Umberto Mosco
WPI
Harold J. Gay Professor of Mathematics
May 18, 2021

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Worcester Polytechnic Institute
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Curriculum Vitae

Current position: Harold J. Gay Professor of Mathematics, Worcester Polytechnic Institute, Worcester MA, U.S.A.

Languages: English, French, German, Italian (mother language)

Specialization: Applied Mathematics

Research Interests:: Fractal and Partial Differential Equations, Homogenization, Finite Elements Methods, Stochastic Optimal Control, Variational Inequalities, Potential Theory, Convex Analysis, Functional Convergence.

Twelve Most Relevant Research Articles

1. Time, Space, Similarity. Chapter of the book "New Trends in Differential Equations, Control Theory and Optimization, pp. 261-276, WSPC-World Scientific Publishing Company, Hackenseck, NJ, 2016.

2. Layered fractal fibers and potentials (with M.A.Vivaldi). J. Math. Pures Appl. **103** (2015) pp. 1198-1227. (Received 10.21.2013, Available online 11.4.2014).

3. Vanishing viscosity for fractal sets (with M.A.Vivaldi). Discrete and Continuous Dynamical Systems - Special Volume dedicated to Louis Nirenberg, 28, N. 3, (2010) pp. 1207-1235.

4. Fractal reinforcement of elastic membranes (with M.A.Vivaldi). Arch. Rational Mech. Anal. 194, (2009) pp. 49-74.

5. Gauged Sobolev Inequalities. Applicable Analysis, **86**, no. 3 (2007), 367-402.

6. Invariant field metrics and dynamic scaling on fractals. Phys. Rev. Letters, **79**, no. 21, Nov. (1997), pp. 4067-4070.

7. Variational fractals. Ann. Scuola Norm. Sup. Pisa Cl. Sci. (4) **25** (1997) No. 3-4, pp. 683-712.

8. A Saint-Venant type principle for Dirichlet forms on discontinuous media (with M. Biroli). Publ. Labor. Anal. Numer. U. Paris VI, No. R93005, March 1993, Ann. Math. Pura Appl. (IV), **CLXIX**, 1995, pp. 125-181.

9. Composite media and asymptotic Dirichlet forms. Featured Reviews, Amer. Math. Soc., 1995, J. Funct. Anal, **123**, 1994, no. 2, pp. 368-421.

10. A pointwise regularity theory for the two-obstacle problem (with G. Dal Maso and M.A. Vivaldi). Acta Math, **163**, no. 1-2, 1989, pp. 57-107.

11. Wiener criterion and potential estimates. Indiana J. Math., **36**, 1987, pp. 455-494.

12. Convergence of convex sets and of solutions of variational inequalties, Adv. in Math., **3**, 4, 1969, pp. 510-585.

Books

- New Directions in Dirichlet Forms. Co-authored by J. Jost, W. Kendall, U. Mosco, M. Röckner and K.-Th. Sturm. AMS/IP Stud. Adv. Math. **8**. AMS., Providence, RI, USA, 1998.

- An Introduction to the Approximate Solution of Variational Inequalities. (in Chinese) [Transl. Wang L.H. and Wang Z.S., Shangai 1985], Chinese Academy of Sciences, Bejing, China, 1985

- Transformada de Fourier y Distribuciones, National University of Rosario, Argentina, 1972

Selected Lecture Notes

- Functional Analysis, WPI, 2014.

- Optimal Design of Fractal Boundaries, WPI and University of Rome, 2013.

- Hilbert Spaces and Applications to PDE, WPI, 2012.

- Advanced Calculus, WPI, 2011.

- Convex Analysis, WPI, 2010.

- An elementary introduction to fractal analysis. Springer-Verlag Italia, Math. Notes. 28, 2004.

- Measure-valued Lagrangians. PhD course, University of Roma La Sapienza, Roma, Italy, 2004. Memorie Mat. Appl. Rendiconti Acc.XL, 2006.

- Some introductory remarks on implicit variational problems. Aligarh University, Aligarh, India, 1989. Recent Developments in Applicable Mathematics. MacMillan Media Ltd ed., India, 1994.

- Forme di Dirichlet, mezzi compositi e controllo (Italian). PhD course, Department Me.Mo.Mat,, University of Roma La Sapienza, Roma, Italy, 1995.

- Implicit variational problems and quasi-variational inequalities. Lecture Notes in Mathematics 543, Springer V., Berlin - New York, 1976.
- Inéquations quasi-variationnelles. (Arab/French). Cours D.E.A., Ghezireh University of Alger, Alger, Algeria, 1984.
- An introduction to the approximate solution of variational inequalities. CIME course, Erice, Italy, 1971. CIME Lecture Notes, Cremonese Ed., Roma, Italy, 1973.

Students, post-docs

PRESENT– 2005

PHD ADVISEES:

Haodong Liang, PhD Degree WPI 2013. Dissertation *Fractal Interfaces and Heat Transmission Problems*, WPI April 2013. Research papers.
Emily J. Evans, PhD Degree WPI 2011. Dissertation *Extension Operators and Finite Elements for Fractal Boundaries*. WPI April 2011. Research papers.
Rebecca Wasyk, PhD Degree WPI 2007. Dissertation *Finite Element Approximations of Pre-Fractal Transmission problems*. WPI April 2007.

MS ADVISEES:

Pan Liu, MS Degree and Thesis, WPI 2012. Research papers.
Haodong Liang, MS student, MS Degree and Thesis, WPI 2009. Research papers.
Eric Mbakop, BS/ MS, MS Degree, WPI 2008. Research papers.

MQP/ISP ADVISEES:

Shao Shen, MQP Project, WPI 2012.
Haodong Liang, MQP Project and Research papers, GRAD WPI 2011.
Yiqing Li, PhD student, ISP and Report, WPI 2012.
Alex Ramsay, MQP Project, WPI 2009
Michelle Terry, MQP Project, WPI 2009
Emily Evans, MQP Project and Thesis, First Prize GRAD, WPI 2008.
Joseph Strong, MQP Project and Thesis, WPI, 2008
Rebecca Wasyk, MQP, First Prize GRAD, WPI 2007

POSTDOCS:

Alfredo Donno, WPI March-April 2014. Research papers.
Massimo Cefalo, WPI March-April 2014, University of Roma Italy 2011-2013, Research papers.
Guido Dell'Acqua, University of Roma, Italy, 2012. Research papers.
Jun Masamune, Post-doc, WPI 2008. Research papers.

PRIOR TO 2005:

Since late 60's to 2005, several Ph.D., and graduate students, now all professors in various Italian Universities, among others L. Boccardo, P. Marcellini, I. Capuzzo-Dolcetta, M. Matzeu, M. A. Vivaldi, M. Angrisani, M. Falcone, I. Birindelli, G. Posta, A. Garroni, V. De Cicco and several researchers and post-docs from various countries, among others N. Tchou (France), J. Masamune

(Japan), U. Freiberg, K.Th. Sturm (Germany), M.R. Lancia, P. Vernole M.V. Marchi, F. Cagnetti, R. Capitanelli (Italy), A. Gachechiladze (Georgia).

