

Mathieu LEWIN

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CURRICULUM VITAE

Born on November 14th, 1977, in Senlis, France.

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6, rue Clauzel
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FRANCE

POSITIONS

- Oct. 2005:** CNRS position at the Mathematics Department of the University of Cergy-Pontoise.
- March 2005 - Aug. 2005:** Post-doctoral position at INRIA in the team MICMAC (CERMICS, École Nationale des Ponts et Chaussées).
- Aug. 2004 - Feb. 2005:** Post-doctoral position, Institut for Mathematical Sciences, University of Copenhagen (Denmark), with Jan Philip Solovej.
- Sept. 2002 - Aug 2004:** Assistant (“Allocataire-moniteur”) at the University of Paris Dauphine.
- Sept. 1998 - Aug. 2002:** student at the *École Normale Supérieure* of Cachan.

EDUCATION

- June 9, 2009 :** **Habilitation à diriger des recherches**, University of Cergy-Pontoise.
- Sept. 2001 - June 2004:** Ph.D. at the University of Paris Dauphine : “*Some Nonlinear Models in Quantum Mechanics*”. Advisor : Éric Séré.
- Sept. 1998 - Aug. 2002:** Scholarship at the Ecole Normale Supérieure de Cachan.
- July 2001:** French *Agrégation de Mathématiques*.
- 1999 - 2000:** DEA at the University Paris IX Dauphine “*Applied Non Linear Analysis*”.
- June 1999:** Bachelor of mathematics and Master of pure mathematics at the ENS Cachan / University Paris VII Jussieu.
- June 1995:** Scientific Baccalaureate, with highest honours.

TEACHING EXPERIENCE

- 2007-2012:** Mathematical Physics. Laboratoire Jacques Louis-Lions, Univ. Paris 6 (with Éric Cancès).
- 2006-2012:** PDE / Optimization. École Nationale des Ponts et Chaussées (with Frédéric Legoll). [Webpage](#).
- 2009-2010 :** Advanced lecture at the Mathematics department of the University of Cergy-Pontoise. Title: “Variational Methods in Quantum Mechanics”.
- 2003-2004:** Analysis, linear algebra, differential systems. University Paris Dauphine.
- 2002-2003:** Analysis and optimization, differential systems. University Paris Dauphine.
- 1999-2002:** “*Khôlles*” in Classes Préparatoires aux Grandes Ecoles, Paris.

LECTURES FOR YOUNG RESEARCHERS

- January 2012 :** Lecture “Nonlinear equations with fractional powers of the Laplacian and applications to quantum mechanics” (8h shared with Enno Lenzmann), Università di Pisa, Italy.
- August 2011 :** Lecture “Geometric methods for nonlinear many-body quantum systems” (4h). Summerschool on *Current topics in Mathematical Physics*, Erwin Schrödinger Institute, Vienne, Autriche.

DISTINCTIONS

- 2010-2015 :** Starting Independent Researcher Grant of the European Research Council (ERC).

PUBLICATIONS¹

PUBLISHED OR ACCEPTED PAPERS

- [1] L. Boulton, N. Boussaid, and M. Lewin. Generalised weyl theorems and spectral pollution in the Galerkin method. *Journal of Spectral Theory*, in press, 2012. [arXiv:1011.3634](#).
- [2] E. Lenzmann and M. Lewin. On singularity formation for the L^2 -critical Boson star equation. *Nonlinearity*, 24(12):3515, 2011. [arXiv:1103.3140](#), DOI.
- [3] R. L. Frank, M. Lewin, E. H. Lieb, and R. Seiringer. Energy Cost to Make a Hole in the Fermi Sea. *Phys. Rev. Lett.*, 106(15):150402, Apr 2011. [arXiv:1102.1414](#), DOI.

