

Curriculum vitæ et studiorum of Alessandra Lunardi

1. GENERAL DATA

Born in Lucca (Italy), 01.30.1958.

Present position: Full Professor (Dipartimento di Matematica, Università di Parma, Parco Area delle Scienze 53/A, 43100 Parma, Italy).

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2. STUDIES

Corso di Laurea in Matematica, University of Pisa (Italy), 1976–1980. Perfezionamento in Matematica, Scuola Normale Superiore, Pisa (Italy), 1980–1983.

3. PROFESSIONAL EXPERIENCE

1984-1987 Researcher - Dipartimento di Matematica, Università di Pisa.

1987-1994 Full professor - Dipartimento di Matematica, Università di Cagliari.

1994-present Full professor - Dipartimento di Matematica, Università di Parma.

4. SCIENTIFIC ACTIVITIES SINCE 2000

Present research interests

(a) Kolmogorov equations and related problems: invariant measures, elliptic and parabolic differential operators with unbounded coefficients.

(b) Parabolic free boundary problems, mathematical models in combustion theory.

(c) Evolution problems with time in the whole \mathbb{R} .

Editorial work

Member of the Editorial Boards of the journals *Journal of Evolution Equations*, *Nonlinear Differential Equations and Applications (NoDEA)*, *Journal of Mathematical Analysis and Applications*, *Rivista di Matematica della Università di Parma* (Editor in chief).

Participation to research projects

- “*Analisi e controllo di equazioni di evoluzione deterministiche e stocastiche*”, PRIN-Cofin 2000/02 (as local coordinator)
- “*Equazioni di Kolmogorov*”, PRIN-Cofin 2002/04 (as local coordinator)
- “*Equazioni di Kolmogorov*”, PRIN-Cofin 2004/06 (as local coordinator)
- “*Equazioni di Kolmogorov*”, PRIN-Cofin 2006/08 (as local coordinator)
- “*Proprietà analitiche di semigrupperi di Markov*”, GNAMPA-INDAM 2003 (as national coordinator)
- “*Proprietà analitiche di semigrupperi di Markov*”, GNAMPA-INDAM 2004 (as national coordinator)
- “*Evolution Equations for Deterministic and Stochastic Systems*”, RTN2-2001-00012 (2002/06), European Community

- “Nonlinear partial differential equations describing front propagation and other singular phenomena”, RTN-2001-00303 (2002/06) European Community

Training experience I was the PDH thesis advisor of Luca Lorenzi (2001), Marcello Bertoldi (2002), Davide Di Giorgio (2004), Alessandro Zamboni (2006). By grants of the above research projects, I hosted young foreign researchers in Parma for periods of 4 to 6 months: Olivier Baconneau (2001), Vincent Guyonne (2003), Balint Farkas (2005), Nicolas Saintier (2006), Matthias Geissert (2006), Markus Kunze (2006, 2 months).