Selected Grants, Contracts

PRESENT-2005:

NSF Grant Award ID 1109356, 2011-2014, *Fractal Fibers and Singular Homogenization*, co-PI Professor Bogdan Vernescu

NSF Grant Award ID 0807840, 2008-2011, *Transmission Problems with Large Surfaces*, co-PI Professor Bogdan Vernescu

PRIOR TO 2005:

1970–2008, Several Research Contracts by CNR (Italian Research Council), MURST and MIUR (Italian Ministry for Research and Universities), Univesity of Rome "La Sapienza", INDAM (Istituto Nazionale di Alta Matematica)

1985-1989, International Contracts by European (EEC) ERASMUS Program, with Prof. H. Brezis and Prof. H. Beresticky (Paris) and Prof. S. Hildebrandt (Bonn), Project for a joint Graduate Program by the Universities of Bonn, Roma "La Sapienza" and Paris VI

1970-1980, Several International Research Contracts by CNR (Consiglio Nazionale delle Ricerche) and the University of Rome "La Sapienza" for bilateral research cooperation programs with various foreign Universities, *e.g.*: Courant Institute of New York University and NSF (Prof. L. Nirenberg), University of Bordeaux (Prof. J. L. Joly), University Paris IX Dauphine (Prof. J. P. Aubin, Prof. A. Bensoussan, Prof. I. Ekeland), University Paris VI "Pierre et Marie Curie" (Prof. H. Brezis)

Honors, Awards, Distinctions

Member of the Accademia Nazionale Delle Scienze Detta Dei X, Roma, Italy

Alexander-von-Humboldt Stiftung Preisträger, Germany

2020 Special Volume of Journal "Convex Analysis" (published by Norbert Heldermann Verlag, Germany) in Honor of Umberto Mosco, Eds. Lucio Boccardo, Giuseppe Buttazzo, Italo Capuzzo Dolcetta. To appear in 2020.

2012-2013 Invitation to visit MIT from 9.1.2012 to 5.15,1013 during the sabbatical leave

2012-2013 Sabbatical leave for the 2012-2013 academic year at half salary awarded by WPI in 2012

2013 Appointment by the University of Rennes I, France, as *Rapporteur* for the Thèse d'État by Thibaut Deheuvel, Rennes, March 2013

2013 Appointed Editor in the Elsevier Journal NONRWA (Nonlinear Analysis, Real World Applications).

2013 WPI Interview and Video for WPI "Transformations" Magazine

2009 International Conference in Honor of Umberto Mosco, University of Roma "La Sapienza", Faculty of Engineering, Chiostro del Bramante, Roma, Italy

2009 Plenary Lecture, AMS Spring Eastern Section Meeting, Worcester MA, USA

2008 WPI Distinction, by the President and Provost

2005 "Diploma di Benemerenza" and Silber Medal, Aula Magna, University of Rome "La Sapienza", Italy

2004 Marconi Lecture at the Royal Academy of Sciences, Stockholm, Sweden

2002 Gold Medal for Mathematics 2002, by Accademia.Nazionale Delle Scienze Dette Dei XL, Roma, Italy

1998 Alexander-von-Humboldt Foundation Research Award, Domenikaner-bibliotek, Bamberg, Germany

1998 Featured Review, American Mathematical Society, USA

1996 A. Feltrinelli Award for Mathematics, Mechanics and Applications by Accademia Nazionale dei Lincei, Roma, Italy

1991 Plenary lecture, UMI (Italian Mathematical Union), Catania, Italy

1969 A. Bonavera Award, by Accademia delle Scienze di Torino, Torino, Italy

1955 Nomination to "Allievo ricercatore", by Istituto Nazionale Alta Matematica, Committee: F.Severi, G.Bompiani, L.Fantappié, G.Krall, M.Picone, B.Segre, A.Signorini, Roma. Italy

Editorial Boards

NONRWA (Nonlinear Analysis Real World Applications)

deGruyter Monograph Series in Nonlinear Analysis and Applications

Numerical and Functional Analysis Applications

Zetschrift fúr Analyse und ihre Anwendungen (Journal for Analysis and its Applications)

Advances in Mathematical Sciences and Applications

Journal of Convex Analysis

Numerical Functional Analysis and Optimization

Journal of Functional Analysis and Approximation Theory

Journal of the Indian Society of Industrial and Applied Mathematics

Societies

AMS (American Mathematical Society)

SIAM (Society for Industrial and Applied Mathematics)

UMI (Italian Mathematical Union)

EMS (European Mathematical Society)

Professional Qualifications

1971 Full Professorship Nomination (first place in Chair Concorso), by the National Committee for the Chair of Advanced Mathematical Analysis at the University of Bologna, Bologna, Italy, 1971.

1969 Full Professorship's Qualification (Maturitá), by the National Committee for the Chair of Mathematical Analysis at the University of Lecce, Lecce, Italy, 1969

1967 Lecturer Qualification (Libera Docenza) in Mathematical Methods of Physics, Italy

1961 Degree in Physics, University of Rome, Rome, Italy (Thesis Advisor Prof. Raul Gatto)

1959 Degree in Mathematics, University of Rome, Rome, Italy (Thesis Advisor Prof. Gaetano Fichera)

1955 Qualification as Research Student ("Allievo ricercatore") from Istituto Nazionale di Alta Matematica (Director Prof. Francesco Severi), Roma, Italy

1955 High School Diploma (Maturitá), Liceo SCientifico Augusto Righi, Roma, Italy

Appointments

USA

Present-2005 Harold J. Gay Professor of Mathematics, Worcester Polytechnic Institute Worcester MA, U.S.A.

1986 Visiting Professor, Northwestern University (under-graduate courses), Evanston, Illinois, USA

ITALY

2004-1972 Full Professor, Faculty of Sciences, University of Rome La Sapienza (2004-1999, Chair of Analisi superiore, Faculty of Sciences, Dept. of Physics; 1999-1996, Chair of Analisi Superiore, 1996-1975 Chair of Analisi III, Faculty of Sciences, Dept. of Mathematics), Roma, Italy

1979-1977 Director, Institute of Mathematics Guido Castelnuovo, University of Roma La Sapienza, Roma, Italy

1974-1972 Full Professor, Faculty of Statistics, University of Roma La Sapienza, Roma, Italy (Chair of Analisi Matematica)

1974-1972 Adjoint Professor (Professore Incaricato), Mathematics Applied to Economics, Faculty of Statistics, University of Roma La Sapienza, Roma, Italy

1972-1968 Adjoint Professor, Theory of Functions, Faculty of Sciences, University of Roma La Sapienza, Roma, Italy

1972-1968 Assistant to the Chair of Mathematical Analysis (Prof. Guido Stampacchia), University of Roma La Sapienza, Roma, Italy

1968-1964 Assistant to the Chair of Analisi Superiore (Prof. Ennio De Giorgi, Prof. Guido Stampacchia, Prof. Sergio Campa), University of Pisa, Pisa, Italy

1970 Adjoint Professor of "Applied Mathematics to Economics", Faculty of Statistics, Institute of "Politica Economica", Director Prof. Sylos-Labini and G. Spaventa, Italy

1968-1965 Adjoint Professor of Mathematical Physics, Scuola Normale Superiore, Pisa, Italy

1968-1962 Adjoint Professor of Functional Analysis, Scuola Normale Superiore, Pisa, Italy

1964-1963 Adjoint Professor of Mathematical Methods in Physics, Graduate School of Physics, University of Naples, Napoli, Italy

1964-1963 Adjoint Professor of Mathematical Foundations of Field Theories, Graduate School of Physics, University of Florence, Firenze, Italy

1962-1960 Researcher in theTheoretical Group directed by Prof. Raul Gatto and Prof. Nicola Cabibbo at the Laboratories of Physics, CNEN (Nuclear Energy National Committee), Frascati, Roma, Italy

1960-1959 Assistant to the Chair of Mathematical Analysis (Prof. Gaetano Fichera), University of Rome, Roma, Italy

1959-1955 Research Student (Allievo Ricercatore), Istituto Nazionale di Alta Matematica, Roma, Italy

France:

1995 Professeur Associé, Paris, University Paris VI "Pierre et Marie Curie" (graduate course on Dirichlet forms), Paris, France

1993-1992 Professeur Associé, Paris, University Paris VI "Pierre et Marie Curie" (undergraduate and graduate courses), Paris, France

