

CURRICULUM VITAE ET STUDIORUM

CECILIA CAVATERRA

PLACE AND DATE OF BIRTH: Roma (Italy) - May 31st, 1962

CITIZENSHIP: Italian

PRESENT POSITION: Assistant Professor (Ricercatore) in Mathematical Analysis, Department of Mathematics, Università degli Studi di Milano, since november 1990

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EDUCATION

- PhD in Mathematics, Università degli Studi di Bologna, 1993, doctoral dissertation entitled "Alcuni problemi inversi nella teoria dei materiali con memoria".
- Degree in Mathematics summa cum laude (110/110 e lode), Università degli Studi di Milano, 1986, master dissertation (tesi di laurea) entitled: "Identificazione di coefficienti in equazioni iperboliche non lineari".

FELLOWSHIPS

- CNR (National Research Council) fellowship at Istituto di Analisi Globale e Applicazioni, Firenze (Italy), November 1987 - November 1988.

ABILITATION

- Abilitation to the role of Associate Professor in Mathematical Analysis since November 28, 2017.

AFFILIATIONS

- Member of Gruppo Nazionale per l'Analisi Funzionale e le sue Applicazioni (GNAMPA).
- Member of Unione Matematica Italiana (UMI).

PUBLICATIONS

- 1) "An inverse problem for a semilinear wave equation", Boll. Un. Mat. Ital. B (7) 2 (1988), no. 3, 965-711.
- 2) (with M. Grasselli), "Identifying memory kernels in linear thermoviscoelasticity of Boltzmann type", Math. Models Methods Appl. Sci. 4 (1994), no. 6, 807-842.
- 3) (with M. Grasselli), "An inverse problem for the linear viscoelastic Kirchhoff plate", Quart. Appl. Math. 53 (1995), no. 1, 9-33.
- 4) (with A. Lorenzi), "An identification problem for the Maxwell equations in a non-homogeneous dispersive medium", Differential Integral Equations 8 (1995), no. 5, 1167-1190.
- 5) (with M. Grasselli), "On an inverse problem for a model of linear viscoelastic Kirchhoff plate", J. Integral Equations Appl. 9 (1997), no 3, 179-219.
- 6) "An inverse problem for a viscoelastic Timoshenko beam model", Z. Anal. Anwendungen 17 (1998), no. 1, 67-87.

- 7) (with F. Colombo), "Automatic control problems for reaction-diffusion systems", *J. Evol. Equ.* 2 (2002), no. 2, 241-273.
- 8) (with F. Colombo), "Identifying a heat source in automatic control problems", *Comm. Appl. Nonlinear Anal.* 11 (2004), no. 7, 1-23.
- 9) (with M. Grasselli), "Robust exponential attractors for population dynamics models with infinite time delay", *Discrete Contin. Dyn. Syst. Ser. B* 6 (2006), no. 5, 1051-1076.
- 10) (with A. Lorenzi and M. Yamamoto), "A stability result via Carleman estimates for an inverse source problem related to a hyperbolic integro-differential equation", *Comput. Appl. Math.* 25 (2006), no. 2-3, 229-250.
- 11) (with M. Grasselli), "Asymptotic behavior of population dynamics models with nonlocal distributed delays", *Discrete Contin. Dyn. Syst. Ser. A* 22 (2008), no. 4, 861-883.
- 12) (with M. Grasselli), "Robust exponential attractors for singularly perturbed Hodgkin-Huxley equations", *J. Differential Equations* 246 (2009), no. 12, 4670-4701.
- 13) (with C. Gal, M. Grasselli e A. Miranville) "Phase-field systems with nonlinear coupling and dynamic boundary conditions", *Nonlinear Anal.* 72 (2010), no. 5, 2375-2399.
- 14) (with C. Gal e M. Grasselli) "Cahn-Hilliard equations with memory and dynamic boundary conditions", *Asymptot. Anal.* 71 (2011), no. 3, 123-162.
- 15) (with E. Beretta) "Identifying a space dependent coefficient in a reaction-diffusion equation", *Inverse Probl. Imaging* 5 (2011), no. 2, 285-296.
- 16) (with D. Guidetti) "Identification of a convolution kernel in a control problem for the heat equation with a boundary memory term", *Ann. Mat. Pura Appl.* 193 (2014) no. 3, 779-816.
- 17) (with E. Rocca) "On a 3D isothermal model for nematic liquid crystals accounting for stretching terms", *Z. Angew. Math. Phys.* 64 (2013), no. 1, 69-82.
- 18) (with E. Rocca and H. Wu) "Global weak solution and blow-up criteria of the general Ericksen-Leslie system for nematic liquid crystal flows", *J. Differential Equations* 255 (2013), no. 1, 24-57.
- 19) (with M. Grasselli and H. Wu) "Non-isothermal viscous Cahn-Hilliard equation with inertial term and dynamic boundary conditions", *Commun. Pure Appl. Anal.* 13 (2014), no. 5, 1855-1890.
- 20) (with D. Guidetti) "Identification of a source factor in a control problem for the heat equation with a boundary memory term", *Math. Methods Appl. Sci.* 38 (2015), no. 18, 4818-4839.
- 21) (with E. Rocca, H. Wu and X. Xu) "Global strong solutions of the full Navier-Stokes and Q-tensor system for nematic liquid crystal flows in two dimensions", *SIAM J. Math. Anal.* 48 (2016), no. 2, 1368-1399.
- 22) (with E. Beretta, J.H. Ortega and S. Zamorano) "Size estimates of an obstacle in a stationary Stokes fluid", *Inverse Problems* 33 (2017), no. 2, 29 pp.
- 23) (with E. Rocca and H. Wu) "Optimal boundary control of a simplified Ericksen-Leslie system for nematic liquid crystal flows in 2D", *Arch. Ration. Mech. Anal.* 224 (2017), no. 3, 1037-1086.
- 24) (with E. Beretta, M.C. Cerutti, A. Manzoni and L. Ratti) "An inverse problem for a semilinear parabolic equation arising from cardiac electrophysiology", *Inverse Problems* 33 (2017), no. 10, 32 pp.

