

CURRICULUM VITAE

ROBERTO RAIMONDI

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PERSONAL

Date of birth: 16 July 1963
Place of birth : Rome, Italy
Citizenship: Italian

PRESENT POSITION

2004-oggi Associate Professor University Roma Tre

PREVIOUS POSITIONS

1996- 2004 Assistant Professor University Roma Tre.
1996 Research Fellow, Lancaster University, Regno Unito.
1994-1996 Research Associate, Lancaster University, Regno Unito.
1994 Post-doc, Centre D'Etudes Nucleaires de Grenoble, Francia.
1992-1993 INFM bourse.

ACADEMIC STUDIES

1992 PhD in Physics, University Roma "La Sapienza"
1987 Laurea cum Laude in Physics, University Roma "La Sapienza"

TALKS DELIVERED AT CONFERENCES

1. *Spin Hall Effect* Invited talk given at the XCV National Conference of the Italian Physical Society (SIF), Bari (Italy), 28 September-3 October 2009.
2. *Interplay of intrinsic and extrinsic spin-orbit coupling in a two-dimensional electron gas* Invited talk given at the Advanced Workshop: Spin and Charge Properties of Low Dimensional Systems, Sibiu (Romania), 29 June-4 July 2009.
3. *Spin Hall Effect in a two-dimensional electron gas* Invited talk given at Palestinian Conference on Modern Trends in Mathematics and Physics, Birzeit (Palestine), 28-30 July 2008.
4. *Spin Hall Effect in a 2DEG in the presence of magnetic couplings* RTN Nano Meeting 2008: Fundamentals of Nanoelectronics, 2008 Bremen (Germany).
5. *Quasiclassical approach to the spin Hall effect* International Symposium: Nanoscience and Nanotechnology, 2007 Frascati (Italy).
6. *The spin Hall effect and spin relaxation: a quasiclassical Green function approach* RTN NANO Meeting: Fundamentals of Nanoelectronics, 2007 Portoroz (Slovenia).
7. *Spin Hall effect: a quasiclassical approach* Satellite meeting of Statphys 23: Coherence and Incoherence in Strongly Correlated Systems, 2007 Rome (Italy).
8. *Quasiclassical approach to the spin Hall effect in the 2DEG* 378th WE-Heraeus-Seminar: Spin Torque in Magnetic Nanostructures, 2006 Bad Honnef (Germany).
9. *Quasiclassical approach to the Spin Hall Effect in the 2DEG* International Conference: Spin and Charge Effects at the Nanoscale, 2006 Pisa (Italy).
10. *Spin Hall conductivity of a two-dimensional electron system* MCRTN International workshop: Nanoscale Dynamics and Quantum Coherence, 2005 Catania (Italy).
11. *Spin Hall conductivity of a disordered 2DEG*, XCI Congresso Nazionale della SIF, 2005 Catania (Italy).
12. *Nonlinear transport and quantum interaction corrections in disordered conductors: the case of the Wiedemann-Franz law* International Workshop: Nanoscale Dynamics, Coherence and Computation, 2004 Hamburg (Germany).
13. *Electronic thermal conductivity of disordered metals* International Workshop and Seminar: Cooperative Phenomena in Optics and Transport in Nanostructures, 2004 Dresden (Germany).