¹The papers can be downloaded on my web page <http://lewin.u-cergy.fr/>

- [4] P. Gravejat, M. Lewin, and É. Séré. Renormalization and asymptotic expansion of Dirac’s polarized vacuum. *Comm. Math. Phys.*, 306(1):1–33, 2011. [arXiv:1004.1734](#), DOI.
- [5] M. Lewin. Geometric methods for nonlinear many-body quantum systems. *J. Funct. Anal.*, 260:3535–3595, 2011. [arXiv:1009.2836](#), DOI.
- [6] C. Hainzl, E. Lenzmann, M. Lewin, and B. Schlein. On blowup for time-dependent generalized Hartree-Fock equations. *Ann. Henri Poincaré*, 11(6):1023–1052, 2010. [arXiv:0909.3043](#), DOI.
- [7] M. J. Esteban, M. Lewin, and A. Savin. Symmetry breaking of relativistic multi-configuration methods in the nonrelativistic limit. *Nonlinearity*, 23:767–791, 2010. [arXiv:0910.3932](#), DOI.
- [8] M. Lewin and É. Séré. Spectral pollution and how to avoid it (with applications to Dirac and periodic Schrödinger operators). *Proc. London Math. Soc.*, 100(3):864–900, 2010. [arXiv:0812.2153](#), DOI.
- [9] M. Lewin and R. Seiringer. Strongly correlated phases in rapidly rotating Bose gases. *J. Stat. Phys.*, 137(5-6):1040–1062, Dec 2009. [arXiv:0906.0741](#), DOI.
- [10] É. Cancès and M. Lewin. The dielectric permittivity of crystals in the reduced Hartree-Fock approximation. *Arch. Ration. Mech. Anal.*, 197(1):139–177, 2010. [arXiv:0903.1944](#), DOI.
- [11] E. Lenzmann and M. Lewin. Minimizers for the Hartree-Fock-Bogoliubov theory of neutron stars and white dwarfs. *Duke Math. J.*, 152(2):257–315, 2010. [arXiv:0809.2560](#), DOI.
- [12] C. Hainzl, M. Lewin, and J. P. Solovej. The thermodynamic limit of quantum Coulomb systems. Part II. Applications. *Advances in Math.*, 221:488–546, 2009. [arXiv:0806.1709](#), DOI.
- [13] C. Hainzl, M. Lewin, and J. P. Solovej. The thermodynamic limit of quantum Coulomb systems. Part I. General theory. *Advances in Math.*, 221:454–487, 2009. [arXiv:0806.1708](#), DOI.
- [14] P. Gravejat, M. Lewin, and É. Séré. Ground state and charge renormalization in a nonlinear model of relativistic atoms. *Commun. Math. Phys.*, 286(1):179–215, 2009. [arXiv:0712.2911](#), DOI.
- [15] M. Ghimenti and M. Lewin. Properties of periodic Hartree-Fock minimizers. *Calc. Var. Partial Differential Equations*, 35(1):39–56, 2009. [arXiv:0803.3269](#), DOI.
- [16] J. Dolbeault, P. Felmer, and M. Lewin. Stability of the Hartree-Fock model with temperature. *Math. Models Methods Appl. Sci.*, 19(3):347–367, 2009. DOI.
- [17] C. Hainzl, M. Lewin, and É. Séré. Existence of atoms and molecules in the mean-field approximation of no-photon quantum electrodynamics. *Arch. Ration. Mech. Anal.*, 192(3):453–499, 2009. [arXiv:math-ph/0606001](#), DOI.
- [18] C. Hainzl, M. Lewin, and R. Seiringer. A nonlinear model for relativistic electrons at positive temperature. *Rev. Math. Phys.*, 20(10):1283–1307, 2008. [arXiv:0802.4054](#), DOI.