SUBMITTED

- (with E. Bonetti, F. Freddi, M. Grasselli and R. Natalini) "Existence results for a PDE system describing marble sulphation in presence of surface rugosity" (arXiv1710.01225, October 2017).

PROCEEDINGS – INTERNAL REPORTS

- 1) (with G. Talenti and F. Tonani) "First approach to diffusion and convection in a geologic setting", *pubblicazioni dell'Istituto di Analisi Globale e Applicazioni del CNR*, no. 51 (1990), 1-33.
- 2) "Automatic control problems for integrodifferential parabolic equations, Mathematical models and methods for smart materials" (Cortona, 2001), 19-29, *Ser. Adv. Math. Appl. Sci.*, 62, World Sci. Publ., River Edge, NJ, 2002.

RESEARCH EXPERIENCES

- Department of Mathematics, Rutgers University, New Brunswick NJ (USA).
- Department of Mathematics, Ohio University, Athens OH (USA).
- Graduate School of Mathematical Sciences, University of Tokyo (Giappone).
- Department of Mathematics, Università di Poitiers (Francia).
- Institute of Mathematics, Fudan University, Shanghai (Cina).
- King Abdullah University of Sciences & Technology - KAUST (Saudi Arabia).
- Departamento Ecuaciones Diferenciales Y Analisis Numerico, Universidad de Sevilla (Spagna).
- Erwin Schrödinger International Institute for Mathematics and Physics (ESI), Vienna (Austria).
- New York University, Abu Dhabi (Emirati Arabi Uniti).

