Thomas Chen

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Curriculum Vitae

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Personal

Citizenship: USA and Switzerland.

Employment History

2018 -	Professor of Mathematics, University of Texas at Austin
2017 - 2024	Chair, Department of Mathematics
2014 - 2017	Graduate Advisor, Department of Mathematics
2013 - 2018	Associate Professor of Mathematics, University of Texas at Austin
2008 - 2013	Assistant Professor of Mathematics, University of Texas at Austin (on leave in the academic year 2007/08)
2004 - 2008	Assistant Professor of Mathematics, Princeton University
2001 - 2004	Courant Instructor, Courant Institute, New York University Mentor: Prof. Horng-Tzer Yau (Harvard University).

Education

2001	Ph.D. Theoretical and Mathematical Physics, ETH Zürich. Thesis advisor: Prof. Jürg Fröhlich. Coadvisor: Prof. Gian-Michele Graf.
1999	Ph.D. Mechanical Engineering, ETH Zürich. Thesis advisor: Prof. Hans Brauchli. Coadvisor: Prof. Eduard Zehnder.

Research Interests

Analysis, Mathematical Physics, Applied Mathematics: Spectral and dynamical problems in quantum field theory, random Schrödinger equations, renormalization group (RG) methods, scaling limits of quantum dynamics, nonlinear PDEs, Hamiltonian dynamics. Mathematical foundations of deep learning.

Grants and Honors

- National Science Foundation Grant DMS-2009800, 2020 - 2025, PI.
- Fellow of the American Mathematical Society, class of 2020.
- National Science Foundation Grant DMS-1716198, 2017 - 2020, PI.
- National Science Foundation Conference Grant DMS-1739320 for TexAMP 2017, PI.
- Frank Gerth III Faculty Fellowship, UT Austin, 2014 -
- National Science Foundation Conference Grant DMS-1412627 for TexAMP 2014, PI.
- NSF CAREER Grant DMS-1151414, 2012 - 2018, PI.
- Annales Henri Poincaré Prize 2010 for the publication [22] in the bibliography.
- National Science Foundation Grant DMS-1009448, 2010 - 2013, PI.
- National Science Foundation Grant DMS-0704031 / DMS-0940145, 2007 - 2010, PI.
- National Science Foundation Grant DMS-0407644 / DMS-0524909, 2004 - 2007, PI.
- NYU Research Challenge Fund Award 2003 - 2004.

Mentoring

• *PhD thesis:*

- Patricia Muñoz Ewald
- Ali Mezher
- Esteban Cardenas
- Michael Hott (PhD 2022, UT Austin)
- Yanlin Cheng, Amie Urban, Chuwei Zhang (PhD 2021, UT Austin)
- Kenneth Taliaferro (PhD 2015, UT Austin).
- Daniel Blazevski (PhD 2012, UT Austin; co-supervisor with Rafael de la Llave).

• *Postdoctoral:*

- Dr. Jacky Chong (PhD 2019, University of Maryland), 2019-2022 (jointly with Nataša Pavlović).
- Dr. Ryan Denlinger (PhD 2016, Courant Institute), 2016-2019 (jointly with Nataša Pavlović).
- Dr. Younghun Hong (PhD 2013, Brown University), 2013-2016 (jointly with Nataša Pavlović). Associate Professor, Chung-Ang University, South Korea.
- Dr. Itaru Sasaki (PhD 2007, Hokkaido University), 2007/08 at Princeton University. Associate Professor, Shinshu University, Japan.

Doctoral Thesis Committees, UT Austin

• *Mathematics:*

William Carlson (PhD 2015, advisor Misha Vishik). Jiexian Li (PhD 2015, advisor Gordan Zitkovic). Zhihui Xie (PhD 2014, advisor Nataša Pavlović). Rohit Jain (PhD 2016, advisors Luis Caffarelli, Alessio Figalli). Sona Akopian (PhD 2017, advisor Irene Gamba). Clark Pennie (PhD 2020, advisor Irene Gamba). Maja Tasković (PhD 2016, advisors Irene Gamba, Nataša Pavlović). Ioakeim Ampatzoglou (PhD 2020, advisor Nataša Pavlović). Matt Rosenzweig (PhD 2021, advisor Nataša Pavlović).

