RÉMI CARLES Born November 13, 1971 in Vouziers (France) French citizenship. Married E-mail: Remi.Carles@math.cnrs.fr URL: carles.perso.math.cnrs.fr IRMAR CNRS & Univ. Rennes Campus de Beaulieu F-35 042 RENNES CEDEX

## CURRICULUM VITAE

Positions	
2018-	CNRS senior researcher, IRMAR, Rennes.
2011-2018	CNRS senior researcher, IMAG (formerly I3M), Montpellier.
2007 – 2011	CNRS junior researcher, I3M, Montpellier.
2006 - 2007	CNRS junior researcher, Pauli Institute, Vienna.
2005	Habilitation thesis, Bordeaux: Oscillations, concentration and dispersion for wave and Schrödinger equations.
2003 - 2005	Mobility at IRMAR, University Rennes 1.
2001 - 2007	CNRS junior researcher, IMB, University Bordeaux 1.
2000-2001	Assistant professor, Brittany site of ENS Cachan (now ENS Rennes).
2000	Post-doc at SISSA, Trieste, Italy (January-June).
1999	Visiting Assistant Professor, Ann Arbor, Michigan, USA (Fall term).
1999	PhD thesis, IRMAR, University Rennes 1, advised by Guy Métivier: <i>Studies of nonlinear oscillations near a caustic.</i>

## PhD theses supervision

- Hans Peter Stimming (Vienna, 2004), partial supervision.
- Pei Cao (Beijing, 2012), partial supervision.
- Lounès Mouzaoui (Montpellier, 2010–2013).
- Guillaume Ferriere (co-advised by Matthieu Hillairet, Montpellier, 2018–2021).
- Quentin Chauleur (co-advised by Erwan Faou, Rennes, 2019–2022).

## POST-DOC SUPERVISION

• Divyang Bhimani, Rennes, 2019-20.

# Administrative responsibilities

2019-	President of the scientific council of INSMI (mathematics institute at CNRS).
2012-2016	Scientific secretary of the mathematics section of the national committee of scientific research.
2009-2014	Head of the team ACSIOM (subset – a quarter – of the institute IMAG).
2009-2010	Scientific representative of the library in the maths department.
2009-2011	Scientific representative for mathematics in the doctoral school I2S (Information, Structure and Systems), Montpellier.
2008-2011	Elected member of the scientific council of the University Montpellier 2.

# PROJECT PARTICIPATION

2019-2020	Member of the CNRS 80 prime project Algorithms in molecular quatum dynamics (leader: Clotil de Fermanian).
2016-2017	Member of the CNRS Inphyniti project $Quantum trajectories methods$ (QTM).
2014-2017	Member of the ANR project <i>Boundaries, Numerics and Dispersion</i> (BoND).
2013-2017	Member of the ANR project Bose-Einstein Condensates: Advanced Simulation. Leader of the Montpellier team.
2013-2016	Member of the ANR project Schrödinger equations and applications.
2010-2011	Member of the French-Japanese Sakura project <i>Dynamics of model equations</i> in Bose–Einstein condensation.
2008-2012	Leader of the ANR project Asymptotic Regimes for Schrödinger equations.
2005-2008	Member of the ANR project SCASEN (leader: C. Cheverry).
2001-2003	Member of the research group <i>Wave equations: oscillations, dispersion and control</i> , with N. Burq, C. Fermanian-Kammerer, I. Gallagher and L. Miller.

# Organization

2021	With Zied Ammari, Valeria Banica and Benoît Grébert, workshop Schrödinger equations: normal forms, quantum mechanics, and nonlinear aspects, Le Croisic, as part of the thematic semester <i>Physique mathématique</i> of Henri Lebesgue Center, Conference and semester initially planned in 2020, post-
	poned due to the CoVid-19.
2020	With Clotilde Fermanian and Caroline Lasser, workshop Algorithms in Quan- tum Molecular Dynamics (AlgDynQua), CIRM (Marseille).