SEMINARS AT CONFERENCES

- 1) "Un problema inverso per una equazione iperbolica semilineare", XIII Congresso UMI, September 3-9, 1987, Torino (Italy).
- 1) "Diffusion of gas from sources in the underground", Venice 1: Symposium on Applied and Industrial Mathematics, October 2-6 1989, Venezia (Italy).
- 2) "Un problema di identificazione per la piastra di Kirchhoff viscoelastica", XIV Congresso UMI, September 19-25, 1991, Catania (Italy).
- 3) "Propagazione di onde elettromagnetiche in mezzi dispersivi non omogenei", Convegno Progetto Nazionale Equazioni Differenziali, April 15-16, 1993, Firenze (Italy).
- 4) "An inverse problem for a thermoviscoelastic plate model", Inverse Problems in Engineering Sciences (IPES-94), July 27-30, 1994, Osaka (Japan).
- 5) "Identifying relaxation kernels in viscoelastic plates and beams", Symposium on Inverse Problems, March 13-14, 1995, Chemnitz (Germany).
- 6) "Un problema inverso per un modello lineare di piastra di Kirchhoff viscoelastica", XV congresso UMI, September 11-16, 1995, Padova (Italy).
- 7) "An inverse problem for a viscoelastic Timoshenko beam model", Volterra Centennial Symposium, May 23-25, 1996, Arlington (USA).
- 8) "Un problema inverso per un modello viscoelastico di trave di Timoshenko", Giornate di studio sui problemi iperbolici, October 10-12, 1996, Torino.
- 9) "An inverse problem for a viscoelastic Timoshenko beam model", 2nd Saxon Symposium on Inverse Problems, Mathematical Methods and Applications, September 24-26, 1997, Oybin (Germany).
- 10) "Automatic control problems for reaction-diffusion systems", WCNA-2000, July 22-26, 2000, Catania (Italy).
- 11) "Problemi di controllo automatico per equazioni paraboliche integrodifferenziali", Workshop: Modelli matematici e problemi analitici per materiali speciali", June 25-29, 2001, Cortona (Italy).
- 12) "Global large time behavior of population dynamics with memory", Inverse and Direct Problems, June 20-24, 2005, Cortona (Italy).
- 13) "Exponential attractors for population dynamics models with non local delays", Evolution Equations: Direct and Inverse Problems, September 18-20, 2006, Bologna (Italy).
- 14) "Exponential attractors for population dynamics models with non local delays", International Conference on Nonlinear Partial Differential Equations and their Applications, June 1-4, 2007, Shanghai (China).
- 15) "On the singularly perturbed Hodgkin-Huxley equations", International Conference on Interdisciplinary Mathematical and Statistical Techniques (IMST2008), May 16-18, 2008, Memphis (USA).
- 16) "Robust exponential attractors for singularly perturbed Hodgkin-Huxley equations", 7th AIMS International Conference on Dynamical Systems, Differential Equations and Applications, May 18-21, 2008 Arlington (USA).

- 17) "Phase-field systems with nonlinear coupling and dynamic boundary conditions", 6th European Conference on Elliptic and Parabolic Problems, May 25-29, 2009, Gaeta (Italy).
- 18) "Phase-field systems with nonlinear coupling and dynamic boundary conditions", VIII Workshop on Partial Differential Equations, August 25-28, 2009, Rio de Janeiro (Brazil).
- 19) "Cahn-Hilliard equations with memory and dynamic boundary conditions", 8th AIMS International Conference on Dynamical Systems, Differential Equations and Applications, May 25-28, 2010 Dresda (Germany).
- 20) "Cahn-Hilliard equations with memory and dynamic boundary conditions", Workshop on deterministic and stochastic dynamical systems, April 04, 2011, Siviglia (Spain).
- 21) "Identifying a space dependent coefficient in a reaction-diffusion equation", Conference of the European GDR Control of PDEs, November 21-23, 2011, Marsiglia (France).
- 22) "On a 3D isothermal model for nematic liquid crystals accounting for stretching terms", INdAM Workshop Mathematical Models and Analytical Problems in Special Materials, April 16-20, 2012, Roma (Italy).
- 23) "On a 3D isothermal model for nematic liquid crystals accounting for stretching terms", PDEs for multiphase advanced materials ADMAT2012, September 17-21, 2012, Cortona (Italy).
- 24) "Identifying a space dependent coefficient in a reaction-diffusion equation", Applied analysis for the material sciences - Conference in honor of Michael Vogelius 60th birthday, May 27-31, 2013, Luminy (France).
- 25) "Long-time dynamics of a hyperbolic non-isothermal viscous Cahn Hilliard equation with dynamic boundary conditions", Diffuse interface models DIMO2013, September 10-13, 2013, Levico Terme (Italy).
- 26) "Global weak solution and blow-up criterion of the general Ericksen-Leslie system for nematic crystal flows", 10th AIMS conference, July 7-11, 2014, Madrid (Spain).
- 27) "Identification of a source factor in a control problem for the heat equation with a boundary memory term", 10th AIMS conference, July 7-11, 2014, Madrid (Spain).
- 28) "Global weak solution and blow-up criterion of the general Ericksen-Leslie system for nematic crystal flows", 3rd Amarena Day, April 27, 2015, Amiens (France).
- 29) "Global weak solution and blow-up criterion of the general Ericksen-Leslie system for nematic crystal flows", Workshop on Deterministic and Stochastic Partial Differential Equations, June 18, 2015, Siviglia (Spain).
- 30) "Non-isothermal viscous Cahn-Hilliard equation with inertial term and dynamic boundary conditions", 8th Congress Romanian Mathematicians, June 26- July 01, 2015, Iasi (Romania).
- 31) "Global strong solutions of the full Navier-Stokes and Q-tensor system for nematic liquid crystal flows in 2D: existence and long-time behavior", 4th Amarena Day, May 09, 2016, Amiens (France).
- 32) "Global strong solutions of the full Navier-Stokes and Q-tensor system for nematic liquid crystal flows in 2D: existence and long-time behavior ", OCERTO 2016, June 20-24, 2016, Cortona (Italy).
- 33) "Global strong solutions of the full Navier-Stokes and Q-tensor system for nematic liquid crystal flows in 2D: existence and long-time behavior", SIMAI2016, September 13-16, 2016, Milano (Italy).
- 34) "Mathematical Modeling of Damage, Conservation and Restoration of Cultural Heritage", Scientific Research for Cultural Heritage, February 27-March 01, 2017, Abu Dhabi (United Arab Emirates).
- 35) "Optimal boundary control of a simplified Ericksen-Leslie system for a nematic liquid crystal flows in 2D", 5th Amarena Day, May 15-16, 2017, Amiens (France).
- 36) "An inverse problem for a semilinear parabolic equation arising from cardiac electrophysiology", Current trends in applied mathematics, October 27-29, 2017, Iasi (Romania).
- 37) "Optimal boundary control of a simplified Ericksen-Leslie system for a nematic liquid crystal flows in 2D", International Conference on Applied Mathematics, January 3-6, 2018, Miami (USA).
- 38) "An optimal boundary control problem for nematic liquid crystal flows in 2D", Workshop Trends in variational evolution, February 21, 2018, Vienna (Austria).