14. *Nonlinear transport and quantum interaction corrections in disordered conductors: the case of the Wiedemann-Franz law* Condensed Matter and Materials Physics CMMP04, 2004 Warwick (UK).
15. *Nonlinear transport and quantum interaction corrections* International Conference: Nanoelectronics, 2003 Lancaster (UK).
16. *Spin-orbit induced anisotropy in the magnetoconductance of 2D metals* International workshop: Correlation Effects in low-dimensional electron systems, 2001 Lancaster (UK).
17. *Magnetoconductance of a 2D disordered metal in the presence of spin-orbit coupling* INFM Meeting, 2001 Roma (Italy).
18. *Magnetoconductance of a 2D disordered metal with spin-orbit coupling* COST-MESOSCOPIC ELECTRONICS Joint working group meetings: Mesoscopic Superconductivity and Spin Injection, 2001 Villard de Lans (France).
19. *Magnetoconductance anisotropy in 2D disordered metals in the presence of spin-orbit* RTN Workshop: Nanoscale Dynamics, Coherence and Computing, 2001 Matrafured (Hungary).
20. *Non-linear conductivity and Quantum interference and in disordered metals* E.U. Workshop: Phase Coherent Dynamics of Hybrid Nanostructures, 2000 Cargèse (France).
21. *Quantum interference and non-linear conductivity in disordered metals* COST-TMR-CCP) Workshop: Mesoscopic Superconductors and Hybrid Structures, 1999 Lancaster (UK).
22. *Specific heat anomaly and adiabatic hysteresis in disordered electron systems in a magnetic field* TMR Meeting: Phase-Coherent Dynamics in Hybrid nanostructures, 1998 Ioannina (Grecia).
23. *Tunnelling di Andreev in dots quantistici con forte correlazione* XVII Convegno di Fisica teorica e struttura della materia, 1998 Fai della Paganella (Italy).
24. *Boundary conditions for quasiclassical Green functions* E.U. Workshop: Phase Coherent Dynamics of Hybrid Nanostructures, 1997 Miraflores (Spain).
25. *Ballistic and diffusive motion in hybrid systems* E.U. Workshop: Quantum Dynamics of Phase-Coherent Structures, 1996 Catania (Italy).
26. *Andreev interferometry* Euroconference: Mesoscopic Superconductivity and Josephson Junction Arrays, 1995 Torino (Italy).
27. *Andreev interferometry* E.U. Workshop: Quantum Dynamics of Phase-Coherent Structures, 1995 Hamburg (Germany).
28. *Upper and lower Hubbard bands in the extended Hubbard model* 6th Conference on High Temperature Superconductors (SATT VI), 1993 Riccione (Italy).

LECTURES DELIVERED AT INTERNATIONAL SCHOOLS

1. *Sistemi Elettronici Disordinati* European Graduate College: Electron-electron Interactions in Solids, 2006 Rackeve (Hungary).
2. *Transizione metallo-isolante in sistemi disordinati: aspetti teorici* Workshop and School: Semiconductor nanostructures, 1998 Pisa (Italy).
3. *Boundary Conditions in the Theory of Superconductivity* International School: Superconductivity in networks and mesoscopic systems, 1997 Pontignano (Italy).

PAPERS

- [1] R. Raimondi, P. Schwab, *Interplay of intrinsic and extrinsic mechanisms to the spin Hall effect in a two-dimensional electron gas*, *Physica E* In press (2010).
- [2] R. Raimondi, P. Schwab, *Using the Spin Hall Effect in a Two-Dimensional Electron Gas*, *EPL* 87, 37008 (2009).
- [3] C. Gorini, P. Schwab, M. Dzierzawa, R. Raimondi, *Spin Hall effect in a 2DEG in the presence of magnetic couplings*, *J. Phys.: Conf. Ser.* 150, 2009 (022017).
- [4] C. Gorini, P. Schwab, M. Dzierzawa, R. Raimondi, *Spin polarizations and spin Hall currents in a two-dimensional electron gas with magnetic impurities*, *Physical Review B* 78, 125327 (2008).
- [5] P. Lucignano, R. Raimondi, A. Tagliacozzo, *Spin Hall effect in a two-dimensional electron gas in the presence of a magnetic field*, *Physical Review B* 78, 035336 (2008).
- [6] M. Milletari, R. Raimondi, P. Schwab, *Magneto-spin Hall conductivity of a two-dimensional electron gas*, *Europhysics Letters* 82, 67005 (2008).
- [7] P. Barone, R. Raimondi, M. Capone, C. Castellani, M. Fabrizio, *Gutzwiller scheme for electrons and phonons: the half-filled Hubbard-Holstein model*, *Physical Review B* 77, 235115 (2008).
- [8] C. Gorini, P. Schwab, M. Dzierzawa, R. Raimondi, *Quasiclassical approach and spin-orbit coupling*, *Physica E* 40, 1078 (2008).
- [9] R. Raimondi, C. Gorini, M. Dzierzawa, P. Schwab, *Current-induced spin polarization and the spin Hall effect: a quasiclassical approach*, *Solid State Communications* 144, 524 (2007).
- [10] G. V. Roberto D'Agosta, R. Raimondi, *Temperature-dependent theory of tunneling in the fractional quantum Hall effect*, *Physica E: Low-dimensional Systems and Nanostructures* 34, 199 (2006).