2019	With Jean-Claude Saut, workshop Some news on dispersive PDEs : model- ing, theory and numerics, Pauli Institute (Vienna).
2019	With Yongyong Cai and Hanquan Wang, mini-symposium <i>Multiscale analysis and numerical methods for highly oscillatory PDEs</i> , ICIAM 2019, Valencia (Spain).
2019	With Karine Beauchard, Olivier Ley, Karel Pravda-Starov and Miguel Ro- drigues, <i>Journées Jeunes EDPistes 2019</i> , Rennes.
2017	With Justin Holmer and Svetlana Roudenko: French-American Conference on Nonlinear Dispersive PDEs, CIRM (Marseille).
2017	With Laurence Halpern and David Lannes: Contemporary Microlocal Anal- ysis, a conference in the honor of Jeffrey Rauch, Montpellier.
2016	With Jean-Claude Saut: workshop at Pauli Institute (Vienna), <i>Qualitative aspects of nonlinear dispersive equations</i> .
2016	With Weizhu Bao and Ionut Danaila: conference New Challenges in Mathematical Modelling and Numerical Simulation of Superfluids, CIRM (Marseille).
2014	With Jean-Claude Saut: workshop at Pauli Institute (Vienna), <i>Dispersive equations with nonlocal dispersion</i> .
2014	With Christof Sparber: mini-symposium Large time behavior in Schrödinger equations from different perspectives, SIAM Conference on Nonlinear Waves and Coherent Structures, Cambridge.
2014	With Ionut Danaila: project meeting at CIRM, Advanced numerical methods for the simulation of Bose-Einstein Condensation.
2013	With Jean-Claude Saut: workshop at Pauli Institute (Vienna), Modified dispersion for dispersive equations and systems.
2012	With Valeria Banica: workshop at CIRM (Marseille), on the theme Asymptotic regimes for Schrödinger equation.
2012	With Valeria Banica: workshop at WPI (Vienna), on the theme Asymptotic regimes for Schrödinger equation.
2010	With Valeria Banica: workshop at CIRM (Marseille), on the theme Asymptotic regimes for Schrödinger equation.
2007	Organizer for the workshop <i>Critical nonlinear Schrödinger equations</i> , Wolfgang Pauli Institut (Vienna), with N. Mauser.
2006	Member of the orginizing committee for the conference in the honor of J. Rauch, with JF. Bony and M. Keel (Bordeaux, May 18-20).
2003	Member of the orginizing committee for the conference of the working group EAPQ in Bordeaux, with C. Galusinski and D. Lannes.
2002	Member of the orginizing committee for the conference in the honor of JL. Joly, with G. Carbou, T. Colin, P. Fabrie and D. Lannes (Bordeaux, Sept. 18-20).
1998-99	Organizer of the working group Scattering for Schrödinger equation, Rennes.

Hiring	
2022, 2023	Member of the IUF (Institut Universitaire de France) jury for junior positions (candidates must be under 40 years old).
2019, 2022	Member of the admission jury for CNRS senior researchers.
2016	Member of the hiring committee for the assistant professor position <i>Partial Differential Equations</i> , Montpellier.
2015	Member of the hiring committee for the assistant professor position $Analysis$ , $Optimization$ , Montpellier.
2014	Member of the hiring committee for the full professor position $Analysis$ of $PDEs$ , Montpellier.
2012	President of the hiring committee for the full professor position Analysis of PDEs, numerical analysis, scientific computing, Montpellier.
2012	Member of the hiring committee for the <i>maitre de conférences</i> position <i>Par- tial differential equations</i> , Marseille.
2010	President of the hiring committee for the <i>maitre de conférences</i> position Numerical analysis and partial differential equations, Montpellier.
2010	Member of the hiring committee for the <i>maitre de conférences</i> position Anal- ysis, Marseille.
2009	President of the hiring committee for the <i>maitre de conférences</i> position Analysis, geometry, nonlinear partial differential equations, Montpellier.
2008-	Expert for the hiring committees in applied mathematics, Montpellier.
2008-	Expert for the hiring committees in mathematics, Nice.
2007-08	Member for the hiring committee in theoretical physics, Montpellier.
2004-07	Member for the hiring committee in mathematics, Cergy–Pontoise.

