

Mathieu LEWIN

CEREMADE
Université Paris-Dauphine
Place de Lattre de Tassigny
F-75 016 PARIS

Tel. (+33) 1 44 05 42 83
mathieu.lewin@math.cnrs.fr
<http://www.ceremade.dauphine.fr/~lewin>

Né le 14 Novembre 1977 à Senlis (France)

Positions

Oct. 2014 –	Directeur de Recherche CNRS CEREMADE, Université Paris-Dauphine
Sept. 2017 –	Professeur chargé de cours École Polytechnique, Palaiseau
Oct. 2005 – Sept. 2014	Chargé de Recherche CNRS Laboratoire de Mathématiques, Université de Cergy-Pontoise
Mar. 2005 – Août 2005	Post-doc INRIA CERMICS, École Nationale des Ponts et Chaussées, avec Éric Cancès
Août 2004 – Fév. 2005	EU Post-doc University of Copenhagen (Danemark), avec Jan Philip Solovej

Diplômes et formation

Juin 2009	Habilitation à diriger des recherches, Université de Cergy-Pontoise
Juin 2004	Thèse de doctorat avec Éric Séré, Université Paris Dauphine
Sept. 1998 – Août 2002	Élève normalien à l'ENS Cachan

Distinctions

2024 (– 2029)	Porteur, avec Éric Cancès et Julien Toulouse, d'un projet interdisciplinaire du programme "recherche à risque", attribué par le comité de direction du CNRS
2022	Conférencier invité au congrès international de mathématiques (ICM 2022)
2017 – 2023	Consolidator Grant du European Research Council (ERC)
2015	Plenary speaker at the International Congress of Mathematical Physics
2012	EMS Prize
2010 – 2015	Starting Grant du European Research Council (ERC)

Activités éditoriales

2023 –	Éditeur pour <i>Journal of Spectral Theory</i>
2022 –	Éditeur en chef (avec Anne-Laure Dalibard) pour les <i>Annales de l'Institut Henri Poincaré C – Analyse Non Linéaire</i>
2019 –	Éditeur pour <i>Probability and Mathematical Physics</i>
2014 –	Éditeur pour <i>Letters in Mathematical Physics</i>
2013 –	Éditeur pour <i>Mathematical Models and Methods in Applied Sciences (M3AS)</i>

Responsabilités administratives

2023 –	Directeur du CEREMADE (UMR CNRS 7534)
2015-20, 2024–26	Membre élu du conseil exécutif de l’association internationale de physique mathématique (IAMP)
2020 –	Membre du comité scientifique du labex CEMPI de Lille
2019 – 2022	Membre du comité éthique de la recherche de l’université Paris-Dauphine
2015 – 2021	Membre élu du conseil d’administration de la SMAI
Oct. 2014 – Dec. 2017	Chargé de mission CNRS/INSMI : membre du comité de pilotage de la Mission pour l’Interdisciplinarité du CNRS (MI)
2010 – 2014	Membre élu du conseil d’administration de l’institut Henri Poincaré

Comités & autres

2024–	Membre du comité de la série de conférences “Strongly Correlated Coulomb Systems (SCCS)”
2018	Président du comité pour le IAMP Early Career Award
2015 & 2016	Membre du comité maths-info de l’ANR
2015 & 2016	Président du comité de sélection pour les postes MCF d’analyse à Dauphine

Projets & réseaux

2024 (– 2029)	Porteur, avec Éric Cancès et Julien Toulouse, du projet interdisciplinaire <i>Nouvelles approches mathématiques pour des systèmes quantiques en interaction</i> du programme “recherche à risque”, attribué par le comité de direction du CNRS
2017 – 2023	PI of the ERC Consolidator Grant <i>Mathematics of Density Functional Theory</i> , H2020 no. 725528.
2018 – 2022	Responsable local du projet ANR <i>molQED</i> (molecular Quantum Electrodynamics) en chimie
2010 – 2015	PI of the ERC Starting Grant <i>Mathematics and Numerics of Infinite Quantum Systems</i> , FP7/2007–2013 no. 258023.
2010 – 2014	Coordinateur du projet ANR <i>NoNAP</i> (Nonlinear Methods in Atomic and Nuclear Physics)
2010 – 2011	Grant PHC-Alliance obtenu avec Lyonell Boulton (Heriot Watt University, Écosse)
2005 – 2009	Membre du projet ANR <i>ACCQUAREL</i> (Approches Computationnelles an Chimie QUAntique RELativiste)

Étudiants

Post-Docs

Asbjorn Lauritsen, Nov. 2024 –
Michal Jex, Sept. 2020 – Août 2022
Peter Madsen, Oct. 2019 – Fév. 2023
Fabio Pizzichillo, Oct. 2018 – Oct. 2021
Thomas Ourmières-Bonafos, Sept. 2018 – Août 2019
Luca Nenna, Sept. 2017 – Août 2018
Faizan Nazar, Janv. 2017 – Août 2019
Jonas Lampart, Janv. 2014 – Sept. 2016
Simona Rota-Nodari, Oct. 2012 – Sept. 2013
Phan Thành Nam, Oct. 2011 – Sept. 2013
Nicolas Rougerie, Déc. 2010 – Sept. 2011
Marco Ghimenti, 2007
Guillaume Legendre (avec É. Séré), Nov. 2006 – Août 2007

Doctorant-e-s

Francesco Cocco, Sept. 2025 –
Louis Detzen, Sept. 2024 –
Martin Malvy, avec Laure Dumaz, Sept. 2022–
Rodrigue Lelotte, Sept. 2020 –Sept. 2023
Jean Cazalis, Sept. 2018 – Août 2022
Louis Garrigue, Sept. 2017 – Sept. 2020
Arnaud Triay-Alcouffe, Sept. 2015 – Juin 2019
Raphaël Ducatez, Sept. 2015 – Août 2018
Julien Ricaud, Oct. 2012 – Juin 2017
Salma Lahbabi, avec Éric Cancès, Oct. 2010 – Juil. 2013
Julien Sabin, Sept. 2010 – Déc. 2013
Séverine Paul, Sept. 2008 – Oct. 2012
Codirecteur d'Amélie Deleurence (thèse avec Éric Cancès), Sept. 2005 – Déc. 2008

Master & autres

Francesco Cocco, 2025 (master Dauphine)
Louis Detzen, 2024 (master Dauphine)
Maher Billon, 2024 (ENS)
Pascal Capetillo & Jonathan Hornewall, 2022 (Polytechnique)
Yvann Gaudillot Estrada, 2021 (ENS)
Florent Fougères, 2021 (Polytechnique)
Rodrigue Lelotte, 2019 & 2020 (Polytechnique)
Louis Garrigue, 2017 (ENS)
Raphaël Ducatez, 2015 (ENS)
Arnaud Triay, 2013, 2014 & 2015 (ENS Lyon)
Thomas Dumas, 2013 (master Cergy)
Julien Ricaud, 2012 (master Paris 6)
Julien Sabin, 2008 & 2009 (ENS Lyon & master Dauphine)