1989 Professeur Associé, University Paris VI "Pierre et Marie Curie" (graduate course on Quasi-variational Inequalities)

1989 Visiting Professor, Muslim University of Aligarh (graduate corse on Implicit variational problems), Aligarh, India

1983-1981 Professeur Associé, University Paris X! Orsay (undergraduate courses), Paris-Orsay, France

1981-1980 Professeur Associé, University Paris IX Dauphine (undergraduate and graduate courses), Paris, France

1978-1977 Professeur Associé, University Paris IX Dauphine (undergraduate and graduate courses), Paris, France

India

1989 Muslim University of Aligarh, Aligarh (graduate course on Stochastic control and quasi-variational inequalities)

Algeria

1974 Visiting Professor, Ghezireh University of Alger (graduate course on Variational Inequalities), Alger, Algeria

Argentina

1972 Visiting Professor, University of Rosario (course on Fourier Analysis), Rosario, Argentina

Resident research appointments

2013 University of Roma, Italy, May-July

2003 Uppsala, Sweden, U. of Uppsala, June

2001 Rennes, France, U. of Rennes and Ecole Normale Supérieure de Chachan, Professeur assocé, April – May

2000 Cambridge, England, INI (Isaac-Newton-Institute)

1999 Cambridge, England, INI (Isaac-Newton-Institute), Mathematics and Applications of Fractals, April

1999-1998 Bonn, Germany, Alexander- von-Humboldt-Stiftung Research Prize, U. of Bonn, 6 months, host professors: Prof. J. Frehse and Prof. S. Hildebrandt

1995 New York, N.Y. USA, Courant Institute of New York U., NY, April, invited by Prof. L. Nirenberg

1995 Bonn, Germany, U. of Bonn, Institut Angewandte Mathematik, SFB 256

1994 Montpellier, France, U. of Montpellier II, April-June

1992 Bonn, Germany, U. of Bonn, Institut Angewandte Mathematik, SFB 256

1991 Trieste, Italy, SISSA (Intern. School for Advanced Studies and Applications)

1991 Minneapolis, Minn. USA, IMA (Institute Applied Mathematics) "Phase Transitions and Free Boundaries" April-June, one-month invited guest by Prof. A. Friedman

1990 Bonn, Germany, U. of Bonn, Institut Angewandte Mathematik, SFB 256

1989 Aligarh, India, Muslim U. of Aligarh, March

1986 Princeton, N.J., USA, Princeton U. and Institute for Advanced Studies, invited by Prof. F. J. Almgren

1986 New York, N.Y. USA, Courant Institute of New York U., October, invited by Prof. L. Nirenberg

1986-1984 Minneapolis, Minn. USA, IMA (Institute Applied Mathematics)

1984 Laxenburg, Austria, IIASA (Intern. Institute Applied System Analysis), August

1984 Berkeley, Cal. USA, U. of Berkeley, invited by Prof. F. Browder

1982 Bejing, China, Chinese Academy of Sciences Computing Center, September, invited by Prof. Feng Kang

1982 Shanghai, Xian, Canton, China, U. of Shanghai, Xian, Canton

1983,1981,1980 Bonn, Germany, U. of Bonn, Institut Angewandte Mathematik, several months, cooperation within SFB 272

1980 Paris, France, CNRS (National Scientific Research Council), one-year Research Contract

1979 Novosibirsk, URSS, Akademgorokod, Computing Center of the Siberian Branch of the Academy of Sciences, September,invited by Prof.Y. Marchuk

1978 Warsaw, Poland, Banach Center

1978,1976 Alger, Algeria, one month, Ghezireh U. of Alger

1975 Warszawa, Poland, Banach Center

1975-1972 Trieste, Italy, ICTP (Intern. Center Theoretical Physics), several weeks per year

1973 Bordeaux-Talence, France, U. of Bordeaux I, October

1972 New York, N.Y. USA, Courant Institute of New York U., September – October, invited by Prof. L. Nirenberg

1968 Berkeley, Cal. USA, U. of Berkeley, two months, invited by Prof. F. Browder

1966 Cambridge, Mass. USA, MIT, 1st semester, Research associate at the Dept. of Mathematics, invited by Prof. I. Segal

Courses at Graduate Schools, Workshops, Research Institutes

2107 RISM-Course "Between Discrete and Continuous Structures", Varese, Italy, June 19-23, 2107

2013 Graduate course on *Optimal Control of Fractal Boundaries* at the University of Roma, Italy, 4-22-5.6.2013, for the EEC (European Economic Community) Project ITN-SADCO (Initial Training Network-Sensitivity Analysis for Deterministic Control Design)

2010 Workshop Asymptotic analysis and stochastic methods for heterogeneous media, U. Alba Iulia and Institute Math. Romanian Acad. Sciences, Alba Iulia, Romania

2004 Faculty of Engineering, University of Rome "La Sapienza", Graduate course on "Measure-valued Lagrangians"

2002 Sammomme', Pistoia, Italy, May 2-7, Math. School "Nonlinear Analysis and Applications to Physical sciences": course "An Introduction to Fractal Analysis"

1999 Napoli, Italy, U. of Naples, Graduate School: course on Non-Euclidean Structures

1998-1997 Roma, Italy, U. of Rome, Graduate School: courses on Dirichlet Forms

1997 Anogia, Crete, Greece, June 22 – 28, Euro-Conf. in Mathematics "Dirichlet Forms and their Applications in Geometry and Stochastics": course on "Dirichlet Forms and Self-similarity"

1990 Usedom, Germany, Summer School "Optimal Control Theory"

1984 Laxenburg, Austria, IIASA Workshop "Dynamics od Macrosystems"

1979-1977 Italy, courses on Functional Analysis and applications at SAFA (Seminars of Functional Analysis): 1979 U. of Naples; 1978, U. of Bari; 1977, U. of Calabria

1978 Erice, Italy, Majorana Center, CIME course on "Implicit Complementarity Problems and Nonlinear Quasi-variational Inequalities in Stochastic Control Theory"

1976-1975 Berlin, GDR, Academy of Sciences of GDR, Intern. Schools "Theory of Nonlinear Operators. Constructive Aspects": lectures on "Stochastic Impulse Control and Quasi-variational Inequalities"

1975 Trieste, Italy, ICTP Autumn Math. School "Control Theory and Topics of Functional Analysis": course on "Introduction to Variational and Quasi-variational Inequalities"

1975 Intern. School "Variational Inequalities", Majorana Center, Erice, Italy

1974-1972 Trieste, Italy, courses at ICTP

1974 Bruxelles, Belgium, U. of Bruxelles, NATO Research Institute "Nonlinear Operators and Calculus of Variations" course on "Implicit Variational Problems and Quasi-variational Inequalities"

1971 Erice, Italy, Majorana Center, June 27 -July 7, CIME School "Constructive aspects of functional analysis": course on "An Introduction to the Approximate Solution of Variational Inequalities"

1970 " Lezioni di Matematica Applicata all' Economia, Part 1", Faculty of Statistics, Institute of "Politica Economica", Directors Prof. Sylos-Labini and G. Spaventa, Italy

1968 Venezia, Italy, NATO Advanced Study Institute "Theory and Applications of Monotone Operators" lectures on "Convergence of Solutions of Variational Inequalities"

Invited Lectures

2017 Seventh Congress of Romanian Mathematicians, title "Remarks on Fractals and PDEs"

2016 11th AIMS Int. Conf. on Dynamical Systems, Differential Equations and Applications, title "On the dynamics of space-filling attractors", 7.5.2016. (Colleague Giuliana Davidoff)

2016 Köln, Germany, Mathematisches Institut Universität zu Köln, Chair Prof. Bernd Kavhol, Oberseminar "Nichtlineare Analyses", title "On the discrete dynamics of space-filling attractors and self-organized sand piles", 6.8.2016

2015 Chicago ILL. USA, Loyola University Chicago, AMS Sectional Meeting October 3-4, 205, Special Session "Nonlinear PDEs and Calculus of Variations", title "On a dynamic interpolation of $1-$D and $2-$D attractors", 10.4.2015