- [19] É. Cancès, A. Deleurence, and M. Lewin. Non-perturbative embedding of local defects in crystalline materials. *J. Phys.: Condens. Matter*, 20:294213, 2008. [arXiv:0706.0794](#), DOI.
- [20] M. J. Esteban, M. Lewin, and É. Séré. Variational methods in relativistic quantum mechanics. *Bull. Amer. Math. Soc. (N.S.)*, 45(4):535–593, 2008. [arXiv:0706.3309](#), DOI.
- [21] É. Cancès, A. Deleurence, and M. Lewin. A new approach to the modelling of local defects in crystals: the reduced Hartree-Fock case. *Commun. Math. Phys.*, 281(1):129–177, 2008. [arXiv:math-ph/0702071](#), DOI.
- [22] C. Hainzl, M. Lewin, É. Séré, and J. P. Solovej. A minimization method for relativistic electrons in a mean-field approximation of quantum electrodynamics. *Phys. Rev. A*, 76:052104, 2007. [arXiv:0706.1486](#), DOI.
- [23] C. Hainzl, M. Lewin, and J. P. Solovej. The mean-field approximation in quantum electrodynamics: the no-photon case. *Comm. Pure Appl. Math.*, 60(4):546–596, 2007. [arXiv:math-ph/0503075](#), DOI.
- [24] É. Cancès, M. Lewin, and G. Stoltz. The electronic ground-state energy problem: a new reduced density matrix approach. *J. Chem. Phys.*, 125(6):64101, 2006. [arXiv:quant-ph/0602042](#), DOI.
- [25] M. Lewin. Solution of a mountain pass problem for the isomerization of a molecule with one free atom. *Ann. Henri Poincaré*, 7(2):365–379, 2006. DOI.
- [26] É. Cancès, H. Galicher, and M. Lewin. Computing electronic structures: a new multiconfiguration approach for excited states. *J. Comput. Phys.*, 212(1):73–98, 2006. DOI.
- [27] C. Hainzl, M. Lewin, and É. Séré. Self-consistent solution for the polarized vacuum in a no-photon QED model. *J. Phys. A*, 38(20):4483–4499, 2005. [arXiv:physics/0404047](#), DOI.
- [28] C. Hainzl, M. Lewin, and C. Sparber. Existence of global-in-time solutions to a generalized Dirac-Fock type evolution equation. *Lett. Math. Phys.*, 72(2):99–113, 2005. [arXiv:math-ph/0412018](#), DOI.
- [29] C. Hainzl, M. Lewin, and É. Séré. Existence of a stable polarized vacuum in the Bogoliubov-Dirac-Fock approximation. *Commun. Math. Phys.*, 257(3):515–562, 2005. [arXiv:math-ph/0403005](#), DOI.
- [30] M. Lewin. A mountain pass for reacting molecules. *Ann. Henri Poincaré*, 5(3):477–521, 2004. DOI.
- [31] M. Lewin. Solutions of the multiconfiguration equations in quantum chemistry. *Arch. Ration. Mech. Anal.*, 171(1):83–114, 2004. DOI.
- [32] M. Lewin. The multiconfiguration methods in quantum chemistry: Palais-Smale condition and existence of minimizers. *C. R. Math. Acad. Sci. Paris*, 334(4):299–304, 2002. DOI.

PREPRINTS

- [1] E. Cancès, S. Lahbabi, and M. Lewin. Mean-field models for disordered crystals. preprint arXiv, 2012. [arXiv:1203.0402](#).
- [2] M. Lewin and N. Rougerie. On the binding of small polarons in a mean-field quantum crystal, 2012. [arXiv:1202.5103](#).
- [3] X. Blanc and M. Lewin. Existence of the thermodynamic limit for disordered quantum Coulomb systems, January 2012. [arXiv:1201.4670](#).
- [4] M. Lewin and N. Rougerie. Derivation of Pekar’s Polarons from a Microscopic Model of Quantum Crystals, 2011. [arXiv:1108.5931](#).
- [5] R. L. Frank, M. Lewin, E. H. Lieb, and R. Seiringer. A positive density analogue of the Lieb-Thirring inequality, 2011. [arXiv:1108.4246](#).

PROCEEDINGS

- [1] M. Lewin. Sur l’effondrement dynamique des étoiles quantiques pseudo-relativistes. In *Séminaire Laurent Schwartz*. École Polytechnique, April 2011.
- [2] M. Lewin. Renormalization of Dirac’s polarized vacuum. In P. Exner, editor, *Mathematical Results In Quantum Physics*. World Scientific Publishing, 2011. Proceedings of the QMath 11 Conference, Hradec Králové, Czech Republic, 6–10 September 2010. [arXiv:1010.0075](#).
- [3] É. Cancès, M. Lewin, and G. Stoltz. The microscopic origin of the macroscopic dielectric permittivity of crystals: A mathematical viewpoint. In B. Engquist, O. Runborg, and Y. Tsai, editors, *Numerical Analysis of Multiscale Computations*, volume 82 of *Lecture Notes in Computational Science and Engineering*, pages 87–125. Springer, 2011. Proceedings of a Winter Workshop at the Banff International Research Station 2009. [arXiv:1010.3494](#), DOI.
- [4] C. Hainzl, M. Lewin, and J. P. Solovej. The thermodynamic limit of quantum Coulomb systems: A new approach. In I. Beltita, G. Nenciu, and R. Purice, editors, *Mathematical results in Quantum Mechanics: Proceedings of the QMath10 Conference*. World Scientific, 2008. [arXiv:0806.2436](#), DOI.
- [5] M. Lewin. On the computation of excited states with MCSCF methods. *J. Math. Chem.*, 44(4):967–980, 2008. Conference “Mathematical Methods for Ab Initio Quantum Chemistry”, Nice (FRANCE), Nov. 2005. DOI.
- [6] M. Lewin. The thermodynamic limit of Quantum Coulomb Systems. *Oberwolfach Reports*, 4(1):399–400, 2007. Workshop “Multiscale and Variational Methods in Material Science and Quantum Theory of Solids”.
- [7] M. Lewin. On the computation of excited states with MCSCF methods. *Oberwolfach Reports*, 3(4):2833–2836, 2006. Workshop “Mathematical and Numerical Aspects of Quantum Chemistry Problems”.
- [8] M. Lewin. Solutions of the multiconfiguration equations in quantum chemistry. *Oberwolfach Reports*, 1(3):1541–1586, 2005. Workshop “Calculus of variations” June, 2004.