Enseignements récents

Cours

- 2016 – Cours et petites Classes, École Polytechnique
- 2007 – *Théorie spectrale et méthodes variationnelles* (avec Éric Cancès), M2 Analyse-EDP, Univ. Paris Pierre & Marie Curie, [web](#)
- 2017 *Analyse Fonctionnelle et mécanique quantique*, M2 Mathématiques Fondamentales, Univ. Pierre & Marie Curie, [web](#)
- 2014 & 2015 Leçon de Mathématiques *Inégalités fonctionnelles et mécanique quantique*, École Normale Supérieure
- 2006 – 2016 Cours / TD niveau M1 *Mathématiques des modèles multi-échelles* (avec Frédéric Legoll), École des Ponts - Paris Tech, [web](#)

Cours pour (post-)doctorant·e·s

Fév. 2025	<i>Gross-Pitaevskii theory of supersolids</i> (5h), winter school and workshop <i>Mathematical Challenges in Quantum Mechanics</i> , L'Aquila, Italy
Août 2024	<i>Theory of Inhomogeneous Classical Coulomb Systems</i> (5h), <i>Mathematical challenges in classical & quantum statistical mechanics</i> , Venice, Italy
Juin 2024	<i>Mathematical Foundations of Density Functional Theory</i> (5h), <i>ISTA Summer School in Analysis and Mathematical Physics</i> , Kolterneuburg, Austria
Mai 2024	<i>Lieb-Thirring inequalities</i> (4h), <i>Summer School and Workshop on "Spectral Theory, Fourier Analysis and PDE"</i> , Bilbao, Spain
Août 2023	<i>Statistical mechanics of Coulomb and Riesz gases</i> (4h), <i>VIASM-IAMP Summer-school in Mathematical Physics</i> , Quy Nhon, Vietnam
Mars 2023	<i>Optimal transport in quantum chemistry and statistical mechanics</i> (2h), <i>Optimal Transport Theory and Applications to Physics</i> , Les Houches, France
Nov. 2022	<i>Derivation of Gibbs measures from quantum mechanics</i> (4h), <i>Journées Louis Antoine</i> , Rennes, France
Oct. 2022	Online course <i>Coulomb and Riesz gases: a review of what's known and unknown</i> (3h), Academy of Mathematics and System Sciences, Chinese Academy of Sciences, China. Peut être visualisé sur youtube
Août 2022	<i>Coulomb and Riesz gases: the known and the unknown</i> (4h30), within the Conference <i>The Statistical Physics of Continuum Particle Systems with Strong Interactions</i> , Singapore
Mai 2022	<i>The mathematical description of solids</i> (9h), Mini-school on mathematics for theoretical chemistry and physics, GDR <i>NBODY</i> , Paris, France
Fév. 2022	<i>Lieb-Thirring inequalities: old and new</i> (3h), Conference of the GDR <i>Quantum Dynamics</i> , Toulouse, France
Oct. 2021	<i>Large-scale limits for quantum gases</i> (4h), Conference on <i>Large-scale limits of interacting particle systems</i> , IHÉS, Bures sur Yvette, France. Peut être visualisé sur youtube
Avril 2021	Mini-cours <i>Riesz and Coulomb gases: what's known and unknown</i> (2h), Séminaire en ligne du GDR MEGA. Peut être visualisé sur youtube
Mars 2019	<i>Nonlinear Gibbs measures and their derivation from quantum mechanics</i> (6h), Mittag-Leffler Institute, Stockholm, Sweden
Juil. 2017	<i>An introduction to critical point theory, with applications to quantum mechanics</i> (6h), Summerschool on <i>Current topics in Mathematical Physics</i> , Univ. Zürich, Suisse
2016	Cours de l'école doctorale, Université Paris-Dauphine
Juin 2015	Cours de l'IHÉS sur les <i>Mesures de Gibbs non linéaires et leur dérivation à partir de la mécanique quantique</i> (8h), visible sur youtube
Fév. 2015	<i>Open quantum systems and effective equations</i> (6h), École d'hiver, Research Training Group 1838 on <i>Spectral Theory and Dynamics of Quantum Systems</i> (Univ. Stuttgart & Tübingen), Freudenstadt, Allemagne
Juil. 2013	<i>Mathematical foundations of quantum mechanics</i> (4h), École d'été "Mathématiques – Chimie – Calcul Haute Performance", Institut du Calcul et de la Simulation (Univ. P. & M. Curie), Roscoff, France
Janv. 2012	<i>Nonlinear equations with fractional powers of the Laplacian and applications to quantum mechanics</i> (8h avec Enno Lenzmann), Università di Pisa, Italie
Août 2011	<i>Geometric methods for nonlinear many-body quantum systems</i> (4h), Summerschool on <i>Current topics in Mathematical Physics</i> , Erwin Schrödinger Institute, Vienne, Autriche

Organisation d'événements scientifiques

Programmes longs

- 15 Avril – 13 Juil. 2013 (avec Maria J. Esteban) Trimestre thématique *Variational and Spectral Methods in Quantum Mechanics*, Institut Henri Poincaré, [web](#)
- 2008 Coordinateur du semestre thématique *Systèmes Quantiques, Systèmes Complexes*, Université de Cergy-Pontoise

Conférences

- Juin 2025 (avec J. Dolbeault, M.J. Esteban, R.L. Frank & É. Trélat), *Workshop on Functional Inequalities*, Paris-Dauphine, France
- Déc. 2024 (avec R.L. Frank & P.T. Nam), conference on *Mathematical Physics and PDEs*, Herrsching, Germany
- Déc. 2022 (avec S. Serfaty), conference on *Coulomb gases and universality*, Sorbonne Université, Paris, France
- 12 – 16 Août 2019 (avec J. Yngvason), session on *many-body systems*, Conference QMATH 14, Århus, Denmark
- 20 – 25 Mai 2019 Workshop on *Mean-field and other effective models in mathematical physics*, Fondation Les Treilles, France
- 28 Janv. – 1 Fév. 2019 (avec P. Gori Giorgi & B. Pass), Conference on *Optimal Transport Methods in Density Functional Theory*, Banff International Research Station, Canada
- 10 Sept. – 14 Sept. 2018 (avec R. L. Frank & B. Schlein), Conference on *Many-body Quantum Mechanics*, CRM Montréal, Canada
- 30 Juin – 4 Juil. 2014 (avec R. L. Frank), Conference *Effective Equations in Mathematical Physics*, Mittag Leffler Institute, Stockholm, Sweden
- 14 – 18 Avril 2014 (avec P. D'Ancona, M.J. Esteban, L. Fanelli, L. Vega & N. Visciglia), Conference *Analysis of Relativistic and Non-Relativistic models in Quantum Mechanics*, La Sapienza, Roma, Italy
- 6 – 10 Août 2012 (avec M. Griesemer) Session *Quantum many-body theory and condensed matter physics*, International Congress on Mathematical Physics, Ålborg, Denmark
- 21 – 25 Juin 2010 (avec É. Séré) Conference *Mathematical Aspects of Quantum Electrodynamics*, Institut Henri Poincaré, Paris, France
- 28 Mai 2009 Session *Applications to Quantum Chemistry*, Conference SCICADE 09, Beijing, China
- 21 – 25 Avril 2008 Conference *Quantum Statistical Physics and Information Theory*, Université de Cergy-Pontoise
- 31 Janv. – 1 Fév. 2008 (avec F. Germinet & L. Bruneau) Conference *Spectral Problems in Quantum Mechanics*, Université de Cergy-Pontoise
- Juil. 2007 (avec G. Turinici) Session *Computational issues in Relativistic Quantum Chemistry*, ICIAM, Zurich, Switzerland
- 3 – 6 Sept. 2006 (avec J.M. Barbaroux, F. Dunlop, F. Germinet, P. Hislop & F. Klopp) Conference *Transport and Spectral Problems in Quantum Mechanics* in honor of Jean-Michel Combes, Université de Cergy-Pontoise