• *Physics:*

Victor Chua (PhD 2013, advisor Gregory Fiete). Yingyue Boretz (PhD 2013, advisor Linda Reichl). David Stark (PhD 2016, advisors Richard Hazeltine, Swadesh Mahajan). Hai Bui (PhD 2016, advisor Arno Bohm).

Organization of meetings and courses

2023/24	TexAMP '23/24, Texas A&M U. Advisory organizer with D. Damanik. Main organizers: D. Baskin, G. Berkolaiko, A. Comech, P. Kuchment, W. Liu, J. Lührmann, M.-B. Tran
2020/21	TexAMP '20/21, Online conference. Jointly organized with David Damanik.
2019/20	TexAMP '19/20, Rice University. Jointly organized with David Damanik.
2018	TexAMP '18, Baylor U. Jointly organized w. D. Damanik, J. Harrison, B. Simanek, C. Liaw.
2017	TexAMP '17, UT Austin. Jointly organized with David Damanik.
2016	TexAMP '16, Rice University. Jointly organized with David Damanik.
2015	TexAMP '15, UT Dallas. Jointly organized with David Damanik and Vladimir Dragovic.
2014	TexAMP '14, UT Austin. Jointly organized with David Damanik.
2013	TexAMP '13, Rice University. Jointly organized with David Damanik.
2012-2017	Thematic minicourses, UT Austin, through NSF CAREER Grant DMS-1151414.
2011	Summer School on Analysis, PDE's and Mathematical Physics, UT Austin. Jointly organized with Luis Caffarelli, Irene Gamba, and Natasa Pavlovic. Taught minicourse (five 1-hour lectures).

Invited lecture series

2009	"RG Methods in Math. Sciences 2009", three 1-hour lectures, RIMS, Kyoto University.
2007	"Renormalization and Spectral Analysis in QED", five 2-hour lectures, Kyushu University.
2003	"RG Methods in Math. Sciences 2003", three 1-hour lectures, RIMS, Kyoto University.

Professional Services

• *Grant proposal reviews:*

NSF review panelist in 2006, 2008, 2011, 2013, 2014, 2015, 2019, 2021, 2024.
Simons Foundation, Reviewer of Grant Proposals, 2013.

• *Departmental Service:*
Department Chair, 1/17/2017 - 8/31/2024. Interim Chair 12/16/2016 - 1/16/2017.
Graduate Advisor, 10/2014 - 1/2017.
Graduate Admissions Director, 2013 - 2017.
Co-organizer of the Analysis of Complex Physical Systems Seminar, 2021 - 2023.
Co-organizer of the Analysis Seminar until 2018, and of the Mathematical Physics Seminar.
Member of Tenure Promotion Triad, 2014.
Instructor Hiring Committee (chair), 2013/14, 2014/15.
Graduate Prelim Exam Committee: Applied Math, S10, F10. Analysis (chair), F13, F14.
Committee Membership: Undergraduate Studies, Calculus Reform, 2011-2015.

• *University Service:*
Member of President's Consultative Commitee for Search of Provost, 2021.
Elected member of Graduate Assembly, 2016 - 2017.

• *Journal Refereeing:*
Abhandlungen des Mathematischen Seminars der Universität Hamburg, Advances in Mathematics, Annales Henri Poincaré, Annales de l'Institut Henri Poincaré Analyse Non-Linéaire, Archive in Rational Mechanics and Analysis, Communications in Mathematical Physics, Documenta Mathematica, Duke Mathematical Journal, International Mathematical Research Notices, Inventiones Mathematicae, Journal of the AMS, Journal of Differential Equations, Journal of Functional Analysis, Journal of Mathematical Physics, Journal of Physics A, Journal of Statistical Physics, Letters in Mathematical Physics, Nonlinearity, Physica D, Reviews in Mathematical Physics, SIAM Journal on Mathematical Analysis, Symmetry Integrability and Geometry - Methods and Applications.

