Curriculum Vitae - Stefano Luzzatto (Dec 2024)

Abdus Salam Centre for Theoretical Physics (ICTP), Trieste, Italy
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Senior research mathematician with international outlook and extensive experience in education and capacity building.

CV Overview:

Experience and Education: Born in New York, USA (1964); Primary education in Ibadan, Nigeria (1965-1974); Middle/High school in Naples, Italy (1974-1981), and Holland Park School, London UK (1981-1983). Higher education: University of Warwick, UK (BA Math, 1987); Marlboro College, Vermont, USA (MSc Philosophy of Math Education, 1989); International School for Advanced Studies (SISSA), Trieste, Italy and Instituto de Matematica Pura e Aplicada (IMPA), Rio de Janeiro, Brazil (PhD in Dynamical Systems, 1995). Postdoctoral fellowships: University of Paris VI, France (1995); University of Warwick, UK (1995-1999). Permanent faculty positions: Imperial College London, UK (2000-2009); Abdus Salam International Centre for Theoretical Physics (2009-present).

Research: Internationally respected and active *Researcher in Dynamical Systems (Chaos Theory)* with more than 40 publications in prestigious journals in collaboration with researchers in 18 institutions, in 9 countries spread over 4 continents. Invited speaker and visiting professor at international conferences and institutions. Experienced research team leader including the supervision of 16 postdoctoral fellows and 11 PhD students.

Teaching: Deep interest and 35 years experience in *mathematics education* in several different contexts, from remedial mathematics at Marlboro College, Vermont, USA to mini-courses at schools or departments around the world (including Benin, Senegal, Libya, Iran, Nepal, India, China), to regular undergraduate and postgraduate courses (Warwick University, Imperial College London, SISSA, Trieste, and ICTP). Supervised more than 40 undergraduate and Master's theses of students with a wide range of nationalities and backgrounds and been an external examiner for 10 PhD examinations. Currently completing a textbook, *Introduction to Dynamical Systems and Ergodic Theory (A Socratic approach)*, which implements a *student-centered/ flipped classroom* approach to learning in which all the material is developed through exercises.

Science Promotion: Extensive experience of 15 years as a Research Scientist and Senior Research Scientist at the Abdus Salam International Centre for Theoretical Physics (ICTP), a UNESCO institute with the mission of *promoting excellence in science in developing countries*. Duties include research and teaching, and a significant involvement in programmes focussed on supporting scientists in developing countries. These include supervising and mentoring students and visitors, promoting and organizing educational and research activities, and high level negotiations with senior university and government officials. A main role has been that of *founder* and *international scientific coordinator* of the International Mathematics Master (IMM).

Languages: Italian (Native/Bilingual), English (Native/Bilingual), Brazilian Portuguese (Fluent), French (Intermediate), Indonesian (Beginner)

Experience and Education

Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy

2009-2024, Research Scientist; 2024-Present, Senior Research Scientist

- Conducting mathematical research at an international level, publishing research papers in international journals, disseminating results at international conferences.
- Team Leader for the Dynamical Systems group at ICTP, supervising and mentoring PhD students, postdoctoral fellows, and visitors. Organizing seminars and reading groups.
- Teaching in the ICTP pre-PhD Diploma programme in the ICTP-SISSA PhD programme as well as in other shorter schools and other events in developing countries.
- Participating in the organization, administration, and participant selection, of ICTP programmes, such as Diploma, Associates, and STEP, as well as the ICTP Schools and Conferences held at ICTP and in developing countries
- International Scientific Coordinator of the International Mathematics Master (IMM).

International Mathematics Master (IMM)

2018-Present, Founder and International Scientific Coordinator

- Drafting vision and mission statement and detailed proposal for the creation and implementation of IMM.
- Conducting negotiations with senior administration of COMSATS University Islamabad (CUI), Pakistan, concerning setting up the IMM programme at the Lahore Campus of CUI. Overseeing the signing of MoU between ICTP Director and CUI Rector in 2019.
- Conducting negotiations with faculty and senior administrators of the Lahore University of Management Science (LUMS) for planning transition of IMM from CUI to LUMS from September 2023 within the framework of the ICTP Affiliated Centre programme.
- Conducting negotiations with faculty and senior administrators of the National Higher School of Mathematics (NHSM) in Algeria for opening new node of IMM from September 2024 and new ICTP Affiliated Centre.
- Full responsibility for IMM academic programme and structure, recruitment of international visiting faculty and tutors, selection of students, fundraising, relationship with local faculty.

Imperial College London, UK

2000-2006 Lecturer, 2006-2010 Senior Lecturer, 2010-2011 Reader

- Conducting mathematical research at an international level, publishing research papers in international journals, disseminating results at international conferences.
- Teaching undergraduate and postgraduate courses, supervising undergraduate student projects and PhD students.
- Organizing schools and workshops in Dynamical Systems, creating networks. Co-applicant on a successful proposal for a major grant (BREUDS) from the European Science Foundation for 5 year network and exchanges with Brazilian partners.
- Co-founder, with colleague Jeroen Lamb, of the *Dynamical Systems at Imperial College (DynamIC)* research group, which is still today one of the strongest groups in Dynamical Systems in the UK.

University of Warwick, UK

1995-1996 Temporary Lecturer, 1996-1999 Postdoctoral Research Assistant.

- Teaching undergraduate courses in Mathematics, tutoring undergraduate students, started supervising first PhD student, Mark Holland, currently full professor at University of Exeter. Postdoctoral research assistant working with *Sebastian van Strien*.

