solides, *Seminar of the Laboratory of Mechanics and Technology, Paris 6 University*, February 20, 1996, Cachan, France.
9. Décomposition de domaines. Application à la mécanique des solides, *Seminar of the Laboratory of Modelling and Computing, Joseph Fourier University, National Polytechnic Institute of Grenoble*, April 4, 1996, Grenoble, France.
10. La cavitation en plasticité, *Seminar of the Laboratory of Modelling and Computing, Joseph Fourier University, National Polytechnic Institute of Grenoble*, March 20, 1996, Grenoble, France.
11. On the dynamic cavitation in solids, *Third International Conference on Material Processing Defects*, July 1-3, 1997, Cachan, France.
12. Sur le phénomène de cavitation dans les solides, *Seminar of the Laboratory of Applied Mathematics, University of Chambéry*, September 23, 1997, Chambéry, France.
13. Solution faible et approche éléments finis du problème des Options américaines, *Seminar of the Laboratory of Applied Mathematics, University of Chambéry*, September 26, 1997, Chambéry, France.
14. Quelques conclusions sur une tentative de parallélisation, *Seminar of the Laboratory of Mechanical and Thermodynamic Properties of the Materials, Paris 13 University*, October 22, 1997, Paris, France.
15. On the Schwarz-Neumann method with an arbitrary number of domains, *Seminar of the Institute of Mathematics of the Romanian Academy*, February 11, 1999, Bucharest, Romania.
16. Adaptive mesh finite element method for the sedimentary basin problem, *Conference of Mechanics of Solids*, May 28-29, 1999, Ploiesti, Romania.
17. Sur une méthode spectrale de domaines fictifs utilisant un contrôle optimal distribué, *5-ème Colloque Franco-Roumain de Mathématique Appliquées*, August 28- September 1st, 2000, Constanta, Romania.
18. On an embedding domain method using a distributed optimal control, *Second International Conference on Applied Mathematics*, October 19-21, 2000, Baia Mare, Romania.
19. On the Schwarz-Neumann method with an arbitrary number of domains, *Seminar of Institute of Mathematics, Bergen University*, May 9, 2001, Bergen, Norway.

20. Taux de convergence d'une méthode multiréseau pour des inéquations variationnelles fortement nonlinéaires, *Seminar of the Laboratory of Applied Mathematics, University of Chambéry*, January 29, 2002, Chambéry, France.
21. Convergence rate of a one and two level Schwarz method for strongly nonlinear variational inequalities, *Seminar of Applied Mathematics*, April 15, 2002, University of Bucharest, Faculty of Mathematics, Romania.
22. Taux de convergence d'une méthode de Schwarz multi-niveaux pour des inéquations variationnelles fortement nonlinéaires, *6ème Colloque Franco-Roumain de Mathématiques Appliquées*, September 2-6, 2002, Perpignan, France.
23. Convergence rate of a multiplicative Schwarz method for strongly nonlinear variational inequalities, Conference on *Analysis and Optimization of Differential Systems*, September 10-14, 2002, "Ovidius" University, Constanta, Romania.
24. Taux de convergence d'une méthode de Schwarz multiéchelle pour la minimisation de fonctionnelles non quadratique, November 13, 2003, *Institut de Mathématiques, Ecole Polytechnique Fédérale de Lausanne*, Switzerland.
25. On a Schwarz multigrid method for the constraint minimization of non-quadratic functionals, *The 5th Congres of Romanian Mathematicians*, June 22-28, 2003, Pitesti, Romania.
26. On a multilevel Schwarz method for the Constrained Minimization of non-Quadratic Functionals, *The 15th International Conference on Domain Decomposition Methods*, July 21-25, 2003, Berlin, Germany.
27. One and two-level multiplicative Schwarz methods for the constrained minimization of non-quadratic convex functionals, Conference on *New trends in continuum mechanics*, September 8-12, 2003, Constanta, Romania.
28. Multigrid methods for variational problems, *Joint seminar of IMAR and Faculty of Mathematics, University of Bucharest*, October 9th, 2003 (first part), October 23th, 2003 (second part), Romania.
29. Méthode de Schwarz multi-échelle pour la minimisation de fonctionnelles non quadratiques, *Laboratoire Jacques-Louis Lions, Pierre et Marie Curie (Paris 6) University*, January 19th, 2004, France.
30. On the Schwarz-Neumann method with an arbitrary number of domains, *Institut de Mathématiques, Ecole Polytechnique Fédérale de Lausanne*, March 24, 2004, Switzerland.
31. Schwarz-Neumann method with more than two domains, *The Second European Finite Element Fair*, Berlin, June 4-5, 2004, Germany.
32. Constrained minimization of non quadratic functionals by a multilevel Schwarz method, *IMAR Workshop*, June 22-27, 2004, Bucharest, Romania.

33. (coauthors: I. R. Ionescu and S. Wolf) Schwarz decomposition method in capturing dynamic friction instabilities, *ECCOMAS 2004 - European Congress on Computational Methods in Applied Sciences and Engineering*, 24-28 July 2004, Jyväskylä, Finland.
34. Sur l'Evaluation des Options Américaines, *7ème Colloque Franco-Roumain de Mathématiques Appliquées*, August 30 – September 3, 2004, Craiova, Romania.
35. Méthode Multiréseau pour la Minimisation avec Contraintes de Fonctionnelles Non-Quadratiques, *Seminar of the Laboratory of Applied Mathematics, University of Chambéry*, March 14, 2005, Chambéry, France.
36. Multilevel Schwarz method for the minimization with constraints of non-quadratic functionals, *Conference on Applied Nonlinear Functional Analysis*, June 9-11, 2005, Constanta, Romania.
37. Domain decomposition method for fixed-point problems, "*Caius Iacob*" *National Conference of Fluid Mechanics and Tehnical Applications*, November 25-26, 2005, Bucharest, Romania
38. Additive Schwarz method for the constrained minimization of functionals in reflexive Banach spaces, *17th International Conference on Domain Decomposition Methods*, St. Wolfgang/Strobl, Austria, July 3–7, 2006.
39. Méthodes de décomposition des domaines de Schwarz pour les inéquations avec opérateurs de contraction, *8ème Colloque Franco-Roumain de Mathématiques Appliquées*, August 28 – Septembre 1, 2006, Chambéry, France.
40. One- and two-level Schwarz methods for inequalities with nonlinear operators, *SFB 611 Seminary*, Institute of Applied Mathematics, University of Bonn, April 26, 2007
41. Additive and multiplicative Schwarz methods for inequalities with contraction operators, *6-th Congress of Romanian Mathematicians*, June 28 - July 4, 2007, Bucharest, Romania
42. L. Badea: One- and Two-Level Domain Decomposition Methods for Nonlinear Problems, *First International Conference on Parallel, Distributed and Grid Computing for Engineering*, 6-8 April 2009, Pécs, Hungary

TEACHING EXPERIENCE

- Undergraduate courses in mathematics at the Polytechnic University of Bucharest from 1978 to 1980, Romania.
- Graduate and undergraduate courses in applied mathematics at the Polytechnic University of Ploiesti from 1994 to 1995, Romania.
- Graduate and undergraduate courses in applied mathematics at ENSIMAG, National Polytechnic Institute of Grenoble from 1995 to 1997, France.

- Graduate courses in applied mathematics at University of Chambéry in 1996, France.
- Undergraduate courses in mathematics at Texas A&M University, College Station in 1998, USA.
- Graduate courses in mathematics at University of Chambéry in 2003, France.