

Curriculum Vitae

Personal data

Name : Marcello Porta
Date and place of birth : 04/08/1983 in Taranto, Italy
Professional address : University of Zürich,
Mathematics Department,
Winterthurerstrasse 190, CH-8057 Zürich (Switzerland)
E-mail : marcello.porta@math.uzh.ch
marcello.porta@gmail.com
Spoken languages : Italian (mother tongue), English (fluent), French (fluent), German (basic)

Studies

02/2011 : **Ph.D. degree**, Università di Roma “Sapienza” (Italy), Physics Department
Thesis title : *A lattice gauge theory model for graphene*
Advisors : Giovanni Gallavotti, Vieri Mastropietro
Final Evaluation : Excellent (*Ottimo*).
09/2007 : **Master degree**, Università di Roma “Sapienza” (Italy), Physics Department
Thesis title : *Study of the Sinai-Ruelle-Bowen measure in a simple system*
Advisor : Giovanni Gallavotti
Final Mark : 110/110 *cum laude*
11/2005 : **Bachelor degree**, Università di Roma “Sapienza” (Italy), Physics Department
Thesis title : *The Curie-Weiss model in a non homogeneous external field*
Advisor : Marzio Cassandro
Final Mark : 110/110 *cum laude*

Scientific Career

01/10/2017 – : **Full Professor (W3)**, University of Tübingen, Math. Dept.
01/02/2016 – 31/09/2017 : **Assistant Professor**, University of Zürich, Math. Dept.
01/02/2014 – 31/01/2016 : **Post-Doc**, University of Zürich, Math. Dept. (with B. Schlein)
01/11/2012 – 31/01/2014 : **Post-Doc**, University of Bonn, Hausdorff Center for Mathematics, Institute for Applied Mathematics (with B. Schlein).
01/11/2010 – 31/10/2012 : **Post-Doc**, ETHZ, Institute for Theoretical Physics, (with G. M. Graf).
01/11/2007 – 31/10/2010 : **Ph.D. student**, Università di Roma “La Sapienza”, Phys. Dept.

Grants and fellowships

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| Fall 2018 : | Simons-CRM Scholar (2 months), CRM Montréal (Canada). |
| 09/2016 – 09/2019 : | SNF grant, “Mathematical Aspects of Many-Body Quantum Systems”. Amount of funds : 488'199 CHF. |
| 02/2016 – : | NCCR SwissMAP (as part of a larger team). |
| 11/2007 – 10/2010 : | Ph.D. scholarship, University of Rome “Sapienza”. |

List of papers and preprints

18. *Spin Hall insulators beyond the Helical Luttinger model* (with V. Mastropietro). [arXiv:1709.05008](#).
 17. *Universal edge transport in interacting Hall systems* (with G. Antinucci and V. Mastropietro). [arXiv:1708.08517](#).
 16. *Mean field evolution of fermions with Coulomb interaction* (with S. Rademacher, C. Saffirio and B. Schlein). *J. Stat. Phys.* **166**, 1345 (2017).
 15. *Topological phase transitions and universality in the Haldane-Hubbard model* (with A. Giuliani, I. Jauslin and V. Mastropietro). *Phys. Rev. B* **94**, 205139 (2016).
 14. *Universality of the Hall conductivity in interacting electron systems* (with A. Giuliani and V. Mastropietro). *Comm. Math. Phys.* **349**, 1107 (2017).
 13. *Effective evolution equations from quantum dynamics* (with N. Benedikter and B. Schlein). *Springer-Briefs in Mathematical Physics* **7** (2016).
 12. *From the Hartree dynamics to the Vlasov equation* (with N. Benedikter, C. Saffirio and B. Schlein). *Arch. Rational Mech. Anal.* **221**, 273-334 (2016).
 11. *Mean-field evolution of fermionic mixed states* (with N. Benedikter, V. Jakšić, C. Saffirio and B. Schlein). *Comm. Pure Appl. Math.* **69**, 2250–2303 (2016).
 10. *Mean-field dynamics of fermions with relativistic dispersion* (with N. Benedikter and B. Schlein). *J. Math. Phys.* **55**, 021901 (2014).
 9. *Mean-field evolution of fermionic systems* (with N. Benedikter and B. Schlein). *Comm. Math. Phys.* **331**, 1087-1131 (2014).
 8. *Bulk-edge correspondence for two-dimensional topological insulators* (with G. M. Graf). *Comm. Math. Phys.* **324**, 851-895 (2013)
 7. *Lattice quantum electrodynamics for graphene* (with A. Giuliani and V. Mastropietro). *Ann. Phys.* **327**, 461-511 (2012).
 6. *Universality of conductivity in interacting graphene* (with A. Giuliani and V. Mastropietro). *Comm. Math. Phys.* **311**, 317-355, (2012).
 5. *Absence of interaction corrections in the optical conductivity of graphene* (with A. Giuliani and V. Mastropietro). *Phys. Rev. B* **83**, 195401 (2011).
 4. *Lattice gauge theory model for graphene* (with A. Giuliani and V. Mastropietro). *Phys. Rev. B* **82**, 121418(R) (2010).
 3. *Borel summability of φ_4^4 planar theory via multiscale analysis* (with S. Simonella). *Rev. Math. Phys.* **22**, 9, 995 - 1032 (2010).
 2. *Anomalous behavior in an effective model of graphene with Coulomb interactions* (with A. Giuliani and V. Mastropietro). *Ann. H. Poincaré* **11**, 1409 – 1452 (2010).
 1. *Fluctuation theorem, non linear response and the regularity of time reversal symmetry*. *Chaos* **20**, 023111 (2010).
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Proceedings