OTHER TALKS

- 1) "An identification problem for the Maxwell equations in a non-homogeneous dispersive medium", Graduate School of Mathematical Sciences, University of Tokyo, August 03, 1994, Tokyo (Japan).
- 2) "Identifying relaxation kernels of linear viscoelastic plates and beams", Ohio University, May 29, 1996, Athens OH (USA).
- 3) "Inverse and direct problems for a model of viscoelastic Timoshenko beam with nonlinearities", Institut für Angewandte Mathematik I, Bergakademie, September 22, 1997, Freiberg (Germany).
- 4) "Analysis of a semilinear hyperbolic integrodifferential system", Ohio University, May 07, 1998, Athens OH (USA).
- 5) "Identifying memory kernels in thermoviscoelasticity", Ohio University, May 13, 1998, Athens OH (USA).
- 6) "Automatic control problems for reaction-diffusion systems", Dipartimento di Matematica, Technion, May 30, 2001, Haifa (Israel).
- 7) "Automatic control problems for integrodifferential parabolic equations", Dipartimento di Matematica, Università di Modena, March 05, 2003, Modena (Italy).
- 8) "Automatic control problems for integrodifferential parabolic equations", Poitiers University, May 27, 2004, Poitiers (France).
- 9) "Automatic control problems for integrodifferential parabolic equations", Fudan University, May 11, 2005, Shanghai (China).
- 10) "Perturbazioni singolari delle equazioni di Hodgkin-Huxley", Università degli Studi di Firenze, April 11, 2008, Firenze (Italy).
- 11) "Global weak solution and blow-up criterion of the general Ericksen-Leslie system for nematic crystal flows", November 26, 2013, KAUST, (Saudi Arabia).
- 12) "Global weak solution and blow-up criterion of the general Ericksen-Leslie system for nematic crystal flows", March 19, 2014, Fudan University, Shanghai (China).
- 13) "Global weak solution and blow-up criterion of the general Ericksen-Leslie system for nematic crystal flows", May 26, 2014, Poitiers University (France).
- 14) "An inverse problem for a semilinear parabolic equation arising from cardiac electrophysiology" May 31, 2017, Fudan University, Shanghai (China).
- 15) "An inverse problem for a semilinear parabolic equation arising from cardiac electrophysiology", October 19, 2017, Istituto di Statistica Matematica e Matematica Applicata, Bucarest (Romania).