Professional Affiliations

American Mathematical Society (AMS).
International Association of Mathematical Physics (IAMP).
Society of Industrial and Applied Mathematics (SIAM).

Teaching Experience

• *University of Texas at Austin:*

- *Graduate:* Meth. Appl. Math. I, PDE I, Complex Analysis, Math. Quantum Theory.
- *Undergraduate:* Introd. Differential Equations, Introd. Real Analysis, Applied PDEs, Calculus I, Real Analysis I, Functions of a Complex Variable, Probability.
- *Graduate reading courses:* Ali Mezher (F23-). Mark Abate (S24-). Patricia Muñoz Ewald (F22-). Esteban Cárdenas (F19-). Michael Hott (F16-S22). Amie Urban (S17-S21). Yanlin Cheng (F16-S21). Chuwei Zhang (F15-S21). Kenneth Taliaferro (S11-S15). Claudia Raithel (F12-S14). Chris White (S11-F11). Rohit Jain (F10-S11, F12). Chirag Barai, Jason Jo (S10).

- *Undergraduate reading courses:* Abigail Perryman (S23). Chris Lutsko (S14-S16). Jacob Pollard (S13). Boyi Yang (S09-F09).

• *Princeton University:*

- *Undergraduate:* Calculus I, II. Introductory Multivariable Calculus (head instructor, multiple times). Advanced Multivariable Calculus (review lecturer and head instructor).

• *New York University:*

- *Undergraduate:* Abstract Algebra. Calculus II. Discrete Math. Chaos & Dynamical Systems.

• *ETH Zürich (TA):*

- Quantum Field Theory. Theoretical Physics for Mathematicians I, II. Quantum Mechanics I.

- Mechanics I $\sim$ III. Multibody Dynamics. Numerical Methods in Mechanics. Introd. Chaos Theory. Co-supervision of several Diploma (M.S.) students.

Research Visits

2018 ETH Zürich, invited by Prof. J. Fröhlich.
2017 ETH Zürich, invited by Prof. J. Fröhlich.
2016 Tübingen University, invited by Prof. C. Hainzl
Central China Normal University Wuhan, invited by Prof. A. Soffer.
2015 Stanford University, invited by Prof. L. Ryzhik.
ETH Zürich, invited by Prof. J. Fröhlich.
2014 Stanford University, invited by Prof. L. Ryzhik.
Mittag-Leffler Institute, 1 week.
Columbia University, invited by Prof. G. Bal.
University of Toronto, invited by Prof. I.M. Sigal.
Stanford University, invited by Prof. L. Ryzhik.
2011 University of Toronto, 1 week (January), invited by Prof. I.M. Sigal
2010 Princeton University, 1 week (December), invited by Prof. I. Rodnianski.
Erwin Schrödinger Institute, 1 week (June).
ETH Zürich, 1 week (May), invited by Prof. J. Fröhlich.
2009 Kyoto University, 1 week (September), invited by Prof. K. Ito.
ETH Zürich, 1 week (June/July), invited by Prof. J. Fröhlich.
Princeton University, 1 week (January), invited by Prof. I. Rodnianski.
2008 University of Toronto, 1 week (March), invited by Prof. I.M. Sigal.
Erwin Schrödinger Institute, University of Vienna. Had to decline.
2007 Kyushu University, Japan, 1 week (May), invited by Profs. K. Ito and F. Hiroshima.
University of Heidelberg, Germany, 1 week (March), invited by Prof. V. Bach.
2006 University of Texas at Austin, 1 week (November).
Kyushu University and RIMS, Kyoto University, Japan, 2 weeks (September),
invited by Profs. K. Ito and I. Ojima.
Erwin Schrödinger Institute, University of Vienna, 1.5 weeks (June).