## EVALUATION

Reviewer for zbMATH, since 2023.

Reviewer for the Mathematical Reviews from 2002 to 2019.

Referee for some journals, including: Ann. Henri Poincaré, Ann. IHP Section C, Ann. ENS, Arch. Ration. Mech. Anal., Comm. Math. Phys., Comm. Partial Differential Equations, Diff. Int. Eq., J. Differential Equations, J. Stat. Phys., J. Math. Phys., Math. Z., Nonlinearity, SIAM J. Math. Analysis, Numerical Algorithms, BIT Numerical Mathematics.

Expert for the French ANR (2008, 2009).

Expert for NSERC (Natural Sciences and Engineering Research Council of Canada), 2010.

2012: Expert of the AERES visiting committee for DMA (ENS).

2013: Expert of the AERES visiting committees for CMAP, and CMLS (École polytechnique).

2015: Expert of the HCERES visiting committee for LMRS (Rouen).

2017: President of the HCERES visiting committee for IRMA (Strasbourg).

## PhD reports

- Rada Maria Weishaüpl (Vienna, 2006).
- Fanny Delebecque (Rennes, 2009).
- Manal Hussein (Lille, 2009).
- Pauline Klein (Nancy, 2010).
- Lysianne Hari (Cergy-Pontoise, 2014).
- Michele D'Amico (Gran Sasso, 2017).
- Tristan Robert (Cergy-Pontoise, 2018).
- Van Duong Dinh (Toulouse, 2018).
- Arnaud Triay (Paris-Dauphine, 2019).
- Xavier Friederich (Strasbourg, 2021).

## Habilitation report

• Stefan Le Coz (Toulouse, 2018).

## Other jurys

- Laurent Thomann (PhD thesis, Orsay, 2007, president of the defence committee).
- Zakaria Hachemaoui (PhD thesis, Paris 13, 2009).
- Afaf Bouharguane (PhD thesis, Montpellier, 2011).
- André de Laire (PhD thesis, Paris 6, 2011).
- Aurélien Poiret (PhD thesis, Orsay, 2012).
- Pierre Alifrangis (PhD thesis, Montpellier, 2013).
- Matthieu Alfaro (habilitation thesis, Montpellier, 2013).
- Ingrid Lacroix-Violet (habilitation thesis, Lille, 2017).
- Abdelwahab Bensouilah (PhD thesis, Lille, 2019, president of the defence committee).
- Evelyne Miot-Desecures (habilitation thesis, Grenoble, 2019).
- Julien Sabin (habilitation thesis, Orsay, 2022, president of the defence committee).

### EDITORIAL ACTIVITIES

2016- Member of the editorial board, Evolution Equations and Control Theory.

### LECTURES AND OUTSIDE VISITS

## $\boldsymbol{2022}$

- Online conference, Computation, Analysis & Applications of PDEs with Nonlocal and Singular Operators, Singapore.
- Talk at the *IECL PDE days*, Nancy.
- Numerical and analytical approaches for nonlinear dispersive PDEs, Dijon.
- Nonlinear dispersive equations Inverse scattering and PDE methods, WPI, Vienna.

### $\boldsymbol{2021}$

- Mini-course (three times 1 hour) organized by Xing Cheng (Hohai University), with participants from various departments in China.
- Mini-course (3h), PDE conference of the CNRS thematic network Analysis of PDEs.

### 2020

- Seminar in Marseille.
- Enriques-Lebesgue seminar (online).
- Colloquium (online), Gran Sasso Science Institute, Italy.

## 2019

- Seminars in Bordeaux, Lille.
- Minisymposium *Multiscale analysis and numerical methods for oscillatory PDEs*, ICIAM, Valence.
- Workshop Mathematical Questions of Molecular Quantum Dynamics, IHP.
- Workshop Some news on dispersive PDEs : modeling, theory and numerics, Pauli Institute, Vienna.

