

LUIGI ACCARDI: Curriculum vitae et studiorum
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1 Biographical data

- Born in Naples 13.8.1947.

- Degree in Mathematics cum laude, University of Naples 31.10.1970.
Thesis: Algebraic theory of automata and applications to neural networks.
Supervisors: Prof. E.R. Caianiello, Prof. M. Curzio.

- Prize Vittorio Nobile for the best degree in Mathematics.
1970 ... 71. Scholarship at the Laboratorio di Cibernetica of the CNR (Consiglio Nazionale delle Ricerche), Arco Felice.
1972 Becomes researcher of the CNR at the Laboratorio di Cibernetica of Arco Felice (Napoli).

- From September 1971 to April 1974 obtains a scholarship, twice renewed, in the framework of the agreements CNR–URSS Academy of Sciences. Works at the Institute of Control Sciences in Moscow at the Laboratory directed by prof. M.A. Aizerman and at the Cathedra of Functional Analysis of Moscow University, under the supervision of prof. I.M. Gelfand.

1974 May. Obtains the title Candidat Nauk at the Faculty of Mathematics and Mechanics, Moscow University, with a thesis on Noncommutative Markov theory and square roots of measures. Supervisor: prof. Y.G. Sinai; referees by prof. A.A. Kirillov and A.M. Vershik; prof. I.M. Gelfand and R.L. Dobrushin also wrote an official relation on the thesis.

1974 ... 75 Researcher at CNR. Teaches the course of Geometry at the University of Salerno.

1975 ... 76. On leave from CNR, invited researcher of the French CNRS at the Centre de Physique Theorique of the CNRS, Marseille.

1976 ... 77. Researcher at CNR. Teaches the course of Probability at the University of Salerno.

1977 ... 78. Researcher at CNR. Teaches the course of Probability at the University of Salerno.

1978 April - September. At the Department of Mathematics, Cornell University with the support of a scholarship NATO-CNR.

1978 ... 79. Researcher at CNR. Teaches the course of Probability at the University of Milan. Spends the month of February 1979 at the Dublin Institute for Advanced Studies, as visiting professor, invited by prof. J.T. Lewis.

1979 .. 80. Researcher at CNR. Teaches the course of Probability at the University of Milan.

1980. Full professor. Leaves the CNR.

1980 ... 81. Professor of Probability theory at the University of Cagliari. Teaches there the course of Functional Analysis.

1982. Professor of Probability theory at the University of Roma Tor Vergata. Teaches the course of Probability Theory in Roma and a free course in Analytical Mechanics in Cagliari.

1982 ... 83. Teaches the course of Geometry. Visiting professor for two months in New Delhi (invited by prof. K.R. Parthasarathy).

1984 ... 85. Teaches the course of Probability Theory.

1985 ... 86. Visiting professor for three months in Princeton at the Department of Statistics. Teaches the course Stochastic Processes for graduate students in Statistics (on invitation of Professor J.S. Watson.). Visiting professor for one month at the University of Warwick, Dept. of Mathematics, on invitation of prof. D. Elworthy.

1986 ... 87. On leave from the University of Roma Tor Vergata. Visiting professor for the whole Academic year at Princeton University, Department of Statistics, on invitation of Professor J.S. Watson.

1987 ... 88. Teaches the course of Probability Theory.

1988 ... 89. Teaches the course of Probability Theory. Visiting professor for one month at the University of Strasbourg on invitation of Professor P.A. Meyer and for three months at the University of Gainesville (Florida) on invitation of Professor R.E.Kalman.

1989 ... 90. Teaches the course of Istituzioni di Analisi Superiore. Visiting professor for three months at the University of Gainesville (Florida) on invitation of Professor R.E. Kalman; for one month at the ETH (Zurich) on invitation of Prof. R.E. Kalman; for one month at the University of Moscow on invitation of the USSR Academy of Sciences; for one month at the Tokyo Science University on invitation of Prof. M. Ohya.

1990 ... 91. Teaches the course of Probability Theory. Visiting professor for one month at the Tokyo Science University on invitation of Prof. M. Ohya.

1991 ... 92. Teaches the course Matematica Generale at the Faculty of Economy.

1992 ... 93. Moves from the Faculty of Science to that of Economy. Teaches the course Matematica Generale.

1993 ... 95. Teaches the course Matematica Generale. Invited for 3 months by the Japan Society for the Promotion of Science. Visits several universities

in Japan.

1996 ... 98. Professor at the Graduate School of Polymathematics, Nagoya University.

1998 ... present. Professor at the Faculty of Economy of the University of Roma Torvergata.

2 Membership to Organizing, Scientific or Program Committees

1978

- Arco Felice Symposium: Mathematical problems in the theory of irreversible quantum systems (together with V. Gorini, G. Parravicini). Proceedings published by the CNR. 1981

- Local Organizing Committee of the conference: Storia della Matematica, Cagliari (1981)

1982

- Villa Mondragone (Rome) Workshop: Quantum Probability and applications to the quantum theory of irreversible processes (together with A. Frigerio, V. Gorini). Proceedings published by Springer LNM n. 1055.

1984

- 15 October, IId Workshop on Quantum Probability and Applications, Heidelberg (together with L.J. van Hemmen, W. von Waldenfels). Proceeding published by Springer LNM n. 1136

- Convegno: L' insegnamento della Probabilità e della statistica nelle Facoltà di Scienze e Ingegneria . Università di Roma Tor Vergata. 1985

- Leuven Summer school in Quantum Probability and applications. Heidelberg (together with A. Verbeure, J.T. Lewis, W. von Waldenfels). 1987

- Oberwolfach Workshop on Quantum Probability and applications. (together with W. von Waldenfels). Proceeding published by Springer LNM 1303

- Roma Tor Vergata Year of Quantum Probability. (together with W. von Waldenfels). Proceedings in Springer LNM 1136 (same volume as Heidelberg).

1988

- Convegno: Fractals in Nature and in Mathematics. Roma, Istituto della Enciclopedia Italiana 1618 Maggio. Proceedings ed. by Istituto della Enci-

cllopedia Italiana 1992.

- 17th Bernoulli Conference on Stochastic Processes and their applications. Roma, Accademia dei Lincei 27 Giugno, 5 Luglio. (together with G. Koch, G. Salinetti, W. Runngaldier). Abstracts of the communications published by the journal Stochastic Processes and Applications

- IVth workshop on Quantum Probability and its Applications. Heidelberg, September 26-30. (together with W. von Waldenfels). Proceedings in Springer LNM 1442.

1989

- Invited organizer of the Session Quantum Probability at the 5th international Vilnius Conference on Probability and Mathematical Statistics. -

Organizer of the Exhibition Guardare la matematica on Scientific visualization of mathematical problems and techniques (Cortina d'Ampezzo, Milano (1989); Napoli (1990), Sesto Fiorentino (1991), Verona (1992)).

- Organizer of the workshop on Quantum Probability and Stochastic Mechanics, Roma, November 3-8, 1989, Univerita' di Roma I, Dipartimento di Fisica (together with F. Guerra).