2013 "1 Decembrie 1918" - University of Alba Iulia, Romania, AMS-Romanian Mathematica Society Joint International Meeting in partnership with the Simon Stoilow Institute of Mathematics of the Romanian Academy, Alba Iulia, Romania, Special Session on Mathematical Models in Material Science and Engineering, "A ODE approximation of the Laplace operator in a square", 6.28.2103

2013 "1 Decembrie 1918" - University of Alba Iulia, Romania, AMS-Romanian Mathematica Society Joint International Meeting in partnership with the Simon Stoilow Institute of Mathematics of the Romanian Academy, Alba Iulia, Romania, Special Session on Calculus of Variations and Partial Differential Equations, "Wave operators for elliptic operators with fractal singularities", 6.25.2103

2013 Roma, Italy, U.of Rome "La Sapienza", "Finite differences: 1D to 2D", 4.24.2013

2012 College Park, Maryland, University of Maryland College Park, Colloquium lecture " A PDE view of fractals", 11.07.2012

2012 Neark, Delaware, University of Delaware, International Conference in Honor of Robert Gilbert, "Dimensional collapse and dimensional blow-up in fractal asymptotics", 8.9.2012

2012 Roma, Italy, University of Roma "La Sapienza", "Fractal asymptotics, I", 6.26.2012

2012 Roma, Italy, University of Roma "La Sapienza", "Fractal asymptotics, II", 6.27.2012

2012 Trento, Italy, University of Trento, colloquium lecture, "On the asymptotics of fractal interfaces", 6.6.2-12

2011 SIAM Conference on Analysis of Partial Differential Equations, San Diego, Mynisymposium on Recent Developments in Potential Theory, Harmonic Analysis and PDEs, "Elliptic Operators and fractal Singularities", 11.15.11

2011 Pavia, Italy, Dept. of Math. F. Casorati, International Conference in Memory of Enrico Magenes, "BVPs and Fractals", 11.03.11

2011 Brasov, Romania, The Seventh Congress of Romanian Mathematicians, "Remarks on Fractals and PDEs", 07.01.11

2010 The Lester J. Senechal Lecture, Mount Holyoke College Connecticut Valley Mathematical Colloquium, "Fractals and PDEs between Scylla and Charibdis", 12.20.2010

2010 Alba Iulia, Romania, U. of Alba Iulia and Inst. Math. Romanian Acad. Sciences, Workshop on Asymptotic Analysis and Stochastic Methods for Heterogeneous Media, "Variational fractals and Convergence", 06.09-13.10

2010 AMS Sectional Meeting, Syracuse, Special Session on Fractals, "Vanishing viscosity for fractal sets", 10.2-3.2010

2009 Worcester, MA, AMS Regional Meeting, plenary lecture "Fractal spectra between Scylla and Charibdis", 4.25.2009

2008 New York, Courant Institute of N.Y.U., 12.04.08 2008

2008 Roma, Italy, U.of Rome "La Sapienza", International Conference in Honor of Italo Capuzzo Dolcetta, 09.02.08

2008 Roma, Italy, U.of Rome "La Sapienza", International Conference in Honor of Vladimir Mazya, plenary lecture title "Sobolev Inequalities and Fluctuating Geometry", 07.01.08

2008 Baltimore, 6th International Conference on Differential Equations and Dynamical Systems, 05.23.08

2008 Providence, Brown University, 04.25.08

2007 Chiba, Japan, Chiba U., International Conference on Free Boundary Problems, plenary lecture, 11.28.07

2007 Prague, Chech Republic, Math. Inst. of the Academy of Science, 9.11.2007

2007 New Orleans, AMS Joint Mathematical Meetings, Special Session on Nonsmooth Analysis in Inverse and Variational Problems I, 1.7.2007

2006 Cologne, Germany, Koeln U., Lectures at Graduate PhD School, Dec. 2006

2006 Storrs, CT, AMS Regional Meeting, Minisymposium on Fractals, 10.29.2006

2006 Pittsburgh, PN, International Conference in Honor of David Kinderlehrer, Carnegie Mellon U., plenary lecture, 10.20.2006

2006 Boston, MA, SIAM Conference, Minisymposium, 7.11.2006 2006, Taormina, Italy, Third International Symposium in Memory of Gaetano Fichera, plenary lecture, 6.29.2006

2006 Storrs, CT, U. of Connecticut Colloquium, 4.20.2006

2006 Jena, Germany, U. of Jena, 1.10.2006

2005 Roma, Italy, U. Roma "La Sapienza", Math. Depth. Colloquium, 6.23.2005

2005 Potenza, Italy, U. of Basilicata, Dept. Math. Colloquium, 6.9.2005

2005 WPI-Worcester Polytechnic Institute MA USA, "Some Variational Problems with Irregularities", Hiring Conference, 5.11.2005

2005 Pittsburgh, CT, Carnegie Mellon U. Colloquium, 3.18.2005

2004 Torino, Italy, Accademia Nazionale delle Scienze detta dei XL, prolusione (in memory of my Father, 1915 Politecnico di Torino), 12.14.2004

2004 Stockholm, Sweeden, The Royal Academy of Science, Marconi Lecture, 11.10.2004

2003 Bonn, Germany, U. of Bonn, Stiftung caesar, Intern. Conf. "Singuläre Phänomene und Skalierung in mathematische Modellen" on the occasion of the 60^{th} Birthday of Prof. Jens Frehse: "Fluctuating membranes", 10.29.2003

2003 Oberwolfach, Germany, Mathematical Research Institute of Oberwolfach, Workshop "Multi Scale Systems, Modelling, Analysis and Numerics": 7.31.2003, "Fractal layers"

2003 Uppsala, Sweeden, U. of Uppsala: Colloquium 6.4.2003, "Metric fluctuations and fractal analysis"

2003 Friedrichroda, Germany, Intern. Conf. "Fractal Geometry and Stochastics III", 3.17-22.2003 , Organ. Committee with Prof. C. Bandt and Prof. M. Zäle and research communication on two-scale Sobolev inequalities

2002 Köln, Germany, Köln U. Colloquium, 11.22.2002, "Fractals and PDE's"

2002 Lecce, Italy, U. of Lecce, Dept. of Math. E. De Giorgi: 10.30.2002, "Metriche Lagrangiane nei fratttali"

2002 Roma, Italy, Accademia dei Lincei, Intern. Conf. "Whence the boundary conditions in modern continuum physics?": 10.15.2002, "Highly conductive fractal layers"

2002 Bordeaux, France, Conf. "Systèmes Hyperboliques et Oscillations" in honor of Prof. Jean Luc Joly: 9.19.2002, "Irregular similarity and spectral scaling for some non-Euclidean structures"

2002 Saint Priest de Gimel, France, Conf. "Stochastic Analysis and Potential Theory": 9.2.2002 "Irregular Similarity and Quasi-metric Scaling"

2002 Oberwolfach, Germany, Mathematical Research Institute of Oberwolfach, Workshop "Calculus of Variations": 7.4.2002, "Harnack inequalities on scale irregular fractals"

2001 Pisa, Italy, Scuola Normale Superiore, Meeting in Memory of Ennio De Giorgi: 10.26.2001, "On the Metric Roots of De Giorgi – Nash – Moser's Theory"

2001 Paris, France, U. of Créteil: 9.22.2001

2001 Cernobbio, Italy, Workshop "Variational Methods for Discontinuous Structures – Applications to Image Segmentation and Continum Mechanics": 7.6.2001 "Effective Distances and Fractal Ramifications"

2001 Paris-Cachan, France, Ecole Normale Spérieure de Cachan: 6.21.2001, "Ramifications et Distances Effectives dans les Fractales"