## 2018

• Joint seminar in nonlinear analysis and PDEs, ENS Paris/UPMC/Paris Diderot.

- XVII International Conference on Hyperbolic Problems: Theory, Numerics, Applications (HYP2018), Penn State (invited speaker).
- Mini-course (4h30) at the workshop Fundamental problems in Mathematical and Theoretical Physics, Waseda University, Tokyo.
- Linear and Nonlinear Wave Phenomena: Stability, Propagation of Regularity and Turbulence, Cortona.
- Seminars at ENS Rennes, and IRMAR (Rennes)
- Mini-course (4h) at the meeting *Quantum meeting: From many Particle Systems to Quantum Fluids*, Gran Sasso Science Institute, Italy.

- Workshop *Harmonic Analysis and Wave Equations*, organized in the framework of the French-Chinese laboratory of applied mathematics. Shanghai.
- Seminar in Bordeaux, Chambéry, Créteil, Rennes, Toulouse.
- Talk at Journées Jeunes EDPistes.
- Workshop Advances in Mathematical Modelling & Numerical Simulation of Superfluids, Rouen.
- 10 days at the National University of Singapore, invited by Weizhu Bao.
- Conference for the 70th birthday of Jean-Claude Saut, Bordeaux.

### 2016

- Conference Asymptotic Behavior of systems of PDE arising in physics and biology: theoretical and numerical points of view, Lille.
- Summer school Nonlinear Waves 2016, IHÉS.
- Workshop Waves, boundary and oscillations in numerical schemes, Rennes.

- Workshop IDTPSI: Theory and Numerics, Nice.
- PDE seminar, Orsay.
- Analysis seminar, ETH & Univ. Zürich.
- Summer school Long time in PDEs, Nantes.
- Equa Diff, minisymposium Nonlinear waves in dispersive equations, Lyon.
- Workshop Modeling and Numerics for Quantum systems, Toulouse.
- One week invitation, Univ. Lisbon. Seminar at CMAF.
- Workshop for the ANR project Lodiquas, Dinard. Problèmes Spectraux en Physique Mathématique (Séminaire tournant), IHP.

- Geometry, PDE and mathematical physics seminar, Cergy-Pontoise.
- Geometry and Semiclassical Analysis in interaction with Spectral Theory and Physics, Madrid.
- Analytical aspects of the dynamics of nonlinear Schrödinger equations, AIMS Conference Series on Dynamical Systems and Differential Equations, Madrid.
- Équations de Schrödinger et Applications, CIRM.
- Applied analysis seminar, Marseille.
- Large time behavior in Schrödinger equations from different perspectives, SIAM Conference on Nonlinear Waves and Coherent Structures, Cambridge.
- KAM Theory and Dispersive PDE's, Rome.

## 2013

- Workshop on dispersive shocks, CIRM.
- Workshop Hosdina, Univ. Dijon.
- Nonlinear Wave Equations, Instituto Superior Técnico, Lisbon.
- PDE seminar, Univ. Rennes 1.
- Classical and Quantum Mechanical Models of Many-Particle Systems, Oberwolfach.

- Journée Schrödinger, Toulouse.
- Semiclassical & multiscale aspects of wave propagation, Heraklion.
- French-Chinese summer institute Dynamics of nonlinear dispersive and fluid mechanics equations, Beijing.
- Joint ENS Lyon-Univ. Lyon PDE seminar.
- One week invitation, Univ. Lisbon.
- Mathematical physics seminar, Univ. Lille 1.

### $\mathbf{2011}$

- Workshop GDR EDP/Dispeq/Univ. Bilbao (Bayonne).
- Problems in the dynamics of nonlinear dispersive equations, WPI, Vienna.
- Functional analysis seminar, Univ. Paris 6.
- Nonlinear dispersive equations and related topics, IHP.
- Hamiltonian and Dispersives Equations : Dynamics (Berder).
- Problèmes Spectraux en Physique Mathématique (Séminaire tournant), IHP.
- Analyse de modèles en mécanique quantique, Rennes.
- Stability problems in nonlinear dispersive PDEs, JSPS meeting, Cergy–Pontoise.