2005 CTS, ETH Zürich, and Dept. of Mathematics, Mainz Univ., 2 weeks (June), invited by Profs. J. Fröhlich and V. Bach.
Department of Mathematics, U Notre Dame, 1 week (May), invited by Prof. I.M. Sigal.
LMU Munich, 1 week (April), invited by Prof. H. Siedentop.
Center of Theoretical Studies (CTS), ETH Zürich, 1 month (Jan), invited by Prof. J. Fröhlich.

2004 Department of Mathematics, Stanford U, 1 month (May/June), invited by Prof. H.-T. Yau.
Department of Mathematics, University of Virginia, 1 week (May), invited by Prof. I. Herbst.
Department of Mathematics, Stanford University, 2 weeks (Jan), invited by Prof. H.-T. Yau.

2003 RIMS, Kyoto University, and Dept. of Mathematics, Tokyo University, 2 weeks (Sep), invited by Profs. I. Ojima, K. Ito, and K. Yajima.
TU and LMU Munich, 1 week (June), invited by Prof. H. Spohn.

2002 Department of Mathematics, University of Toronto, 1 week (May), invited by Prof. I.M. Sigal.

Conference Presentations

2023 Invited speaker, "Effective theories in class. & quantum particle systems", SwissMap.

2022 Invited speaker, FRG Conference, MIT.
Invited speaker, Session "QM and quantum chemistry", 12th IMACS conf., Athens GA.

2021 Invited speaker, Session "Spectral theory", SIAM Conference Texas-Louisiana Section.

2020 Invited speaker, Special Session 47, AIMS Conference Atlanta, canceled (COVID-19).

2019 Invited speaker, 122nd Statistical Mechanics Conference, Rutgers U.
Invited speaker, Session "Nonlinear Waves and Applications", SIAM meeting, SMU.
Invited speaker, Session "Effect. Eqs. of Quantum Physics", AMS meeting, Gainesville FL.
Invited speaker, Workshop "From Many Body Problems to Random Matrices", Banff, had to cancel.
Invited speaker, Session "QM and Quantum Chemistry", IMACS conference, U Georgia
Invited speaker, "Spectral Methods in Mathematical Physics", Mittag Leffler Institute.

2018 Invited speaker, "Nonlinear phenomena in Stockholm: kinetic meets dispersive", KTH, had to decline.
Invited speaker, "Many-Body Quantum Mechanics", CRM Montreal.
Invited speaker, Session "Nonlin. eqs and many particle systems", AIMS Conf Taipei, had to decline.
Invited speaker, Mathematical and Numerical Aspects of Quantum Dynamics, U Maryland.
Invited speaker, Session "Nonlinear evolution equations", AMS meeting, San Diego.

2017 Invited participant, Oberwohlfach workshop on Quantum Electrodynamics, had to decline.
Invited speaker, Quantum Mean Field and Related Problems, U Paris 13.
Invited speaker, Great Lakes Mathematical Physics Meeting, Michigan State U.
Invited speaker, session on nonlinear evolution equations, IMACS conference, U Georgia

2016 Invited speaker, Mathematical and Physical Models of Nonlinear Optics, IMA.
Invited speaker, Madison workshop in PDE and Analysis, U Wisconsin Madison.
Invited participant, Oberwohlfach workshop on Many Body Quantum Systems, had to decline.
Invited speaker, SIAM Minisymposium on Quantum Many-Body Dynamics, Philadelphia.

2015 Invited speaker, Session "Transp. Theory in Complex Particle Systems", SIAM conf., Scottsdale.
Invited speaker, Session "Solitons, vortices, domain walls", 9th IMACS conference, Athens GA.
Plenary speaker, "33rd Annual Western States Meeting of Mathematical Physics", Caltech.

2014 Invited speaker, Conference "Effective Equations in Math. Physics" Mittag-Leffler Institute.
Invited speaker, Session "NLS and applications", SIAM conference, Madrid.

Invited speaker, Session "Math Phys & Spectral Theory" AMS meeting, Knoxville.

2013 Invited speaker, Session "Dispersive Equations", SIAM conference, Orlando.
Invited speaker, KI-Net Workshop on Quantum Systems, U Maryland.
Invited speaker, IMACS Conference, Athens, GA, had to decline.