- Vth workshop on Quantum Probability and its Applications, Trento, December 4-8, Villa Madruzzo (together with W. von Waldenfels). Proceedings ed. by World Scientific.

1990

- Symposium in honour of Rudolph E. Kalman; Villa Mondragone 17-18-19 Maggio 1990

- Member of the Programme Committee of the 19th Bernoulli conference on Stochastic Processes and Applications . Eisenhach (GDR), with E. Cinlar, K.H. Fichtner, A. Joffe, K. Matthes, A.N. Shiryaev.

- Convegno riunito dei gruppi nazionali: Processi Stocastici e calcolo stocastico e Probabilità e Statistica Matematica. Maiori, 3-6 Ottobre (together with L. Piccinato).

1991

- IId Oberwolfach Workshop on Quantum Probability and applications (together with W. von Waldenfels). Proceeding published by World Scientific.

1992

- Invited organizer of the Session Quantum Probability at the 20th European Meeting of Statisticians (Bath, 14-18 September).

- Intensive Semester on: Infinite dimensional analysis and probability jointly organized by: Centro Volterra, Centro MAP (Matematica a Pisa), Scuola Normale Superiore, Dipartimento di Matematica Università di Pisa, Dipar-

timento di Matematica Università di Roma Tor Vergata. Co-organizers: G. Da Prato, M. Pratelli, G. Letta, P.M. Cannarsa.

- Primo simposio ItaloRusso di probabilità e statistica matematica, L'Aquila, Scuola Superiore G. Reiss Romoli, 27-30 Aprile 1992; jointly organized with Centro V. Volterra, Università di L'Aquila, Dipartimento di Matematica pura e applicata, Progetto Nazionale 40%: Processi stocastici e calcolo stocastico, Accademia delle Scienze Russa, Steklov Mathematical Institute, Società Bernoulli Russa. Coorganizers: M. Cerasoli, F. Marchetti, M. Piccioni, T. Tofoni)

- Symposium: The interpretation of quantum theory: where do we stand?, New York, April 14, 1992, jointly organized with the Istituto della Enciclopedia Italiana and the Italian Academy for Advanced Studies in America. Scientific Committee: L. Accardi, E. Beltrametti, N. Cartwright, P. Lahti, M. Namicki, B. van Fraassen, A. van der Merwe.

- Oberwolfach workshop Quantenstochastik (together with Wilhelm von Waldenfels).

1993

- 6th Vilnius Conference on Probability and Mathematical Statistics, Vilnius July 28 - August 3, 1993.

- Co-organizer (with M. Lucertini, V. Colizzi, P. Zellini, A. Carsetti) of the Symposium Complexity in complex coordinated structures.

1994

- Oberwolfach Workshop on Quantum Probability and applications (together with W. von Waldenfels).

- 24-25 Maggio, Roma Tor Vergata, Convegno: La realtà e la sua imitazione (with V. Colizzi, S. Forestiero).

1995

- Convegno: Quantum probability and infinite dimensional analysis. Bari, 30-31 marzo 1995, jointly organized by the Dipartimento di Matematica dell'Università di Bari, IRMA-CNR-Bari and Centro V. Volterra, Università Roma Tor Vergata.

1996

- Member of the Scientific Committee of the Third International Workshop on Quantum Communications and Related topics, Hakone, September 25-30

1997

- ItalianJapanese Meeting of Mathematicians on: The growing role of mathematics in society, Istituto Italiano di Cultura, Tokyo, 28-29 October; Models, Simulations and Fluctuations, Nagoya University, Oct. 30-31; Probability for

structure prediction, Kyoto, IIAS, 1-2 November

- Member of the Program Committee of the 24-th Bernoulli Conference on Stochastic Processes and their applications, Vina del Mar, Chile, June 16-20, 1997.

1998

- Member of the International Advisory Board of the: International Conference on Quantum Communication and Measurement, Evanston, Illinois (USA) August 22-27, 1998

1999

- Member of the Scientific Program Committee of SPA26, the 26th Conference on Stochastic Processes and their Applications, Beijing, China, June 14 to 18, 1999

2001

- Member of the Program Committee of: Convegno intermedio della Società Italiana di Statistica: Processi e metodi statistici di valutazione, Roma, 4-6 giugno 2001

- Member of the Scientific Committee and one of the 3 main teachers of: VolterraCIRM school on Quantum Markov chains and their applications in physics and quantum information, Levico, December 14-20

- Within the framework of the manifestations of the activities of Italia- Giappone 2001, L. Accardi has organized a delegation of mathematicians, physicists and computer scientists who visited Japan from september 20 to october 2 with the following programme:

22 september: official guest at the celebration ceremony for the 75-th anniversary of Meijo University

17-20 September 2001: Japan-Italy Joint workshop on: Quantum Information theory Kyoto International Institute for Advanced Studies, organizers: T. Hida, L. Accardi

24-26 September 2001: Japan-Italy Joint workshop on: Quantum Probability and Information Theory, Tohoku University, Sendai, organizers: N. Obata, F. Hiai, L. Accardi,

27-29 September 2001: Japan-Italy Joint workshop on: Quantum open systems and quantum measurement, Waseda University, organizer: S. Tasaki, L. Accardi

1, 2 October 2001: Japan-Italy Joint workshop on: Quantum computer and quantum complexity theory, Tokyo Science University, organizer: M. Ohya, L. Accardi

2002

- 24th Conference Infinite Dimensional Analysis and Quantum Probability, June 10-15, 2002, Levico (Trento) Italy
- First Sino-German Meeting on Stochastic Analysis - Satellite Conference to the International Congress of Mathematicians (ICM 2002), Beijing 29-8-2002 - 3-9-2002 (member of the Scientific Committee)
- Third International Conference Unconventional Models of Computation, Himeji (Kobe), Japan 16-19 October 2002. (member of the Programme Committee)

2003

- Symposium on Quantum Theory and Symmetries, (QTS3). Cincinnati, September 10-14 (2003) (member of the International Advisory Committee)
- 24th Conference on Quantum probability and infinite dimensional analysis, Greifswald (Germany), June 22-28 (2003) (member of the Organizing Committee)
- Member of the Scientific Committee of the International conference on Quantum Information and Nanotechnologies, Waseda University, Tokyo, Japan, October 29-31 2003
- Member of the Scientific Committee of the International conference on Quantum Information (ICQI03TUS), Tokyo University of Science, Tokyo, Japan, November 1-3 2003
- Member of the Scientific Committee of the International conference on Quantum Information (ICQI03IIAS), Institute for Advanced Studies, Kyoto, Japan, November 5-7 2003
- Member of the Scientific Committee of the International conference on Quantum Information, Meijo University, Nagoya, Japan, November 8-9 2003

2006

- Member of the Scientific Committee of the International conference: Quantum Probability, Information and Control Symposium (QP-27), University of Nottingham, England 15-22 JULY 2006
- Member of the Scientific Committee of the International conference: Perspectives in Probability Theory and its Connections with Science and Society, Levico Terme, Italia 3-7 December 2006

2007

- Member of the Scientific Committee of The first QBIC Symposium on Quantum Bio-Informatics, Tokyo University of Science, Tokyo 14-17 March
- Member of the Internacional Advisory Committee of the V International Symposium on Quantum Theory and Symmetries (QTS-5) Valladolid, Spain, 22-28 July