## 2010

- Applied mathematics seminar, Univ. Toulouse 3.
- PDE working group, LAMA (Créteil).
- Dispersive nonlinear evolution equations, CIRM.
- Shocks and oscillations, in the honor of Guy Métivier, Bordeaux.
- Classical and Quantum Mechanical Models of Many-Particle Systems, Oberwolfach.
- PDE Models for Quantum Fluids, Newton Institute (Cambridge).

### 2009

- Mini-course (3\*1h30) on semiclassical analysis for nonlinear Schrödinger equation, Lyon (ANR project SCASEN).
- PDE seminar, Univ. Nantes.
- Dynamique des équations dispersives non linéaires, Cergy.
- Invited conference at Mathematical Methods in Quantum Mechanics, Bressanone (Italie).
- Two weeks in Chengdu (Sichuan Normal University). Five 1h30 talks.

- One week in Cambridge (one talk).
- Équations dispersives sur les variétés (Orléans).
- Séminaire tournant (IHP).
- Paris-Londres Analysis Seminar (IHP).

- Nonlinear Waves and Coherent Structures, SIAM (Rome).
- The Gross-Pitaevskii equation and related topics (Porquerolles).
- Étude qualitative d'ÉDP dispersives (Lille).
- Two weeks in Kyoto (French-Japanese project); 3h talk.
- Joint ENS Lyon-Univ. Lyon 1 seminar.

- Long-time phenomena evolution and shocks: from quantum mechanics to PDEs through dynamical systems, Vienne.
- Seminar at Univ. Nice, Univ. Montpellier 2, ENS Paris.
- Mathematical Analysis and Numerical Simulation for Bose-Einstein Condensation, ICIAM, Zürich.
- Nonlinear Waves and Dispersive Equations, Oberwolfach.
- Two weeks in Beijing (*Morningside center*). Course (10h) on semiclassical analysis for nonlinear Schrödinger equation.

#### 2006-07

Academic year at CNRS Pauli Institute (Vienna):

- Speaker at the meeting Modern application of Gross-Pitaevskii equations: the Bose-Einstein condensation.
- Advanced course (6h): WKB methods and semi-classical limit for the nonlinear Schrödinger equation.

#### 2006

- Three months in Lisbon (two talks).
- Two weeks at MIT (one week), invited by G. Staffilani.
- Schrödinger Evolution Equations (Banff International Research Station, Canada).
- Seminar, Univ. Lille 1.
- One month in Japan (JSPS fellowship): three weeks i Sapporo (two talks), one week in Osaka (one talk) and Kyoto (one talk).

- Seminars in Bordeaux, Rennes, Orsay, Grenoble, Evry. Colloquium Univ. Vienne.
- Two one week stays at Wolfgang Pauli Institut (WPI), Vienna, invited by N. Mauser.
- One and a half month in Lisbon.

- Two months in Lisbon, with J. P. Dias (CMAF) and J. Silva (Instituto Superior Técnico). Talks at CMAF and IST.
- Seminar at ENS Paris.
- One moth at De Giorgi Center (Pisa) to attend the meeting *Phase Space Analysis of PDEs.*
- Post-doc fellowship (FCT), Lisbon (CMAF and IST), three months.

## 2003

- Analysis of PDEs, Forges-les-Eaux.
- French-Tunisian meeting, Hammamet.
- One month at the Free Univ. of Brussels, with P. Godin.
- Six weeks in Lisbon (CMAF), with J. P. Dias. Talks at CMAF, Instituto Superior Técnico, and Univ. Coimbra.
- One week at WPI (Vienna), invited by P. Markowich.