Visiting Positions (1 Month or longer)

- University of Oslo, **Norway** (2022); University of Maryland, **USA** (2022); Penn State University, **USA** (2006 and 2008) ; Chinese Academy of Sciences, Beijing and Soochow University, **China** (2007); IMPA, Rio de Janeiro, **Brazil** (2000 and 2005); University of Barcelona, **Spain** (2005); University of Kyoto, **Japan** (2004); Universidade Federal da Bahia (UFBA), Salvador, **Brazil** (2002); Centre de Physique Theorique (CPT), Marseille, **France** (2001)**;** University of Uppsala, **Sweden** (1998)

University of Paris VI (now Sorbonne University)

1995 Postdoctoral Research Assistant with *F. Ledrappier*.

Scuola Internazionale Superiore di Studi Avanzati (SISSA), Trieste, Italy and Instituto de Matematica Pura e Aplicada (IMPA), Rio de Janeiro, Brazil

1990-1995 PhD Student

- **PhD in Mathematics (Dynamical Systems) 1995** Supervisors: *J. Palis and M. Viana*

Marlboro College, Vermont, USA

1987-1990 Mathematics Intern, 1987-1898 MSc Student

- Responsible for teaching "remedial mathematics" (Pre-Algebra and Pre-Calculus) to students majoring in Arts, Humanities or Social Sciences.
- **MSc** in **Philosophy of Mathematics Education 1989**. *The unfolding of the concept of number: Theory and Practice*. A study of the relationship between the *logical* development of the concept of number from a Hegelian point of view and the *psychological* development of the concept of number from a teacher's point of view. Supervisor: *Joe Mazur*

University of Warwick, UK

1984-1987 Undergraduate Student

- **BA** in **Mathematics 1987** with various elective course in philosophy, psychology, and mathematics education.

Luethi-Peterson Camps (LPC) for International Understanding

Summers 1982-83-84 Camp Counsellor, 1985-86-88-89 Camp Director

- LPC is a non-profit summer camp organization founded in 1946 by Armin Luethi (CH) and Natalie Peterson (USA) with the mission of bringing together a small group of 20-25 children from countries which had been at war with each other, helping them to get to know and appreciate different customs and cultures in an atmosphere of mutual support and understanding. There is an emphasis on community and everyone is involved in all aspects of the planning and running of the camp, including cleaning and cooking.
- Duties as camp counsellor are full time immersion for the 3-4 weeks of duration of the camp, leading various sports, music, or arts activities, planning and leading hikes and excursions, sharing cooking and cleaning duties together with the campers. Duties as camp director additionally involve all the planning of the camp, management of the finances, selecting the participants, and motivating and leading the counsellor group.

Research and Dissemination

Preprints (<u>ArXiv</u>)

1. *Statistical stability of interval maps with critical points and singularities,*
   Preprint (**2024**) With J.F. Alves and D. Gama. (<u>ArXiv</u>)

Book in Preparation

2. *Introduction to Dynamical Systems and Smooth Ergodic Theory, A Socratic approach.* **Springer.**

Selected Papers (Mostly available on <u>ArXiv</u>)

3. *Persistent Non-Statistical Dynamics in One-Dimensional Maps*
   Comm. in Math. Physics (2024) with D. Coates

4. *Doubly Intermittent Full Branch Maps with Critical Points and Singularities,*
   Comm. in Math. Physics 402(**2023**) with D. Coates and M. Muhammad.

5. *SRB measures and Young Towers for surface diffeomorphisms,*
   Annales Henri Poincaré 23 (**2021**) with V. Climenhaga, Y. Pesin

6. *Integrability of Continuous Bundles,*
   Journal for die Reine und Angewandte Mathematik (2019) with S. Tureli and K. War

7. *SRB measures for partially hyperbolic systems whose central direction is weakly expanding,*
   Journal of the EMS 19 (**2017**) with J. F. Alves, C.L. Dias, V. Pinheiro

8. *The geometric approach for constructing Sinai-Ruelle-Bowen measures*
   Journal of Statistical Physics 27 (**2017**) with V. Climenhaga and Y. Pesin

9. *Geometry of expanding measures and the liftability problem*
   Ann. Inst. H. Poincaré Anal. Non. Lin. 30 (**2013**) with J. F. Alves, C. Dias.

10. *Statistical properties and decay of correlations for interval maps with critical points and singularities*
    Communications in Mathematical Physics 320 (**2013**) with I. Melbourne.

11. *Uniform hyperbolic approximation of measures with non-zero Lyapunov exponents*
    Proceedings of the AMS 141 (**2013**) with F. Sanchez-Salas.

12. *From rates of mixing to recurrence times via large deviations*
    Advances in Mathematics, 228 (**2011**) with J.F. Alves, J.M. Freitas, S. Vaienti

13. *Finite resolution dynamics,*
    Foundations of Computational Mathematics, Vol 11, No. 2 (**2011**) with , P. Pilarczyk.

14. *Invariant measures for interval maps with critical points and singularities*
    Advances in Mathematics pp. 1428-1444 (**2009**) with V. Araujo, M. Viana.

15. *Topological invariance of generic non-uniformly expanding one-dimensional maps,*
    Mathematical Research Letters, 13, pp. 343-357 (**2006**). with L. Wang.

16. *Parameter exclusions in Hénon-like systems,*
    Russian Mathematical Surveys. **58** (**2003**) with M. Viana.

17. *Markov structures and decay of correlations for non-uniformly expanding maps,*
    Ann. de l'Inst. Henri Poincare, Anal. Non-Lin., 22 (**2005**) with J. F. Alves, V. Pinheiro.

18. *The Lorenz attractor is mixing,*
    Communication in Mathematical Physics, 260 (**2005**) with I. Melbourne, F. Paccaut.

19. *Rates of decay of correlations for one-dimensional dynamics,*
    Ann. Sci. de l'École Normale Supérieure 36 (**2003**) with H. Bruin, S. van Strien.