- [11] P. Barone, R. Raimondi, M. Capone, C. Castellani, M. Fabrizio, *Extended Gutzwiller wavefunction for the Hubbard-Holstein model*, *Europhysics Letters* 79, 47003 (2007).
- [12] P. Schwab, M. Dzierzawa, C. Gorini, R. Raimondi, *Spin relaxation in narrow wires of a two-dimensional electron gas*, *Physical Review B* 74, 155316 (2006).
- [13] R. Raimondi, C. Gorini, P. Schwab, M. Dzierzawa, *Quasiclassical approach to the spin-Hall effect in the two-dimensional electron gas*, *Physical Review B* 74, 035340 (2006).
- [14] P. Barone, R. Raimondi, M. Capone, C. Castellani, *Effective electron-phonon coupling and polaronic transition in the presence of strong correlation*, *Physical Review B* 73, 085120 (2006).
- [15] R. Raimondi, P. Schwab, *Spin-Hall effect in a disordered 2D electron-system*, *Physical Review B* 71, 033311 (2005).
- [16] R. D'Agosta, G. Vignale, R. Raimondi, *Temperature Dependence of the Tunneling Amplitude between Quantum Hall Edges*, *Physical Review Letters* 94, 086801 (2005).
- [17] S. Roddaro, V. Pellegrini, F. Beltram, G. Biasiol, L. Sorba, R. D'Agosta, R. Raimondi, G. Vignale, *Quasi-particle tunneling between fractional quantum Hall edges*, *Physica E* 22, 185 (2004).
- [18] R. Raimondi, G. Savona, P. Schwab, T. Lück, *Electronic thermal conductivity of disordered metals*, *Physical Review B* 70, 155109 (2004).
- [19] C. D. Castro, R. Raimondi, *Disordered electron systems*, in G. F. Giuliani, G. Vignale, eds., *The electron liquid paradigm in condensed matter physics : Proceedings of the International School of Physics "Enrico Fermi" : Varenna, Italy, 29 July-8 August 2003*, 259–333, IOS Press; Società Italiana di Fisica, Amsterdam; Bologna (2004), iISBN 1-58603-446-4 (IOS); ISBN 88-7438-019-4 (SIF).
- [20] C. D. Castro, R. Raimondi, S. Caprara, *Renormalization group and Ward identities in quantum liquid phases and in unconventional Critical phenomena*, *Journal of Statistical Physics* 115, 91 (2004).
- [21] R. D'Agosta, R. Raimondi, G. Vignale, *Transport properties of a two-dimensional electron liquid at high magnetic field*, *Physical Review B* 68, 035314 (2003).
- [22] P. Schwab, R. Raimondi, *Quasiclassical theory of charge transport in disordered interacting electron systems*, *Annalen der Physik (Leipzig)* 12, 471 (2003).
- [23] G. Franzese, R. Raimondi, R. Fazio, *Parity-dependent Kondo effect in ultrasmall metallic grains*, *Europhysics Letters* 62, 264 (2003).
- [24] S. Roddaro, V. Pellegrini, F. Beltram, G. Biasiol, L. Sorba, R. Raimondi, G. Vignale, *Nonlinear quasiparticle tunneling between fractional quantum Hall edges*, *Physical Review Letters* 90, 046805 (2003).