2012 Invited speaker, Session "Dyn. Systems and Spectral Theory", AIMS conf., Orlando.
Invited speaker, Session "Nonlin. PDE's of Fluid and Gas Dyn.", AMS meeting, U Hawaii.

2011 Invited speaker, Session "Dispersive PDE's & Fluid Mech.", SIAM meeting San Diego.
Invited speaker, "Rigorous QFT in the LHC era", at ESI, Vienna.
Invited participant, "Renormalization" Oberwohlfach, had to decline.

2010 Invited speaker, Southern California Analysis and PDE Conference, UCLA.
Invited speaker, Program "Matter and Radiation", at Erwin Schrödinger Institute, Vienna.
Invited speaker, FRG Workshop in Kinetic Theory, Brown University.
Invited speaker, "Classical and Random Dynamics in Mathematical Physics", UT Austin.
Invited speaker, Program on Quantum Field Theory, NUS, Singapore.

2009 Invited speaker, Session on Harmonic Analysis and PDE's, AMS meeting, Waco, TX.
Invited speaker, "Analyt. & num. issues on quantum, kinetic and statist. evol.", UT Austin.
Invited speaker, Oberwohlfach workshop on Dynamics of Quantum Systems.
Invited speaker, "RG Methods in Mathematical Sciences", RIMS, Kyoto Univ. Three talks.
Invited speaker, "Nonlinear PDE's and Engineering Applications", Banff.

2008 Invited speaker, "Quantum manybody systems", CMS, Univ. of Montreal, had to decline.
Invited speaker, "Math. Horizons for Quantum Physics", NUS, Singapore, had to decline.
Invited speaker, one hour talk, 26th Western States Meeting on Math Phys, Caltech.

2007 Invited lecture series, Kyushu University (five 2-hour lectures).
Invited speaker, Minisymposium at SIAM conference on PDE's, Arizona.
Invited speaker, Meeting of the German Mathematical Society, Berlin, had to decline.
Main speaker, Meeting of the German Physical Society, University of Heidelberg.

2006 Invited speaker, "Current Status of Rigorous Statistical Mechanics & QFT", Kyushu Univ.
Invited speaker, "Evolution of microscopic and macroscopic fields", Banff, had to decline.
Invited speaker, "Analysis of Large Quantum Systems", ESI, Vienna University.

2005 Invited speaker, "International Conference on Analysis and Quantum", LMU Munich.

2004 Invited speaker, "QMath 9", Giens, France, had to decline.
Invited speaker, "Dynamics in Statistical Mechanics", CMS, University of Montreal.

2003 Invited speaker, "RG Methods in Mathematical Sciences", RIMS, Kyoto Univ. Three talks.
Invited talk, ICMP 2003, Lisbon, Portugal.

2002 ICM 2002 Beijing, Short Communications.
Int. Conf. on Differential Equations and Mathematical Physics, UAB, 2002.

2001 Invited talk, Oberwohlfach workshop on Quantum Field Theory, had to decline.

1998 4th World Congress on Computational Mechanics, Buenos Aires, Argentina, 1998.
ESM Conference, University of Manchester, UK, 1998.

1997 NATO Adv. Study Inst. Conf. on Comp. Meth. in Mech., Varna, Bulgaria, 1997.
SIAM 45th Anniversary Conference, Stanford University, 1997.

1996 19th International Congress on Theoretical and Applied Mechanics, Kyoto, 1996.

Seminar Presentations

2023 ETH Zürich, *Mathematical Physics Seminar.*

2022 Sustech (China), *Math Center Distinguished Colloquium* (Remote).
Louisiana State University, *Analysis Seminar* (Remote).
University of Saskatchewan, *Colloquium* (Remote).
Georgia Tech, *Mathematical Physics Seminar* (Remote).

2021 University of Toronto, *Analysis and Applied Mathematics Seminar.*
Rice University, *Departmental Colloquium* (Remote).