20. *Non-uniformly expanding dynamics in maps with criticalities and singularities,*
    Publications Mathematiques IHES, 89 (**1999**) with W. Tucker.

Other papers (Mostly available on <u>ArXiv</u>)

21. *Rigorous numerics for critical orbits for the quadratic family*
    Chaos, 30 (**2020**) with A. Golmakani, C.E. Koudjinan, P. Pilarczyk.

22. *Integrability of dominated decompositions in dimension three,*
    Ergodic Theory & Dynamical Systems 37-2 (**2017**) with S. Tureli and K. War.

23. *Uniform expansivity outside the critical neighbourhood in the quadratic family*
    Experimental Mathematics. 25-2 (**2016**) with A. Golmakani and P. Pilarczyk.

24. *Young Towers for product systems*
    Discrete and Continuous Dynamical Systems 36-3 (**2016**) with M. Ruziboev.

25. *A Frobenius Theorem for continuous corank-1 continuous distributions in dimensions 2 and 3.*
    International Journal of Mathematics 27 (**2016**) 467-493 (with S. Tureli and K. War)

26. *Integrability of C^1 invariant splittings*
    Dynamical Systems: An International Journal. 31-1 (**2016**) with S. Tureli and K. War.

27. *Some remarks on the geometry of the standard map*
    International Journal of Bifurcation and Chaos pp 2213-2232 (**2009**) with K. Bloor.

28. *Quantitative hyperbolicity estimates in one-dimensional dynamics*
    Nonlinearity 21 (2008) with S. Day, H. Kokubu, K. Mischaikow, H. Oka, P. Pilarczyk.

29. *The boundary of hyperbolicity for Hénon-like families*
    Ergodic Theory and Dynamical Systems 4 (2008) with Y. Cao, I. Rios.

30. *Hyperbolicity estimates for random maps with positive Lyapunov exponents*
    Proceedings of the AMS 136 (2008) with Y. Cao, I. Rios.

31. *Stable manifolds under very weak hyperbolicity conditions*
    Journal of Differential Equations, 221 (**2006**) with M. Holland.

32. *Stochastic-like behaviour in non-uniformly expanding maps,* in
    Handbook of Dynamical Systems, Vol. 1B, Hasselblatt and Katok (Eds), Elsevier. (**2006**)

33. *Computable starting conditions for nonuniform hyperbolicity in one-dimensional maps,*
    Nonlinearity 19, (**2006**) with H. Takahashi.

34. *Topological invariance of the sign of the Lyapunov exponents in one-dimensional maps,*
    Proceedings of the AMS, 134 (2006), with H. Bruin.

35. *A non-hyperbolic system with non-zero Lyapunov exponents for all invariant measures: internal tangencies,*
    Discrete and Continuous Dynamical Systems, 15, (**2006**) with Y. Cao, I. Rios).

36. *Decay of correlations for one-dimensional Lorenz-like maps with critical points and singularities,*
    Stochastics and Dynamics, 6 (**2006**), with K. Diaz-Ordaz, M. Holland.

37. *A new proof of the stable manifold theorem for hyperbolic fixed points on surfaces*
    Journal of Difference Equations & Applications, 11, (2005) with M. Holland.

38. *A minimum principle for Lyapunov exponents and higher dimensional version of a Theorem of Mané,*
    Qualitative Theory of Dynamical Systems, 6 (**2005**) with Y. Cao, I. Rios.

39. *Lyapunov exponents and rates of mixing for one-dimensional maps*
    Ergodic Theory and Dynamical Systems 24 (2004) with J. F. Alves, V. Pinheiro.

40. *Markov structures and decay of correlations for non-uniformly expanding maps*
    Electronic Research Announcements AMS, 9 (2003), with J. F. Alves, V. Pinheiro.

41. *Positive Lyapunov exponents for a family of Lorenz-like maps with criticalities*
    Astérisque, 261 (2000), with M. Viana.

42. *Bounded recurrence of critical points and Jakobson's Theorem,* in **The Mandelbrot set: themes and variations,** Tan Lei (Editor), LMS Lecture Notes vol 274, CUP (**2000**).

43. *Is philosophy detrimental to mathematics education ?*
    Philosophia Mathematica, Vol 6, 65-72 (**1991**)

Invited research lectures and seminars

2024 University of Maribor, **Slovenia,** *Workshop on Topological Dynamics, Continuum Theory, and related topics;* Sultan Qaboos University, **Oman**, *International Conference on Recent Trends in Mathematics;* Ferdowsi University, Mashhad, **Iran,** (Online) *55th Annual Iranian Mathematics Conference;* University of Parà, **Brazil**, *1 Dinâmica Pai D'Égua;* PUC Rio de Janeiro, **Brazil,** *EDAI seminar;* IMPA, Rio de Janeiro, **Brazil** *Seminar;* Universitas Islam Negeri Walisongo, **Indonesia** (Online) *1st International Conference on Mathematics and Mathematics Education.*

2023 Institut Teknologi Bandung (ITB), **Indonesia,** *Seminar;* Aga Khan University, Karachi, **Pakistan**, *Seminar;* Namal University, **Pakistan,** (Online) *Seminar;* University of Oslo, **Norway**, *Seminar;* Centro Enrico de Giorgi, Pisa, **Italy**, *Workshop on Probabilistic Methods in Dynamics;* **Nigeria** (Online) *Nigerian Mathematical Society Annual Conference.*