- [25] P. Schwab, R. Raimondi, *Magnetoconductance of a two-dimensional metal in the presence of spin-orbit coupling*, *The European Physical Journal B* 25, 483 (2002).
- [26] L. Amico, A. D. Lorenzo, A. Mastellone, A. Osterloh, R. Raimondi, *Electrostatic analogy for integrable pairing force Hamiltonians*, *Annalen der Physik* 299, 228 (2002).
- [27] P. Schwab, R. Raimondi, *Coherent transport in disordered metals: zero dimensional limit*, *European Physical Journal B* 30, 5 (2002).
- [28] P. Schwab, R. Raimondi, *Coherent transport in disordered metals out of equilibrium*, *European Physical Journal B* 24, 525 (2001).
- [29] R. Raimondi, M. Leadbeater, P. Schwab, E. Caroti, C. Castellani, *Spin-orbit induced anisotropy in the magnetoconductance of two-dimensional metals*, *Physical Review B* 64, 235110 (2001).
- [30] M. Leadbeater, R. Raimondi, P. Schwab, C. Castellani, *Non-linear conductivity and quantum interference in disordered metals*, *European Physical Journal B* 15, 277 (2000).
- [31] M. Leadbeater, C. J. Lambert, R. Raimondi, A. F. Volkov, *Sub-gap conductance in ferromagnetic-superconducting mesoscopic structures*, *Physical Review B* 59, 12264 (1999).
- [32] R. Raimondi, P. Schwab, C. Castellani, *Non-linear effects and dephasing in disordered electron systems*, *Physical Review B* 60, 5818 (1999).
- [33] R. Raimondi, P. Schwab, *Andreev Tunneling in Strongly Interacting Quantum Dots, Superlattices and Microstructures* 25, 1141 (1999).
- [34] P. Schwab, R. Raimondi, *Andreev tunnelling in quantum dots: A slave-boson approach*, *Physical Review B* 59, 1637 (1999).
- [35] P. Schwab, R. Raimondi, C. Castellani, *Specific Heat Anomaly and Adiabatic Hysteresis in Disordered Electron Systems in a Magnetic Field*, *The European Physical Journal B* 7, 175 (1999).
- [36] R. Fazio, F. W. J. Hekking, A. A. Odintsov, R. Raimondi, *Properties of superconductor - Luttinger liquid hybrid systems*, *Superlattices and Microstructures* 25, 1163 (1999).
- [37] C. J. Lambert, R. Raimondi, *Phase coherent transport in hybrid superconducting nanostructures*, *Journal of Physics: Condensed Matter* 10, 901 (1998).
- [38] R. Fazio, R. Raimondi, *Resonant Andreev tunneling in strongly interacting quantum dots*, *Physical Review Letters* 80, 2913 (1998).
- [39] R. Raimondi, *Boundary conditions in the theory of superconductivity*, in C. Giovannella, C. J. Lambert, eds., *Lectures on superconductivity in networks and mesoscopic systems*, vol. 427, 359–376, AIP (1998).

- [40] C. J. Lambert, R. Raimondi, V. Sweeney, A. F. Volkov, *Boundary conditions for quasiclassical equations in the theory of superconductivity*, *Physical Review B* 55, 6015 (1997).
- [41] L. F. Feiner, J. H. Jefferson, R. Raimondi, *Intrasublattice hopping in the extended t - J model and T_c^{max} in the cuprates: reply to comment*, *Physical Review Letters* 79, 3794 (1997).
- [42] L. F. Feiner, J. H. Jefferson, R. Raimondi, *Intrasublattice hopping in the extended t - J model and T_c^{max} in the cuprates*, *Physical Review Letters* 76, 4939 (1996).
- [43] P. M. A. Cook, R. Raimondi, C. J. Lambert, *Phase coherent transport in hybrid superconducting structures: the case of d -wave superconductors*, *Physical Review B* 54, 9491 (1996).
- [44] N. R. Claughton, R. Raimondi, C. J. Lambert, *Diffusive and ballistic motion in superconducting hybrid structures*, *Physical Review B* 53, 9310 (1996).
- [45] N. K. Allsopp, J. S. Cañizares, R. Raimondi, C. J. Lambert, *Giant conductance oscillations in mesoscopic Andreev interferometers*, *Journal of Physics: Condensed Matter* 8, L377 (1996).
- [46] R. Raimondi, J. H. Jefferson, L. F. Feiner, *Effective single-band models for the high- T_c cuprates. II. Role of apical oxygen*, *Physical Review B* 53, 8774 (1996).
- [47] L. F. Feiner, J. H. Jefferson, R. Raimondi, *Effective single-band models for the high- T_c cuprates. I. Coulomb interactions*, *Physical Review B* 53, 8751 (1996).
- [48] L. F. Feiner, J. H. Jefferson, R. Raimondi, *Effective Coulomb interactions between doped carriers in the high T_c cuprates*, *Physical Review B* 51, 12797 (1995).
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- [50] R. Raimondi, M. Lavagna, *Spin fluctuations beyond the Gutzwiller approximation: a renormalized Paramagnon theory*, *Journal of Low Temperature Physics* 99, 355 (1995).
- [51] R. Raimondi, *Optical conductivity of the Mott-Hubbard insulator V_2O_3* , *Physical Review B* 51, 10154 (1995).
- [52] L. F. Feiner, J. H. Jefferson, R. Raimondi, *Coulomb interactions in a generalized single-band Hubbard model for charge-transfer systems*, *Physica C* 235-240, 2201 (1994).
- [53] R. Raimondi, L. F. Feiner, J. H. Jefferson, *Apical oxygen and a generalized single-band Hubbard model for the cuprates*, *Physica C* 235-240, 2203 (1994).