4. *Mean field dynamics of interacting fermionic systems*. Proceedings of the QMath 13 conference (2017). (To appear).
 3. *Universality of charge transport in weakly interacting fermionic systems* (with A. Giuliani and V. Mastropietro). Proceedings of the XVIII International Congress on Mathematical Physics (2015).
 2. *Mean-field evolution of fermionic systems*. Séminaire Laurent Schwartz - EDP et applications, **331.3**, 1-13 (2014-2015).
 1. *Hartree-Fock dynamics for weakly interacting fermions* (with N. Benedikter and B. Schlein). Proceedings of the QMath 12 conference (2014).
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Teaching

- Fall 2017 : “Linear PDEs”. University of Tübingen, Math. Dept.
- Fall 2017 : “Thomas-Fermi theory”. University of Tübingen, Math. Dept.
- Spring 2017 : “Classical mechanics”. University of Zürich, Math. Dept.
- Fall 2016 : “Thomas-Fermi theory of atoms and molecules”. University of Zürich, Math. Dept.
- Spring 2016 : “Classical mechanics”. University of Zürich, Math. Dept.
- Fall 2015 : Proseminar “Topics in Analysis” (tutor). University of Zürich, Math. Dept.
- Spring 2015 : “Classical statistical mechanics”. University of Zürich, Math. Dept.
- Spring 2014 : “Effective equations for quantum many-body systems” (minicourse, with B. Schlein). School “Mathematical Physics, Analysis and Stochastics”, University of Heidelberg, Institute for Theoretical Physics.
- Spring 2014 : “Hartree-Fock theory” (minicourse). McGill University, Math. Dept. (Montréal).
- Spring 2014 : “Thomas-Fermi and Hartree-Fock theories of atoms and molecules” (with B. Schlein). University of Zürich, Math. Dept.
- Spring 2013 : “Mean-field evolution of fermionic systems” (minicourse). University of Tübingen, Math. Dept.
- Spring 2012 : Proseminar “The Reduced Density Matrix” (tutor). ETH Zürich, ITP.
- Spring 2011 : Proseminar “From Field Theory to String Theory” (tutor). ETH Zürich, ITP.
- Spring 2008 : Exercise classes for “Mathematics I”. Università Roma 3, Geology Dept.
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Students and postdocs

- Postdocs :** Dr. Marco Falconi, 01.04.2017 –
Dr. Giovanni Antinucci, 01.01.2017 –
Dr. Rafael Greenblatt, 10.10.2016 – 31.12.2016
Dr. Ian Jauslin, 01.02.2016 – 01.10.2016
- Ph.D. students :** Luca Fresta, 01.10.2016 –
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Talks

Talks at international conferences (as invited speaker)