2020 University of Houston, *PDE Seminar.*

2018 Harvard University, *Probability and Random Matrix Theory Seminar.*
ETH Zürich, *Mathematical Physics Seminar.*

2016 Tübingen University, *Department Colloquium.*
Rutgers University, *Mathematical Physics Seminar.*
Rochester University, *Analysis Seminar.*

2015 Brown University, *Lefschetz Center for Dynamical Systems Seminar.*
ETH Zürich, *Talks in Mathematical Physics.*
UT Austin, *Undergraduate Research Math Club.*

2014 Stanford University, *Applied Mathematics Seminar.*
University of Texas at Dallas, *Mathematics Colloquium.*

2011 University of Texas at Austin, *Mathematical Physics Seminar.*
Michigan State University, *Analysis Seminar.*
University of Toronto, *Applied Mathematics and PDE Seminar.*

2010 Texas A&M University, *Mathematical Physics Seminar.*
Rice University, *Geometry-Analysis Seminar.*
University of Texas at Austin, *Undergraduate Research Math Club.*

2009 University of Texas at Austin, *Analysis and Mathematical Physics Seminar.*

2008 University of Texas at Austin, *Analysis Seminar.*
University of Texas at Austin, *Mathematical Physics Seminar.*
University of Toronto, *Applied Mathematics and PDE Seminar.*
Rutgers University, *Mathematical Physics Seminar.*

2007 University of Illinois Urbana Champaign, *Special Colloquium.*

2006 University of Alabama Birmingham, *Mathematics Colloquium.*
University of Texas at Austin, *Analysis Seminar.*
University of Texas at Austin, *Mathematical Physics Seminar.*
RIMS, Kyoto University, *Mathematical Physics Seminar.*

2005 Princeton University, *Mathematical Physics Seminar.*
Ludwig-Maximilians-Universität München (LMU), *Oberseminar Analysis.*

2004 Rutgers University, *Mathematical Physics Seminar.*
Invitation to McMaster University, but had to decline.
University of Virginia, *Mathematical Physics Seminar.*
Princeton University, *Mathematical Physics Seminar.*

2003 University of Massachusetts, Amherst, *Applied Analysis Seminar.*
University of Tokyo, *Functional Analysis Seminar.*

RIMS, Kyoto University, *Mathematical Physics Seminar.*
University of Geneva, *Mathematical Physics Seminar.*
Technische Universität München, *Mathematical Physics Seminar.*
Ludwig-Maximilians-Universität München, *Mathematical Physics Seminar.*

2002 University of California Irvine, *Mathematical Physics Seminar.*
California Institute of Technology, *Mathematical Physics Seminar.*
University of California Davis, *Mathematical Physics Seminar.*
Princeton University, *Mathematical Physics Seminar.*

2001 Courant Institute, *Special Analysis Seminar.*

2000 Technische Universität München, *Mathematical Physics Seminar.*
Johannes Gutenberg Universität Mainz, *Mathematical Physics Seminar.*

Bibliography

An updated list of publications with links to the papers and preprints can be found under

http://www.math.utexas.edu/users/tc

1. (with J. Fröhlich and M. Seifert) "Renormalization group methods: Landau-Fermi liquid and BCS superconductor", *Session LXII of Les Houches summer schools*, F. David, P. Ginsparg, J. Zinn-Justin (eds.), Elsevier, 1996.

2. (with H. Brauchli) "Dynamical behaviour of a constrained system near a singularity of the configuration space", *Proc. 4th World Congr. Comp. Mech.*, Buenos Aires, 1998.

3. "Non-holonomy, critical manifolds and stability in constrained Hamiltonian systems", *Ph.D. Thesis*, Diss-ETH 13017, 1999.

4. "Operator-theoretic infrared renormalization and construction of dressed one-particle states in non-relativistic QED", *Ph.D. Thesis*, Diss-ETH 14203, 2001.

5. (with J. Fuchs) "The Haag-Lopuszanski-Sohnius theorem", *Concise encyclopedia of supersymmetry*, J. Bagger, S. Duplij, W. Siegel (eds.), Kluwer, 2003.