## 2002

- Two weeks in Japan, invited by N. Hayashi.Talks in Osaka (Nonlinear dispersive PDE) and Tokyo (Kagurazaka Seminar).
- PDE seminar, Univ. Rennes 1.
- Hyperbolic systems and oscillations, Bordeaux (in the honor of Jean-Luc Joly).
- Talks (twice one hour and a half), working group, École polytechnique.

### $\mathbf{2001}$

- PDE seminars in Rennes and Orsay.
- Stays at the Erwin Schrödinger Institut (Vienna), invited by N. Mauser and P. Gérard, in February (two weeks) and November (one week).
- GDR Équations d'Amplitude et Propriétés Qualitatives (EAPQ), ENS Lyon.
- Analyse Haute-Fréquence dans les EDP non-linéaires et Applications, CIRM.
- Séminaire X-EDP (École polytechnique).

- PDE seminars in Orsay and Bordeaux.
- Waves 2000, Santiago de Compostela, Espagne.
- Post-doc at SISSA (Trieste, Italy), six months.

#### 1999

- PDE seminar, Rennes.
- Mesures de Wigner, théorie cinétique et ondes de Bloch, CIRM.
- Four months at the University of Michigan, Ann Arbor, invited by J. Rauch, as a visiting assistant professor. PDE seminars in Ann Arbor and Chapel Hill (North Carolina).

PUBLICATIONS (EXCEPT RESULTS ANNOUNCEMENTS)

## Book

Semi-classical analysis for nonlinear Schrödinger equations, World Scientific Publishing Co. Pte. Ltd., Hackensack, NJ, 2008. xii+243 pp.

# Book chapter

On the semi-classical limit for the nonlinear Schrödinger equation. Stationary and Time Dependent Gross-Pitaevskii Equations, A. Farina and J.-C. Saut editors, Contemp. Math. 473 (2008), Amer. Math. Soc., pp. 105-127.

## Articles

## 1998

• Comportements précisés près d'une caustique en optique géométrique non linéaire. Comm. in Partial Diff. Eq. 23 (1998), no. 11-12, 1929-1967.

- Geometric optics with caustic crossing for some nonlinear Schrödinger equations. Indiana Univ. Math. J. 49 (2000), no. 2, 475-551.
- Focusing on a line for nonlinear Schrödinger equations in ℝ<sup>2</sup>. Asymptotic Analysis 24 (2000), 255-276.

#### $\boldsymbol{2001}$

• Geometric optics and long range scattering for one-dimensional nonlinear Schrödinger equations.

Comm. Math. Phys. 220 (2001), no. 1, 41-67.

• Remarques sur les mesures de Wigner. C. R. Acad. Sci. Paris, t. 332, Série I, 981-984, 2001.

## $\boldsymbol{2002}$

- Focusing of spherical nonlinear pulses in ℝ<sup>1+3</sup>.
  With J. Rauch. Proc. Amer. Math. Soc. 130 (2002), 791-804.
- Remarks on the nonlinear Schrödinger equation with harmonic potential. Ann. Henri Poincaré **3** (2002), no. 4, 757–772.
- Critical nonlinear Schrödinger equations with and without harmonic potential. Math. Models Methods Appl. Sci. 12 (2002), no. 10, 1513–1523.

#### 2003

- Semi-classical Schrödinger equations with harmonic potential and nonlinear perturbation. Ann. Inst. H. Poincaré Anal. Non Linéaire 20 (2003), no. 3, 501–542.
- Focusing of a pulse with arbitrary phase shift for a nonlinear wave equation. With D. Lannes. *Bull. Soc. Math. France* **131** (2003), 289–306.
- On the role of quadratic oscillations in nonlinear Schrödinger equations. With C. Fermanian Kammerer and I. Gallagher. J. Funct. Anal. 203 (2003), no. 2, 453–493.
- Nonlinear Schrödinger equations with repulsive harmonic potential and applications. *SIAM J. Math. Anal.* **35** (2003), no. 4, 823–843.