Écoles

- 28–29 Juin 2024 (avec R. Cote, C. Fermanian, S. Klevtsov, G. Weick), Young Research Symposium at the *International Congress on Mathematical Physics*, Strasbourg, France
- 3 Août – 7 Août 2015 (avec C. Hainzl, R. Seiringer, E. Stockmeyer, J. Tan & R. Tiedra), Summerschool *Current topics in Mathematical Physics*, Federico Santa María Technical University, Viña del Mar, Chile
- 2 – 7 Sept. 2013 (avec M.J. Esteban & R. Seiringer), Summerschool *Current topics in Mathematical Physics*, CIRM Marseille, France

Séminaires

- 2014 – Co-organisateur du séminaire mensuel “Problèmes spectraux” du GDR Dynamique Quantique, Institut Henri Poincaré
- 2017 – 2020 Co-organisateur du groupe de travail “ESCAPADE” en Analyse et Probabilités du CEREMADE, avec Laure Dumaz
- 2005 – 2014 Co-organisateur du groupe de travail de physique mathématique, Université de Cergy-Pontoise

Activités de vulgarisation

- 2025 Interview par l’INSMI concernant le projet à risque MAQUI, [website](#)
- 2024 Interview par l’INSMI concernant le modèle de publication S2O, [website](#)
- 2022 Interview par l’INSMI à l’occasion de l’ICM 2022, [website](#)
- 2021 Interview filmée pour le site “Parlons Maths”, [youtube](#)
- 2019 Interview filmée par la FSMP à l’ICIAM 2019, [youtube](#)
- 2019 Interview à propos de la conjecture de cristallisation dans le dossier “Les maths expliquent le monde” de *Sciences et Avenir*, numéro 874
- 2017 M. Lewin, Bretzels, bagels, donuts et... topologie, CNRS Le Journal, [website](#)
- 2015 Portrait “Mathieu Lewin : Fidèle à une fantastique équation” publié dans le dossier “La jeune garde de la science” par le magazine *La Recherche* à l’occasion du numéro 500, [website](#)
- 2014 M. Lewin, Des cristaux et des maths, CNRS Le Journal, [website](#)
- 2014 Membre de l’équipe communication au CNRS pour l’année de la cristallographie

Autres activités

- 2016–17 Interventions sur les projets ERC en mathématiques à l’Académie des Sciences Polonaises (2016), pour la formation des cadres supérieurs du CNRS (2017), et lors de la célébration des 10 ans de l’ERC au siège du CNRS avec les pays de l’EU13, [webpage](#)

PUBLICATIONS

Livres

- [1] M. Lewin. *Spectral theory and quantum mechanics*. Universitext. Springer International Publishing, 2024.
- [2] M. Lewin. *Théorie spectrale et mécanique quantique*. Mathématiques et Applications (SMAI). Springer International Publishing, 2022.
- [3] R. L. Frank, A. Laptev, M. Lewin, and R. Seiringer, editors. *The Physics and Mathematics of Elliott Lieb: The 90th Anniversary Volume (2 books)*. EMS Press, 2022.

Preprints

- [1] I. Anapolitanos, M. Lewin, and M. Roth. Differentiability of the van der Waals interaction between two atoms. *ArXiv e-prints*, 2019. [arXiv:1902.06683](#).

Articles acceptés ou publiés

- [1] E. Carlen, M. Lewin, E. H. Lieb, and R. Seiringer. Stability estimate for the Lane-Emden inequality. *Calc. Var. Partial Differential Equations*, in press, 2025. [arXiv:2410.20113](#).
- [2] M. Jex, M. Lewin, and P. Madsen. Classical Density Functional Theory: The Local Density Approximation. *Rev. Math. Phys.*, 37(04): 2450037, 2025. [arXiv:2310.18028](#), DOI.
- [3] M. Lewin and P. T. Nam. Positive-density ground states of the Gross-Pitaevskii equation. *Probab. Math. Phys.*, 6(3): 647–731, 2025. [arXiv:2310.03495](#), DOI.
- [4] S. Di Marino, M. Lewin, and L. Nenna. Grand-Canonical Optimal Transport. *Arch. Rat. Mech. Anal.*, 249: art. 12, 2025. [arXiv:2201.06859](#), DOI.
- [5] R. L. Frank, D. Gontier, and M. Lewin. Optimizers for the finite-rank Lieb-Thirring inequality. *Amer. J. Math.*, 147(2): 503–560, April 2025. [arXiv:2109.05984](#), DOI.
- [6] S. Di Marino, M. Lewin, and L. Nenna. Ground state energy is not always convex in the number of electrons. *J. Phys. Chem. A*, 128(49): 10697–10706, November 2024. [arXiv:2409.08632](#), DOI.
- [7] M. Jex, M. Lewin, and P. Madsen. Classical Density Functional Theory: Representability and Universal Bounds. *J. Stat. Phys.*, 190: 23, mar 2023. [arXiv:2210.07785](#), DOI.
- [8] M. Lewin, E. H. Lieb, and R. Seiringer. Improved Lieb-Oxford bound on the indirect and exchange energies. *Lett. Math. Phys.*, 112: Art. 92, 2022. Themed collection “Mathematical Physics and Numerical Simulation of Many-Particle Systems”; V. Bach and L. Delle Site (eds.). [arXiv:2203.12473](#), DOI.
- [9] M. Lewin. Coulomb and Riesz gases: The known and the unknown. *J. Math. Phys.*, 63: 061101, 2022. Special collection in honor of Freeman Dyson. [arXiv:2202.09240](#), DOI.
- [10] J. A. Carrillo, M. G. Delgadino, R. L. Frank, and M. Lewin. Fast diffusion leads to partial mass concentration in Keller-Segel type stationary solutions. *Math. Models Methods Appl. Sci.*, 32(4): 831–850, 2022. [arXiv:2012.08586](#), DOI.
- [11] A. Teale, T. Helgaker, A. Savin, M. Lewin, and 66 other authors. DFT Exchange: Sharing Perspectives on the Workhorse of Quantum Chemistry and Materials Science. *Phys. Chem. Chem. Phys.*, 2022. Advance article. Preprint available on ChemRxiv:2022-13j2v. DOI.
- [12] M. J. Esteban, M. Lewin, and É. Séré. Dirac-Coulomb operators with general charge distribution. II. The lowest eigenvalue. *Proc. London Math. Soc.*, 123(4): 345–383, 2021. [arXiv:2003.04051](#), DOI.
- [13] M. J. Esteban, M. Lewin, and É. Séré. Dirac-Coulomb operators with general charge distribution. I. Distinguished extension and min-max formulas. *Ann. Henri Lebesgue*, 4: 1421–1456, 2021. [arXiv:2003.04004](#), DOI.
- [14] R. L. Frank, D. Gontier, and M. Lewin. The nonlinear Schrödinger equation for orthonormal functions II. Application to Lieb-Thirring inequalities. *Comm. Math. Phys.*, 384: 1783–1828, 2021. [arXiv:2002.04964](#), DOI.