2001 Rolduc, Holland, 4th European Conf. "Elliptic and Parabolic Problems": 6.19.2001, "On Fractal Physical Bodies"

2000 Paris, France, Ecole Normale Supérieure, "Two days in honor of Prof. Alain Bensoussan on the occasion of his 60th anniversary": 12.4.2000, "Metric Fractals"

2000 Paris, France, U. Paris VI: 12.1.2000, "Harnack Inequalities on certain Metric Fractals" 2000, Santiago de Chile, Chile, U. of Chile, Centro de Modelamiento Matematico: 9.27.2000 "On some non-Euclidean Fractal Models"

2000 Rosario, Argentina, U. of Rosario – Sociedad Matématica Argentina, "Sésion Comemorativa del 60^o Aniversario del Istituto de Matématica Beppo Levi de la Universidad de Rosario": 9.21.2000, "Distance, Mass and Energy in Analysis"

2000 Montpellier, France, U. of Montpellier II, Conf. on Convex Analysis: 9.4.2000, "Energy Functionals on certain Fractal Structures"

2000 Suzdal, Russia, Steklov Institute of Mathematics and U. of Vladimir, Intern. Conf. "Differential Equations and Dynamical Systems": 8.23.2000, "Harnack Inequalities on recurrent Metric Fractals"

2000 Würzburg, Germany, U. of Würzburg: 6.28-7.2.2000

2000 Milano, Italy, Polytechnic of Milan: 3.23.2000

2000 Bielefeld, Germany, ZIF – U. of Bielefeld Workshop "Fractal Objects in Mathematics and Natural Sciences": 3.17.2000, "Metric Scaling on Fractals"

2000 Pisa, Italy, Scuola Normale Superiore, Conf. in Memory of Ennio De Giorgi: 2.25.2000

1999 Bari, Italy, U. of Bari: 11.19.1999, "Un Approccio Pseudo-Riemanniano alle Metriche Intrinseche nei Frattali"

1999 Cassino, Italy, U. of Cassino: 11.12.1999, "Misure Autosimili in Spazi Quasi-Metrici"

1999 Heidelberg, Germany, IWH – U. of Heidelberg, Workshop "Multiscale Problems and Homogenization": 12.2.1999, "Asymptotic Energies and Function Spaces on Fractals", invited by Prof. W. Jäger and Prof. A. Mikelic

1999 Jena, Germany, U. of Jena: 6.29.1999, "Sobolev Inequalities on Fractals" 6.28.1999, "Variational Fractals", invited by Prof. M. Zähle and Prof. H. Triebel

1999 Aachen, Germany, RWTH – Aachen, Workshop on PDE's: 6.25.1999, "On Variational Fractals"

1999 Bielefeld, Germany, U. of Bielefeld: Colloquium 6.18.1999, "An Excursion into Analysis and Irregularity", invited by Prof. W. Hansen

1999 Bonn, Germany, U. of Bonn, S. Hildebrandt Oberseminar zur Analysis: 6.10.1999, "A Pseudo-Riemannian Approach to Fractals"

1999 Cambridge, Great Britain, INI–Isaac-Newton-Institute, Workshop "Mathematics and Applications of Fractals": 3.22.1999 "On the Theory of Variational Fractals"

1998 Hammamet, Tunisia, U. of Tunis, ICPA98 Intern. Conf. "Potential Analysis": 11.5.1998, "Self-Similarity, Lagrangians and Metrics"

1998 Taormina, Italy, Intern. Conf. "Problemi Attuali dell'Analisi e della Fisica Matematica – In Memory of G. Fichera": 10.16.1998, "Some Spectral Properties of Self-Similar Structures"

1998 Usedom, Germany, Intern. Conf. "Fractal Geometry and Stochastics II": 9.1.1998, "Lagrangian Metrics and Fractal Dynamics"

1998 Rome, Italy, Accademia dei Lincei, Intern. Conf. "Interactions between Analysis and Mechanics – The Legacy of Gaetano Fichera ": 4.22.1998, "Spectral Properties of Fractal Structures"

1998 Oberwolfach, Germany, Mathematical Research Institute of Oberwolfach, Workshop "Dirichlet Forms", Feb. 15 – 21: "Dirichlet Forms and Fractals"

1998 Bonn, Germany, U. of Bonn, Oberseminar zur Analysis: 2.5.1998 "Fractal Dynamics and Morrey-Sobolev Imbeddings"

1997 Bologna, Padua, Genoa, Trento, Italy, lectures at the U.

1997 Leipzig, Germany, Max-Planck-Institut "Mathematics in Natural Sciences"

1996 Venice, Italy, Intern. Conf. "Recent Advances in PDE's" – Marking the 70th Birthdays of Peter Lax and Louis Nirenberg: "Lagrangian metrics on fractals"

1996 Oberwolfach, Germany, Mathematical Research Institute of Oberwolfach, Workshop on "Dirichlet Forms",

1996 Perugia, Italy, Intern. Conf. in honor of Prof. Calogero Vinti, U. of Perugia

1995 Tuscolo, Frascati, Italy, Intern. Conf. "Degree, Singularities and Variations": "Variations and Irregularities"

1995 Nice, France, Intern. Conf. "Homogenization and Material Sciences": "Metric properties of degenerate and fractal media"

1995 Heidelberg, Germany, U. of Heidelberg Colloqium, invited by Prof. A. Dold

1995 Erlangen, Germany, U. of Erlangen-Nürnberg, invited by Prof. H. Bauer

1995 Cambridge, Mass. USA, MIT, invited by Prof. G. Strang

1995 New York, N.Y., USA, Courant Institute of New York U.

1994 Irsee, Germany, Workshop "Eur-Homogenization"

1994 Varenna, Italy, Intern. Conf. "Variational Methods for Discontinuous Structures"

1994 Parma, Italy, Intern. Conf. "Potential Theory and Dirichlet Forms"

1994 Avignon, France, U. of Avignon

1994 Montpellier, France, U. of Montpellier II

1993 Genua, Italy, U. of Genua, Conf. "Variational Methods, Nonlinear Analysis and Differential Equations", in honor of Prof. Jaures Cecconi: "Degenerate elliptic operators and Dirichlet forms"

1993 Paris, France, Collège de France, J. L. Lions Seminar

1993 Perugia, Italy, U. of Perugia, Conf. "Nonlinear Analysis and Calculus of Variations" in honor of Prof. Calogero Vinti: "Uniformly sub-elliptic operators with discontinuous coefficients"

1992 Paris Cachan, France, Ecole Supérieure de Cachan

1992 Trieste, Italy, SISSA Intern. School of Mathematics

1992 Nancy, France, U. of Nancy

1992 Paris, France, Ecole Normale Supérieure

1992 New York, USA, Courant Institute of New York U.

1991 Essen, Germany, Technische Hochschule

1991 Trier, Germany, U. of Trier, Intern. Conf. "Operation Research"

1991 Minneapolis, Minn., USA, U. of Minnesota, IMA

1991 Zürich, Switzerland, Polytechnic of Zürich

1991Catania, Italy, U. of Catania, Congresso UMI, Plenary Lecture: "Alcuni aspetti variazionali dei mezzi discontinui"