TALKS

INTERNATIONAL CONFERENCES

Spectral Days, Munich, April 9–13, 2012.

EMS Week End, session on *PDEs and applications to mechanics and physics*, Bilbao, Spain, Oct. 7–9 2011.

Thematic Minisymposia on *Quantum Modeling in Molecular Simulation* and on *Current interests in Mathematical Physics*, *International Congress on Industrial and Applied Mathematics* (ICIAM 2011), Vancouver, Canada, July 18–22, 2011.

Conference *Intellectual Challenges in Multiscale Modelling of Solids*, University of Oxford, UK, July, 4–5, 2011.

Workshop *Mathematical Methods in Quantum Chemistry*. Oberwolfach, Allemagne, June 27 – July 1st, 2011.

Fourth School and Workshop on *Mathematical Methods in Quantum Mechanics*. Bressanone, Italy, Feb. 14–19, 2011.

Conference on *New Approaches in Many-Electron Theory* (invited speaker). Max-Planck-Institut für Polymerforschung, Mainz, Germany, Sept. 20–24, 2010.

QMATH11, Conference on *Mathematical Results in Quantum Physics* (plenary speaker). Hradec Králové, Czech Republic, Sept. 6–10, 2010.

ICM 2010 Satellite Conference on *Quantum Systems*. Chennai, India, August 14–18, 2010.

Workshop on *Matter and Radiation*. Erwin Schrödinger Institute, Vienna, Austria, June 7–18, 2010.

SIAM Conference on Mathematical Aspects of Material Sciences. Session on “Electronic structure”. Philadelphia, USA, May 24–26, 2010.

2010 British Mathematical Colloquium and *British Applied Mathematics Colloquium*. Session “Spectral Theory”. Edinburgh, Scotland, April 6, 2010.

Annual meeting of the German Math. Society (DMV). Session “Mathematical methods in quantum chemistry and electronic structure theory”. Munich, Germany, March 9, 2010.

International Conference on Numerical Analysis and Applied Mathematics. Symposium on “Numerical methods and their applications in molecular simulation”, Rethymnon, Crete, Sept. 18–22, 2009.

Conference *Mathematics of Complex Quantum Systems*, Oberwolfach (Germany), August 5 – Sept. 5, 2009.

IMA Annual Program Year Workshop *Mathematical and Algorithmic Challenges in Electronic Structure Theory*, Minneapolis (USA), Sept. 29 – Oct. 3, 2008

XI Encuentro de Matematica y sus Aplicaciones (plenary speaker), Quito (Ecuador), July 7–11, 2008.

Canadian-French Conference, Montréal (Canada), June 2–5, 2008.

Conference *QMATH 10* (invited speaker), Moeiciu (Romania), Sept. 9–15, 2007.

4th Danish Symposium on *Applied Analysis*, Copenhagen (Denmark), August 15–18, 2007.

International Conference on Scientific Computation and Differential Equations (*SciCADE 2007*). Symposium “Applications to Chemistry”. Saint-Malo (France), July 9–13, 2007.

Conference *Relativistic Effects in Heavy Elements*, Ottrott (France), March 21–25, 2007.

Workshop *Multiscale and Variational Methods in Material Science and Quantum Theory of Solids*, Oberwolfach (Germany), Feb 11–17, 2007.

Conference *Semi-classical Days XIV*, CIRM, Marseille-Luminy (France), January 16-19, 2007.

Conference *Mathematical and Numerical Aspects of Quantum Chemistry Problems*, Oberwolfach (Germany), Oct. 22–26, 2006.

Conference *Mathematics in Chemistry*, Lisbon (Portugal), July 19-21, 2006.

Workshop on *Quantum Mechanics of Complex Systems*. Erwin Schrödinger Institute, Vienna (Austria), June 1st, 2006.

Conference *Topological and Variational Methods in Partial Differential Equations*, Guanajuato (Mexico), Dec. 5-9, 2005.

Conference *Mathematical Methods for Ab Initio Quantum Chemistry*, Nice (France), Nov. 18-19, 2005.

Fourth international conference on *Analysis and Quantum*, München (Germany), april 9-11, 2005.