6. (with V. Bach, J. Fröhlich, and I. M. Sigal) "Smooth Feshbach map and operator-theoretic renormalization group methods", *J. Funct. Anal.*, **203** (1), 44-92, 2003. (49 pages)

7. (with V. Vougalter and S. A. Vugalter) "The increase of binding energy and enhanced binding in non-relativistic QED", *J. Math. Phys.*, **44** (5), 2003. (10 pages)

8. (with J. Fröhlich and J. Walcher) "The decay of unstable noncommutative solitons", *Comm. Math. Phys.*, **237** (1-2), 243-269, 2003. (27 pages)

9. (with J.-M. Barbaroux and S. A. Vugalter) "Binding conditions for atomic N-electron systems in non-relativistic QED", *Ann. H. Poinc.*, **4** (6), 1101-1136, 2003. (36 pages).

10. "Long-time dynamics and localization lengths for the 3-D Anderson model at weak disorders", *Proceedings ICMP 2003*, World Scientific, 2005.

11. "Critical manifolds and stability in Hamiltonian systems with non-holonomic constraints", *J. Geom. Phys.*, **49** (3-4), 418-462, 2004. (45 pages)

12. "Localization lengths and Boltzmann limit for the Anderson model at small disorders in dimension 3". *J. Stat. Phys.*, **120** (1-2), 279-337, 2005. (59 pages)

13. "Localization lengths for Schrödinger operators on $\mathbb{Z}^2$ with decaying random potentials", *Int. Math. Res. Not.*, **2005:54**, 3341-3373, 2005. (33 pages)

14. "Convergence in higher mean of a random Schrödinger to a linear Boltzmann evolution". *Comm. Math. Phys.*, **267**, 355-392, 2006. (38 pages)

15. (with V. Bach, J. Fröhlich, and I. M. Sigal) "The renormalized electron mass in non-relativistic QED". *J. Funct. Anal.*, **243** (2), 426-535, 2007. (110 pages)

16. "Infrared renormalization in non-relativistic QED and scaling criticality". *J. Funct. Anal.*, **254** (10), 2555-2647, 2008. (93 pages)

17. (with J. Fröhlich) "Coherent infrared representations in non-relativistic QED", *Spectral Theory and Mathematical Physics: A Festschrift in Honor of Barry Simon's 60th Birthday, Proc. Symp. Pure Math.*, AMS, 2007. (Refereed research article, 21 pages)

18. (with J.-M. Barbaroux, V. Vougalter, and S. A. Vugalter) "On the ground state energy of the translation invariant Pauli-Fierz model". *Proc. Amer. Math. Soc.*, **136** (2), 2008. (8 pages)

19. (with J. Fröhlich and A. Pizzo) "Infraparticle scattering states in non-relativistic QED: I. The Bloch-Nordsieck paradigm". *Commun. Math. Phys.*, **294** (3), 761-825, 2010. (65 pages)

20. (with J. Fröhlich and A. Pizzo) "Infraparticle scattering states in non-relativistic QED: II. Mass shell properties". *J. Math. Phys.*, **50** (1), 2009. (34 pages)

21. (with I. Sasaki) "Boltzmann limit and quasifreeness for a homogenous Fermi gas in a weakly disordered random medium." *J. Stat. Phys.*, **132** (2), 329-353, 2008. (25 pages)

22. (with J.-M. Barbaroux, V. Vougalter, and S. A. Vugalter) "Quantitative estimates on the Hydrogen ground state energy in non-relativistic QED." *Ann. H. Poincaré,* **11** (8), 1487-1544, 2010. (58 pages). *Received Annales Henri Poincaré Prize 2010.*

23. (with N. Pavlović) "The quintic NLS as the mean field limit of a Boson gas with three-body interactions." *J. Funct. Anal.,* **260** (4), 959-997, 2011. (39 pages)

24. (with N. Pavlović) "On the Cauchy problem for focusing and defocusing Gross-Pitaevskii hierarchies." *Discr. Contin. Dyn. Syst.*, **27** (2), 715-739, 2010. (25 pages)

25. (with N. Pavlović and N. Tzirakis) "Energy conservation and blowup of solutions for focusing Gross-Pitaevskii hierarchies." *Ann. Inst. H. Poinc. (C) Anal. Non Lin.*, **27** (5), 1271-1290, 2010. (24 pages)

26. (with N. Pavlović) "Recent results on the Cauchy problem for focusing and defocusing Gross-Pitaevskii hierarchies", *Math. model. nat. phenom.*, **5** (4), 2010. Spectral problems. Issue dedicated to the memory of M. Birman (V. Volpert, A. Laptev et al., eds.).