- Focusing of spherical nonlinear pulses in ℝ<sup>1+3</sup> II. Nonlinear caustic. With J. Rauch. *Rev. Mat. Iberoamericana* 20 (2004), no. 3, 815–864.
- Focusing of spherical nonlinear pulses in ℝ<sup>1+3</sup>, III. Sub and supercritical cases. With J. Rauch. *Tohoku Math. J.* 56 (2004), no. 3, 393–410.
- Semiclassical Nonlinear Schrödinger equations with potential and focusing initial data. With L. Miller. Osaka J. Math. 41 (2004), no. 3, 693–725
- Nonlinear Schrödinger equations with Stark potential.
  With Y. Nakamura. Hokkaido Math. J. 33 (2004), no. 3, 719–729.
- Semiclassical asymptotics for weakly nonlinear Bloch waves.
  With P. A. Markowich and C. Sparber. J. Stat. Phys. 117 (2004), nos. 1-2, 343–375.

- Scattering theory for the Schrödinger equation with repulsive potential. With J.-F. Bony, D. Häfner and L. Michel. J. Math. Pures Appl. 84 (2005), no. 4, 509–579.
- Global existence results for nonlinear Schrödinger equations with quadratic potentials. *Discrete Contin. Dyn. Syst.* **13** (2005), no. 2, 385–398.
- Linear vs. nonlinear effects for nonlinear Schrödinger equations with potential. Commun. Contemp. Math. 7 (2005), no. 4, 483–508.
- (Semi)classical limit of the Hartree equation with harmonic potential. With N. J. Mauser and H. P. Stimming. *SIAM J. Appl. Math.* **66** (2005), no. 1, 29–56.

## 2007

- On the role of quadratic oscillations in nonlinear Schrödinger equations II. The L<sup>2</sup>-critical case.
  With S. Keraani. Trans. Amer. Math. Soc. 359 (2007), no. 1, 33–62.
- Geometric optics and instability for semi-classical Schrödinger equations. Arch. Ration. Mech. Anal. 183 (2007), no. 3, 525–553.
- WKB analysis for nonlinear Schrödinger equations with potential. Comm. Math. Phys. 269 (2007), no. 1, 195–221.
- Cascade of phase shifts for nonlinear Schrödinger equations. J. Hyperbolic Differ. Equ. 4 (2007), no. 2, 207–231.
- Semi-classical limit of Schrödinger–Poisson equations in space dimension  $n \ge 3$ . With T. Alazard. J. Differential Equations 233 (2007), no. 1, 241–275.
- Numerical aspects of nonlinear Schrödinger equations in the presence of caustics. With L. Gosse. *Math. Models Methods Appl. Sci.* **17** (2007), no. 10, 1531–1553.
- On instability for the cubic nonlinear Schrödinger equation. C. R. Math. Acad. Sci. Paris 344 (2007), no. 8, 483–486.

#### $\boldsymbol{2008}$

• Monotonicity properties of the blow-up time for nonlinear Schrödinger equations: numerical evidence.

With C. Besse, N. Mauser and H. P. Stimming. *Discrete Contin. Dyn. Syst. Ser. B* **9** (2008), no. 1, 11–36.

- On the wave operators for the critical nonlinear Schrödinger equation. With T. Ozawa. *Math. Res. Lett.* **15** (2008), no. 1, 185–195.
- On the Cauchy problem in Sobolev spaces for nonlinear Schrödinger equations with potential.
  Portugal. Math. (N. S.) 65 (2008), no. 2, 191–209.

- A Poisson formula for the Schrödinger operator. With T. Ozawa. J. Fourier Anal. Appl. 14 (2008), no. 3, 475–483.
- Scattering theory for radial nonlinear Schrödinger equations on hyperbolic space. With V. Banica and G. Staffilani. *Geom. Funct. Anal.* 18 (2008), no. 2, 367–399.
- Semiclassical analysis for Hartree equation.
  With S. Masaki. Asymptot. Anal. 58 (2008), no. 4, 211–227.
- On the Gross-Pitaevskii equation for trapped dipolar quantum gases. With P. Markowich and C. Sparber. *Nonlinearity* **21** (2008), 2569–2590.

