

Curriculum vitae

Personal data:

Name: Gian Michele Graf
Address: Theoretical Physics
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Date of birth: July 14, 1962
Citizenship: Swiss

Education and Professional Career:

1981-1986 Undergraduate student in Physics at ETH Zürich. Diploma thesis advisor: Prof. J. Fröhlich.
1986-1990 Graduate student at the Institute of Theoretical Physics of ETH. PhD awarded on March 22, 1990. Advisor: Prof. W. Hunziker.
1991-1992 Assistant Professor of Mathematics, California Institute of Technology, Pasadena.
1992-1998 Assistant Professor of Theoretical Physics, ETH Zürich.
1998-2001 Associate Professor of Theoretical Physics, ETH Zürich.
2001- Professor of Theoretical Physics, ETH Zürich.

Related data:

1991: Plenary talk at the X International Congress on Mathematical Physics, Leipzig.
1992: Alfred P. Sloan Research Fellow.
1996: Professorship in Mathematics at the Université Paris XI (declined).
1998: Invited talk * at the International Congress of Mathematicians, Berlin (not delivered).
2003: Invited talk at the XIV International Congress on Mathematical Physics, Lisbon.
2006: Member of the Scientific Committee of the XV International Congress on Mathematical Physics, 2006.
2006: Invited talk at the International Congress of Mathematicians, Madrid.
2008: Invited talk at the European Congress of Mathematics, Amsterdam.
2017: Invited talk at the Mathematical Congress of the Americas

Research stays (≥ 1 months) at: California Institute of Technology, Pasadena; Mittag-Leffler Institute, Stockholm; Institute for Mathematics and its Applications, Minneapolis; Institut des Hautes Etudes Scientifiques, Bures-sur-Yvette; Institute for Advanced Study, Princeton; Fields Institute, Toronto; E. Schrödinger Institut, Vienna; Technion, Haifa.

Publication list

Refereed publications:

- [1] Phase space analysis of the charge transfer model. *Helv. Phys. Acta* **63**, 107-138 (1990).
- [2] The Mourre estimate in the semiclassical limit. *Lett. Math. Phys.* **20**, 47-54 (1990).
- [3] Asymptotic completeness for N -body short-range quantum systems: A new proof. *Commun. Math. Phys.* **132**, 73-101 (1990).

- [4] A remark on long-range Stark scattering. *Helv. Phys. Acta* **64**, 1167-1174 (1991).
- [5] (with F. Gesztesy, B. Simon) The ground state energy of Schrödinger operators. *Commun. Math. Phys.* **150**, 375-384 (1992).
- [6] (with B. Simon) Asymptotic series for the ground state energy of Schrödinger operators. *J. Funct. Anal.* **112**, 442-446 (1993).
- [7] (with J. Fröhlich, J.M. Richard, M. Seifert) Proof of stability of the hydrogen molecule. *Phys. Rev. Lett.*, **71**, 1332-1334 (1993).
- [8] (with J.P. Solovej) A correlation estimate with applications to quantum systems with Coulomb interactions. *Rev. Math. Phys.* **6**, 977-997 (1994).
- [9] Anderson localization and the space-time characteristic of continuum states. *J. Stat. Phys.* **75**, 337-346 (1994).
- [10] (with D. Schenker) The free energy of systems with net charge. *Lett. Math. Phys.* **35**, 75-83 (1995).
- [11] (with D. Schenker) On the molecular limit of Coulomb gases. *Commun. Math. Phys.* **174**, 215-227 (1995).
- [12] Stability of matter through an electrostatic inequality. *Helv. Phys. Acta* **70**, 72-79 (1997).
- [13] (with D. Schenker) 2-Magnon scattering in the Heisenberg model. *Ann. Inst. H. Poincaré*, **67**, 91-107 (1997).
- [14] (with L. Bugliaro, J. Fröhlich) Stability of quantum electrodynamics with non-relativistic matter. *Phys. Rev. Lett.* **77**, 3494-3497 (1996).
- [15] (with C. Fefferman, J. Fröhlich) Stability of non-relativistic quantum mechanical matter coupled to the (ultraviolet cutoff) radiation field. *Proc. Natl. Acad. Sci.* **93**, 15009-15011 (1996).
- [16] (with L. Bugliaro, C. Fefferman, J. Fröhlich, J. Stubbe) A Lieb-Thirring bound for a magnetic Pauli Hamiltonian. *Commun. Math. Phys.* **187**, 567-582 (1997).
- [17] (with C. Fefferman, J. Fröhlich) Stability of ultraviolet-cutoff quantum electrodynamics with non-relativistic matter. *Commun. Math. Phys.* **190**, 309-330 (1997).
- [18] (with M. Aizenman) Localization bounds for an electron gas. *J. Phys. A*, **31**, 6783-6806 (1998).
- [19] (with L. Bugliaro, C. Fefferman) A Lieb-Thirring Bound for a magnetic Pauli Hamiltonian, II. *Revista Matematica Iberoamericana* **15**, 593-619 (1999).
- [20] (with J. Fröhlich, J. Walcher) On the extended nature of edge states of Quantum Hall Hamiltonians, *Annales Henri Poincaré* **1**, 405-442 (2000).
- [21] (with J. Fröhlich, D. Hasler, J. Hoppe, S.-T. Yau) Asymptotic form of zero energy wave functions in supersymmetric matrix models, *Nucl. Phys. B* **567**, 231-248 (2000).
- [22] (with J.E. Avron, A. Elgart, L. Sadun) Geometry, statistics and asymptotics of quantum pumps. *Phys. Rev. B* **62**, R10618 (2000).
- [23] (with J.E. Avron, A. Elgart, L. Sadun) Optimal quantum pumps, *Phys. Rev. Lett.* **87**, 236601 (2001).
- [24] (with J.E. Avron, A. Elgart, L. Sadun) Time-energy coherent states and adiabatic scattering, *J. Math. Phys.* **43**, 3415-3424 (2002).
- [25] (with W. Aschbacher, J. Fröhlich, K. Schnee, M. Troyer) Symmetry breaking regime in the nonlinear Hartree equation, *J. Math. Phys.* **43**, 3879-3891 (2002).