EDITORIAL ACTIVITY

- 1) Member of the editorial board of Discrete and Continuous Dynamical Systems Series S.
- 2) Co-editor (with P. Cannarsa, A. Favini, A. Lorenzi, E. Rocca) of the volume "New trends in direct, inverse, and control problems for evolution equations", Discrete Contin. Dyn. Syst. Ser. S, 4 (2011).
- 3) Co-editor (with E. Bonetti, E. Rocca, R. Rossi) of the volume "Special issue dedicated to Michel Frémond on the occasion of his 70th birthday", Discrete Contin. Dyn. Syst. Ser. S, 6 (2013).

REFEREE AND REVIEW ACTIVITY

- 1) Referee for: Mathematical Methods in the Applied Sciences, Discrete and Continuous Dynamical Systems, Nonlinear Analysis Series A: Theory, Methods & Applications, Applicable Analysis, Mathematical Modeling and Analysis, Electronic Journal of Differential Equations, Inverse Problems, AIMS Proceedings, Czechoslovak Mathematical Journal, Springer INDAM Series, Applied Mathematics Letters, Journal of Optimization Theory and Applications, Mathematic Control and related Fields, Journal of Mathematical Analysis and Applications, Communications on Pure and Applied Analysis.
- 2) Referee for INdAM fellowships in Mathematics and/or Applications cofounded by Marie Curie Actions.
- 3) Reviewer for Mathematical Reviews since 2006.

SCIENTIFIC AND ORGANIZING COMMITTEES

- 1) Second Meeting on Inverse and Direct Problems and Applications (Gargnano, April 02-06, 2001).
- 2) Minicorsi progetto di formazione INdAM "Problemi Inversi ed Applicazioni" (Milano December 09-13, 2002).
- 3) Third Meeting on Inverse and Direct Problems and Applications (Gargnano, March 31-April 04, 2003).
- 4) Evolution Equations: Inverse and Direct Problems (Cortona , June 20-25, 2004).
- 5) Direct and Inverse Problems in Evolution Equations (Rimini, March 17-19, 2005).
- 6) Inverse and Control Problems for PDE's (ICOP) (Roma, March 13-16, 2006).
- 7) Direct, Inverse and Control Problems for PDE's (DICOP) (Roma, June 25-28, 2007).
- 8) Direct, Inverse and Control Problems for PDE's (DICOP-08) (Cortona, September 22-26, 2008).
- 9) Interfaces and Discontinuities in Solids, Liquids and Crystals (INDI2011) (Gargnano, June 20-23, 2011).
- 10) Workshop "Applications in Inverse Problems" (Milano, January 26-29, 2015).
- 11) Special Materials in Complex Systems, (SMaCS 2015) (Roma, May 18-22, 2015).
- 12) Special Materials and Complex Systems, (SMaCS 2018) (Gargnano, June 18-22, 2018).
- 13) SS144 - Analytic properties and numerical approximation of differential models arising in applications, AIMS 12th conference (Taipei, July 05-09, 2018).