- Member of the Scientific Committee of the 10th Workshop Noncommutative probability, Bedlewo, Poland 6-12 August
- Member of the Scientific Committee of the 28-th International Conference on Quantum Probability and Related Topics, Guanajuato, Mexico, September 2-8 September
(web page of the conference: <http://www.cimat.mx/Eventos/28quantum/>)
- International Conference on Stochastic Analysis and Applications, 05- 10 November, Hammamet (Tunisia) (Organizer of the Session: Quantum Probability)
- 2008** 29th Conference on Quantum Probability and Related Topics, October, 13-18 2008, Hammamet (Tunisia) XI workshop: Non-commutative Harmonic Analysis with applications to probability, Bedlewo, 17-23 August, 2008
- Member of the Scientific Committee of The second QBIC Symposium on Quantum Bio-Informatics, Tokyo University of Science, Tokyo 14-17 March 2008
- 2009**
- 12th Workshop Non-Commutative Harmonic Analysis, Bedlewo 2009
- Member of the Scientific Committee of The third QBIC Symposium on Quantum Bio-Informatics, Tokyo University of Science, Tokyo 14-17 March 2009
- 12th Workshop Non-Commutative Harmonic Analysis, International Conference Center of the Mathematical Institute of the Polish Academy of Sciences in Bedlewo (near Poznan, Poland) August 16-22, 2009
- 30th Conference on Quantum Probability and Related Topics Santiago, Chile from November 23-28, 2009
- 2010**
- 31-th International Conference on Quantum Probability and Related Topics, Bangalore (India) August 14-17, 2010. Satellite meeting of the International Congress of Mathematicians (Hyderabad (India), August 19-27, 2010)
- 3rd International Symposium on Applied Sciences in Biomedical and Communication Technologies (ISABEL 2010) Roma, 7-10 Nov. 2010 (Advisory Committee and session organizer)
- Member of the Scientific Committee of The fourth QBIC Symposium on Quantum Bio-Informatics, Tokyo University of Science, Tokyo 14-17 March 2010
- 2011**
- Organizer of the "Workshop on Information Security". Tokyo, 15 September 2011. The Workshop is included in the session "Italy

in Japan 2011: Science, Technology and Innovation”, and it is the focus of the joint Italo–Japanese Research Laboratory for Information Security as a section of QBIC, branch of the Research Institute of Tokyo University of Science.

- Scientific Committee in the International Conference on Stochastic Analysis and Applications. Hammamet, October, 10 -15, Tunisia.

- Organizing Committee of the International conference “Irreversibility Problem in Classical and Quantum Dynamical Systems”.

Steklov Mathematical Institute of the Russian Academy of Sciences, Moscow, December 8 – 10, 2011

3 Editorial board of Journals

- Member, from 1986 to 1991 of the Editorial Board of the Journal: Probability Theory and Related Fields (Springer).

- Member, from 1986 to 1994, of the Editorial Board of the Journal: *Cultura e Scuola*.

- Member, from 1987 to 1993 of the Editorial Board of the Journal de la Fondation Louis de Broglie.

- Member, since 1989 of the Editorial Board of the Journal: Reports of Mathematical Physics.

- Member, from 1989 to 1994, of the Editorial Board of the Journal: .

- Member, since 1990 of the Editorial Board of the Journal: Random Operators and Stochastic equations.

- Member, since 1991 of the Editorial Board of the Journal: Probability and Mathematical Statistics.

- Co-editor-in-chief since 1992 of the Editorial Board of the journal: Open Systems and Information Dynamics.

- Editor-in-chief from 1989 to 1994 of the Editorial Board of the series Quantum Probability and related topics. Since 1994, in the Advisory Board of the series.

- Member since 1996 of the Advisory Board Methods of Functional Analysis and Topology

- Member since 1997 of the Editorial Board of the journal Infinite Dimensional Analysis, Quantum Probability and related topics. Managing Editor since 2004.

- Member since 2006 of the Advisory Board of the journal Interdisciplinary

Information Sciences.

- Editor since 2012 of the journal: Functional Analysis and Other Mathematics.

4 Administrative Responsibilities

- Member, from 1988 to 1995 of the International Committee of the Bernoulli Society for the organization of the Conferences on Stochastic Processes and their applications.

- Director, since July 1988, of the Centro V. Volterra.

- Coordinator, from 1988 to 1991, of the National Research Project -Processi Stocastici e calcolo stocastico of the Ministero della Pubblica Istruzione (FONDI 40%).

- Coordinator, from 1988 to 1991, of the National Research Project Progetto Volterra of the Ministero della Pubblica Istruzione (FONDI 40%).

- Coordinator, from 1983 to 1986 of a joint programme, supported by the European Community for the organization of a European post-graduate doctorate in Quantum Probability involving the Universities of Heidelberg, Leuven, Roma Tor Vergata, and the Dublin Institute for Advanced Studies.

- Coordinator, from 1989, 1991 of an Erasmus PIC in Quantum Probability, supported by the European Community involving Universities of Groeningen, Heidelberg, Leuven, Roma Tor Vergata, Tuubingen, Udine.

- Participant, from 1989, of an Erasmus PIC in Mathematical Physics, supported by the European Community. The centres involved in the programme are: the Universities of Dublin, Bielefeld, Leuven, Roma Tor Vergata Madeira, Padova.

- Coordinator, from 1993 to 1994 of a Human Capital and Mobility network in Quantum Probability, supported by the European Community involving the Universities of Nijmegen, Heidelberg, Roma Tor Vergata, Tubingen, Udine, Milano, Nottingham, Imperial College (London), Université Paris VI, American College of Greece (Athens).

- Member, since 1982 of the Board of Directors of the Dizionario delle Scienze Fisiche of the Istituto dell'Enciclopedia Italiana.

- Responsible, from 1988 to 1996, of the Mathematics Volume of the Storia del XXo Secolo of the Istituto dell'Enciclopedia Italiana.

- Treasurer and responsible, since 1985, of the organization of the Associ-

azione Premio Europeo Cortina-Ulisse (the oldest Italian Prize on Scientific popularization, awarded every other year).

- Director, since December 1995, of the CEMAS (Center for Mathematical Sciences) of the Istituto Italiano di Cultura, Centro Culturale Italo-Giapponese (Bldg. 4, Ushinomiya-cho, Yoshida, Sakyo-ku Kyoto 606). From 1997 this center has changed its name into: CESNA (Center for Natural Sciences).

5 Membership to Scientific and Cultural Associations

- Member of the Italian Mathematical Society.
- Member of the Bernoulli Society for probability and statistics.
- Member of the Società italiana di Relatività Generale e Fisica della Gravitazione.
- Member of the Società italiana di Statistica.
- Member from 1989 to 1991 of the Associazione: Centro per la Cooperazione dei Paesi Emergenti.
- Member from 1997 to 1999 of the Mexican Mathematical Society.
- Member from 1995 to 1998 of the Società italiana di Logica e Filosofia della Scienza.