- [26] (with D. Hasler, J. Hoppe) No zero energy states for the supersymmetric x^2y^2 potential, *Lett. Math. Phys.* **60**, 191-196 (2002).
- [27] (with P. Elbau) Equality of bulk and edge Hall conductance revisited, *Commun. Math. Phys.* **229**, 415-432 (2002).
- [28] (with F. Bernasconi, D. Hasler) The heat kernel expansion for the electromagnetic field in a cavity, *Ann. H. Poincaré* **4**, 1001-1013 (2003).
- [29] (with J.E. Avron, A. Elgart, L. Sadun, K. Schnee) Adiabatic charge pumping in open quantum systems, *Comm. Pure and App. Math.* **57**, 528-561 (2004).
- [30] (with J.E. Avron, A. Elgart, L. Sadun) Transport and Dissipation in Quantum Pumps. *J. Stat. Phys.* **116**, 425-473 (2004).
- [31] (with A. Elgart, J. Schenker) Equality of the bulk and edge Hall conductances in a mobility gap. *Comm. Math. Phys.* **259**, 185-221 (2005).
- [32] (with C. Buchendorfer) Scattering of magnetic edge states, *Ann. H. Poincaré*, **7**, 303-333 (2006).
- [33] (with L. Cattaneo, W. Hunziker) A general resonance theory based on Mourre's inequality, *Ann. H. Poincaré* **7**, 583-601 (2006).
- [34] (with A. Vaghi) A remark on the estimate of a determinant by Minami, *Lett. Math. Phys.* **79**, 17-22 (2007).
- [35] Aspects of the integer quantum Hall effect. *Proceedings of Symposia in Pure Mathematics Spectral theory and mathematical physics: a Festschrift in honor of Barry Simon's 60th birthday*, 429-442, *Proc. Sympos. Pure Math.*, 76, Part 1, Amer. Math. Soc. (2007).
- [36] (with J.E. Avron, S. Bachmann, I. Klich) Fredholm determinants and the statistics of charge transport, *Comm. Math. Phys.* **280**, 807-829 (2008).
- [37] (with G. Ortelli) Comparison of quantization of charge transport in periodic and open pumps, *Phys. Rev.* **B77**, 033304 (2008).
- [38] (with G. Bräunlich and G. Ortelli) Equivalence of topological and scattering approaches to quantum pumping, *Comm. Math. Phys.* **295**, 243 (2010).
- [39] (with S. Bachmann and G. Lesovik) Time ordering and counting statistics. *J. Stat. Phys.* **138**, 333-350 (2010).
- [40] (with J.E. Avron, M. Fraas, P. Grech) Landau-Zener tunneling for dephasing Lindblad evolutions, *Comm. Math. Phys.* **305**, 633-639 (2011).
- [41] (with J.E. Avron, M. Fraas, P. Grech) Optimal time schedule for adiabatic evolution, *Phys. Rev.* **A82**, 040304 (2010).
- [42] (with J.E. Avron, M. Fraas, O. Kenneth) Quantum response of dephasing open systems. *New J. Phys.* **13**, 053042 (2011).
- [43] (with J.E. Avron, M. Fraas, P. Grech) Adiabatic theorems for generators of contracting evolutions. *Comm. Math. Phys.* **314**, 163-191 (2012).
- [44] (with J.E. Avron, M. Fraas) Adiabatic response for Lindblad dynamics. *J. Stat. Phys.* **148**, 800-823 (2012).
- [45] (with M. Porta) Bulk-edge correspondence for two-dimensional topological insulators. *Commun. Math. Phys.* **324**, 851895 (2013).
- [46] (with V. Beaud, A. Lebedev, G. Lesovik) Statistics of charge transport and modified time ordering. *J. Stat. Phys.* **53**, 177-210 (2013).

- [47] (with A. Agazzi, J.-P. Eckmann). The colored Hofstadter butterfly for the honeycomb lattice. *J. Stat. Phys.* **156**, 417426 (2014).
- [48] (with I. Giordanelli). The real spectrum of the imaginary cubic oscillator: An expository proof. *Ann. H. Poincaré* **16**, 99-112 (2015).
- [49] (with S. Bachmann, M. Fraas) Dynamical crossing of an infinitely degenerate critical point. *Ann. H. Poincaré* **18**, 1755-1776 (2017).
- [50] (with. C. Tauber) Bulk-edge correspondence for two-dimensional Floquet topological insulators. *Ann. H. Poincaré*, **19** 709-741 (2018).
- [51] (with J. Shapiro) The bulk-edge correspondence for disordered chiral chains (submitted).