2022 University of Rwanda, Kigali, **Rwanda,** *Research Colloquium;* University of Vienna, **Austria,** *Seminar;* University of Amsterdam, **Netherlands** *Seminar;* University of Oslo, **Norway** *Mini lecture course;* Royal Institute of Technology (KTH), Stockholm, **Sweden,** *Seminar;* University of Porto, **Portugal**, *Seminar;* Institute de Matematica Pura e Aplicada (IMPA), Rio de Janeiro, **Brazil,** *Conference on Dynamical Systems;* Georgia Tech, Atlanta, **USA,** *Seminar;* University of Maryland, **USA** *Seminar;* Penn State University, **USA** *Conference on Dynamical Systems.*

2021 **Uzbekistan** (Online) *School on Dynamical Systems;* University of Oslo, **Norway**. *Colloquium Seminar;* IPM, Tehran, **Iran** (Online) *Workshop on Dynamical Systems.*

2020 Berlin Mathematical School, **Germany** *Seminar;* Brazilian Academy of Sciences, **Brazil** *Academical Bridges (in honour of the 80th Birthday of J. Palis);* PUC Rio, **Brazil** (Online) *Seminar, Resistencia Dinamica;* Fields Institute, Toronto, **Canada** (Online) *Conference on Machine Learning and Dynamical Systems.*

2019 Tor Vergata, Rome, **Italy,** *Conference Dynamical Systems: from geometry to mechanics;* Unione Matematica Italiana, Pavia, **Italy,** *Annual Conference;* IMPA, Rio de Janeiro, **Brazil.** *Brazilian Mathematical Colloquium;* COMSATS University, Lahore, **Pakistan,** *International Conference;* Tata Institute, Mumbai, **India,** *Seminar;* University of Laos, **Laos,** *Conference on Mathematics Education.*

2018 Valparaiso, **Chile,** *Conference Dynamics in Valparaiso;* Loughborough, **UK,** *Conference Dynamics Days Europe;* UFBA, Salvador, **Brazil,** *Conference on Dynamical Systems and Related Topics;* IMPA, Rio de Janeiro, **Brazil,** *Seminar;* University of Porto, **Portugal,** *Seminar;* TMU, Tehran, **Iran,** *TMU-ICTP School and Conference in Dynamical Systems;* University of **Esfahan, Iran,** *Seminar, Esfahan University;* Udine, **Italy,** *Workshop on Dynamical Systems.*

2017 University of Nova Gorica, **Slovenia** *East Alpine Meeting on Dynamical Systems;* Bochum University, **Germany** *Seminar;* Hammamet, **Tunisia** *First International Conference on Dynamical Systems;* Indam, **Rome** *Conference DinAmicI V - Modern Trends in the Ergodic Theory of Dynamical Systems;* Kerman, **Iran** *Maharani Mathematical Research Centre, Seminar;* Tarbiat Modares University, Tehran, **Iran** *Seminar;* Institute of Fundamental Research (IPM), Tehran, **Iran** *Programme in Dynamical Systems;* **Imperial College London** *Conference Aspects of Dynamical Systems;* CIRM, Marseille, **France** *Conference Non-uniformly and partially hyperbolic dynamical systems;* California State University, **USA** *Seminar.*

2016 ICERM, Brown University, **USA,** *Seminar;* Warwick University, **UK** *Conference The Dynamics of Complex Systems;* Imperial College London, **UK** *Seminar;* Lorentz Center, Leiden, **Netherlands.** *Conference on One-Dimensional Dynamics;* Centre for Applied Mathematics and Theoretical Physics, Maribor, **Slovenia.** *Seminar.*

2015 Penn State University, **USA** *Seminar;* Tashkent, **Uzbekistan** *International Conference on Algebra, Analysis and Quantum Probability;* Maceio, Alagoas, **Brazil** *UFAL Workshop in Dynamical Systems;* Budapest, **Hungary** *Budapest-Vienna Dynamics Seminar.*

2014 AUST, Abuja, **Nigeria** *33rd Nigerian Mathematical Society Meeting;* Institute of Mathematics, Uzbekistan National University, **Uzbekistan,** *Seminar;* Samarkand University, **Uzbekistan** *Seminar;* Abdus Salam School of Mathematical Sciences, Lahore **Pakistan** *Seminar;* Moscow, **Russia** *Conference Attractors, Foliations and Limit Cycles;* **ICTP, Trieste, Italy.** *Conference and School in Geometry, Dynamics and Integrable Systems;* University of Rome, Tor Vergata, **Italy.** *Seminar,* Department of Mathematics.

2013 Cuernavaca, **Mexico** *Conference on Complex Geometry, Dynamical Systems and Number Theory;* Lausanne, **Switzerland** *Conference on Hyperbolic Dynamics, Large Deviations and Fluctuations;* University of North Carolina at Chapel Hill, **USA** *Conference on Ergodic Theory.*

2012 Universiti Kebangsan, **Malaysia** *Workshop;* International Islamic University, **Malaysia** *Seminar;* National University of **Singapore** *Workshop on 1-dimensional dynamics.*

2011 Penn State University, **USA** *Seminar;* UFBA, Salvador, **Brazil** *Summer School;* IMPA, Rio de Janeiro, **Brazil** *Brazilian Mathematical Colloquium;* Uppsala, **Sweden** *Workshop on rigorous computations in Dynamical Systems;* Yaounde, **Cameroon** *ICTP School on Nonlinear Dynamics in Complex Systems;* PISA, **Italy** *Young Italian Hyperbolicians.*

2010 Saint Petersburg, **Russia** *Conference Topology, Geometry and Dynamics: Rokhlin memorial;* IMPA, Rio de Janeiro, **Brazil** *International Conference in Dynamical Systems;* Universidad de la Republica, Montevideo, **Uruguay** *Seminar;* University of Masshad, **Iran** *Seminar;* University of Trieste, **Italy,** *Seminar.*

