

CURRICULUM VITAE

Pascal SIMON

Marital life, 1 child, 36 years old

Nationality: French

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Languages : French (mother tongue); English, Italian (actively); German (6 years at school)

Education

- Nov. 2003: Habilitation thesis at Joseph Fourier university.
- April 1998: Ph.D. at the university Paris XI-Orsay, France (with honors)
Title of the thesis: "From 2D frustrated spin systems to coupled minimal models"
Supervisor: Prof. B. Douçot
- June 1994: DEA de Physique Théorique (Master of Science in Theoretical Physics) with honors
(directed by Prof. E. Brézin, ENS, Paris)

Positions held

- 08/06-07/07 Visiting professor at the university of Basel (in the group of D. Loss)
- 01/03-present Assistant-professor at Joseph Fourier university, Grenoble, France
- 08/02-12/02 Research Associate at the university of Basel (with D. Loss)
- 09/01-08/02 Research Associate at Boston university (with I. Affleck).
- 09/00-08/01 Research Associate at the university of British Columbia, Vancouver (with I. Affleck).
- 09/98-08/00 Postdoctoral fellow at SISSA/ISAS, Trieste, Italy (with G. Mussardo).
- 09/95-08/98 PhD student at the LPTHE, university Paris VI-VII, France (with B. Douçot)
- 09/94-08/95 Military service at the CEA Saclay in experimental particles physics
in the OPAL experiment of the CERN (Geneve)

Research interests

General theoretical condensed matter physics with an emphasis on mesoscopic strongly correlated electronic systems. More specifically, I am interested in:

- Transport in correlated mesoscopic systems (quantum dots, carbon nanotubes, molecules, ...).
- Decoherence in correlated nanodevices.
- Magnetic properties of strongly correlated electronic systems.
- Quantum disordered spin and electronic systems.

Invited talks in conferences and workshops

- Dec. 1998 “New fixed points in coupled minimal models”
workshop entitled “Integrability, non perturbative effects and symmetries”
“in field theory” Mons, (Belgique)
- Sept. 2003: “Kondo screening cloud effects in mesoscopic devices”
GDR Physique Quantique Mésoscopique, Aussois (France).
- Sept. 2003: “Kondo screening cloud effects in mesoscopic devices”
Euro-conf rence “ Spin and Charge Transport in Nanostructures”, Braga (Portugal).
- Nov. 2003: “Kondo screening cloud effects in mesoscopic devices”
workshop in theoretical condensed matter physics (Grenoble).
- Nov. 2004: “Exotic Kondo effect from magnetic trimers”
International Argonne Fall Workshop on Nanophysics IV, Argonne (USA).
- Aug. 2005: “Spintronics with orbital Kondo effect”
Workshop “Ultra 1D mesoscopic physics”, Corfu (Greece).
- Dec. 2005: “Spintronics with orbital Kondo effect”
International Argonne Fall Workshop on Nanophysics V, Argonne (USA).
- April 2006: “Spintronics with orbital Kondo effect”
workshop on quantum infromation (Frejus,France)
- May 2006: “Kondo effect in nanostructures”, Nanophysics day (Marseille).
- Sept. 2006: “Spectroscopic analysis of magnetic adatoms clusters”
International workshop on Correlated Surface Science (Hambourg)
- Nov. 2006: “Transport through a Kondo dot with $SU(4)$ entanglement”
International conference part of the Argonne Fall Workshop on Nanophysics VI,
Argonne (USA).

Contributed talks in conferences and workshops

- Nov. 1995: “Antiferromagnetic vacuum in the $2D J_1 - J_2$ XY model”
Delta meeting (Heidelberg-Strasbourg-Zurich)
- Aug. 1996: “Etude du modèle XY $J_1 - J_2$ à deux dimensions ”
Journées de la matière condensée (Société Francaise de Physique) (Orléans)
- June 1998: “New fixed points in coupled minimal models”
Workshop on ”Structures non perturbatives en théorie des champs et des cordes”
- Mars 2001: “Detecting the Kondo screening cloud around a quantum dot”
March Meeting of the American Physics Society, Seattle (USA).