6 Plenary Lectures and Seminars

- 6th international Conference on Probability and Mathematical Statistics, Vilnius July 28 - August 3, 1993.
- Simposio Chileno de Matematica: Santiago 27-2 October 1993.
- Deutsche Mathematiker Vereinigung Conference, Jena, 15-21 September 1996.
- XXX Congreso Nacional of the Mexican Mathematical Society, Aguascalientes, September-October 1997
- Congress of the Japan Mathematical Society, Tokyo 23-28 March 1999. - Colloque annuel de la Societe Tunisienne de Mathematiques, Sousse, Tunisie 27-29 March 2000
- Quantum theory and symmetries, Crakow, Poland, 17-22 July 2001 - In-

ternational Workshop: Lie Theory and Its Applications in Physics (LT-7), Varna, Bulgaria 18-24 June 2007

- V International Symposium on Quantum Theory and Symmetries (QTS-5) Valladolid, Spain, 22-28 July 2007

- Cycle of special lessons on "Security Manager" during the Academic year 2011-2012; University of Rome Tor Vergata, Facoltà di Giurisprudenza, via O. Raimondo 18, 00133 Roma.

7 Invited speaker at the following conferences

1973

- Varenna Summer School: C-algebras and their applications to quantum Field theory and quantum statistical mechanics.

1974

- School of Mathematical Physics, Camerino.

1975

- Symposium: C-algebras and their applicationsm Istituto Nazionale d'Alta Matematica, Roma.

- Convegno: Aspetti strutturali e ideologici nel rapporto tra scienze Fisiche e Matematiche, Lecce 1-5 Luglio.

1977

- Convegno: Gruppo Nazionale Analisi Funzionale e Applicazioni Rimini.

- Covegno: International conference on the mathematical problems in theoretical physics, Roma, June 6-15

- Covegno: Stochasticity in classical and quantum Hamiltonian systems. Villa Volta, Como.

1979

- Congress: Problems of a policy of scientific research in intermediately developed capitalistic countries, Camerino 29-29 September

- Workshop: The growth of quantum mechanics, 3-6 September, Lecce 1980

- Workshop: Foundations of Quantum Mechanics. Salamanca.

- Workshop: Stochastic Differential Equations in Physics, Les Houches.

1981

- International Conference in Probability and Statistics, Vilnius.

- Workshop: Stochastic Processes in Quantum Theory and Statistical Physics, Marseille.

- Convegno: Stochastic Problems in Mechanics, Torino. - Workshop: Foun-

dations of Quantum Mechanics. Salamanca. - Workshop: Stochastic Differential Equations in Physics, Les Houches.

1983

- Symposium: The waveparticle dualism, in honour of the 80th birthday of Louis de Broglie, Perugia.

1984

- Colloquium and workshop on Random Fields: Rigorous results in statistical mechanics. 26 August - September 1, Kłoszeg, Hungary

1985

- Centenary Session International Statistical Institute, Amsterdam August 12-22.

- Fundamental Aspects of Quantum Theory, Como September.

- International Vilnius Conference on Probability Theory and Mathematical statistics, Vilnius 24-29 June.

- Information complexity and control in quantum theory. Udine, CISM.

1986

- 1st World Conference of the Bernoulli Society. Tashkent

1988

- Ascona Conference on Stochastic processes and quantum field theory. (org. S. Albeverio)

- Luino Conference on Statistics in Science. (organized by D. Costantini)

1989

- February: Erice School on Statistics and Probability (organized by E. Regazzini).

1990

- June: Nagoya Conference in honor of P. Levy.

- July: 9th SINAPE (Simposio National Probabilità Estatica), Sao Paulo

- July 30 August 10: 9th Winter School on Probability and Statistics, Santiago

- August: 5th Symposium on Gaussian Random Fields and applications, Nagoya.

- October: Conferenza in memoria del centenario di V.Volterra. Academia dei Lincei.

- November: Quantum aspects of optical communication, Paris.

- December: Terzo Seminario del Gruppo di Epistemologia della Matematica, Roma

- 311290; 4191: New Delhi Quantum Probability and applications.

- 815.1.91, Calcutta: Mathematical Physics and Hydrodynamics.

1991

- April, Bari: Convegno Teoria dei Campi e Meccanica Statistica. - May 6-11, Siena: International Workshop on Probabilistic Methods in mathematical Physics
- 17-22 September, Steklov Institute, Moscow: Conference in honour of Vinogradov.
- Luglio 5-6, Roma: Incontro sulla nozione di coerenza in probabilità classica e quantistica.
- Gennaio 22-26, Cortina D'Ampezzo: Workshop Quantum Measurement in Optics.

1992

- June 1-4, Bari: Conference: Quanta, Probability and Measurements;
- Marzo 18-19, Napoli, Società Italiana di Logica e Filosofia della Scienza e Istituto di Studi Filosofici: Scientific Realism and Empirical Theories.
- May 14-18, Les Treilles: Centennial workshop in honour of Louis de Broglie, Fondation Louis de Broglie.
- May 18-22, Kyoto International Institute for Advanced Studies: Mathematical Approach to Fluctuations in Astronomy, Physics and Biology.

1993

- 19-20 March, Cesena: Formalismo Matematico e Realtà Fisica.
- 25-30 April, Nottingham: Conference on quantum Probability.
- 5-8 Luglio, Milano: Incontro Progetto Nazionale 40% Processi Stocastici e Calcolo Stocastico.
- 13-24 Settembre, Kyoto, International Institute for Advanced Studies: 2nd Workshop on Mathematical Approach to Fluctuations in Astronomy, Physics and Biology.
- 5-9 Ottobre, Lecce: I fondamenti della meccanica quantistica: analisi storica e programmi aperti.
- 25-31 Ottobre, Pechino: International Conference on Dirichlet forms and stochastic processes.

1994

- 14-17 February, Roma: International Conference: Mesoscopic Physics and fundamental problems in quantum mechanics.
- 8-11 March, Kyoto, International Institute for Advanced Studies Workshop: Mathematical Approach to Fluctuations.
- 20-21 Maggio, Roma: Convegno di studi: Giovanni Gentile 1875-1944.

- 24-25 Maggio, Roma: La realtà e la sua imitazione.
- 20-24 June, Marseille: Workshop: Quantum Probability and applications.
- July 11-16, Nottingham: Quantum Communication and Measurement.
- 12-13 September, Udine: Conference in Memory of Alberto Frigerio.
- 19-20-21 September, Trento: Convegno di Probabilità del Gruppo Nazionale 40%.
- 26-29 Settembre, Cesena: Convegno di Fondamenti e Filosofia della Fisica.
- 25-26 November, Roma Tor Vergata: Conference: Finance and innovation: theoretical models and empirical analysis.
- 6-8 December, Torun (Poland): The 27-th Symposium on Mathematical Physics.