- [15] D. Gontier, M. Lewin, and F. Q. Nazar. The nonlinear Schrödinger equation for orthonormal functions I. Existence of ground states. *Arch. Rat. Mech. Anal.*, 240: 1203–1254, 2021. [arXiv:2002.04963](#), DOI.
- [16] M. Lewin, P. T. Nam, and N. Rougerie. Classical field theory limit of many-body quantum Gibbs states in 2D and 3D. *Invent. Math.*, 224(2): 315–444, 2021. [arXiv:1810.08370](#), DOI.
- [17] M. Lewin and S. Rota Nodari. The double-power nonlinear Schrödinger equation and its generalizations: uniqueness, non-degeneracy and applications. *Calc. Var. Partial Differ. Equ.*, 59: 197, 2020. [arXiv:2006.02809](#), DOI.
- [18] S. Fournais, M. Lewin, and A. Triay. The Scott correction in Dirac-Fock theory. *Comm. Math. Phys.*, 378: 569–600, 2020. [arXiv:1911.09482](#), DOI.
- [19] M. Lewin and J. Sabin. The Hartree and Vlasov equations at positive density. *Comm. Partial Differential Equations*, 45(12): 1702–1754, 2020. [arXiv:1910.09392](#), DOI.
- [20] M. Lewin, E. H. Lieb, and R. Seiringer. The Local Density Approximation in Density Functional Theory. *Pure Appl. Anal.*, 2(1): 35–73, 2020. [arXiv:1903.04046](#), DOI.
- [21] I. Anapolitanos and M. Lewin. Compactness of molecular reaction paths in quantum mechanics. *Arch. Rat. Mech. Anal.*, 236(2): 505–576, 2020. [arXiv:1809.06110](#), DOI.
- [22] M. Lewin, E. H. Lieb, and R. Seiringer. Floating Wigner crystal with no boundary charge fluctuations. *Phys. Rev. B*, 100: 035127, July 2019. [arXiv:1905.09138](#), DOI.
- [23] M. Lewin, P. Madsen, and A. Triay. Semi-classical limit of large fermionic systems at positive temperature. *J. Math. Phys.*, 60: 091901, 2019. [arXiv:1902.00310](#), DOI.
- [24] D. Gontier and M. Lewin. Spin symmetry breaking in the translation-invariant Hartree-Fock Uniform Electron Gas. *SIAM J. Math. Anal.*, 51(4): 3388–3423, 2019. [arXiv:1812.07679](#), DOI.
- [25] D. Gontier, C. Hainzl, and M. Lewin. Lower bound on the Hartree-Fock energy of the electron gas. *Phys. Rev. A*, 99: 052501, 2019. [arXiv:1811.12461](#), DOI.
- [26] M. J. Esteban, M. Lewin, and É. Séré. Domains for Dirac-Coulomb min-max levels. *Rev. Mat. Iberoam.*, 35(3): 877–924, 2019. [arXiv:1702.04976](#), DOI.
- [27] M. Lewin. Existence of Hartree-Fock excited states for atoms and molecules. *Lett. Math. Phys.*, 108(4): 985–1006, 2018. [arXiv:1708.00287](#), DOI.
- [28] M. Lewin. Semi-classical limit of the Levy-Lieb functional in Density Functional Theory. *C. R. Math. Acad. Sci. Paris*, 356(4): 449–455, 2018. [arXiv:1706.02199](#), DOI.
- [29] M. Lewin, E. H. Lieb, and R. Seiringer. Statistical mechanics of the Uniform Electron Gas. *J. Éc. polytech. Math.*, 5: 79–116, 2018. [arXiv:1705.10676](#), DOI.
- [30] M. Lewin, P. T. Nam, and N. Rougerie. Gibbs measures based on 1D (an)harmonic oscillators as mean-field limits. *J. Math. Phys.*, 59: 041901, 2018. [arXiv:1703.09422](#), DOI.
- [31] P. Gravejat, M. Lewin, and É. Séré. Derivation of the magnetic Euler-Heisenberg energy. *J. Math. Pures Appl.*, 117: 59–93, 2018. [arXiv:1602.04047](#), DOI.
- [32] S. Fournais, M. Lewin, and J. P. Solovej. The semi-classical limit of large fermionic systems. *Calc. Var. Partial Differ. Equ.* 57–105, 2018. [arXiv:1510.01124](#), DOI.
- [33] M. Lewin, P. Thành Nam, and N. Rougerie. A note on 2D focusing many-boson systems. *Proc. Amer. Math. Soc.*, 145(6): 2441–2454, June 2017. [arXiv:1509.09045](#), DOI.
- [34] S. Fournais, J. Lampart, M. Lewin, and T. Østergaard Sørensen. Coulomb potentials and Taylor expansions in Time-Dependent Density Functional Theory. *Phys. Rev. A*, 93(6): 062510, June 2016. [arXiv:1603.02219](#), DOI.
- [35] J. Lampart and M. Lewin. Semi-classical Dirac vacuum polarisation in a scalar field. *Ann. Henri Poincaré*, 17(8): 1937–1954, 2016. [arXiv:1506.00895](#), DOI.
- [36] M. Lewin, P. T. Nam, and N. Rougerie. The mean-field approximation and the non-linear Schrödinger functional for trapped Bose gases. *Trans. Amer. Math. Soc.*, 368(9): 6131–6157, 2016. [arXiv:1405.3220](#), DOI.
- [37] X. Blanc and M. Lewin. The crystallization conjecture: A review. *EMS Surv. Math. Sci.*, 2(2): 255–306, 2015. [arXiv:1504.01153](#), DOI.
- [38] J. Lampart and M. Lewin. A many-body RAGE theorem. *Comm. Math. Phys.*, 340(3): 1171–1186, 2015. [arXiv:1503.00496](#), DOI.