Conference of the 2004-2005 *Warwick EPSRC Symposium*, “Mathematical challenges in quantum chemistry”, Warwick (UK), December 13-15, 2004.

Conference of the 2004-2005 Warwick EPSRC Symposium, *Large many-body systems*, Warwick (UK), August 23-28, 2004.

Satellite conference of the Fourth European Congress of Mathematics, *Spectrum and Quantum Mechanics*, Stockholm (Sweden), July 3-5, 2004 (within the EU network “Analysis and Quantum”).

Workshop *Calculus of variations*, Oberwolfach (Germany), June 13-19, 2004.

Meeting of the EU network “Analysis and Quantum”, Vienna (Austria), Dec. 6-7 2003.

AMAM (*Applied Mathematics and Applications of Mathematics*), Symposium of Quantum Chemistry, Nice (France), Feb. 2003.

WORKSHOPS, SEMINARS, COLLOQUIUM

Seminario de Operadores y Física Matematica (2h), IIMAS, Universidad Nacional Autónoma de México, March 15 & 16, 2012

Séminaire POEMS, ENSTA / INRIA, March 8, 2012.

Groupe de travail de Physique Mathématique, Univ. Cergy-Pontoise, Feb. 13 & 20, 2012

Conference of the ANR project ArDyPitEq “Analysis of quantum models”, Rennes, Nov. 17-18, 2011.

Groupe de travail “Analyse non linéaire”, Laboratoire Jacques-Louis Lions, Univ. Paris 6, Oct. 4, 2011

Séminaire “Combinatoire, algorithmique et interactions”, Laboratoire d’Informatique de Paris-Nord, Université Paris 13, 21 Juin 2011.

Séminaire Laurent Schwartz “PDE and applications”, École Polytechnique, Palaiseau, April 5, 2011.

Seminar of the Theoretical Physics Department, CEA-DAM, Bruyères-Le-Châtel, Feb. 2, 2011.

Séminaire de Calcul Scientifique, CERMICS (ENPC), Marne-la-Vallée, January 12, 2011.

Mathematical Physics Seminar, Princeton (USA), Dec. 14, 2010.

Conference *Mathematical models of Quantum Field Theory*, École Polytechnique, Dec. 7-8, 2010.

Séminaire d’Analyse Numérique et EDP, Université Paris-Sud, Nov. 18, 2010.

Oberseminar Analysis, Max Plank Institute, Leipzig, Nov. 16, 2010.

Analysis Colloquium, CRM, Université de Montréal, Oct. 29, 2010.

Mathematical Physics Seminar, McGill University, Montréal, Oct. 27, 2010.
Séminaire Analyse-Géométrie, Université de Nice Sophia Antipolis, Oct. 7, 2010.
Séminaire de EDP / Physique Mathématique, Université de Bordeaux, March 30, 2010.
Séminaire Analyse numérique & Équations aux dérivées partielles, Université de Lille, Jan. 21, 2010.
Séminaire d'Analyse, Université de Nantes, Jan. 14, 2010.
Séminaire Problèmes Spectraux en Physique Mathématique, Institut Henri Poincaré, Jan. 11, 2010.
Séminaire de Mathématiques appliquées, Collège de France, Jan. 8, 2010.
Seminario de Física de la Materia Condensada, Pontificia Universidad Católica, Santiago de Chile, Dec. 11, 2009.
 Groupe de travail de *Physique Mathématique*, Cergy, Nov. 30, 2009.
Quantum and Classical Dynamics Seminar, Centre de Physique Théorique, Marseille, Nov. 25, 2009.
Analysis seminar, Cambridge (UK), Nov. 23, 2009.
Mathematical Physics Seminar, Princeton University (USA), Nov. 10, 2009.
Analysis and Geometry Seminar, University of Copenhagen (Denmark), Oct. 9, 2009.
Séminaire EDP, Rennes, Oct. 1st, 2009.
 Workshop “Analysis of nonlinear wave equations and applications in engineering”, Banff International Research Station (Canada), August 9–14, 2009.
Mainz-Heidelberg seminar. Mainz (Germany), June 19, 2009.
 Colloquium *Mathematical aspects of quantum field theory*. Bordeaux, April 3-4, 2009.
Mathematical Physics Seminar, ETH Zürich, Physics Department, March 26, 2009.
Paris-London Seminar, University College, London (UK), March 20, 2009.
Analysis Seminar, Imperial College, London (UK), March 19, 2009.
Analysis and Geometry Seminar, University of Copenhagen (Denmark), March 6, 2009.
Mathematical Physics Seminar, University of Alabama at Birmingham (USA), February 20, 2009.
 Groupe de travail *Analyse non linéaire*, Université Paris 6 / ENS, Jan. 15, 2009.
Séminaire Equations aux Dérivées Partielles, Université de Besançon, Nov. 7, 2008.
 Session *Strongly Interacting Many-Particle Systems*, Program *Mathematical Horizons for Quantum Physics*. Institute of Mathematical Sciences, Singapore, Sept. 2, 2008.
 Session *Nonlinear elliptic equations in physical modelling*, Le Donne del Laplaciano, Cortona, June 12, 2008.
Seminari di fisica matematica, Università di Pisa (Italy), June 10, 2008.
Statistical Mechanics Seminar, Department of Mathematics, University of Warwick (UK), May 23, 2008.
Analysis / PDE Seminar, Massachusetts Institute of Technology, Cambridge (USA), May 7, 2008.
Analysis Seminar, Maxwell Institute for Mathematical Sciences / Heriot-Watt University (Scotland), Feb. 5, 2008.
Séminaire de Physique Mathématique, Université Paris-Sud, January 17, 2008.
Séminaire d'Analyse, Université de Franche-Comté, Besançon (France), Dec. 20, 2007.
Séminaire de Calcul Scientifique, CERMICS, École Nationale des Ponts et Chaussées, Marne-La-Vallée (France), Dec. 18, 2007.