1995

- 13-24 January, Karpacz: Winter School on Mathematical Physics.
- 8-10 March, Epinal (France), Conference on the European Doctorate organized by the French Presidency of the European Community.
- 19-23 June, Singapore, Bernoulli Society Conference on Stochastic Processes.
- 24 July - August 5, Warwick: Workshop on Differential Geometry and Stochastic Analysis.
- 19-25 August, Firenze: The international Congress of Philosophy of Science.
- 16-19 September, Cesena: Convegno Logica, Matematica, e teorie fisiche.
- 2-6 October, New York: Symposium: Probability towards two thousand. Organized by the Institute of Italian Encyclopedia, the Italian Academy for Advanced Studies in America, the Department of Statistics and the Center for Applied Probability of Columbia University and the V. Volterra Center of the University of Roma Tor Vergata.
- 14-18 November, Antofagasta (Chile) Workshop on Mathematical Physics.
- 20-24 November, Valparaiso (Chile) VI Latin American Congress of Probability and Mathematical Statistics (CLAPEM): New Directions in Stochastic Processes.
- 25-26 November, Roma Tor Vergata: 2d Conference: Finance and innovation: theoretical models and empirical analysis.

1996

- Società Italiana di Logica e Filosofia delle Scienze, Convegno triennale, January 3-5 (1996), Roma, Italy
- 8-12 April, Huangzhou: Stochastic Differential Geometry
- Advanced Research Seminar on: Probability, System theory and Econo-

- metrics, May 27-29 (1996), Sophia Antipolis, Antibes/Nice, France
- Probabilistic extensions of Classical and Quantum dynamics (organizers: I. Prigogine, J. Antoniou) July 4-10, les Treilles (France)
- 4-th World Conference of the Bernoulli Society, 26-31 August, Vienna
- Convegno: Scienza, filosofia e teologia di fronte alla nascita dell'universo, 24-25-26 September 1996, Varenna and Milano
- Conferenza: Matematica Applicata in Italia (organizers: CNR and Accademia dei Lincei), 21-24 Ottobre Roma
- Convegno: 1895 e dintorni: non solo Cinema, ROMA, 25-27 Ottobre 1996, Università di Roma 3.
- Second Workshop on Stochastic Analysis and Mathematical Physics: Asymptotic Quantum Dynamics, Feynman Integrals and related topics. 16-21 December 1996, Vigna del Mar (Chile)
- Third International Workshop on Quantum Communications and Related topics (organizers: O. Hirota), September 25-30 1996, Hakone (Japan)
- Workshop: Fluctuations and Quantum computer, 2-3 November, IAS Kyoto (Japan)

1997

- Convegno: Stochastic Partial Differential Equations and Applications, Levico Terme, 6-11, January
- Convegno : L'antichità del nuovo: le radici classiche della scienza moderna, Venezia, February 28-March 1-st
- Workshop: Fluctuations, IAS, Kyoto, 27-31 March
- White noise mini-Workshop, Nagoya 11-13 June 1997
- Workshop on Quantum Probability, Gdansk, July 1-6, 1997
- Convegno: La filosofia della fisica in Italia (1897-1997) Accademia delle Scienze di Bologna, Palazzo del Ridotto di Cesena, Università di Urbino, 27-30 ottobre '97.
- Workshop: Recent trends in Infinite dimensional noncommutative analysis, Kyoto 14-17 October 1997
- Conference on Quantum Information, Meijo University, 4-8 November 1997
- Seminar: Facing the uncertain on the occasion of the 20-th anniversary of the Nobel Prize to Ilya Prigogine, Université Libre de Bruxelles, 13-15 November

1998

- The Seventh UK Conference on Mathematical and Conceptual Foundations of Modern Physics, Nottingham 7-11 September, 1998
- Workshop on Quantum Probability 21-26 September 1998, Siegmundsburg

(Germany)

- Scuola Estiva di Filosofia della Scienza, Cesena, 14-18 settembre 1998 - Workshop: Development of Infinite-Dimensional Noncommutative Analysis, RIMS, Kyoto October 14-16 (1998).
- International symposium on analysis, Sogang University (Seul), October 23-24 (1998)
- Gaussian processes and quantum analysis, Nagoya October 29-31 1998
- Workshop: Quantum Information and Quantum Computer, Meijo University, Nagoya November 16 - 28 (1998)
- Symposium on Quantum Computer and Quantum Chaos, Tokyo Science University, 17-19 November 1998
- 21-st Solvay Conference, Irreversible processes and dynamical systems, Keihanna 1-5 November 1998.

1999

- The Second International Conference on Quantum Information, Meijo University, March 1-5, 1999
- Conference: Quantum Computer and Quantum Chaos, Keio university, 25-27 March, 1999.
- Workshop: The Applications of Mathematics to the Sciences of Nature: Critical Moments and Aspects, Arcidosso, 28 giugno-1 luglio Cesena, Scuola Superiore di studi in Filosofia e Fondamenti della Fisica
- Lezione: L'effetto camaleonte e il paradosso di Einstein-Podolsky-Rosen, 5 Maggio
- Les Treilles colloquium: Probability and irreversibility in quantum mechanics July 3-8,
- Workshop: Rigged Hilbert Spaces and Time Asymmetric Quantum Mechanics in Clausthal, Harz Mountain (Germany), July 26 - 31.
- 6-th International Congress on Amino Acids, Bonn (Germany) 3-7 August
- Conference in honour of Vytautas Statulevicius, Vilnius, August 26-28
- XX International Seminar on Stability Problems for Stochastic Models Lublin - Naleczow 5 - 11 September
- Bogoliubov Conference: Problems in theoretical and Mathematical Physics, Moscow, Dubna and Kiev, September 27- October 6
- Workshop: 'Stochastics and Quantum Physics', organized by MaPhySto (Centre for Mathematical Physics and Stochastics), Aarhus, 21-26 October.
- 3rd Tohwa International Meeting on Statistical Physics, Tohwa University, Fukuoka, Japan, November 8-11.
- Invited speaker and member of the Advisory Board for the Conference on

Infinite Dimensional Analysis and Quantum Probability, Bangalore, India, 13 to 17 December.

2000

- IVth International Workshop on Stochastic Analysis and Mathematical Physics, ANESTOC'2000, Santiago 5-11 January , 2000.
- workshop on: Stochastic Partial Differential Equations and Applications, Levico Terme (Trento, Italy), Hotel Bellavista 10-15 January 2000.
- 3-rd Meijo Conference on Quantum Information, March 7 - 10
- Invited course (8 lectures) VI Simposio de Probabilidad y Procesos Estocasticos, Mayo 23-27, 2000, CIMAT, A.C., Guanajuato, Gto., Mexico
- Invited speaker and member of the Scientific Committee for the Second International Conference: Quantum Communication, Measurement and Computing Capri - July 3-8, 2000
- XXIII International Colloquium on Group Theoretical Methods in Physics, GROUP - 23, Dubna, Russia, Joint Institute for Nuclear Research, July 31 - August 05, 2000
- Workshop Quantum Probability Good (near Budapest), August 30 September 7, <http://chardonay.math.bme.hu/qppq>
- 9th Workshop Open Systems and Information Dynamics, Institute of Physics of Nicholas Copernicus University, Torun, Poland, September 19-21.
- Invited speaker and member of the Scientific Committee of the International Conference: Foundations Probability and Physics, Vaxjo (Sweden) November 27 - December 1.
- Invited speaker and member of the Program Committee for the Second International Conference Unconventional Models of Computation UMC2K, Solvay Institutes, Brussels, 13-16 December.