- [39] M. Lewin, P. T. Nam, and N. Rougerie. Derivation of nonlinear Gibbs measures from many-body quantum mechanics. *J. Éc. polytech. Math.*, 2: 65–115, 2015. [arXiv:1410.0335](#), DOI.
- [40] M. Lewin and E. H. Lieb. Improved Lieb-Oxford exchange-correlation inequality with gradient correction. *Phys. Rev. A*, 91(2): 022507, 2015. [arXiv:1408.3358](#), DOI.
- [41] M. Lewin and S. Rota Nodari. Uniqueness and non-degeneracy for a nuclear nonlinear Schrödinger equation. *NoDEA Nonlinear Differential Equations Appl.*, 22(4): 673–698, 2015. [arXiv:1405.1165](#), DOI.
- [42] M. Lewin, P. T. Nam, and N. Rougerie. Remarks on the quantum de Finetti theorem for bosonic systems. *Appl. Math. Res. Express (AMRX)*, 2015(1): 48–63, 2015. [arXiv:1310.2200](#), DOI.
- [43] M. Lewin and J. Sabin. The Hartree equation for infinitely many particles. I. Well-posedness theory. *Comm. Math. Phys.*, 334(1): 117–170, 2015. [arXiv:1310.0603](#), DOI.
- [44] M. Lewin, P. T. Nam, and B. Schlein. Fluctuations around Hartree states in the mean-field regime. *Amer. J. Math.*, 137(6): 1613–1650, dec 2015. [arXiv:1307.0665](#), DOI.
- [45] M. Lewin, P. T. Nam, S. Serfaty, and J. P. Solovej. Bogoliubov spectrum of interacting Bose gases. *Comm. Pure Appl. Math.*, 68(3): 413–471, march 2015. [arXiv:1211.2778](#), DOI.
- [46] M. Lewin and J. Sabin. The Hartree equation for infinitely many particles. II. Dispersion and scattering in 2D. *Analysis & PDE*, 7(6): 1339–1363, 2014. [arXiv:1310.0604](#), DOI.
- [47] M. Lewin and J. Sabin. A family of monotone quantum relative entropies. *Lett. Math. Phys.*, 104(6): 691–705, 2014. [arXiv:1309.4046](#), DOI.
- [48] R. L. Frank, M. Lewin, E. H. Lieb, and R. Seiringer. Strichartz inequality for orthonormal functions. *J. Eur. Math. Soc. (JEMS)*, 16: 1507–1526, 2014. [arXiv:1306.1309](#), DOI.
- [49] M. Lewin, P. T. Nam, and N. Rougerie. Derivation of Hartree’s theory for generic mean-field Bose systems. *Adv. Math.*, 254: 570–621, March 2014. [arXiv:1303.0981](#), DOI.
- [50] M. Lewin and S. Paul. A numerical perspective on Hartree-Fock-Bogoliubov theory. *ESAIM: M2AN*, 48(1): 53–86, 2014. [arXiv:1206.6081](#), DOI.
- [51] E. Lenzmann and M. Lewin. Dynamical ionization bounds for atoms. *Analysis & PDE*, 6(5): 1183–1211, 2013. [arXiv:1207.6898](#), DOI.
- [52] P. Gravejat, C. Hainzl, M. Lewin, and É. Séré. Construction of the Pauli-Villars-regulated Dirac vacuum in electromagnetic fields. *Arch. Rat. Mech. Anal.*, 208(2): 603–665, May 2013. [arXiv:1204.2893](#), DOI.
- [53] É. Cancès, S. Lahbabi, and M. Lewin. Mean-field models for disordered crystals. *J. Math. Pures Appl.*, 100(2): 241–274, 2013. [arXiv:1203.0402](#), DOI.
- [54] M. Lewin and N. Rougerie. On the binding of polarons in a mean-field quantum crystal. *ESAIM Control Optim. Calc. Var.*, 19(3): 629–656, July 2013. [arXiv:1202.5103](#), DOI.
- [55] M. Lewin and N. Rougerie. Derivation of Pekar’s Polarons from a Microscopic Model of Quantum Crystals. *SIAM J. Math. Anal.*, 45(3): 1267–1301, 2013. [arXiv:1108.5931](#), DOI.
- [56] C. Hainzl, M. Lewin, and C. Sparber. Ground state properties of graphene in Hartree-Fock theory. *J. Math. Phys.*, 53: 095220, 2012. Special issue in honor of E.H. Lieb’s 80th birthday. [arXiv:1203.5016](#), DOI.
- [57] X. Blanc and M. Lewin. Existence of the thermodynamic limit for disordered quantum Coulomb systems. *J. Math. Phys.*, 53: 095209, 2012. Special issue in honor of E.H. Lieb’s 80th birthday. [arXiv:1201.4670](#), DOI.
- [58] M. Lewin. Comment on ‘Solutions to quasi-relativistic multi-configurative Hartree-Fock equations in quantum chemistry’, by C. Arguez and M. Melgaard. *Nonlinear Analysis: Theory, Methods & Applications*, 75: 2988–2991, 2012. [arXiv:1111.4491](#), DOI.
- [59] R. L. Frank, M. Lewin, E. H. Lieb, and R. Seiringer. A positive density analogue of the Lieb-Thirring inequality. *Duke Math. J.*, 162(3): 435–495, 2012. [arXiv:1108.4246](#), DOI.
- [60] L. Boulton, N. Boussaid, and M. Lewin. Generalised Weyl theorems and spectral pollution in the Galerkin method. *J. Spect. Theory*, 2(4): 329–354, 2012. [arXiv:1011.3634](#), DOI.
- [61] 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.

- [62] 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.
- [63] M. Lewin. Geometric methods for nonlinear many-body quantum systems. *J. Funct. Anal.*, 260: 3535–3595, 2011. [arXiv:1009.2836](#), DOI.
- [64] P. Gravejat, M. Lewin, and É. Séré. Renormalization and asymptotic expansion of Dirac’s polarized vacuum. *Commun. Math. Phys.*, 306(1): 1–33, 2011. [arXiv:1004.1734](#), DOI.
- [65] M. J. Esteban, M. Lewin, and A. Savin. Symmetry breaking of relativistic multiconfiguration methods in the nonrelativistic limit. *Nonlinearity*, 23: 767–791, 2010. [arXiv:0910.3932](#), DOI.
- [66] 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.
- [67] 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.
- [68] 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.
- [69] 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.
- [70] 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.
- [71] 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.
- [72] 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.
- [73] 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.
- [74] 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.
- [75] 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.
- [76] 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.
- [77] 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.
- [78] 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.
- [79] 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.
- [80] 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.
- [81] 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.
- [82] 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.

- [83] 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.
- [84] 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.
- [85] 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.
- [86] 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.
- [87] 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.
- [88] 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.
- [89] M. Lewin. Solutions of the multiconfiguration equations in quantum chemistry. *Arch. Ration. Mech. Anal.*, 171(1): 83–114, 2004. DOI.
- [90] M. Lewin. A mountain pass for reacting molecules. *Ann. Henri Poincaré*, 5(3): 477–521, 2004. DOI.
- [91] 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.

Chapitres de livres

- [1] M. J. Esteban, M. Lewin, and É. Séré. Which Nuclear Shape Generates the Strongest Attraction on a Relativistic Electron? An Open Problem in Relativistic Quantum Mechanics. In J.-M. Morel and B. Teissier, editors, *Mathematics Going Forward*, volume 2313 of *Lecture Notes in Mathematics* 487–497. Springer Cham, August 2023. [arXiv:2203.13484](#), DOI.
- [2] M. Lewin, E. H. Lieb, and R. Seiringer. Universal Functionals in Density Functional Theory. In E. Cancès and G. Friesecke, editors, *Density Functional Theory — Modeling, Mathematical Analysis, Computational Methods, and Applications* 115–182. Springer, 2023. [arXiv:1912.10424](#), DOI.
- [3] R. L. Frank, D. Gontier, and M. Lewin. The periodic Lieb–Thirring inequality. In P. Exner, R. Frank, F. Gesztesy, H. Holden, and T. Weidl, editors, *Partial Differential Equations, Spectral Theory, and Mathematical Physics. The Ari Laptev Anniversary Volume*, volume 18 of *EMS Series of Congress Reports* 135–154. EMS Publishing House, June 2021. [arXiv:2010.02981](#), DOI.
- [4] M. Lewin, P. T. Nam, and N. Rougerie. Blow-up profile of rotating 2D focusing Bose gases. In D. Cadamuro, M. Duell, W. Dybalski, and S. Simonella, editors, *Macroscopic Limits of Quantum Systems*, volume 270 of *Springer Proceedings in Mathematics and Statistics* 145–170. Springer, springer edition, 2018. Conference in honor of Herbert Spohn 70th birthday, Munich, Germany, March 20 – April 1, 2017. [arXiv:1802.01854](#), DOI.
- [5] M. Lewin and É. Séré. Spurious Modes in Dirac Calculations and How to Avoid Them. In V. Bach and L. Delle Site, editors, *Many-Electron Approaches in Physics, Chemistry and Mathematics*, Mathematical Physics Studies 31–52. Springer International Publishing, 2014. [arXiv:1306.5401](#), DOI.
- [6] 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* 87–125. Springer, 2011. Proceedings of a Winter Workshop at the Banff International Research Station 2009. [arXiv:1010.3494](#), DOI.