24. *Universal edge transport in interacting Hall systems*. “Quantissima in the Serenissima II”. Venice (Italy), 08/2017.
23. *Bulk and edge universality in interacting topological insulators*. “Celebrating Physics with a good excuse” (in honor of B. Halperin’s 75th birthday), PSI, Villingen (Switzerland), 07/2017.
22. *Universality in the critical Haldane-Hubbard model*. “117th Statistical Mechanics conference” (in honor of J. Fröhlich, T. Spencer, H. Spohn), Rutgers University (USA), 05/2017.
21. *Mean field evolution of fermionic systems*. “Spectral days”, University of Stuttgart (Germany), 04/2017.
20. *Mean field evolution of fermionic systems*. “5th Strasbourg-Zürich meeting”, IRMA, Strasbourg (France), 03/2017.
19. *Topological phase transitions in the Haldane-Hubbard model*. “Trieste quantum days 2017”, SISSA, Trieste (Italy), 02/2017.
18. *Mean field evolution of fermionic systems*. “QMath13 : Mathematical Results in Quantum Physics”, Atlanta (USA), 10/2016.
17. *Universality of charge transport in weakly interacting fermionic systems*. “Condensed Matter and Critical Phenomena”, Frascati (Italy), 09/2016.
16. *Universality of charge transport in weakly interacting fermionic systems*. “Methods of Modern Mathematical Physics”, Fields Institute, Toronto (Canada), 08/2016.
15. *Universality of charge transport in weakly interacting fermionic systems*. “Mathematical Many-Body Theory and its Applications”, Bilbao (Spain), 06/2016.
14. *Hall transitions in the Haldane-Hubbard model*. “The Renormalization Group”, MFO Oberwolfach (Germany), 05/2016.
13. *Integer quantum Hall effect for weakly interacting fermionic systems*. “Joint Annual Meeting of DMV and GAMM”, TU Braunschweig (Germany), 03/2016.
12. *Universality of charge transport in weakly interacting fermionic systems*. “XVIII International Congress on Mathematical Physics”, Santiago (Chile), 07/2015.
11. *Universality of charge transport in the interacting Haldane model*. “Constructive Renormalization : A conference in memory of Pierluigi Falco”, Frascati (Italy), 06/2015.
10. *Bulk-edge correspondence for two-dimensional topological insulators*. “Topological states and non-commutative geometry”, Advanced Institute for Materials Research, Tohoku University, Sendai (Japan), 03/2015.
9. *Universality in interacting graphene models*. “Mathematical physics and cold atoms”, Laboratoire de Physique et Modélisation des Milieux Condensés, Université J. Fournier, Grenoble (France), 03/2015.
8. *Hartree-Fock dynamics of weakly interacting fermionic systems*. “Mathematical Physics”, GDR DYN-QUA Annual Meeting, Centre de Mathématiques Henri Lebesgue, Nantes (France), 02/2015.
7. *Mean-field evolution of fermionic systems*. “Scaling limits and effective theories in classical and quantum mechanics”, ESI Vienna (Austria), 09/2014.
6. *Mean-field evolution of fermionic systems*. “Selected problems in Mathematical Physics”, La Spezia (Italy), 09/2014.
5. *Bulk-edge correspondence for two dimensional topological insulators*. “Conical intersections in Mathematical Physics”, Institut Henri Poincaré, Paris (France), 05/2013.
4. *Many-body interactions in graphene*. “Variational and spectral methods in Quantum Field Theory”, Institut Henri Poincaré, Paris (France), 04/2013.
3. *Bulk-edge correspondence for two dimensional topological insulators*. “Coarse graining and condensed matter Physics”, Hausdorff Institute for Mathematics, Bonn (Germany), 06/2012.

2. *Exact renormalization group for graphene : Beyond the Dirac approximation* (Poster presentation). “GraphITA”, L’Aquila (Italy), 03/2011.
 1. *A lattice gauge theory model for graphene*. “Mathematical Aspects of Quantum Electrodynamics”, Institut Henri Poincaré, Paris (France), 06/2010.
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Talks at national workshops and university seminars