2001

- Invited talk at the AMS special session Analysis on Infinite Dimensional Spaces (in honor of L. Gross) during the AMS-MAA Joint Mathematics Meetings in New Orleans, LA, January 10-13, 2001.
- 4-th Meijo Conference on Quantum Information, March 26 - April 1
- Invited speaker at the Qrandom workshop, 12-16 February 2001, Eu-ran-dom, Eindhoven, Netherlands, February 12-16
- Invited speaker at the Oberwolfach workshop: Stochastics in Science, 11-17 March
- Invited speaker at the 22-th Conference Quantum Probability and Infinite Dimensional Analysis, March 15-20, 2001, Burg/Cottbus, Germany
- Invited speaker at the Conference Non commutative geometry, Quantum

Probability and quantum groups, Trieste: 26-29 March

- Invited speaker at the workshop on Resonances and Time Asymmetric Quantum Theory, Tuesday, May 29 - Monday, June 4, 2001 Jaca (Huesca, Spain)

- Invited speaker at the Conference: Quantum Theory: reconsideration of foundations, June 17-21, 2001, Vaxjo, Sweden

- Invited speaker at the EuroWorkshop on Quantum Computers, Institute for Scientific Interchange (ISI) Torino, June 17-30

- Invited speaker at the session Quantum Filtering and Control at the 5th IFAC Symposium on Nonlinear Control Systems (NOLCOS 2001) St. Petersburg, Russia on 4-6 July.

- Invited talk at the European Meeting of Statisticians, session on 'Quantum probability and statistics', Funchal, Madeira, 12-21 August

- Popular conference of L. Accardi at the Aichi, 21 september Prefecture Science and Technology Association

- Popular conference of L. Accardi at the Aichi Prefecture University, 3 October

- Invited speaker and member of the Scientific Committee: International Conference on Stochastic Analysis and Applications Hammamet (Tunisia), October 22- 27

- Invited speaker at the 22-d International Solvay Conference in Physics, Delphi and Lamia, 24-30 November

2002

- Stochastic Partial Differential Equations and Applications 7-12, January , Leviso Organizing Committee: G. Da Prato, L. Tubaro

- International Symposium: The direction of time - The role of reversibility/irreversibility in the study of nature, Centre for Interdisciplinary Research, Bielefeld University, January 14 - 19, 2002. Organizing Committee: S. Albeverio, P. Blanchard, M. Drieschner, S. Paycha

- Convegno ELSAG: L'applicazione della Fisica quantistica al calcolo e alla sicurezza delle comunicazioni. 28 febbraio, Sala Marconi-CNR, piazzale Aldo Moro 7 Roma Tel. 010/255146

- QRandom II: Quantum ... Optics, Information, Probability, Max Plank INstitute, Dresden, January 27 - February 1st

- Workshop: Quantum information, theoretical and physical aspects, Institut Henri Poincare, Paris, France, 14 March

- The IXth International Conference on Quantum Optics (ICQO '2002), Raubichi, Belarus, May 14-17

- Foundations of probability and physics-2, Vaxjo University, Sweden, June 2-7
- International Conference dedicated to the 90 years of Gnedenko, Kiev, Ukraina, 3-7 June
- International Conference Perspectives in Quantum Field Theory, Statistical Mechanics and Stochastics in onore dei 60 anni di Francesco Guerra, Pontignano, Siena, Italy, June 30 -July 3
- Conferenza Nazionale per la commemorazione di Mario Lucertini, CNR, Roma, Italia, 3 Luglio
- Conference: Information Geometry and its applications, Pescara, Italy, 1-5 July
- Workshop on Quantum Information, IIAS, Kyoto, Japan, 8 October
- 2003**
- 2d Meijo Winter School: Quantum Information and Complexity, Meijo University, Nagoya, Japan, January 6-10
- Workshop on Quantum Information, IIAS, Kyoto, Japan, 11 January
- Quantum probability and quantum Information, Tohoku University, Sendai, Japan, January 14-15
- AMS Regional Meeting, Baton Rouge, USA, March 14-16
- International Conference Quantum Theory: Reconsideration of Foundations-2, Vaxjo, Sweden, 31 May - 6 June
- International Conference Kolmogorov and Contemporary Mathematics, dedicated to the Centennial of Andrei Nikolaevich Kolmogorov, Moscow June 16-21 - Web-site: <http://kolmogorov-100.mi.ras.ru>
- 24-th conference on Quantum Probability and related topics (QPIDA), Greifswald, Germany, June 23 - 27
- VolterraCIRMGreifswald International Conference Classical and Quantum Levy Processes: Theory and Applications, Levico (Trento, Italy), September 27-October 3
- von Neumann Centennial conference, Budapest, Hungary, October 15-20
- International congress, Analysis and Probability, Hammamet, Tunisia, October 20-25
- International conference on Quantum Information and Nanotechnologies, Waseda University, Tokyo, Japan, October 29-31
- International conference on Quantum Information (ICQI03TUS), Tokyo University of Science, Tokyo, Japan, November 1-3
- International conference on Quantum Information (ICQI03IIAS), Institute for Advanced Studies, Kyoto, Japan, November 5-7

- International conference on Quantum Information, Meijo University, Nagoya, Japan, November 8-9

2005

- Second Abel Symposium: Stochastic Analysis and Applications, Oslo, Norway 29 July - 4 August

- 8th Workshop Non-Commutative Harmonic Analysis with Applications to Probability” Bedlewo, 29 August - 3 September

- International Conference on Mathematical Analysis of Random Phenomena, Hammamet, Tunis 12-17 September

2006

- International Conference on White Noise Theory and its Applications, Meijo University, Nagoya, Japan 21-23 February

- Workshop: Establishment of Mathematical Foundations of Quantum Information, IIAS, Kyoto, Japan 24 February

- International Conference on Quantum Probability and Its Applications Greifswald 27-31 March 2006

- International workshop: Stochastic Partial Differential Equations, Pisa, Italia 3-8 Aprile 2006

- International conference on Quantum Optics, Minsk, Bielorussia 26-31 May

- Quantum Probability, Information and Control Symposium (QP27), University of Nottingham, England 15-22 JULY

- 9th Workshop: Non-Commutative Harmonic Analysis with Applications to Probability”, Bedlewo, Polonia 28-9, 4-10

- The 5–th Nagoya Levy conference (opening lecture), Meijo University, Nagoya, Japan 17-18 December

2007

- The first QBIC Symposium on Quantum Bio-Informatics, Tokyo University of Science, Tokyo 14-17 March

- International Workshop on Quantum Probability and its Applications, Campobasso, Italy 13-16 May

- International conference: Quantum Theory: reconsideration of foundations-4, Vaxjo, Sweden, 6-11 June

- Workshop/conference on Free Probability/Operator Spaces/von Neuman algebras, Sibiu, Romania 9-16 June 2007

- Fields Institute Workshop on, Noncommutative Dynamics and Applications, Toronto, Canada 16-20 July 2007