Publications

- 1) (with C.-M. Brauner and J. Hulshof) *A general approach to stability in free boundary problems*, Journal of Differential Equations **164** (2000), 16-48.
- 2) (with C.-M. Brauner and O. Baconneau) *Computation of bifurcated branches in a free boundary problem arising in combustion theory*, Mathematical Modelling and Numerical Analysis **34** (2000), 223-239.
- 3) (with C.-M. Brauner) *Instability of the free boundary in a two-dimensional combustion model*, C.R.A.S. Paris **330** (2000), 77-81.
- 4) *Problemi parabolici a frontiera libera*, Bollettino U.M.I. (8) **1-B** (2000), 11-29.
- 5) (with C.-M. Brauner) *Instabilities in a combustion model with free boundary in R^2* , Archive for Rational Mechanics and Analysis **154** (2000), 157-182.
- 6) (with C.-M. Brauner and J. Hulshof) *A critical case of stability in a free boundary problem*, Journal of Evolution Equations **1** (2001), 85-113.
- 7) (with C.-M. Brauner) *Bifurcation of nonplanar travelling waves in a free boundary problem*, Nonlinear Analysis T.M.A. **44** (2001), 247-261.
- 8) (with C.-M. Brauner and Cl. Schmidt-Lainé) *Stability analysis in a multidimensional interface problem*, Nonlinear Analysis T.M.A. **44** (2001), 263-280.
- 9) *On generators of noncommuting semigroups: sums, interpolation, regularity*, in: Evolution Equations, Semigroups and Functional Analysis, in Memory of Brunello Terreni, A. Lorenzi, B. Ruf Eds., Birkhäuser Verlag, Basel (2002), 263-277.
- 10) (with L. Lorenzi) *Stability in a two-dimensional free boundary combustion model*, Nonlinear Analysis TMA **53** (2003), 227-276. Erratum “Stability in a two-dimensional free boundary combustion model” [Nonlinear Anal. 53 (2003) 227-276], Nonlinear Analysis **53** (2003), 859-860.
- 11) (with O. Baconneau) *Smooth solutions to a class of free boundary parabolic problems*, Trans. Amer. Math. Soc. **356** (2004), no. 3, 987-1005.
- 12) (with G. Da Prato) *Elliptic operators with unbounded drift coefficients and Neumann boundary condition*, J. Diff. Eqns. **198** (2004), 35-52.
- 13) (with G. Metafuné) *On the domains of elliptic operators in L^1* , Differential Integral Equations **17** (2004), no. 1-2, 73-97.
- 14) (with G. Da Prato) *On a class of elliptic operators with unbounded coefficients in convex domains*, Rend. Mat. Acc. Naz. Lincei, Serie 9. **15** (2004), 315-326.
- 15) *On a class of parabolic free boundary problems*, in: “Nonlinear partial differential equations and their applications”, GAKUTO Internat. Ser. Math. Sci. Appl., 20, Gakkotosho, Tokyo (2004), 149-158.
- 16) (with G. Guatterri) *Smoothing of quasilinear parabolic operators and applications to forward-backward stochastic systems*, Adv. Differential Equations **10** (2005), no. 1, 65-88.
- 17) (with D. Di Giorgio) *On Fredholm properties of $Lu = u' - A(t)u(t)$ for paths of sectorial operators*, Proc. Royal Soc. Edinb. **135 A** (2005), 39-59.

- 18) (with G. Metafune and D. Pallara) *Dirichlet boundary conditions for elliptic operators with unbounded drift*, Proc. Amer. Math. Soc. **133** (2005), no. 9, 2625–2635. Erratum: Proc. Amer. Math. Soc. **134** (2006), no. 8, 2479–2480.
- 19) (with D. Di Giorgio and R. Schnaubelt) *Fredholm properties of abstract parabolic operators in L^p spaces on the real line*, Proc. London Math. Soc. (3) **91** (2005), no. 3, 703–737.
- 20) (with J. Bouwe van der Berg, C.-M. Brauner, J. Hulshof) *The speed law for highly radiative flames in a gaseous mixture with large activation energy*, SIAM J. Appl. Math. **66** (2006), no. 2, 408–432.
- 21) (with G. Da Prato) *Kolmogorov operators of Hamiltonian systems perturbed by noise*, Partial differential equations and functional analysis, 61–71, Oper. Theory Adv. Appl., 168, Birkhuser, Basel, 2006.
- 22) (with G. Da Prato) *Maximal dissipativity of class of elliptic degenerate operators in weighted L^2 spaces*, Discrete Contin. Dyn. Syst. Ser. B **6** (2006), no. 4, 751–760.
- 23) (with B. Farkas) *Maximal regularity for Kolmogorov operators in L^2 spaces with respect to invariant measures*, J. Math. Pures Appl. **86** (2006), 310–321.
- 24) (with L. Lorenzi) *Elliptic operators with unbounded diffusion coefficients in L^2 spaces with respect to invariant measures*, J. Evol. Equ. **6** (2006), 691–709.
- 24) (with G. Da Prato) *On a class of self-adjoint elliptic operators in L^2 spaces with respect to invariant measures*, J. Diff. Eqns. **234** (2007), 54–79.
- 25) (with G. Da Prato) *On a class of degenerate elliptic operators in L^1 spaces with respect to invariant measures*, Math. Z. **256** (2007), 509–520.
- 26) (with G. Da Prato) *Ornstein-Uhlenbeck operators with time periodic coefficients*, J. Evol. Equ. **7** (2007), 587–614.
- 27) (with C.-M. Brauner, M. Frankel, J. Hulshof, G. Sivashinsky) *On the kappa-theta model of cellular flames: existence in the large and asymptotics*, Discr. Cont. Dyn. Syst. Series S, **1** (2008), 27–39.
- 28) (with M. Geissert) *Invariant Measures and Maximal L^2 Regularity for Nonautonomous Ornstein-Uhlenbeck Equations*, J. Lond. Math. Soc. (2) **77** (2008), no. 3, 719–740.