- [54] E. Arrigoni, C. Castellani, M. Grilli, R. Raimondi, G. C. Strinati, *Functional-integral formulation of the slave-boson approach: beyond the mean-field treatment with the correct continuum limit*, *Physics Reports* 241, 291 (1994).
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- [56] E. Arrigoni, C. Castellani, R. Raimondi, G. C. Strinati, *Revising the $1/N$ expansion for the slave-boson approach within the functional integral*, in D. Baeriswyl, D. K. Campbell, J. M. P. Carmelo, F. Guinea, eds., *The Hubbard Model - Its Physics and Mathematical Physics*, vol. 343, 209–216, Plenum Press (1995), NATO ASI Series.
- [57] R. Raimondi, C. Castellani, *Lower and upper Hubbard bands: a slave boson treatment*, *Physical Review B* 48, 11453 (1993).
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- [59] R. Raimondi, C. Castellani, M. Grilli, Y. Bang, G. Kotliar, *Charge collective modes and dynamic pairing in the three-band Hubbard model. II. Strong-coupling limit*, *Physical Review B* 47, 3331 (1993).
- [60] Y. Bang, G. Kotliar, R. Raimondi, C. Castellani, M. Grilli, *Charge collective modes and dynamic pairing in the three-band Hubbard model. I. Weak-coupling limit*, *Physical Review B* 47, 3323 (1993).
- [61] C. Castellani, G. Kotliar, R. Raimondi, M. Grilli, Z. Wang, M. Rosenberg, *Collective excitations, photoemission spectra, and optical gaps in strongly correlated Fermi systems*, *Physical Review Letters* 69, 2009 (1992).
- [62] Y. Bang, C. Castellani, M. Grilli, G. Kotliar, R. Raimondi, Z. Wang, *Single particle and optical gaps in charge-transfer insulators*, *International Journal of Modern Physics B* 6, 531 (1992).
- [63] Y. Bang, C. Castellani, C. D. Castro, M. Grilli, G. Kotliar, R. Raimondi, *Superconductivity, phase separation and charge transfer instability in the $U = \infty$ limit of the three band model of the CuO_2 planes*, *Physica C* 185-189, 1525 (1991).
- [64] N. Cancrini, S. Caprara, C. Castellani, C. D. Castro, M. Grilli, R. Raimondi, *Phase separation and superconductivity in the Kondo-like spin-hole coupled model*, *Europhysics Letters* 14, 597 (1991).
- [65] M. Grilli, R. Raimondi, C. Castellani, C. D. Castro, G. Kotliar, *Phase separation and superconductivity in the $U = \infty$ limit of the extended multiband Hubbard model*, *International Journal of Modern Physics B* 5, 309 (1991).
- [66] Y. Bang, G. Kotliar, C. Castellani, M. Grilli, R. Raimondi, *Phase separation, charge-transfer instability, and superconductivity in the three-band extended Hubbard model: weak-coupling theory*, *Physical Review B* 43, 13724 (1991).

- [67] M. Grilli, R. Raimondi, C. Castellani, C. D. Castro, G. Kotliar, *Superconductivity, phase separation and charge transfer instability in the $U = \infty$ limit of the three-band model of the CuO_2 planes*, *Physical Review Letters* 67, 259 (1991).
- [68] C. D. Castro, R. Raimondi, *An introduction to superconductivity*, in S. Pace, M. Acquarone, eds., *Proceedings of the XXIV Italian National School of Condensed Matter Physics, Bra, Italy* (1989).
- [69] C. D. Castro, R. Raimondi, C. Castellani, A. A. Varlamov, *Superconductive fluctuations in the density of states and tunneling resistance in high- T_c superconductors*, *Physical Review B* 42, 10211 (1990).
- [70] R. Raimondi, C. Castellani, C. D. Castro, *Zeeman spin splitting frequency renormalization in disordered interacting electronic systems*, *Physical Review B* 42, 4724 (1990).