2008

- 3rd International Workshop on Quantum Probability and its Applications

Campobasso, February 12-14

- Conference on Foundation of Probability and Physics-5, Vxj, 24-27 August
- International Conference on Mathematical Physics and Its Applications, Samara (Russia), September 8-13
- 29-th Conference on Quantum Probability and Related Topics 13-18 October, Hammamet (Tunisia)

2009

- Quantum Theory: Reconsideration of Foundations-5, Vxj June 15-18
- Lie Theory and Its Applications in Physics (LT-8), 15-21 June, Varna, Bulgaria.
- Oberwolfach Mini-Workshop on Product Systems and Independence in Quantum Dynamics Mathematisches Forschungsinstitut Oberwolfach (MFO), February 15-21
- Dinamica classica e fondamenti della fisica in onore di Luigi Galgani, Padova 16-17 Ottobre
- Workshop on Data Security in Satellite Applications and Intersection Project 26th October into the Swiss Hall of Villa Mondragone, Monte Porzio Catone (Rome, Italy)
- Scientific Committee of international Conference on Stochastic Analysis and Applications, October, 12 -17 Hammamet (Tunisia)
- XI Jornadas Rolando Chuaqui (special invited lecture), Chilean Philosophical Society, Santiago, Chile, 30-November, 2 December

2010

- Advances in Quantum Theory, Vaxjo, Sweden, June 14-17. Organized by ICMM - International Centre for Mathematical Modelling in physics, engineering and cognitive sciences, Linnaeus University, Vxj, Sweden.
- Conference : Renormalization: algebraic, geometric and probabilistic aspects, Lyon (France) June 16-19
- The 42nd Symposium on Mathematical Physics, Quantum Channels, Quantum Information - Theory and Applications, including the special session in honour of Prof. Roman S. Ingarden, June 19-22 Torun, Poland
- Tecnologia e Sanità: 7 Congresso Nazionale per Operatori degli Uffici Tecnici. Rieti 24-25-26 Giugno, Chiesa San Domenico - Piazza Beata Colomba
- 13th Workshop Non-Commutative Harmonic Analysis, July 11-17, International Conference Center of the Mathematical Institute of the Polish Academy of Sciences in Bdlewo (Poznan, Poland).
- Symposium on Probability and Analysis 2010 , the Institute of Mathematics, Academia Sinica, August 9-12 Taipei (Taiwan)

- ESF Exploratory Workshop on: Dissipative Systems: Entropy Methods, Classical and Quantum Probability, November 01 - 03, Vienna University of Technology, Austria
- Second International Conference on Mathematical Physics and Its Applications, Samara, Russia, August 29-September
- 3d International Symposium on Applied Sciences in Biomedical and Communication Technologies, Rome, 7-10 November 2010 **2011**
- The 6th Jikji Workshop on Infinite Dimensional Analysis and Quantum Probability (IDA–QP) January 8-12 Chungbuk National University, Korea
- 18th IICWG Meeting Eighteenth International ICWG Meeting May 9-13
- 32th Conference on Quantum Probability and Related Topics Levico Terme (Italy) May 29 - June 4
- Conference Irreversibility Problem in Classical and Quantum Dynamical Systems (Moscow, December 8–10 2011)

8 Short term visits and lectures at universities and research institutions

- Tokyo University of Sciences, Master course in Cryptography (February, 15 - 22, 2012)
- Meijo University, PhD Course on the Mathematics of Gambling (February 23 - March 4, 2012)
- Aichi Prefectural University, Faculty of Information Science and Technology, Nagoya (October 3, 2001; March 7, 2005)
- Ann Arbor, Department of Electronic Engineering, University of Michigan (1986)
- Athens, Department of Mathematics and Natural Sciences, The American College of Greece, Atene (215 2006; 18, 12 2007)
- Bari, Istituto di Fisica Università (1979), Istituto di Matematica, Università (1980, 1988, 1993, 2.000)
- Bielefeld University, Institute of Mathematics, (1987)
- Boston, Department of Mathematics, MIT (1985), Department of Electronic Engineering, MIT (1985)
- Bruxelles, Instituts Internationaux de Physique et de Chimie Solvay, Université Libre de Bruxelles (1995)
- Cagliari, Istituto di Matematica, Università (1981) Istituto di Filosofia,

- Università (1981)
- Catania, Istituto di Fisica Università (1983)
 - Cesena (1990)
 - Chicago University, Department of Philosophy (1995)
 - Cornell University, Department of Mathematics, University (1986)
 - Gainesville, University of Florida, Center for Mathematical System Theory (1988), Department of Physics (1989)
 - Genova, Istituto di Fisica Università (1974, 1985), Istituto di Matematica, Università (1976, 1978, 1979, 1980)
 - Firenze, Istituto di Matematica (1983), Istituto Nazionale di Ottica (1987), Dipartimento di Filosofia (1994)
 - Heidelberg, Institute of applied Mathematics, University (1975, 1982, 1983, 1984, 1987, 1988, 1991, 1992)
 - Innsbruck, Institut fur Mathematik und Geometrie Universitaat Innsbruck (1988, 1991); Mathematical and Physical Society Seminar (1995)
 - Kumamoto University (1998)
 - Kyoto, Research Institute for Mathematical Sciences (1989, 1993), International Institute for Advanced Studies (1993, 1994, 1995, 1996, 1997)
 - Kyushu University Fukuoka (1993)
 - Lausanne, Institute of Mathematics, University (1979)
 - Lecce (1994)
 - Leningrad, Steklov Institute of Mathematics, USSR Academy of Sciences, (1973, 1974)
 - Leuven, Instituut voor Theoretische Fysika, Universiteit (1983, 1986, 1988)
 - London, London School of Economics (1993), (1999)
 - Marseille, Centre de Physique Theorique (1975, 1981)
 - Meijo University, Department of Mathematics (1993)
 - Mexico City, University Autonoma do Mexico-Iztapalapa, Departamento de Matematicas (1997), (1999); 2005, 2007 Seminario Interinstitucional de Probabilidad, Centro de Investigacion y de Estudios Avanzados del I.P.N., Departamento de Matematicas (1997)
 - Milano, Istituto di Matematica, Università (1978, 1987), Istituto di Fisica, Università (1979)
 - Minneapolis, University of Minnesota (1989)
 - Montecatini, Terme: Giovedì culturali (1989); (27 Giugno 1991)
 - Moscow University, Cathedra of Functional Analysis (1973), Cathedra of Theory of Probability (1973, 1974)
 - Murray Hill, Bell Research Laboratories (1986)