Proceedings

- [1] M. Lewin. Some open mathematical problems concerning charged quantum particles. *Comptes Rendus. Physique*, 26(G1): 369–380, May 2025. DOI.

- [2] M. Lewin. Mean-field limits for quantum systems and nonlinear Gibbs measures. In D. Beliaev and S. Smirnov, editors, *International Congress of Mathematicians 2022*, volume 5 3800–3821. EMS Press, December 2023. DOI.
- [3] M. Lewin, P. T. Nam, and N. Rougerie. Derivation of renormalized Gibbs measures from equilibrium many-body quantum Bose gases. *J. Math. Phys.*, 60(6): 061901, 2019. Proceedings of the 2018 International Congress of Mathematical Physics at Montréal, Canada. [arXiv:1903.01271](#), DOI.
- [4] M. Lewin, P. T. Nam, and N. Rougerie. The interacting 2D Bose gas and nonlinear Gibbs measures. *Oberwolfach Reports*, 15(2): 1081–1116, 2018. Mini-workshop on “Gibbs measures for nonlinear dispersive equations” organized by Giuseppe Genovese, Benjamin Schlein and Vedran Sohinger. [arXiv:1805.03506](#), DOI.
- [5] M. Lewin, P. T. Nam, and N. Rougerie. Bose gases at positive temperature and non-linear Gibbs measures. In *Proceedings of the International Congress of Mathematical Physics*, 2015. ArXiv e-prints. [arXiv:1602.05166](#).
- [6] M. Lewin. Mean-field limit of Bose systems: rigorous results. In *Proceedings of the International Congress of Mathematical Physics, Santiago de Chile*, 2015. ArXiv e-prints. [arXiv:1510.04407](#).
- [7] P. Gravejat, C. Hainzl, M. Lewin, and É. Séré. Deux modèles effectifs pour les champs électromagnétiques dans le vide de Dirac. In *Séminaire Laurent Schwartz – EDP et applications* Exp. no. 14, 2015-2016. DOI.
- [8] M. Lewin. A nonlinear variational problem in relativistic quantum mechanics. In R. Latała, A. Rucinski, P. Strzelecki, J. Swiatkowski, D. Wrzosek, and P. Zakrzewski, editors, *Proceedings of the 6th European Congress of Mathematics, Krakow (Poland), July 2012*. EMS, 2014. [arXiv:1209.2786](#), DOI.
- [9] P. Gravejat, C. Hainzl, M. Lewin, and É. Séré. Two Hartree-Fock models for the vacuum polarization. In *Proceedings of the “Journées E.D.P.”, June 4–8, 2012, Biarritz (France)*, 2012. [arXiv:1209.6338](#), DOI.
- [10] É. Cancès, S. Lahbabi, and M. Lewin. Mean-field electronic structure models for disordered materials. In A. Jensen, editor, *XVIIth International Congress on Mathematical Physics* 549–557. World Sci. Publ., 2012. [arXiv:1203.0402](#), DOI.
- [11] M. Lewin. Gaz de bosons dans le régime de champ moyen : les théories de Hartree et Bogoliubov. In *Séminaire Laurent Schwartz – EDP et applications*. IHÉS, 2012-2013. Exp. no 3. DOI.
- [12] M. Lewin. Renormalization of Dirac’s polarized vacuum. In P. Exner, editor, *Mathematical Results In Quantum Physics* 45–59. World Scientific Publishing, 2011. Proceedings of the QMath 11 Conference, Hradec Kralove, Czech Republic, 6 –10 September 2010. [arXiv:1010.0075](#), DOI.
- [13] M. Lewin. How much energy does it cost to make a hole in the Fermi sea? *Oberwolfach Reports*, 8(2): 1790–1793, 2011. Workshop “Mathematical Methods in Quantum Chemistry”.
- [14] M. Lewin. Sur l’effondrement dynamique des étoiles quantiques pseudo-relativistes. In *Séminaire Laurent Schwartz*. École Polytechnique, April 2011. DOI.
- [15] 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.
- [16] 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.
- [17] 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”.
- [18] 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”.

- [19] M. Lewin. Solutions of the multiconfiguration equations in quantum chemistry. *Oberwolfach Reports*, 1(3): 1541–1586, 2005. Workshop “Calculus of variations” June, 2004.

Articles généraux et de vulgarisation

- [1] M. Lewin. L'équation de Schrödinger pour les atomes et les molécules. *Gazette des Mathématiciens*, 177: 9–24, July 2023. Société Mathématique de France.
- [2] M. Chupin, J. Dolbeault, M. J. Esteban, and M. Lewin. Une cartographie de la communauté mathématique française. *Matapli – Bulletin de la Société de Mathématiques Appliquées et Industrielles* no. 115 (Mars), p. 51–71 & *La Gazette des Mathématiciens – Bulletin de la Société Mathématique de France* no. 156 (Avril), p. 49–61, 2018.
- [3] M. Lewin. Bretzels, bagels, donuts et... topologie. *CNRS Le Journal*, 2017.
- [4] M. Lewin. Limite de champ moyen et condensation de Bose-Einstein. *Gazette des Mathématiciens*, 139: 35–49, Jan 2014. Société Mathématique de France.
- [5] M. Lewin. Des cristaux et des maths. *CNRS Le Journal*, 2014.

Thèses

- [1] M. Lewin. Large Quantum Systems: a Mathematical and Numerical Perspective. Habilitation à Diriger des Recherches, University of Cergy-Pontoise, June 2009.
- [2] M. Lewin. *Some nonlinear models in Quantum Mechanics*. PhD thesis, University of Paris-Dauphine, June 2004.

Autres

- [1] M. Lewin. Théorie spectrale et mécanique quantique. Cours de l'École Polytechnique, 2018.
- [2] M. Lewin. Éléments de théorie spectrale : le Laplacien sur un ouvert borné. Notes de cours de Master 2, 2017.
- [3] M. Lewin. Describing lack of compactness in Sobolev spaces. Lecture notes on *Variational Methods in Quantum Mechanics*, University of Cergy-Pontoise, hal:02450559, 2010.