2009 Toronto, **Canada** *Workshop on Computational Geometry, Topology, Dynamics;* Tripoli, **Libya** *International Conference on Basic Science;* University of Porto, **Portugal** *Seminar;* University of Exeter, **UK** *Seminar;* University of Udine, **Italy** *Seminar;* Corinaldo, **Italy** *Conference on Dynamical System.*

2008 ESI, Vienna, **Austria** *Semester on Hyperbolic Dynamical Systems;* University of Leeds, **UK** *Seminar;* University of Bristol, **UK** *Seminar;* UFF, Rio de Janeiro, **Brazil** *Seminar;* IMPA, Rio de Janeiro **Brazil** *Seminar;* University of Campinas, **Brazil** *Seminar;* Penn State University, **USA** *Seminar;* SISSA, Trieste, **Italy** *Convegno 30 anni di Analisi Matematica;* ICTP, Trieste, **Italy** *Workshop on Dynamical Systems.*

2007 Marseille, **France** *Conference From Dynamical Systems to Statistical Mechanics;* Hokkaido, **Japan** *Conference Dynamics of Complex Systems;* Chinese Academy of Sciences, Beijing, **China** *Seminar;* Suzhou University, **China** *Seminar;* Udine, **Italy** *Workshop on Dynamics.*

2006 Queen Mary University of London, **UK** *Conference Ergodic optimization and related topics;* University of Manchester, **UK** *Seminar;* Bedlewo, **Poland** *Conference Dynamics, Topology & Computation;* Penn State, **USA** *Seminar;* UIPUI Indianapolis, **USA** *Seminar;* University of Texas, Houston, **USA** *Seminar;* University of Texas, Austin, **USA** *Seminar;* Boston University, **USA** *Seminar;* Bologna, **Italy** *Nonlinear theory and its applications.*

2005 IMPA, Rio de Janeiro, **Brazil** *Conference in Dynamics;* Santander, **Spain,** *Conference Foundations of Computational Mathematics;* University of Barcelona, **Spain** *Seminar;* University of Liverpool, **UK** *British Mathematical Colloquium;* University of Warwick, **UK** *Seminar;* University of Oxford, **UK** *Seminar;* Penn State, **USA** *Dynamics Conference;* Cornell University, **USA** *Seminar;* Courant Institute, NYU, **USA** *Seminar.*

2004 MSRI Berkeley, **USA** *Conference Recent progress in dynamics;* Marseille, **France** *Conference Higher dimensional non-uniformly hyperbolic dynamics;* Tokyo, **Japan** *US-Japan workshop on Dynamics and Computation;* University of Kyoto, **Japan** *Seminar.*

2003 Southampton University, **UK** *Conference Nonlinear dynamics in the life sciences;* ETH, Zurich, **Switzerland,** *Dynamics Conference;* Hasselt, **Belgium** *Conference Equadiff 2003;*

Porto, **Portugal** *Conference Recent trends in dynamics;* University of Picardie, Amiens, **France** *Seminar.*

2002 Scuola Normal Superiore, Pisa, **Italy** *Semester on Dynamical Systems;* University of Durham, **UK** *Conference Markov chains, algorithms, applications and theory;* Penn State, **USA** S*emi-annual meeting in Dynamics;* Porto, **Portugal,** *Conference Recent trends in Dynamics;* CPT, Marseille, **France** *Seminar.*

2001 University of Porto, **Portugal** *Conference Recent Trends in Dynamics;* University of Exeter, **UK** *Seminar*

2000 IMPA, Rio e Janeiro, **Brazil,** *Conference on Dynamical Systems;* University of Surrey, **UK** *Dynamics Days*

1999 Warsaw, **Poland,** *Conference Real and complex dynamics;* University of Dijon, **France** *Conference Coupling Days*

1998 Royal Institute of Technology (KTH), Stockholm, **Sweden** *Seminar;* DAMPT, University of Cambridge, **UK** *Seminar;* University of Liverpool, **UK** *Seminar;* ICTP, Trieste, **Italy** *Conference on Dynamical Systems.*

1997 PUC, Rio de Janeiro, **Brazil** *Conference on Geometry and Dynamics; INLN,* Nice, **France** *Seminar; UESC,* Sao Carlos, **Brazil** *Seminar*

1995 ICTP, Trieste, **Italy** *Conference on Dynamical Systems;* Newton Institute, Cambridge, **UK,** *Finite to infinite dimensional dynamical systems;* Laboratoire de Probabilite, Paris VI, **France** *Seminar;* University of Southampton, **UK** *Seminar.*

Outreach Talks

SynTalk, Radio Interview, Mumbai, India, 2019; **Centre for Excellence in Basic Sciences (CEBS)** Student Organization, Mumbai, India 2019; **Basic Notions Seminar,** ICTP, 2019; **University of Trieste,** Lecture for Undergraduate students 2019; **Public Lecture, Castello di Miramare, Trieste, Italy.** 2018; **ICTP Library**, Lecture for ICTP Admin and General Staff 2018; **Pint of Science, TNT Pub, Trieste**, Italy 2018; **Flash Forward,** Lecture for High School Students in Trieste 2015; **Scuola Corsi,** Lecture for Middle School Students (at ICTP) 2015; **International School of Trieste** *Predicting an uncertain future, the mathematical theory of chaos.* 2011; **Researcher's Night, Trieste.** Lecture for general public. 2010; **Public Lecture, Trieste**. *L'infinito nel finito: la vera geometria della natura.* 2010; **Researcher's Night, Trieste.** Lecture for general public. 2009; **Dunraven High School, London.** *Chaos and Fractals. 2005*