1991 Trieste, Italy, ICTP Workshop on "Composite Media and Homogenization"

1991 Ferrara, Italy, U. of Ferrara, Intern. Conf. "PDE's and Mechanics"

1991 Dobrichovice, Prague, Czechoslovakia, Intern. Conf. "PDE's and Mechanics"

1991 Milan, Italy, Polytechnic of Milan

1991 Pavia, Italy, U. of Pavia

1991 Padua, Italy, U. of Padua

1990 Kaiserlautern, Germany, U. of Kaiserlautern

1990 Florence, Italy, U. of Florence

1989 Milan, Italy, Polytechnic of Milan

1988 Naples, Italy, U. of Naples

1987 Bonn, Germany, U. of Bonn, October 1987

1987 Irsee, Germany, Intern. Conf. Euro-Homogenization, June 17 – 21

1987 Pisa, Italy, U. of Pisa, Jan. 28-31

1987 Paris, France, U. Paris VI, Jan. 24-26

1986 New York, USA, Courant Institute of New York U., Dec.

1986 Cambridge, Mass., USA, MIT, invited by Prof. D. Jerison

1986 College Park, Maryland, USA, U. of Maryland, invited by Prof. L. C. Evans

1986, Chicago, Ill. USA, U. of Chicago, Sept. 21, invited by Prof. I. Herstein

1986 Lexington, KY USA, U. of Kentucky, on invitation of Prof. R. F. Gariepy

1986 Minneapolis, Minn., USA, U. of Minnesota, IMA Workshop "Metastability and Incompletely Posed Problems"

1986 Trento, Italy, U. of Trento, CIRM Conf. "Calculus of Variations and PDE' s" in honor of Prof. Hans Lewy, June

1986 Padova, Italy, U. of Padova, June

1986 Trieste, Italy, SISSA, June

1986 Gainsville, Florida, U. of Florida Meeting on Nonlinear Analysis, Feb.1-7

1986 Ferrara, Italy, U. of Ferrara, Jan. 23-27

1985 New York, N.Y. USA, Courant Institute of New York U., Nov.

1985 Cambridge, Mass. USA, MIT, Nov.

1985 Paris, France, Collège de France, J.L. Lions Seminar

1985 Oberwolfach, Germany, Mathematical Research Institute of Oberwolfach, Workshop Sept. 16-20

1985 Trieste, Italy, SISSA / ICTP, Sept.

1985 Chicago, Ill. USA, U. of Chicago, invited by Prof. I. Herstein

1985 Minneapolis, Minn. USA, IMA Workshop, July

1984 Rome, Italy, , Accademia dei Lincei, Intern. Conf. "Recent Methods on Dynamic Programming"

1984 Laxenburg, Austria, IIASA Workshop "Dynamics of Macrosystems": "Obstacle problems: do continuous solutions exists under wildly irregular constraints ?"

1983 Berkeley, USA, AMS Symposium, U. of Berkeley

1983 Pisa, Italy, Scuola Normale Superiore

1983 Trieste, Italy, SISSA Intern. School of Mathematics

1982 Canton, China, U. of Canton

1982 Shanghai, China, U. of Shanghai

1982 Xian, China, U. of Xian

1982 Bejing, China, Computing Center

1982 Paris, France, Collège de France, J.L. Lions Seminar

1982 Paris, France, Ecole Normale Supérieure

1982 S. Margherita Ligure, Genoa, Italy, Conf. "Variational Inequalities and PDE's"

1982 Milan, Italy, Polytechnic of Milan

1982 Lisboa, Portugal, Meeting Portuguese Mathematical Society

1981 Paris, France, Collège de France, J.L. Lions Seminar

1981 New York, USA, Courant Institute of New York U.

1979 Moscow, USSR, Steklov Institute of the U. of Moscow, invited by Prof. O. Oleinik

1979 Leningrad, USSR, U. of Leningrad, O. A. Ladyzenskaya, V. Solonnikov, N. Uralt'seva Seminar

1979 Pavia, Italy, U. of Pavia and LAN-CNR, Institute on "Free Boundary Problems"

1979 Rimini, Italy, Meeting GNAFA

1979 Udine, Italy, U. of Udine, Intern. Conf. "Mathematical Models and Economics"

1978 Paris, France, Institute Henri Poincaré

1978 Dublin, Ireland, Intern. School on "Numerical Analysis"

1977 Warsaw, Poland, IFIP Conference

1977 Mannheim, Germany, IFIP Conference

1977 Besançon, France, U. of Besançon, "Journées d'Analyse Nonlinéaire"

1977 Prague, Czechoslovakia, Equadiff IV: "Nonlinear quasi-variational inequalities and stochastic impulse control theory"

1976 Southampton, Great Britain, Summer Institute on "Global Analysis"

1976 Louvain, Belgium, U. of Louvain

1976, 1975 Rosario, Argentina, "Istituto de Matèmatica Beppo Levi"

1975 Roma, Italy, CNR Intern. Conf. "Mathematical Aspects of Finite Element Methods"

1975 Marseille, France , U. of Marseilles

1974 Constantine, Algeria, U. of Constantine

1974 Paris, France, IRIA Intern. Conf. "Théorie du Contrôle"

1973 Erice, Italy, CIME School "Constructive Approach to Variational Inequalities" "An introduction to the Approximate Solutions of Variational Inequalities"

1972 Rosario, Argentina, U. of Rosario

1970 Berkeley, USA, AMS Summer Institute on "Global Analysis": "Perturbation of variational inequalities"

1968 Chicago, USA, U. of Chicago, AMS Symposium "Nonlinear Functional Analysis": "Perturbation of Variational Inequalities"

1968 Venezia, Italy, NATO Advanced Institute "Monotone Operators": "Convergence of Solutions of Variational Inequalities"

1967 Bologna, Italy, Conf. "Equazioni alle Derivate Parziali"

1965 Nervi, Genoa, Italy, Conf. "Equazioni alle Derivate Parziali"

Service:

2005–present:

Harold J. Gay Lecture Series on PDEs and Fractals: Planning and organization of this series of lectures by distinguished speakers: Louis Nirenberg 2005, Peter Lax 2006, Benoit Mandelbrot 2006, Barbara Keyfitz 2006, Cathleen Morawetz 2006, Douglas Arnold 2007, Stuart S. Antman 2007, Grigory Barenblatt 2008, David Kinderlehrer 2008, Walter Strauss 2008, Sniravasan Varadhan 2009, Gilbert Strang 2009, Constantine Dafermos 2010, George Papanicolau 2010, Hans Weinberger 2010 Louis H. Kaufman 2011, Graeme Milton 2011, Robert Hardt 2011, David Jerison 2012, Alfio Quarteroni 2012, Luc Tartar 2012, J:uri Emgelbrecht 2013, Irene Fonseca 2013, Luis Caffarelli 2013, Silvio Micali 2013, Sergiu Kleinerman 2014

Conference organization:
International Conference "Homogenization: Flows in collapsing domains and composite materials", Accademia Nazionale delle Scienze Detta dei XL, Villa Torlonia, Roma, Italy, 2012, sponsored by WPI, University of Roma "La Sapienza", INDAM (Istituto Nazionale di Alta Matematica) and Accademia Nazionale delle Scienze Detta dei XL., with B. Vernescu and M.A. Vivaldi

Minisymposia organization:
AMS-Romanian Mathematica Society Joint International Meeting in partnership with the Simon Stoilow Institute of Mathematics of the Romanian Academy, Alba Iulia, Romania, Special Session on "Mathematical Models in Material Science and Engineering", 2013, with B. Vernescu
AMS Regional Sectional Meeting, Boston, Special Session, 2012, with B. Vernescu

Workshop on "Asymptotic analysis and stochastic methods for heterogeneous media", Romanian Academy of Science, Brasov, Romania, 2010, with L. Beznea and B. Vernescu
Minisymposium "Fractals, Homogenization and PDEs", AMS Regional Conference, Worcester, 2008, with B. Vernescu
Minisymposium "Irregularity, Singularities, Homogenization", Siam Conference, Boston, 2006

COMMITTEES:

Math Dept Committee for the Olson Prize, WPI Committee Outstanding Teaching, Math. Dept. Personal Committee, Graduate Committee, Colloquium Committee
Working group for the revision of Analysis courses of the graduate program of the Math. Dept. of WPI
Presentation at the Department Board
Participation in Department Retreats
Organization of WPI Math. Dept. Colloquium Lectures

EDITORIAL ACTIVITY:

Guest Editor of Special Issue "Fractals" of the Journal Complex Analysis and Elliptic Equations, 2009
Co-Editor of the Special Volume of Memorie Accad. dei Xl, in Memory of Gaetano Fichera, 2008
Co-Editor of Special Volume of Memorie Accad. dei XL in Memory of Luigi Amerio, 2006

PRIOR TO 2005

INSTITUTIONAL ADMINISTRATIVE FUNCTIONS: Director of Institute of Mathematics "G. Castelnuovo", University of Rome, 1977-1979
COMMITTEES:

Over the years member of various University, Faculty and Department committees at the University of Rome "La Sapienza" and at the University of Paris-Orsay in Paris
On various occasions, Member of IFIP-TC7, French-German Committee for Zentralblatt, Data Bases Committee of EMS, DFG Committee
Member of several Organizing Committees of International Conferences
Member of Jury-Committee for Doctoral (PhD) at University of Rome La Sapienza, Italy
Theses Jury-Committees for "Thèses d'Etat" and "Thèses d'Hbilitation" in France
Theses Jury-Committees at the University of Alger
Referee for PhD Thesis, Sweden.