Séminaire de *Physique Mathématique*, Institut Fourier, Grenoble (France), Dec. 17, 2007.

Mathematical Physics Seminar. University of Alabama at Birmingham (USA), Nov. 16, 2007.

Lectures in mathematical physics and nonlinear analysis ($2 \times 1\text{h}30$), University of Alabama at Birmingham (USA), Nov. 14 & 20, 2007.

Statistical Mechanics Seminar, Princeton University (USA), Nov. 7th, 2007.

Talk at the Laboratoire de Physique Théorique et Modèles Statistiques, University Paris Sud, Orsay (France). Oct. 22, 2007.

Relativistic Workshop. CMAP, École Polytechnique, Palaiseau (France), Oct. 17 2007.

Coloquium of the Department of Mathematics and Theoretical Physics, Talca (Chile), July 30, 2007.

Workshop on *Nonlinear PDEs and Applications to Biology and Physics*, Santiago (Chile), July 19, 2007.

Séminaire *Analyse - Probabilités*, Ceremade, Université Paris Dauphine (France), June 12, 2007.

Séminaire de *Physique Mathématique*, Université Paris-Sud (France), May 10, 2007.

Séminaire *EDP*, Université de Bordeaux (France), March 29, 2007.

Séminaire de *Physique Mathématique et Géométrie*, Université Paris VII (France), January 23, 2007.

Special day “*Mean Field models in Quantum Chemistry and Nuclear Physics*”, CEA-DAM, Bruyères-Le-Châtel (France), January 16, 2007.

Analysis and Mathematical Physics Seminar (2h), Département de Mathématiques, University of Cergy-Pontoise (France), Nov. 13, 2006.

Special workshop between the Mathematics Department (AGM) and the Theoretical Physics Department (PTM). University of Cergy-Pontoise (France), June 30, 2006.

Groupe de travail de *Physique Mathématique*. Département de Mathématiques. Université Paris-Sud (France), June 27, 2006.

Analysis Seminar, Institute for Mathematical Sciences, University of Copenhagen (Denmark). May 4, 2006.

Séminaire EDP, IRMAR, Rennes (France). April 13, 2006.

Oberseminar Mathematische Physik, LMU, München (Germany), Feb. 7, 2006.

Séminaire de *Physique Mathématique*, Institut Fourier, Grenoble (France), Jan. 3, 2006.

Séminaire POems (ONDES (INRIA) and ENSTA), ENSTA, Nov. 24, 2005.

Séminaire tournant *Problèmes Spectraux en Physique Mathématique (Cergy-X-Orsay-Paris 13)*. Institut Henri Poincaré, Nov. 21, 2005.

Séminaire d’analyse. Département de Mathématiques, Université de Cergy-Pontoise (France), Nov. 14, 2005.

Séminaire *Jacques-Louis Lions*. Laboratoire JLL. Université Pierre et Marie Curie (France), Nov. 4, 2005.

Séminaire *Équations aux dérivées partielles*. Département de Mathématiques. Université Paris-Sud (France), March 29, 2005.

Séminaire de *Physique Mathématique*. Département de Mathématiques, Université de Cergy-Pontoise (France), March 23, 2005.