Teaching and Mentoring

Post-doctoral Research Fellows and Long-Term Visitors

Hamza Ounesli, **Algeria,** (2024-present) Jernej Cinc, Slovenia (2023-present); Dominic Veconi, **USA** (2021-2023); Douglas Coates, **UK** (2019-2021); Wagner Ranter, **Brazil (**2018-2019); Lucia Simonelli, **US/Italy (**2016-2018); Oliver Butterley, **UK (**2015-2018); Li Xin, **China (**2013-2015); Mohammad Soufi, **Iran (**2013-2014); Ali Golmakani, **Iran** (2010-2011); Li Ming, **China (**2010-2011); Cui Hongfei, **China (**2010-2011); Yongluo Cao **China** (2003-2004); Geon Ho Choe **Korea** (2003-2004); Roland Zweimuller, **Austria** (2003-2004); Isabel Rios **Brazil** (2003-2004); Lan Yu Wang **China** (2003-2004); Frederic Paccaut **France (**2000-2001).

PhD Supervision

Rizwanullah (**Pakistan**)-In Progress; Rubio The (**Indonesia**)-In Progress; Hamza Ounesli (**Algeria**) 2024; Mubarak Muhammad (**Nigeria**) 2022; Khadim War (**Senegal**) 2016; Marks Ruziboev (**Uzbekistan**) 2015; Sina Tureli (**Turkey**) 2015; Oliver Butterley (**UK**) 2011; Katie Bloor (**UK**) 2007;

Simon Cedervall (**Sweden**) 2006; Karla Diaz-Ordaz (**Mexico**) 2005; Vincent Lynch (**UK**) 2003; Mark Holland (**UK**) 2001.

PhD Examination Committees

Asad Ullah (Phd, 2024) **Universidade da Beira Interior, Portugal**, *Statistical properties of dynamical systems via induced Weak Gibbs Markov maps* (Supervisor: Helder Vilarinho); Sakshi Jain (PhD, 2023) **Università Roma Tre, Italy,** Dynamics around Discontinuities (Supervisor: Carlangelo Liverani); Raul Chavez (MSc, 2023) **PUC Rio de Janeiro, Brazil,** Statistical behavious of skew-products: Schwarzian derivative and arc-sine laws (Supervisor Lorenzo Díaz); Niloofar Kiamari (PhD, 2021) **Università Roma Tre, Italy,** *Locating Ruelle-Policott Resonances* (Supervisor: Carlangelo Liverani)*;* Comlan Edmond Koudjinan (PhD, 2019, **Università Roma Tre, Italy**. *Quantitative KAM Normal forms and sharp measure estimates* (Supervisor: Luigi Chierchia); Diego de Silva Barros (PhD, 2018) **Universidade Federal do Rio de Janeiro (UFRJ)**. *Fluxos singular a dois parametros* (Supervisors: Christian Bonatti & Maria Jose Pacifico); El Hadji Yaya Tall (PhD, 2018) **Instituto de Matematica Pura e Aplicada (IMPA),** *Moduli of continuity of Lyapunov exponents for random GL(2)-cocycles* (Supervisor: Marcelo Viana); Ghasseb Askri (PhD, 2015) **University of Carthage, Bizerte, Tunisia** *Dynamics of dendrite maps* (Supervisor: Habib Marzougui); Gao Rui (PhD, 2014) **National University of Singapore** *Viana maps driven by Benedicks-Carleson maps* (Supervisor: Weixao Shen); Oswald Fogelklou (PhD, 2012) **University of Uppsala, Sweden.** *Computer-Assisted proofs and other methods for problems regarding Nonlinear Differential Equations.* (Supervisor: Warwick Tucker); Marie Philippe (PhD, 2009) **Université d'Aix-Marseille II** (Supervisor: Sandro Vaienti); Simon Lloyd (PhD, 2006) **University of Warwick** (Supervisor: Sebastian van Strien); Jorge Miguel Freitas (PhD, 2006) **University of Porto** (Supervisor: Jose F. Alves); Martino Barenco (PhD, 2005) **Queen Mary University of London** (Supervisor: D. Arrowsmith); Frederic Paccaut (PhD, 2000) **Université de la Bourgogne** (Supervisor: B. Schmitt)

ICTP Diploma project supervision

2024	Nodirbek Gafforov (**Uzbekistan**)	
2023	Rubio The (**Indonesia**)	-> **PhD SISSA, Italy**
2022	Hagar Ibrahim (**Egypt**)	
2022	Arooj Jamil (**Pakistan**)	-> MSc Calabria, Italy
2022	Rizwanullah (**Pakistan**)	-> MSc Trieste, Italy -> **PhD SISSA**
2021	Mirmukshin Makhmudov (**Uzbekistan**)	-> **Phd, Leiden, Netherlands**
2021	Ruba Hussein (**Egypt**)	
2020	Ibrahem Abdelghany (**Egypt**)	-> MSc, Trieste
2020	Hamza Ounesli (**Algeria**)	-> **PhD, ICTP-SISSA, Italy**
2019	Eugen Bronasco (**Moldova**)	-> Msc Geneve, Switzerland
2019	Asad Ullah (**Pakistan**)	-> **PhD, UBI, Portugal**
2018	Faisal Shah (**Pakistan**)	-> **PhD, Berlin, Germany**
2017	Abror Pirnapasov (**Uzbekistan**)	-> **PhD, Bochum, Germany**
2017	Mubarak Muhammad (**Nigeria**)	-> **PhD, SISSA, Italy**
2016	Alvaro Javeir Fuentes Suárez (**Cuba**)	-> **PhD, Nice, France**
2016	Vahatra Rabodonandrianandraina (**Madagascar**)	-> **PhD, Amsterdam. Netherlands**
2015	Moussa Ndour (**Senegal**)	
2015	Noor Ahmed Mahemd (**Sudan**)	
2014	Lakmi Niwanthi (**Sri Lanka**)	-> **PhD, North Texas**
2014	Rachidi Bolaji Salako (**Benin**)	
2014	El Hadji Yaya Tall (**Senegal**)	-> **PhD, IMPA, Brazil**
2014	Abdoulaye Thiam (**Senegal**)	-> **PhD, Canada**
2014	Shohruh Kholmatov (**Uzbekistan**)	-> **PhD, ICTP-SISSA**
2012	Khadim Mbacke War (**Senegal**)	-> **PhD, ICTP-SISSA**
2011	Marks Ruziboev (**Uzbekistan**)	-> **PhD, ICTP-SISSA**
2011	Anup Lamichane (**Nepal**)	