EXPOSÉS

Conférences internationales (sélection)

2024	Oct.	Mini-Workshop on <i>Condensed Matter Physics</i> , Garmish-Partenkirchen, Germany
	Juil.	Long talk at the Physics Symposium on <i>Open questions in the quantum many-body problem</i> , Paris, France. Peut être visualisé sur Carmin TV ou youtube
	Avril	Conference on <i>Frontiers in Analysis and Mathematical Physics</i> , Seoul, Korea
2023	Oct.	Mini-workshop on <i>Mathematics of Many-body Fermionic Systems</i> , Oberwolfach, Germany
	Sept.	Workshop on <i>Many-Body Quantum Systems</i> , Oberwolfach, Germany
	Août	VIASM-IAMP <i>summer school and workshop in Mathematical Physics</i> , Quy Nhon, Vietnam
	Juin	Conference <i>Frontiers in Mathematical Physics</i> , CY University, Cergy-Pontoise, France
	Juin	Conference <i>Correlations in Mathematical Quantum Mechanics</i> in honor of Jan Philip Solovej, Copenhagen, Denmark
	Juin	Colloquium du laboratoire de physique, ENS Lyon, France
	Mai	Colloquium of the Mathematical Institute, LMU Munich, Germany
	Mars	<i>Maxwell Institute Mini-symposium in Analysis and PDEs</i> , Edinburgh, UK
	Mars	Long course at the Conference on <i>Optimal Transport Theory and Applications to Physics</i> , Les Houches, France
	Août	Long course at the Conference on <i>The Statistical Physics of Continuum Particle Systems with Strong Interactions</i> , Singapore
2022	Juil.	Conference <i>Advances in Mathematical Physics</i> in honor of Elliott H. Lieb on his 90th Birthday, Harvard, USA
	Juil.	Invited speaker at the online ICM 2022. Peut être visualisé sur youtube
	Mai	Conference on <i>Mathematical results of many-body quantum systems</i> , Herrsching, Germany
	Avril	Online talk at the workshop on <i>Model Reduction in Quantum Mechanics</i> , IPAM, University of California Los Angeles, USA
	Mars	Conference <i>CY Days in Nonlinear Analysis</i> , Cergy-Pontoise, France
	Nov.	Workshop <i>Inverse Problems and related fields</i> , Marseille, France
	Août	Conference <i>Solid Math</i> , Marne La Vallée, France
	Juin	IAMP One World Mathematical Physics Seminar, online. Peut être visualisé sur youtube
2021	Juin	SwissMAP workshop on <i>Emergent theories for wave turbulence and particle dynamics</i> , Les Diablerets, Switzerland
	Mai	Conference on <i>Schrödinger equations</i> , Le Croisic, France
	Avril	Eighth Texas Analysis and Mathematical Physics Symposium, online conference at UT Austin, USA
	Janv.	Conference of the GDR <i>N-Body</i> , Lille, France
	Nov.	Symposium on <i>Developments in the Mathematical Sciences</i> , Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany
	Oct.	Conference on <i>The analysis of complex systems</i> , CIRM, France
2019	Sept.	Conference on <i>Density Functionals for Many-Particle Systems: Mathematical Theory and Physical Applications of Effective Equations</i> , Singapore
	Juil.	Minisymposia on <i>Dirac Hamiltonians with critical singularities</i> , ICIAM Conference, Valencia, Spain
	Juin	Conference on <i>Mathematical and Numerical Analysis of Electronic Structure Models</i> , Suzhou, China
	Janv.	Kick-off conference of the trimester on <i>Spectral Methods in Mathematical Physics</i> , Mittag-Leffler Institute, Stockholm, Sweden
	Déc.	Conference <i>Results in Contemporary Mathematical Physics</i> in honor of Rafael Benguria, Santiago, Chile

	Oct.	Workshop on the occasion of the <i>60th birthday of Claude-Alain Pillet</i> , Montreal, Canada
	Juil.	Conference on <i>Physics and Mathematics of Quantum Field Theory</i> , Banff International Research Station, Canada
	Juil.	<i>International Congress on Mathematical Physics</i> (contributed talk), Montréal, Canada
	Juil.	Colloquium of the Mathematics Department, LMU Munich, Germany
	Juin	SIAM Conference on <i>Nonlinear Waves</i> , Los Angeles, USA
	Juin	Workshop on <i>The analysis of Dirac equations</i> , Orsay, France
	Mai	Conference on <i>Partial Differential Equations in Physics and Materials Science</i> , Heraklion, Crete
	Mai	Conference on <i>Recent Results on Quantum Many-Body Systems</i> (in honor of Heinz Siedentop), Herrsching, Germany
	Mars	Workshop on <i>Mathematical Methods in Quantum Chemistry</i> , Oberwolfach, Germany
2017	Sept.	Workshop on <i>Quantum Field Theory</i> , Oberwolfach, Germany
	Août	Conference on <i>Mathematical challenges in classical & quantum statistical mechanics</i> , Venice, Italy
	Mai	Workshop <i>Optimal Transport meets Density Functional Theory</i> , Jyväskylä, Finland
	Mars	Workshop on <i>Macroscopic limits of quantum systems</i> , TU Munich, Germany
	Fév.	Conference <i>New trends in Mathematical Physics at the interface of Analysis and Probability</i> , London, UK
	Janv.	Workshop on <i>Applications of Optimal Transportation in the Natural Sciences</i> , Oberwolfach, Germany
2016	Déc.	Workshop on <i>Evolution Equations</i> , Valdivia, Chile
	Oct.	Workshop on <i>Synergies between Mathematical and Computational Approaches to Quantum Many-Body Physics</i> , ESI Vienna, Austria
	Sept.	Workshop on <i>Many-Body Quantum Systems and Effective Theories</i> , Oberwolfach, Germany
	Août	Conference on <i>Methods of Modern Mathematical Physics</i> (Young Researcher Symposium on the Occasion of the 70th Birthday of Barry Simon), Fields Institute Toronto, Canada
	Juin	Conference on <i>New challenges in mathematical modelling and numerical simulation of superfluids</i> , CIRM Marseille, France
	Juin	Conference on <i>Spectral Theory and Mathematical Physics</i> , Univ. Cergy-Pontoise, France
	Juin	Conference on <i>Mathematical Many-Body Theory and its Applications</i> , BCAM, Bilbao, Spain
	Mai	Workshop on <i>Quantum Dynamics & Control</i> , Institut Henri Poincaré, Paris, France
	Mai	Symposium on <i>Trends in Mathematical Crystallisation</i> , Warwick University, UK
	Janv.	<i>Indo-French conference in Mathematics</i> , Chennai, India
2015	Oct.	Conférence “États de la recherche” on <i>Supraconductivity, superfluidity & Vortices</i> , IHP Paris, France
	Juil.	Plenary speaker at the <i>International Congress of Mathematical Physics</i> , Santiago de Chile
	Juin	ANR Meeting on <i>Spectral and scattering theories in Quantum Field Theory</i> , Porquerolles, France
	Juin	Workshop on <i>Mathematical Methods in Quantum Molecular Dynamics</i> , Oberwolfach, Germany
	Avril	Chemistry workshop on <i>Advances in electronic structure theory</i> , Jussieu, Paris, France
	Mars	Séminaire <i>Monde Quantique</i> , I.H.E.S., France
	Fév.	Opening lecture of the <i>Mary Cartwright lecture</i> by Maria J. Esteban, London Mathematical Society, London, UK
	Janv.	<i>6th itinerant meeting in PDE</i> , SISSA, Trieste, Italy
2014	Oct.	<i>Spectral Theory</i> Workshop to celebrate the 70th birthday of Brian Davies, King’s College London, UK
	Oct.	Conference on <i>Nonlinearity, Transport, Physics, and Patterns</i> , Fields Institute, Toronto, Canada
	Sept.	Conference <i>Scaling Limits and Effective Theories in Classical and Quantum Mechanics</i> , ESI Vienna, Austria
	Avril	Conference <i>Theoretical and Numerical Aspects of Quantum Transport</i> , Ålborg, Denmark
	Mars	Conference <i>Mathematical and Numerical Methods for Complex Quantum Systems</i> , Univ. Illinois Chicago, USA
	Mars	Warwick EPSRC Symposium on <i>Statistical Mechanics: Many-Body Quantum Systems</i> , UK