RESEARCH PROJECTS

- 1) PRIN 1997- Equazioni differenziali e integrodifferenziali: problemi diretti ed inversi (Coordinator Giorgio Talenti).
- 2) PRIN 1999 - Analisi ed approssimazione numerica di problemi di evoluzione (Coordinator Giorgio Talenti).
- 3) PRIN 2004 - Problemi di identificazione per equazioni e sistemi di evoluzione differenziali ed integrodifferenziali, lineari e non lineari (Coordinator Giovanni Alessandrini).
- 4) PRIN 2008 - Problemi inversi per equazioni di evoluzione (Coordinator Giovanni Alessandrini).
- 5) Project GNAFA-GNAMPA 2001 - Problemi inversi per equazioni di evoluzione (Coordinator Giovanni Alessandrini).
- 6) Project GNAMPA 2004 - Problemi diretti ed inversi per equazioni di evoluzione (Coordinator Alfredo Lorenzi).
- 7) Project GNAMPA 2008 - Equazioni di evoluzione nelle scienze dei materiali come sistemi dinamici infinito-dimensionali (Coordinator Giulio Schimperna).
- 8) Project GNAMPA 2009 - Analisi matematica di formulazioni energetiche ed entropiche per problemi non-smooth in termomeccanica (Coordinator Elena Bonetti).
- 9) Project GNAMPA 2010 - Analisi di modelli ad interfaccia diffusa di fluidi interagenti (Coordinator Elisabetta Rocca).
- 10) Project GNAMPA 2012 - Analisi matematica per flussi di cristalli liquidi (Coordinator Antonio Segatti).
- 11) Italian-French European Research Group on Control of PDE, GDRE-CONEDP (Coordinators Fatiha Alabau-Boussouira, Fabio Ancona, Piermarco Cannarsa, Olivier Glass).
- 12) Project GNAMPA 2012 - Analisi matematica per flussi di cristalli liquidi (Coordinator Antonio Segatti).
- 13) Project GNAMPA 2016 - Buona positura e analisi asintotica per modelli di cristalli liquidi e polimeri (Coordinator **Cecilia Cavaterra**).
- 14) Project GNAMPA 2017 - Problemi di riduzione dimensionale nell'ambito del contatto con adesione e analisi del caso dinamico (Coordinator Giovanna Bonfanti).
- 15) Collaborator of Institute CNR IMATI of Pavia for the projects: 1) Mathematical Modeling 2) Bilateral Agreement-Romania RA (Romanian Academy).
- 16) Bilateral agreement project Italia-Romania "Control and stabilization problems for phase-field and biological systems", Coordinator Pierluigi Colli, Università di Pavia.

- 17) Project GNAMPA 2018 - Analisi Matematica di modelli a interfaccia diffusa per fluidi complessi (coordinator Andrea Giorgini).

OTHER ACTIVITIES

- Advisor or co-advisor of Master theses.
- Member of an evaluation committee for a researcher position at Università degli Studi di Sassari.
- Department of Mathematics board member, September 2005 - September 2011.
- Member of PhD board in Scienze Matematiche, Università degli Studi di Milano, academic years 13/14, 14/15, 15/16, 16/17, 17/18.
- Organizer with Ottavio Rizzo and Giulia Lami of the exhibition "Enigma: decifrare una vittoria. I polacchi (e la matematica) al servizio dell'Europa", Dipartimento di Matematica, Università degli Studi di Milano, April 12-2, 2012.
- Member of the Municipal Council of Saronno, responsible for youth, education, culture, sports and equal opportunities, May 2010 – June 2015.

TEACHING ACTIVITIES (in italian)

- 1) Tutor for Istituzioni di Matematiche (corso di laurea in Scienze Biologiche), Istituzioni di Matematiche II (corso di laurea in Chimica Industriale), Analisi Matematica I (corso di laurea in Scienze dell'Informazione), Analisi Matematica II (corso di laurea in Scienze dell'Informazione), Istituzioni di Matematiche I (corso di laurea in Scienze Geologiche), Istituzioni di Matematiche II (corso di laurea in Scienze Geologiche), Analisi Matematica I (corso di laurea in Matematica), Analisi Matematica II (corso di laurea in Matematica), academic years 90/91, 91/92, 92/93 93/94, 94/95, 95/96, 96/97, 97/98, 98/99, 99/00, 00/01 .
- 2) ANALISI MATEMATICA II, corso di laurea in Informatica, academic years 99/00, 00/01, 01/02.
- 3) COMPLEMENTI DI ANALISI, corso di laurea SPECIALISTICA IN TECNOLOGIE DELL'INFORMAZIONE E DELLA COMUNICAZIONE, academic years 03/04, 04/05, 05/06, 06/07, 07/08, 08/09.
- 4) MATEMATICA I, corso di laurea SCIENZE GEOLOGICHE, academic years 02/03, 03/04, 04/05, 05/06, 06/07, 07/08, 08/09, 09/10, 10/11, 11/12, 12/13, 13/14, 14/15.
- 5) EQUAZIONI ALLE DERIVATE PARZIALI II, corso di laurea MAGISTRALE IN MATEMATICA and DOTTORATO DI RICERCA IN MATEMATICA, academic year 09/10.
- 6) EQUAZIONI DI EVOLUZIONE, corso di laurea MAGISTRALE IN MATEMATICA and DOTTORATO DI RICERCA IN MATEMATICA, academic years 10/11, 11/12, 12/13.
- 7) ANALISI MATEMATICA 1, corso di laurea in MATEMATICA, academic years 13/14, 14/15, 15/16, 16/17.