2011	Bob Senyange (**Uganda**)	-> **PhD, South Africa**
2010	Bertran Sedar Koumba Ngoma (**Congo**)	
2009	Silvya Agwang (**Cameroon**)	
2009	Alex Behakanira Tumwesigye (**Uganda**)	

Undergraduate & MSc project supervision (Imperial College London)

Colin Little (2008); Emily Lines (2007); Nick Calafatis (2007; Ryan Millerieux (2007); Solange Dive (2006; Juncal Hernan (2007); Eric Reynolds (2005); Lea Oljaca (2004); Oliver Butterley (2004); Matthew Ford (2004); Alexander Drewitz (2003); Andrew Lawrie (2003); Simon Cedervall (2003); Katie Bloor (2002); Martin Andersson (2002).

Teaching (Intensive Courses)

ICTP-ICTS-TIFR Differentiable and Homogenous Dynamics (2019), I**CTS, Bangalore, India.**
CIMPA School (2018), **Tribhuvan University, Kathmandu, Nepal;**
CIMPA School (2018) ,**Dangbo,Benin;**
MSc course in Dynamical Systems (2017), **University Gaston Berger, Senegal;**
Thematic Programme (2017), **Institute of Fundamental Research (IPM), Tehran, Iran;**
ICTP-CEA-SMA Dynamical Systems Courses (2015), IMSP, **Dangbo, Benin;**
CIMPA School on "Aspects of Ergodic Theory" (2014), **Tribhuvan University, Kathmandu, Nepal;**
ICTP-NLAGA School on Dynamical Systems (2014), **Mbour, Senegal;**
Mini-course (2010), University of **Masshad, Iran;**
ICTP School on Dynamical Systems (2010) University of **Alfateh Tripoli, Libya;**
Special semester on Dynamical Systems (2006), **Chinese Academy of Sciences, Beijing, China;**
School on Real and Complex Dynamics (2005) **Imperial College London;**
Winter School in Dynamical Systems (2002) **SISSA, Trieste, Italy;**
Course on Deterministic Dynamics (2001) **Limburgs Universitair Centrum, Diepenbeek, Belgium.**

Teaching (Advanced Courses)

Introduction to Differential Equations and Dynamical Systems, **ICTP & SISSA, 2009-2023**
Probabilistic Methods in Dynamics (4th Year/Msc), **Imperial College London, 2001-2009**
Introduction to Chaos (3rd/4th Year) **Imperial College London, 2001-2005**
Non-Hyperbolic Dynamics (4th Year/MSc) **Warwick University, 1995-1999**
Hyperbolic Dynamics (3rd/4th Year/MSc) **Warwick University, 1998**
Introduction to Dynamical Systems (3rd Year/MSc) **Warwick University, 1997**
Qualitative Theory of Differential Equations (3rdYear) **Warwick University, 1996**

Teaching (Foundation Courses)

Foundation Mathematics, **University of Manchester Institute of Science and Technology**, 2000
College Algebra, Precalculus, **Marlboro College, VT, USA.** 1998-1990
Maths 1 for Aeronautical Engineering (1st Year), **Imperial College London**, 2001-2009

Capacity Building and Administration

International Mathematics Master (IMM)

2018-present; *Director and International Scientific Coordinator*
The IMM is a new ambitious capacity building programme in fundamental mathematics.
Despite its simplicity it is quite unique in the landscape of mathematics development
programmes and fills in some significant cracks left open by existing activities. It consists of a
full two-year Masters programme in Mathematics *hosted by an existing and established institution* but

taught by visiting professors of international prestige from top universities worldwide. This provides continuity for the students that short intensive schools cannot provide, and the opportunity for local faculty to develop international research collaborations. The first pilot IMM programme was launched in September 2019 at <u>COMSATS University Islamabad, Lahore Campus</u>, Pakistan, and has already benefited from the expertise of almost *40 international visiting lecturers and tutors from top universities worldwide* (including Imperial College London, Ecole Polytechnique, Scuola Normale Pisa, etc.). The success rate has been phenomenal, with 16 out of the 18 students who have graduated in the first two cohorts (class of 2021 and 2022), gaining admission to *fully funded Master or PhD* programmes in Europe or the US. An IMM Alumni Association has been set up which aims to support the alumni to eventually return to their home countries to become themselves mentors and role models. In September 2023, the IMM moved to the <u>Lahore University of Management Sciences</u> (LUMS), one of the best and most dynamic universities in Pakistan and amongst the <u>top 50 small universities worldwide</u>. In September 2024 a *second branch* of IMM will open at the National Higher School of Mathematics in Algiers, Algeria. Serious expressions of interests in opening new IMM branches have been received by universities in several other countries. More information about IMM is available in the <u>IMM Concept Note</u>, the <u>IMM-CUI 2019-2022 Report</u>.