Séminaire de *Calcul Scientifique*. CERMICS, École Nationale des Ponts et Chaussées (France), March 16, 2005.

MaPhySto Workshop on Mathematical Physics, University of Århus (Denmark), Oct. 1, 2004.

Quantum Seminar (2 h), Institute for Mathematical Sciences, University of Copenhagen (Denmark), Sept. 24, 2004.

Séminaire *Quantum and Classical Dynamics*, Centre de Physique Théorique, Université de Marseille (France). April 21, 2004.

Séminaire *Analyse-Probabilités*. Ceremade, Université Paris IX Dauphine (France), March 22, 2004.

Mathematics Colloquium. LMU, München (Germany). Feb. 13, 2004.

Séminaire de *Physique Mathématique et Géométrie*. Université de Lille (France). Feb. 10, 2004.

Séminaire d'*Analyse*. Laboratoire de Mathématiques de Nantes (France), March, 2002.

Séminaire *Analyse et Calcul des variations*. Ceremade, Université Paris IX Dauphine (France), Feb. 12, 2002.

SCHOOLS

Lecture (4h) at the summerschool *Current topics in Mathematical Physics*, ESI, Vienna (Austria), August 2011.

POSTERS

Conference “Current Density Functional Theory”, Tromsø (Norway), Sept. 19–22, 2007.

OTHER ACTIVITIES

LONG VISITS ABROAD

One month (Oct. 2008) at the *Institute for Mathematics and its Applications*, University of Minnesota, Minneapolis (USA). IMA Thematic Year on “Mathematics and Chemistry”.

Three weeks (Sept. 2008) at the *Institute of Mathematical Sciences*, Singapore, Program *Mathematical Horizons for Quantum Physics*.

Seven months (August 2004 - February 2005) post-doctoral position at the *Institut for Mathematical Sciences*, University of Copenhagen (Denmark), with Jan Philip Solovej.

Three weeks (August 2004) at the *Warwick Mathematics Institute*, University of Warwick (UK), invited by Gero Friesecke.

One month (January 2004) at the *P. Universidad Católica de Chile*, Santiago (Chile), invited by Rafael Benguria. ECOS/CONICYT program n°C02E06 .

NETWORKS AND PROJECTS

Coordinator of the ERC Starting Grant *Mathematics and Numerics of Infinite Quantum Systems*, FP7/2007–2013 no. 258023.

Coordinator of the ANR project *NoNAP* (Nonlinear Methods in Atomic and Nuclear Physics) (Oct. 2010 – Sept. 2014).

Grant PHC-Alliance obtained in collaboration with Lyonell Boulton (Heriot Watt University, Scotland) for 2010.

Member and local correspondent for Cergy of the GDR project *Quantum Dynamics* (Jan. 2009 – Dec. 2012), [Webpage](#)

Member of the *MathAmSud* project “Nonlinear Analysis and Partial Differential Equations” (Jan. 2009 – Dec. 2012), [Webpage](#)

Was a member of the ANR project *ACCQUAREL* (Computational Approaches in Relativistic Quantum Chemistry) (Dec. 2005 – Oct. 2009), [Webpage](#)

Was a member of the EU network “Analysis and Quantum” (coordinator: Heinz Siedentop, LMU, Munich) HPRN-CT-2002-00277, [Webpage](#)

Was a member of the program France-Chile ECOS/CONICYT n°C02E06, “Partial Differential Equations in Mathematical Physics”, [Webpage](#)

Member and local correspondent for Cergy, of the SMF and SMAI societies.

ORGANIZATION OF CONFERENCES

5 Mars 2012 Organizer of the workshop “Derivation of effective theories in quantum mechanics”, University of Cergy-Pontoise.

June 21-25, 2010: Co-organizer (with É. Séré) of the international conference “Mathematical Aspects of Quantum Electrodynamics” at the Institut Henri Poincaré, mixing physicists and mathematicians. [Webpage](#)

June 8, 2009 : Co-organizer (with L. Bruneau) of the colloquium “Infinite Quantum Systems” at the University of Cergy-Pontoise. [Webpage](#)

May, 28, 2009 : Organizer of the session “Applications to Quantum Chemistry”, Conference SCICADE 09, Beijing (China). [Webpage](#)

April 6, 2009 : Co-organizer (with D. Dos Santos Ferreira) of the 2nd special meeting between the Cergy and Paris 13. [Webpage](#)