- 2013** Oct. Workshop on *Disordered Quantum Many-Body Systems*, Banff, Canada
 Oct. Conference *Mathématiques pour le graphène*, Univ. Joseph Fourier, Grenoble, France
 Sept. Conference *Analytical and quantum mechanical aspects of Schrodinger and Dirac operators*, Pisa, Italy
 Juin Journées E.D.P., Biarritz, France
 Mai Conference on *Conical Intersections in Mathematical Physics*, Institut Henri Poincaré, Paris
 Mai Workshop on *Analytical Aspects of Mathematical Physics*, ETH Zürich, Switzerland
 Avril Workshop on *Numerical Challenges in Relativistic Quantum Chemistry*, Institut Henri Poincaré, Paris, France
 Avril *EMS Weekend*, session on *Partial Differential Equations and Applications*, Århus, Denmark
 Mars Conference *Analysis and Stochastics in Complex Physical Systems*, Leipzig, Germany
 Fév. 5th meeting of the GDR “Quantum Dynamics”, Lille, France
- 2012** Oct. Conference on *Recent Developments in the Mathematical Analysis of Large Systems*, Erwin Schrödinger Institute, Vienna, Austria
 Sept. Conference on *New Perspectives in Nonlinear PDEs*, Rome, Italy
 Août VMS–SMF Joint Congress, Session on PDE, Hue, Vietnam
 Août Workshop on *New developments in relativistic quantum mechanics and applications*, Newton Institute, Cambridge, UK
 Juil. *Mathematics of Many-Particle Systems* (conference in honor of Elliott H. Lieb, on the occasion of his 80th birthday), Berlin, Germany
 Juil. *6th European Mathematical Congress (EMS Prize talk)*, Kraków, Poland
 Mai Workshop on *Mathematical and Numerical Analysis of Electronic Structure Models*, Beijing, China
 Mai Workshop on *Quantum Many-Body Systems*, Montréal, Canada
 Avril *Spectral Days*, Munich, Germany
- 2011** Oct. *EMS Week End*, session on *PDEs and applications to mechanics and physics*, Bilbao, Spain
 Juil. 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
 Juil. Conference *Intellectual Challenges in Multiscale Modelling of Solids*, University of Oxford, UK
 Juin Workshop *Mathematical Methods in Quantum Chemistry*, Oberwolfach, Germany
 Fév. Fourth School and Workshop on *Mathematical Methods in Quantum Mechanics*. Bressanone, Italy
- 2010** Sept. Conference on *New Approaches in Many-Electron Theory*, Max-Planck-Institut für Polymerforschung, Mainz, Germany
 Sept. QMATH11 (**plenary speaker**), Hradec Králové, Czech Republic
 Août ICM 2010 Satellite Conference on *Quantum Systems*, Chennai, India
 Juin Workshop on *Matter and Radiation*, Erwin Schrödinger Institute, Vienna, Austria
 Mai *SIAM Conference on Mathematical Aspects of Material Sciences*, Session on *Electronic structure*, Philadelphia, USA
 Avril *2010 British Mathematical Colloquium and British Applied Mathematics Colloquium*, Session *Spectral Theory*, Edinburgh, Scotland
 Mars *Annual meeting of the German Math. Society (DMV)*, Session *Mathematical methods in quantum chemistry and electronic structure theory*, Munich, Germany
- 2009** Sept. *International Conference on Numerical Analysis and Applied Mathematics*, Symposium on *Numerical methods and their applications in molecular simulation*, Rethymnon, Crete
 Sept. Conference *Mathematics of Complex Quantum Systems*, Oberwolfach, Germany
 Août Banff workshop on the *Analysis of nonlinear wave equations and applications in engineering*, Banff, Canada
- 2008** Sept. IMA Annual Program Year Workshop *Mathematical and Algorithmic Challenges in Electronic Structure Theory*, Minneapolis, USA
 Juil. *XI Encuentro de Matematica y sus Aplicaciones (plenary speaker)*, Quito, Ecuador

	Juin	<i>Canadian-French Conference</i> , Montréal, Canada
2007	Sept.	<i>QMATH 10</i> , Moeiciu, Romania
	Août	4th Danish Symposium on <i>Applied Analysis</i> , Copenhagen, Denmark
	Juil.	<i>International Conference on Scientific Computation and Differential Equations</i> (SciCADE 2007). Symposium <i>Applications to Chemistry</i> , Saint-Malo, France
	Mars	<i>Relativistic Effects in Heavy Elements</i> , Ottrott, France
	Fév.	Workshop <i>Multiscale and Variational Methods in Material Science and Quantum Theory of Solids</i> , Oberwolfach, Germany
	Janv.	Conference <i>Semi-classical Days XIV</i> , CIRM, Marseille, France
2006	Oct.	Conference <i>Mathematical and Numerical Aspects of Quantum Chemistry Problems</i> , Oberwolfach, Germany
	Juil.	Conference <i>Mathematics in Chemistry</i> , Lisbon, Portugal
	Juin	Workshop on <i>Quantum Mechanics of Complex Systems</i> , Erwin Schrödinger Institute, Vienna, Austria
2005	Déc.	Conference <i>Topological and Variational Methods in Partial Differential Equations</i> , Guanajuato, Mexico
	Nov.	Conference <i>Mathematical Methods for Ab Initio Quantum Chemistry</i> , Nice, France
	Avril	Fourth international conference on <i>Analysis and Quantum</i> , München, Germany
2004	Déc.	Conference of the 2004-2005 Warwick EPSRC Symposium on <i>Mathematical challenges in quantum chemistry</i> , Warwick, UK
	Août	Conference of the 2004-2005 Warwick EPSRC Symposium on <i>Large many-body systems</i> , Warwick, UK
	Juil.	Satellite conference of the 4th European Congress of Mathematics (ECM), <i>Spectrum and Quantum Mechanics</i> , Stockholm, Sweden
	Juin	Workshop on <i>Calculus of variations</i> , Oberwolfach, Germany
2003	Déc.	Meeting of the EU network “Analysis and Quantum”, ESI, Vienna, Austria
	Fév.	<i>Applied Mathematics and Applications of Mathematics</i> (AMAM), Symposium of <i>Quantum Chemistry</i> , Nice, France