Pan African University (PAU)
Team Leader for Mathematics Panel, Curriculum Development. *PAU Stakeholder curriculum validation workshop*, **Addis Ababa, Ethopia,** PAU *Regional Curriculum Development Workshop*, **Nairobi, Kenya,** 2011.

Schools and Workshops Organized (International)
Lead co-organizer in all of the events below.

2021 **Comsats University Islamabad, Lahore Campus, Pakistan**
Recent Advances in Dynamical Systems CIMPA School
with P. Berger (Paris)

2019 **ICTS, Bangalore, India,** *Smooth and Homogenous Dynamics,*
with A. Ghosh (TATA Institute, Mumbai), M. Viana (IMPA, Rio de Janeiro)

2018 **Tarbiat Modares University, Tehran Iran,** *School and Conference in Dynamical Systems*
with M. Nassiri (IPM, Iran), K. Tajbaksh (TMU, Iran), A. Tahzibi (Sao Carlos, Brazil);

2016 **IMSP, Porto Novo, Benin ,** *ICTP-CEA-SMA Dynamical Systems Courses*
with G. Degla (IMSP, Benin);

2015 **IMSP, Porto Novo, Benin ,** *ICTP-CEA-SMA Dynamical Systems Courses*
with G. Degla (IMSP Benin);

2015 **Maceio, Brazil,** *ICTP-UFAL Conference on Dynamical Systems and Ergodic Theory*
with A. Golmakani (UFAL), K. Oliveira (UFAL;

2014 **Mbour, Senegal,** *ICTP-NLAGA School and Workshop in Dynamical Systems*
with I. Assani (University of North Carolina), M. Viana (IMPA, Rio de Janeiro);

2010 **Alfateh University, Tripoli, Libya** *School on Dynamical Systems*
With O. Faitori (Alfateh University, Tripoli);

Schools and Workshops Organized (Italy)
Lead co-organizer in all of the events below. All events at ICTP have a strong focus on promoting science to scientists in developing countries.

2021 **ICTP, Italy,** *Markov Partitions and Young Towers in Dynamics, School and Workshop*
with J.F Alves (Porto), Y Lima (Fortaleza);

2020 **ICTP, Italy** *Workshop on Dynamical Systems*

with J. De Simoi (Toronto), C. Ulcigrai (Zurich), M. Viana (IMPA, Rio de Janeiro)

2018   **ICTP, Italy,** *School in Dynamical Systems*
with J. Rodriguez-Hertz (Shenzen), C. Ulcigrai (Bristol), A. Wilkinson (Chicago);

2017   **Centro de Giorgi, Pisa, Italy** *School on Hyperbolic Dynamics*
with D. Dolgopyat (Maryland), Y. Pesin (Penn State), F. Rodriguez-Hertz (Penn State);

2017   **ICTP, Italy** *Workshop on Hyperbolic Dynamics*
D. Dolgopyat (Maryland), F. Rodriguez-Hertz (Penn State), O. Sarig (Weizmann, Israel);

2017   **ICTP, Italy,** *School on Algebraic, Geometric, and Probabilistic Aspects of Dynamical Systems and Control Theory* with A. Bufetov, Y. Pesin, A. Tahzibi, V. Timorin;

2015   **ICTP, Italy** *School and Conference in Dynamical Systems*
with M. Viana, J.C. Yoccoz;

2014   **ICTP, Italy** *School in Computation and Computability in Dynamics*
with S. Galatolo (Pisa);

2013   **ICTP, Italy** *Advanced School in Real and Complex Dynamics*
with M. Lyubich (Stony Brook), J. Smillie (Cornell), S. van Strien (Imperial College);

2013   **ICTP, Italy** *ICTP-SISSA-Moscow School in Geometry and Dynamics*
with A. Agrachev (SISSA), A. Bufetov (Marseille), V. Timorin (HSE, Moscow);

2012   **ICTP, Italy** *School and Workshop on Dynamical Systems*
with M. Viana (IMPA, Rio de Janeiro, J.C. Yoccoz (College de France);

2011   **ICTP, Italy** *Mini-workshop on Circle Maps*;

2011   **ICTP, Italy** S*chool and Conference on Computational Methods in Dynamics*
with J. Guckenheimer (Cornell), C. Simo (Barcelona), W. Tucker (Uppsala);

2010   **ICTP, Italy** *Mini-Workshop on Dynamical Systems*
with G. Panti (Udine), G. Gentili (Firenze) F. Vlacci (Firenze).

Schools and Workshops Organized (UK)

All events at Imperial College organized together with colleague J. Lamb within the framework of the DynamIC (Dynamical Systems at Imperial College) group.

2008   **Imperial College London** *Computer assisted proofs for uniform hyperbolicity*

2007   **Imperial College London** *Stochastic and Random Dynamics Graduate School*

2006   **Imperial College London** *Real and Complex Dynamics Graduate School.*

2004   **Imperial College London** *Mini-workshop on The Lorenz Equations.*

2002   **Imperial College London** *Geometric, probabilistic and variational methods in Dynamics;*

2001   **Imperial College London** *Concepts and Techniques in Smooth Ergodic Theory;*

2000   **UMIST, Manchester** *Geometry of Heˊnon-like and Lorenz-like maps;*

1998   **Warwick University** *PRODYN programme inaugural International workshop.*

Referees

Jeroen Lamb, Professor, Imperial College London
jeroen.lamb@imperial.ac.uk   *https://www.ma.imperial.ac.uk/~jswlamb/*
Yakov Pesin, Distinguished Professor, Penn State University, USA.
pesin@math.psu.edu   *https://yakovpesin.com/*
Marcelo Viana, Director, Instituto de Matematica Pura e Aplicada (IMPA), Rio de Janeiro, Brazil. **viana@impa.br**   **https://w3.impa.br/~viana/**