27. (with N. Pavlović) "Higher order energy conservation and global wellposedness of solutions for Gross-Pitaevskii hierarchies." *Commun. PDE*, **39** (9), 1597-1634, 2014. (37 pages)

28. (with N. Pavlović) "A new proof of existence of solutions for focusing and defocusing Gross-Pitaevskii hierarchies", *Proc. Amer. Math. Soc.*, **141**, 279-293, 2013. (15 pages)

29. (with I. Rodnianski) "Boltzmann limit for a homogenous Fermi gas with Hartree-Fock interactions in a random medium", *J. Stat. Phys.,* **142** (5), 1000-1051, 2011. (52 pages)

30. (with J. Faupin, J. Fröhlich and I.M. Sigal) "Local decay in non-relativistic QED", *Commun. Math. Phys.*, **309** (2), 543-582, 2012. (40 pages)

31. "Charge Transport in Random Media and Boltzmann Limits for Single Particle and Manybody Models", *RIMS Kokyuroku Bessatsu* **B21**, 63-108, 2011. (45 pages)

32. (with N. Pavlović) "A lower bound on blowup rates for the 3D incompressible Euler equation and a single exponential Beale-Kato-Majda type estimate", *Commun. Math. Phys.*, 314 (1), 265-280, 2012. (15 pages)

33. (with N. Pavlović) "Derivation of the cubic NLS and Gross-Pitaevskii hierarchy from N-body Schrödinger equations in $d = 3$ based on spacetime norms", *Ann. H. Poincaré*, **15** (3), 543-588, 2014. (46 pages)

34. (with N. Pavlović and N. Tzirakis) "Multilinear Morawetz identities for the Gross-Pitaevskii hierarchy", *Contemp. Math.,* **581**, 39-62, 2012. (23 pages)

35. "On the Dynamics of a Fermi Gas in a Random Medium with Dynamical Hartree-Fock Interactions", *IMS Lecture Notes Series "Complex Quantum Systems" (National University of Singapore)*, Vol. **24** (2013).

36. (with W. Abou Salem, V. Vougalter) "On the well-posedness of the semi-relativistic Schrödinger-Poisson system", *Dynamics of PDE*, **9** (2), 121-132, 2012. (12 pages)

37. (with W. Abou Salem, V. Vougalter) "Existence and nonlinear stability of stationary states for the semi-relativistic Schrödinger-Poisson system", *Ann. H. Poincaré*, **15** (6), 1171-1196 (2014). (25 pages)

38. (with V. Bach, J. Faupin, J. Fröhlich and I.M. Sigal) "Effective dynamics of an electron coupled to an external potential in non-relativistic QED", *Ann. H. Poincaré*, **14** (6), 1573-1597, 2013. (24 pages)

39. (with W. Abou Salem, V. Vougalter) "On the generalized semi-relativistic Schrödinger-Poisson system in $\mathbb{R}^n$", *Doc. Math.*, 18, 343-357, 2013. (16 pages)

40. (with K. Taliaferro) "Derivation in strong topology and global well-posedness of solutions to the Gross-Pitaevskii hierarchy", *Commun. PDE.*, **39** (9), 1658-1693, 2014. (35 pages).

41. (with C. Hainzl, N. Pavlović and R. Seiringer) "Unconditional uniqueness for the cubic Gross-Pitaevskii hierarchy via quantum de Finetti", *Commun. Pure Appl. Math.*, **68** (10), 1845-1884, 2015. (40 pages)

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