January 26–27 2009 : Co-organizer (with L. Bruneau, T. Duyckaerts & F. Germinet) of a symposium in honor of Michael Aizenman in the occasion of his Doctorat Honoris Causa at the University of Cergy-Pontoise. [Webpage](#)

April 21–25 2008 : Co-organizer of the week “Quantum Statistical Physics and Information Theory”. [Webpage](#)

Jan. 31 – Feb. 1st 2008 : Co-organizer of the annual meeting “Spectral Problems in Quantum Mechanics ” of the GDRE “Mathematics and Quantum Physics” (with F. Germinet & L. Bruneau). [Webpage](#)

First semester of 2008 : Coordinator of the thematic semester of the University of Cergy-Pontoise “Quantum Systems / Complex Systems” [Webpage](#)

Dec. 3rd, 2007 : Co-organizer (with D. Dos Santos Ferreira) of a special meeting between Cergy and Paris 13. [Webpage](#)

2007-08 : Organizer of a series of thematic colloquia in the Mathematical department of the University of Cergy-Pontoise. [Webpage](#)

July 2007: Co-organizer (with G. Turinici) of the mini-symposium “Computational issues in Relativistic Quantum Chemistry” at the “International Congress on Industrial and Applied Mathematics”, Zurich. [Webpage](#)

March 3rd, 2007: Co-organizer (with C. Fermanian) of the colloquium “Mathematical Methods in Quantum Physics and Chemistry”, University of Cergy-Pontoise. [Webpage](#)

January 8th, 2007: Organizer of the colloquium “Mathematical and Numerical Methods in the Quantum Theory of Solids”, University of Cergy-Pontoise. [Webpage](#)

- Sept. 03–06, 2006:** Co-organizer of the conference “Transport and Spectral Problems in Quantum Mechanics” in honour of Jean-Michel Combes, at the University of Cergy-Pontoise (with J.M. Barbaroux, F. Dunlop, F. Germinet, P. Hislop & F. Klopp). [Webpage](#)
- 2006-07 :** Co-organizer of a series of thematic colloquia in the mathematics department of the University of Cergy-Pontoise (with C. Fermanian). [Webpage](#)
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ORGANIZATION OF SEMINARS AND WORKSHOPS

- 2007-11:** Co-organizer of the seminar “Mathematical Physics” of the mathematics department at the University of Cergy-Pontoise (with L. Bruneau). [Webpage](#)
- 2006-07:** Co-organizer of the seminar “Mathematical Physics” of the mathematics department at the University of Cergy-Pontoise (with C. Fermanian). [Webpage](#)
- 2005-06:** Co-organizer of the seminar “Mathematical Physics and Dynamical Systems” of the mathematics department at the University of Cergy-Pontoise (with F. Germinet & H.-H. Rugh).
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ADVISORY

PhD Thesis

- Advisor of Salma Lahbabi (PhD), with Éric Cancès, Oct. 2010 – .
- Advisor of Julien Sabin (PhD), Sept. 2010 – .
- Host of Phan Thành Nam (PhD student of J.P. Solovej from Copenhagen) during 6 months in 2010.
- Advisor of Séverine Paul (PhD), Sept. 2008 – .
- Co-advisor of Amélie Deleurence (PhD with Eric Cancès), Sept. 2005 – Dec. 2008.

Postdocs

- Advisor of Phan Thanh Nam, Oct. 2011 – Sept. 2013.
- Advisor of Nicolas Rougerie, Dec. 2010 – Sept. 2011.
- Advisor of Marco Ghimenti, post-doc at the CEREMADE in 2007.
- Co-advisor of Guillaume Legendre (Post-Doc of the ANR project “ACCQUAREL”), Nov. 2006 – August 2007.

Others

- Advisor of Julien Sabin, undergraduate student at ENS Lyon, June/July 2008, then Master student in June/July 2009.
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OTHER

- Member of the PhD committees of: Hervé Galicher (Oct. 2009, Univ. Paris 6, adv. Éric Cancès), Nicolas Rougerie (Dec. 2010, Univ. Paris 6, adv. Sylvia Serfaty).
- Referee and member of the PhD committees of: Simona Rota-Nodari (July 2011, Univ. Paris-Dauphine, adv. Éric Séré), Mauricio Garcia-Aroyo (Nov. 2011, Univ. Paris-Dauphine, adv. Éric Séré).
- Member of the governing board of the Institut Henri Poincaré (2010-2013).

Member of two hiring committees for a CNRS chaire in Cergy and for a Maître de Conférence position in Lille in 2010 and 2011.

Member of a hiring committee for a Maître de Conférence position in Cergy in 2008.