- Loss of regularity for supercritical nonlinear Schrödinger equations. With T. Alazard. Math. Ann. **343** (2009), no. 2, 397–420.
- On the time evolution of Wigner measures for Schrödinger equations. With C. Fermanian Kammerer, N. Mauser and H. P. Stimming. Commun. Pure Appl. Anal. 8 (2009), no. 2, 559–585.
- Analyticity of the scattering operator for semilinear dispersive equations. With I. Gallagher. Comm. Math. Phys. **286** (2009), no. 3, 1181–1209.
- Rotating points for the conformal NLS scattering operator. Dyn. Partial Differ. Equ. 6 (2009), no. 1, 35–51.
- On scattering for NLS: from Euclidean to hyperbolic space. With V. Banica and T. Duyckaerts. Discrete Contin. Dyn. Syst. 24 (2009), no. 4, 1113–1127.
- WKB analysis for the Gross-Pitaevskii equation with non-trivial boundary conditions at infinity.
   With T. Alazard. Ann. Inst. H. Poincaré Anal. Non Linéaire 26 (2009), no. 3, 959–977.
- Supercritical geometric optics for nonlinear Schrödinger equations. With T. Alazard. Arch. Ration. Mech. Anal. **194** (2009), no. 1, 315–347.

### $\mathbf{2010}$

 Multiphase weakly nonlinear geometric optics for Schrödinger equations. With E. Dumas and C. Sparber. SIAM J. Math. Anal. 42 (2010), no. 1, 489–518.

### $\mathbf{2011}$

- Minimal blow-up solutions to the mass-critical inhomogeneous NLS equation. With V. Banica and T. Duyckaerts. Comm. Partial Differential Equations 36 (2011), no. 3, 487–531.
- Nonlinear coherent states and Ehrenfest time for Schrödinger equation. With C. Fermanian Kammerer, *Comm. Math. Phys.* **301** (2011), no. 2, 443–472.

- Finite time extinction by nonlinear damping for the Schrödinger equation.
  With C. Gallo, Comm. Partial Differential Equations 36 (2011), no. 6, 961–975.
- Numerical aspects of the nonlinear Schrödinger equation in the semiclassical limit in a supercritical regime.
  With B. Mohammadi, ESAIM Math. Model. Numer. Anal. 45 (2011), no. 5, 981–1008.
- A nonlinear adiabatic theorem for coherent states. With C. Fermanian Kammerer. *Nonlinearity* **24** (2011), no. 8, 2143–2164.
- Nonlinear Schrödinger equation with time dependent potential. Commun. Math. Sci. 9 (2011), no. 4, 937–964.
- On Schrödinger equations with modified dispersion. Dyn. Partial Differ. Equ. 8 (2011), no. 3, 173–184.
- Semiclassical wave packet dynamics for Hartree equations. With P. Cao. *Rev. Math. Phys.* **23** (2011), no. 9, 933-967.

- Semiclassical wave packet dynamics in Schrödinger equations with periodic potentials. With C. Sparber. *Discrete Contin. Dyn. Syst. Ser. B* **17** (2012), no. 3, 759–774.
- Energy cascade for NLS on the torus. With E. Faou. Discrete Contin. Dyn. Syst. 32 (2012), no. 6, 2063–2077.
- Interaction of coherent states for Hartree equations. Arch. Ration. Mech. Anal. 204 (2012), no. 2, 559–598.
- Nonlinear dynamics of semiclassical coherent states in periodic potentials. With C. Sparber. J. Phys. A 45 (2012), no. 24, 244032.
- Madelung, Gross-Pitaevskii and Korteweg.
  With R. Danchin and J.-C. Saut. Nonlinearity 25 (2012), no. 10, 2843–2873.
- Higher order Schrödinger equations.
  With E. Moulay. J. Phys. A 45 (2012), no. 39, 395304.
- Geometric optics and instability for NLS and Davey-Stewartson models.
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