REFEREE:

MURST(Italy); NSF (USA); DFG, Humboldt Science Foundation (Germany), Newton Institute (Great Britain), AMS Proceedings (USA), C.R. Acad. Science

Paris (France), Rendiconti Acc. Lincei, BUMI (Italy), J. Nonl. Anal., Trans. AMS (USA), POTA (France), Math. Journal University of Alger, Arabian Journal for Science and Engineering (Saudi Arabia) and various other scientific Journals and Institutions

Publications

THESES

0 *Lo spettro di un operatore hermitiano come funzione dell'operatore*, Degree Thesis in Mathematical Sciences, Rel. Prof. G. Fichera, University of Roma, 1959.

00 *Emissione di fotoni duri nei processi a fasci incrociati*, Degree Thesis in Physics, Rel. Prof. R. Gatto, University of Roma, 1961.

ARTICLES

1. *New method for producing and analyzing linearly polarized gamma–ray beams*, with N. Cabibbo, G. Da Prato, G. De Franceschi, Phys. Rev. Letters 9 (1962), 270–272.

2. *Absorption of g–rays in crystals and the production and analysis of linearly polarized γ–rays*, with N. Cabibbo, G. Da Prato, G. De Franceschi, Nuovo Cimento 27 (1963), 979–994.

3. *Circular polarization of high–energy γ–rays by birefringence in crystals*, with N. Cabibbo, G. Da Prato, G. De Franceschi, Phys. Rev. Letters 9 (1962), 435–437.

4. *Hard–photon emission in an experiment with electron–positron colliding beams*, Nuovo Cimento 33 (1964), 115–132.

5. *Semigruppi distribuzioni analitici*, with G. Da Prato, Ann. Scuola Norm. Sup. Pisa, XIX (1965), 367–369, M.R. #2899 (1966) 111 32.

6. *Semigruppi distribuzioni prolungabili analiticamente*, Atti del Convegno "Equazioni alle derivate parziali", Nervi 1965, Cremonese ed., Roma, 1966, M.R. #6525 (1967) 11 34.

7. *Regolarizzazione dei semigruppi distribuzioni analitici*, with G. Da Prato, Ann. Scuola Norm. Sup. Pisa XIX (1965), 563–576, M.R. #3359 (1970) 40.

8. *On the duality for linear operators and distribution semi–groups*, Ann. Mat. Pura Appl. LXXV (1967), 121–141, M.R. #3359 (1970) 40.

9. *Approximation of the solutions of some variational inequalities*, Ann. Scuola Norm. Sup. Pisa XXI (1967), 373–393, M.R. #1966 (1969) 37.

10. *A remark on a theorem of F.E. Browder*, J. Math. Anal. Appl. 20 (1967), 90–93, M.R. #3178 (1968) 36.

11 *Perturbazioni di alcune disuguaglianze variazionali non lineari*, Proc. Coll. "Equazioni alle derivate parziali", Bologna 1967, Oderisi ed. Gubbio (1967), 110–115.

12. *Convergence of convex sets and of solutions of variational inequalities*, Adv. in Math. Vol. 3, N. 4 (1969), 510–585.

13. *Convergence of solutions of variational inequalities*, Proc. NATO Adv. Study Inst. on "Theory and Applications of Monotone Operators", Venezia 1968, Oderisi ed. Gubbio (1969), 231–247.

14. *Perturbation of variational inequalities, Nonlinear functional analysis*, Proc. AMS Sympos. Pure Math. on "Non linear Functional Analysis", Chicago 1968, AMS Vol. XVIII, Part I, 1970, 182–194, M.R. #6669 (1971) 42.

15. *On the continuity of the Young–Frenchel transform*, J. Math. Anal. Appl. 35 (1971), 518–535, M.R. #871 (1972) 44.

16. *A dual method for the numerical solution of some variational inequalities*, with A. Fusciardi, F. Scarpini, A. Schiaffino, J. Math. Anal. Appl. 40 (1971), 471–493, M.R. #2865 (1974) 48.

17. *Dual variational inequalities*, J. Math. Anal. Appl. 40 (1972), M.R. #2465 (1974) 47.

18. *Transformada de Fourier y Distribuciones*, Cuadernos del Istituto de Matematica "Beppo Levi", Universidad National de Rosario, Facultad de Ciencias Exactas et Ingenieria, 1972, M.R. #6274 (1978) 56.

19. *On the smoothness of solutions of unilateral Dirichlet problems*, with G. Troianiello, Bollettino UMI 8 (1973), 57–67, M.R. #11305 (1976) 52.

20. *An introduction to the approximate solution of variational inequalities*, Lect. Notes CIME, Erice 1971, Cremonese ed. Roma, 1973.

21. *One–sided approximation and variational inequalities*, with G. Strang, Bull. AMS, March (1973), M.R. #10150 (1974) 48.

22. *Existence theorems for variational and quasi–variational inequalities*, Lect. Notes Seminar on "Funct. Anal. Appl." SAFA, manuscript, Cosenza, 1974.

23. *Inéquation quasi variationelles*, Lect. Notes Ghezireh University, Alger, 1974.

24. *Sur les inéquations quasi–variotionnelles*, with J.L. Joly, C.R. Acad. Paris, t. 279 Série A 499 (1974), M.R. #14415 (1975) 50.

25. *Remarques sur les inéquations quasi–variationnelles*, with J.L. Joly, Proc. Int. Conf. on "Control Theory", IRIA Rocquencourt, 1974, Lect. Notes in Econ. and Math. Systems, Springer V. 107 (1974), 625–642.

26. *Un résultat de régularité pour une inéquations quasi–variationnelle intervenant dans un problème de controle impulsionnel*, with J.L. Joly and G. Troianiello, C.R. Acad. Sc. France 279 (1974), 937–940, M.R. #10952 (1975) 50.

27. *Complementarity systems and approximation of variational inequalities*, with F. Scarpini, R.A.I.R.O., RI (1975), 83–104, M.R. #7991, 57.

28. *Introduction to variational and quasi–variational inequalities*, Autumn Math. Course on "Control Theory and Topics in Functional Analysis", ICTP, Trieste, 1975, IAEA, Vienna, 1976, 255–290, M.R. #23846, 58.

29. *Error estimates for some variational inequalities*, Proc. Int. Conf. on "Mathematical Aspects of Finite Element Methods", Rome 1975, Lect. Notes in Math. Springer V, 606 (1975), 224–236, M.R. #13168, 57.

30. *Implicit variational problems and quasi variational inequalities*, NATO Research Institute, Bruxelles 1974, Lect. Notes in Math. Springer V. 543 (1976), 83–156, M.R. #23827, 58.