30. *Mean field evolution of fermionic systems*. Oresundseminar, Mathematics Department, University of Copenhagen (Denmark), 12/2016.
29. *Topological phase transitions in the Haldane-Hubbard model*. Quantum lunch, University of Copenhagen (Denmark), 12/2016.
28. *Universality in the Haldane-Hubbard model*. Workshop in Mathematical Physics, ETH (Switzerland), 11/2016.
27. *Universality of charge transport in interacting fermionic systems*. Mathematical Physics and Analysis seminar, IST (Austria), 11/2016.
26. *Mean field evolution of fermionic systems*. Mathematical Physics seminar, Physics Department, Princeton University (USA), 10/2016.
25. *Universality of charge transport in weakly interacting fermionic systems*. SwissMAP meeting, ETH Zürich (Switzerland), 06/2016.
24. *Mean-field evolution of fermionic mixed states*. Mathematical Physics seminar, Mathematics Department, Tübingen University (Germany), 07/2015.
23. *Universality in interacting graphene models*. Mathematics Department, ETH Zürich (Switzerland), 05/2015.
22. *Mean-field evolution of fermionic system*. Mathematics Department, University of Roma 1 (Italy), 04/2015.
21. *Universality in interacting graphene models*. Mathematics Department, University of Lyon 1 (France), 02/2015.
20. *Effective dynamics of weakly interacting fermionic systems*. Mathematics Department, McGill University, Montreal (Canada), 01/2015.
19. *Mean-field evolution of fermionic systems*. Laurent Schwartz seminar, Mathematics department, Ecole Polytechnique, Paris (France), 12/2014.
18. *Mean-field evolution of fermionic systems*. University seminar, Mathematics department, Université de Cergy - Pontoise (France), 12/2014.
17. *Mean-field evolution of fermionic systems*. University seminar, Laboratory of Condensed Matter Physics, Université Joseph Fourier, Grenoble (France), 12/2014.
16. *Mean-field evolution of fermionic systems*. University seminar, Laboratory of Theoretical Physics and Statistical Models, Université Paris Sud, Paris (France), 12/2014.
15. *Mean-field evolution of fermionic systems*. “Stochastic problems in Mathematical Physics”, Institut Henri Poincaré, Paris (France), 11/2014.
14. *Universality in interacting graphene models*. “Symposium on Mathematical Physics”, University of Zürich (Switzerland), 11/2014.
13. *Mean-field evolution of fermionic systems*. “End of summer meeting in Mathematical Physics”, ETH Zürich (Switzerland), 09/2014.
12. *Mean-field evolution of fermionic systems*. Mathematics Department, University of Zürich (Switzerland), 02/2014.
11. *Mean-field evolution of fermionic systems*. Mathematical Physics seminar, Mathematics Department, Technische Universität Braunschweig (Germany), 12/2013.
10. *Mean-field evolution of fermionic systems*. Mathematical Physics seminar, Mathematics Department, McGill University, Montreal (Canada), 11/2013.

9. *Mean-field evolution of fermionic systems*. Oberseminar Mathematische Physik, Mathematics Department, Technische Universität München (Germany), 09/2013.
 8. *Many-body interactions in graphene*. Mathematical Physics seminar, Mathematics Department, Erlangen University (Germany), 06/2013.
 7. *Many-body interactions in graphene*. Analysis seminar, Hausdorff Center for Mathematics, Bonn (Germany), 01/2013.
 6. *Bulk-edge correspondence for two dimensional topological insulators*. Mathematical Physics seminar, Mathematics Department, Università di Roma “La Sapienza” (Italy), 01/2013.
 5. *Bulk-edge correspondence for two dimensional topological insulators*. “End of summer meeting in Mathematical Physics”, ETH Zürich (Switzerland), 09/2012.
 4. *Many-body interactions in graphene*. Mathematical Physics seminar, Mathematics Department, Tübingen University (Germany), 07/2012.
 3. *Interacting electrons on the honeycomb lattice : a Renormalization Group analysis*. Mathematical Physics seminar, Institute for Theoretical Physics, ETH Zürich (Switzerland), 10/2011.
 2. *A lattice gauge theory model for graphene*. Condensed Matter Physics seminar, Physics Department, Goethe Universität, Frankfurt (Germany), 07/2010.
 1. *A lattice gauge theory model for graphene*. Theoretical Physics seminar, Physics Department, Università di Roma “La Sapienza” (Italy), 06/2010.
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Forthcoming talks and visits

4. Invited participant, “Scaling limits, rough paths, quantum field theory”, Newton Institute, Cambridge (UK), 10/2018.
 3. Simons-CRM Scholar, Centre de Recherches Mathématiques, Montréal (Canada), 08/2018.
 2. UBC Vancouver, Mathematics Department, 04/2018.
 1. SISSA, Trieste, 09/2017.
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Referee activity

Journals : Journal of Mathematical Physics; Physica A; Journal of Statistical Physics; Journal of Statistical Mechanics : Theory and Experiment; Journal de l'École Polytechnique; Journal of Nonlinear Science; Journal of Functional Analysis; Communications in Mathematical Physics; Mathematical Physics, Analysis and Geometry; Reports on Mathematical Physics; Reviews in Mathematical Physics; Journal of Physics A; Memoirs of the American Mathematical Society; Annales Henri Poincaré; Mathematical Models and Methods in Applied Sciences.

Membership of mathematical associations

- 2016 : NCCR SwissMAP - The Mathematics of Physics. (Part of the *Quantum systems* project).
- 2014 : International Association of Mathematical Physics.
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Last update : 18/09/2017