- Nagoya, Nagoya University, Department of Mathematics (1989, 1993, 1995)
- Nancy (Jan 2001), committee member, thesis Anis Ben Ghorbal
- New York, Courant Institute (1986)
- Palermo, Istituto di Matematica, Università (1980, 1983, 1997)
- Parma, Istituto di Fisica, Università (1974), Istituto di Matematica, Università (1990)
- Pavia, Dipartimento di Matematica, Università (1987) Dipartimento di Fisica, Università (2000)
- Perugia, Istituto di Matematica, Università (1975, 1981, 1991)
- Pisa Scuola Normale Superiore, (1971, 1979, 1986,1991), Università (1978, 1993)
- Princeton, Department of Physics University (1986)
- Rennes, Laboratoire de probabilité et Informatique, Université (1975, 1982)
- Salamanca, Istituto di Filosofia, Università (1980)
- Salerno, Istituto di Fisica, Università (1974, 1985, 1988)
- Santiago, Universidad Catolica de Chile, Departamento de Fisica (1990); Universidad de Chile, Departamento de Fisica (1990)
- Sophia Antipolis, Ecole de Mine (1994)
- S. Remo, Casino (1989) Presentazione libro L.Geymonat
- Seul, Yonsei University, Seoul National University, Sogang University (1996)
- Tashkent, Institute of Mathematics, University (1974)
- Tbilisi, Institute of Cybernetics, USSR Academy of Sciences, (1974)
- Tokyo, Tokyo Science University, Faculty of Information Sciences; Waseda University, Department of Physics (1989, 1990, 1992, 1993, 1995)
- University of Thessaloniki Department of Mathematics (30 november 2001)
- Torino, Istituto di Matematica, Università (1978, 1987) , Istituto di Fisica, Università (1989), Istituto di Studi Superiori di Scienze Umane (1997)
- Trento, Istituto di Matematica, Università (1988)
- Trieste, Laboratorio Interdisciplinare per le Scienze Naturali ed Umanistiche, 3-4 Febbraio 1992
- Trieste, Sissa (1992)
- Trieste, L'immaginario Scientifico: conferenza su Realtà virtuali 1992
- Tsukuba University, Department of Physics (1993)
- Vilnius, Institute for Mathematics and Cybernetics (1974, 1981)
- Warwick, Department of Mathematics, University (1984)
- Waseda University Department of Physics (1990, 1993)
- Yokohama, Shonan Institute of Technology (1990)

- Zurich, ETH, Department of Mathematics (1989)

9 Experience in applied an industrial projects

9.1 Industrial Projects

Classical cryptography

The experience with the Elsag project on quantum cryptography (see below) motivated a deeper study of the classical aspects of this discipline. The result of this investigation was the discovery of a new class of (classical) cryptographic algorithms whose potential interest for applications was object of a further investigation. The positive result of this investigation led to the foundation of a spin off of the University of Roma Torvergata, the company CryptALaRM, which is now growing and can already be proud to include among its customers: Selex Galileo, Calero, Shin Chang and the Italian Defense Ministry. With Elsag Starting from the year 2001, the Volterra Center has initiated a three year project with the italian industry Elsag spa, a leading italian industry in information technology, whose goal is to build a prototype of secret key distribution using methods of quantum cryptography. The project, partially supported by MIUR (Italian Ministry for University Scientific Research and Technology), involved also the Center for Quantum Computation of Oxford University, the Department of Electrical and Computer Engineering of Boston University, (IEN). This project had a part related to physics (quantum optics) and a part related to classical and quantum information. In the classical and quantum information part, the role of Volterra Center is to evaluate the quantum key transmission algorithm by constructing a 'classical benchmark' for it. In this task the experience of the Volterra center on classical simulation of quantum entanglement, a goal that one year ago was universally considered impossible and that now has been experimentally realized by L. Accardi, K. Imafuku and M. Regoli, was put to good use. In other words, our task was to construct a classical simulator of the quantum key distribution process based on the standard BennetBrassard scheme and further implemented through the Eckert protocol. These tasks required a mixture of theoretical, experimental and simulation expertise and our role, beyond the construction of the model was to train young researchers to realize concretely the bridge between these three activities. The first part

of the programme was completed in the first year of the project and the working programme was delivered to Elsag on July 2002. The computer program was based on the dynamical system described in the paper [AcImRe01]. In the second and third year of the project the goal of Volterra Center was to analyse the theoretical aspects of the quantum optics part. Our goal was to model the transmission line of photons (both in optical fiber and open air) and to use these models to help the experimental groups improving the performance of the transmission line by controlling the various forms of dispersion (intensity, chromatic, polarization) which are at the moment the main obstructions to an industrial exploitation of quantum cryptography. Here the stochastic limit of quantum theory played a crucial part. In fact this theory represents the most advanced and sophisticated tool presently available for the description of dissipation in quantum phenomena. The main advantage of this method is that it gives a fairly explicit description of the microscopic structure of the phenomenological parameters which are usually introduced by hand in the phenomenological models presently used to describe dispersion (generalized susceptibilities or transport coefficients). The idea is that, knowing the microscopic structure of these coefficients, one has a tool to reduce dispersion by controlling them. This idea was verified in collaboration with the experimental groups involved in the project. The standard texts on dispersion in fiber optics are based on classical theory, but we are working in a regime where the quantum effects become essential. Therefore an improved performance shall pass through a more advanced model. Also in this part the simulation activity played an important role: it had to be connected with the output of the experiment in order to generate the desired key.

Quantum information

On the more theoretical side of quantum information, L. Accardi has worked on the following problems.

(1) The solution of the teleportation problem in arbitrary finite dimensions [AcOh99], [Ac00a], due to Accardi and Ohya was rediscovered by R. Werner and generalized by S. Albeverio and S.M. Fei. There exist proposals for infinite dimensional solutions of the problem, but these differ from the original one in the fact that they involve approximations whose implications Active collaboration is going on with K.-H. Fichtner, W. Freudenberg, N. Watanabe. We have worked in collaboration with experts of experimental optics and theoretical physicists to verify the possibility to concretely realize this new technique.

(2) The constructive characterization of the most general unitary operator implementing Grover's Algorithm [AcSa00]. It is somewhat surprising that the solution of this problem leads to a family of unitaries depending on a single parameter. This offers the possibility to optimize over the parameter thus increasing the efficiency of the algorithm.

(3) The estimate of complexity in the OhyaMasuda quantum SAT Algorithm [AcSa00]. Before this paper it was not appreciated the fact that the relevance of the distinction, between combinatorial and recursive algorithms, has for quantum computation implications much more relevant than for classical ones. With Siemens Nixdorf Informatica Project: O.C.R.A. [Optimization (of train) Circulation (with) Automatic Resolution] between the Siemens Nixdorf Informatica and the Vito Volterra Center. Analysis and development of a system to solve potential conflicts among trains (i.e. either crossings or violation of the security distance) on line. Our output was essentially an expert system to integrate the job of the decision maker. The program was based on a statistical analysis of the data in the previous ten years of train circulation, integrated with an optimization model based on a theoretical model of train circulation. The program was comparing the possible scenarios, in terms of a cost function based on their realizability and desirability and built with a long collaboration with the experts of the Italian railways.

10 PhD Theses

- 1) Lu Yun Gang (1988)
- 2) Paolo Gibilisco (1992)
- 3) Roman Roshin (2005)
- 4) Alexandr Pechen (2005)
- 5) Abdessathar Barhouni (2005)
- 6) Wided Ayed (2005)
- 7) Skander Hachicha (2005)
- 8) Vito Crismale (2006)
- 9) Habib Rebei (2010)

Si autorizza al trattamento dei dati personali ai sensi del D. LGS 196–2003