31. *On the regular solution of a quasi variational inequality connected to a problem of stochastic impulse control*, with J.L. Joly and G. Troianiello, J. Math. Anal. Appl. 61 N. 2 (1977), 357–369, M.R. #12576, 58.

32. *Sur l'existence de la solution regulière de l'inéquation quasi variationnelle non linéaire du controle optimal impulsionnel et continu*, Journées d'analyse non linéaire, Besancon 1977, Lect. Notes in Math., Springer Verlag, M.R. #80b:93169.

33. *Nonlinear quasi variational inequalities arising in stochastic impulse control theory*, Proc. Conf. EQUADIFF IV, Praha 1977, Lect. Notes in Math. Springer V., 703 (1979), 271–299, M.R., #80g:49013.

34. *Some quasi variational inequalities arising in stochastic impulse control theory*, Proc. Int. School on "Theory of Nonlinear Operators. Constructive Aspects", Berlin 1975, Akademie der Wiss. der DDR, (1977), M.R. #2538, 58.

35. *Régularité forte de la fonction d'Hamilton–Jacobi du control stochastique impulsionnel et continu*, C.R. Acad. Sci. Paris t. 286, Série A 1978), M.R. #13644, 58.

36. *A propos de l'existence et de la régularité des solutions des certaines inéquations quasi–variationnelles*, with J.L. Joly, J. Funct. Anal. Vol. 34, N. 1 (1979), 107–137, M.R. #81a:49007.

37. *Sur la régularité des solutions faibles de certaines inéquations variationnelles et quasi variationnelles non linéaires du controle stochastique*, with j. Frehse, C.R. Acad. Sci. Paris t. 288, Série A (1979), M.R. #80c:49022.

38. *Variational inequalities with one–sided irregular obstacles*, with J. Frehse, Manuscripta Mathematica 28 (1979), 219–233, M.R. #80i:49010.

39. *On some nonlinear quasi variational inequalities and implicit complementarity problems in stochastic control theory*, Proc. Int. School on "Variational inequalities and Applications", Erice 1978, R.W. Cottle, F. Giannessi, J.L. Lions Eds., J. Wiley, 1980, M.R. #83g:49012.

40. *Implicit complementarity problems and quasi variational inequalities*, with I. Capuzzo Dolcetta, Proc. Int. School on "Variational inequalities and Applications", Erice 1978, R.W. Cottle, F. Giannessi, J.L. Lions Eds., J. Wiley, 1980, M.R. #8li:49003.

41. *Irregular obstacles and quasi–variational inequalities of stochastic impulse control*, with J. Frehse, Ann. Scuola Norm. Sup. Pisa, S. IV, IX, n. 1 (1982), 105–157, M.R. #83j:49009.

42. *A stochastic impulse control problem with quadratic growth Hamiltonian and the corresponding quasi variational inequality*, with A. Bensoussan and J. Frehse, J. für Reine und angew. Math. 331 (1982), 124–145, M.R. 83g:49008.

43. *Sur la continuité ponctuelle des solutions locales faibles du problème d'obstacle*, with J. Frehse, C.R. Acad. Sci. Paris t. 295 (1982), 571–574, M.R. #84b:49011.

44. *Stability and homogenization for nonlinear variational inequalities with irregular obstacles and quadratic growth*, with M. Biroli, Nonlinear Analysis 7, n. 1 (1983), 41–60, M.R. #84k:49008.

45. *Sur un problème de controle optimal stochastique continu et impulsionnel avec Hamiltonien à croissance quadratique*, with M. Matzeu and M.A. Vivaldi, C.R. Acad. Sci. Paris t. 296 Série I 59 (1983), 817–820, M.R. #84m:49024.

46. *Estimations ponctuelles sur le bord du module de continuité des solutions faibles des équations paraboliques*, with M. Biroli, C.R. Acad. Sci. Paris t. 296 Série A (1983), 841–843, M.R. #85d:35065.

47. *Obstacle problems: do continuous solutions exist under wildly irregular constraints?*, Workshop on Dynamics of Macrosystems, Laxenburg, Austria, 1984.

48. *On some stochastic optimal impulse control problems*, in "Recent Mathematical Methods in Dynamic Programming" Rome, 1984, Lect. Notes in Math. Springer V. 1119 (1984), 139–159, M.R. #86f:49057.

49. *Wiener obstacles*, with J. Frehse, Proc. Seminaires Collège de France, H. Brezis, J.L. Lions Eds., Pitman ed., 6 (1984), M.R. #86a:49009.

50. *Module de Wiener et estimations du potentiel pour le problème d'obstacle*, C.R. Acad. Sci Paris t. 299, Série I 17 (1984), 851–854, M.R. #86d:49015.

51. *Wiener estimates at boundary points for parabolic equations*, with M. Biroli, Annali Mat. Pura Appl. (IV) CXLI (1985), 353–367, M.R. #87k:49015.

52. *Optimal impulse and continuous control with Hamiltonian of quadratic growth*, with M. Matzeu and M.A. Vivaldi, Methods Oper. Research 51 (1985), 59–105, M.R. #86g:49023.

53. *Existence of regular solutions for nonlinear Signorini's problems*, with M. Biroli, J. Diff. Eq. 57 N. 3 (1985), 333–348, M.R. #86k:49007.

54. *An introduction to the approximate solution of variational inequalities*, Chinese Acad. of Science, transl. by Wang L.H. and Wang Z.S., Shangai, 1985.

55. *Wiener criteria and variational convergences*, in Proc. Int. Conf. on "Calculus of Variations and Partial Differential Equations", in honor of H. Lewy, Trento 1985, Lect. Notes in Math. Springer V. 1340 (1986), 208–238, M.R. #89m:49024.

56. *Mathematical models*, Raporteur's Report, in Proc. int. Conf. on "Free Boundary Problems: Theory and Applications", K.H. Hoffman and J. Sprekels Eds., Vol. II, Pitman Res. Notes Math. 186, 1987.

57. *Wiener criterion and potential estimates for the obstacle problem*, Dedicated to Giuliana, Indiana U. Math. J. 36 (1987), 455–494, M.R. #88k:35084.

58. *Wiener's criterion and* Γ*–convergence*, with G. Dal Maso, J. Appl. Math. Opt. 15 (1987), 15–63, M.R. #88c:49031.

59. *Pointwise potential estimates for elliptic obstacle problems*, Proc. Symp. in Pure Math. Part 2, 45 (1986), 207–217, M.R. #88e:49021.

60. *Wiener criteria and energy decay for relaxed Dirichlet problems*, with G. Dal Maso, Arch. Rational Mech. Anal. 95, n. 4 (1986), 345–387, M.R. #87m:35021.

61. *A derivation theorem for capacities with respect to a Radon measure*, with G. Buttazzo and G. Dal Maso, J. Funct. Anal. 71 (1987), 263–278, M.R.#88d:28007.

62. *Stopping times and* Γ*–convergence*, with J. Baxter and G. Dal Maso, Trans. Amer. Math. Soc. 303 (1987), 1–38, M.R. #89b:35061.

63. *Wiener estimates for parabolic obstacle problems*, with M. Biroli, Nonlinear Anal. T.M.A. 11, n. 9 (1987), 1005–1027, M.R. #89g:35059.

64. *Variational Stability and relaxed Dirichlet problems*, in "Metastability and Incompletely Posed Problems", S. Antman, J.L. Ericksen Eds., Springer V., 1987, M.R. #88e:35051.

65. *The Wiener modulus of a radial measure*, with G. Dal Maso, Houston J. Math. 15, 1 (1989), 35–57, M.R. #90i:35076.

66. *Asymptotic behaviour for Dirichlet problems in domains bounded by thin layers*, with G. Buttazzo and G. Dal Maso, in "Partial Differential Equations and Calculus of Variations", Essays in Honor of Ennio De Giorgi, Birkhauser, Boston, 1989, M.R. #91d:35022.

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