- June 2001: “Detecting the Kondo screening cloud around a quantum dot”
meeting of the Canadian Association of Physics (CAP), Victoria (Canada)
- March 2002: “Finite size effects in mesoscopic Kondo devices”
March meeting of the American Physics Society, Indianapolis (USA)
- Oct. 2002: “Detecting the Kondo screening cloud in mesoscopic devices”
Workshop “Electron Interference and Decoherence in Nanostructures”, Dresden
- Sept. 2005: “Exotic physics in Chromium trimers adsorbed on Gold surface”
International conference “Spintronics05”, (Poznan).
- Aug. 2006: “Determining the Exchange Interaction Between Single Magnetic Atoms”
International Conference on Nanoscience and Technology (ICNT 2006) (Basel)

Recent invited Seminars since 2000

- January 00: Seminar at the university of Karlsruhe (Germany)
- January 00: Seminar at the university of Geneve (Switzerland)
- January 00: Seminar at the university of Freiburg (Germany))
- April 00: Seminar at the Ecole Normale Supérieure de Lyon (France)
- November 00: Seminar at the university of British Columbia (Vancouver, Canada)
- November 00: Seminar at Simon Fraser university (Burnaby, Canada)
- December 00: Seminar at the Ecole Normale Supérieure (Paris)
- January 01: Seminar at the Paul Scherrer Institute (Switzerland)
- December 01: Seminar at the “Centre de Physique Théorique” (Marseille, France)
- April 02: Seminar at the university Paris-Sud (Orsay, France)
- April 02: Seminar at the university of Basel (Switzerland)
- November 02: Seminar at the university of Freiburg (Germany))
- November 02: Seminar at the Paul Scherrer Institute (Switzerland)
- November 02: Seminar at the university of Dusseldorf (Germany))
- December 02: Seminar at the CNRS-Grenoble (France)
- April 03: Seminar at McMaster univeristy (Hamilton, Canada)
- April 03: Seminar at Sherbrooke university (Sherbrooke, Canada)
- April 03: Seminar at Mc Gill university (Montreal, Canada)
- May 03: Seminar at Boston university (Boston, USA))
- May 03: Seminar at Cornell university (Ithaca, USA))
- October 03: Seminar at the technical university of Budapest (Hungary))
- January 04: Seminar at the “service de Physique Théorique”- CEA Saclay (France)
- April 04 : Seminar at the condensed matter theory department, university of Karlsruhe (Germany)
- April 04 : Seminar at the university of Basel (Switzerland)
- August 04 : Seminar at the Paul Scherrer Institute (Switzerland)
- April 05 : Condensed matter seminar of the plateau (Orsay-Saclay-Polytechnique)
- June 05 : Condensed matter at the university of British Columbia (Canada)
- October 05 : Seminar at the university of Baleari island (Spain)

January 06: Seminar at the physics department of the Hamburg university
March 06: Seminar at the Max Planck Institute in Stuttgart
Avril 06 : Seminar at the laboratoire de Physique théorique, IRSAM, (Toulouse)
Oct 06 : Seminar at laboratoire de Physique des Matériaux of Nancy university.
Nov 06 : Seminar at the Institut de Physique et de Chimie (Strasbourg).

Other professional activities

Referee for Phys. Rev. Lett., Phys. Rev. B, Euro. Phys. Journal, Europhysics letters, Physics Letters A. Referee for the american National Science fundation (NSF) and the binational Israel-USA science foundation

Grants

Fall 2003: Shared grant from the IPMC (local institue of condensed matter) (53kE).
Fall 2005: Shared grant from the French National Agency (349 kE) (S. Andergassen is financed with this grant)
Fall 2006: ECOS grant with Argentina (Bariloche). This program allows exchanges of scientists and students.

Publications in scientific journals

- [1] A. Perez, M. Rausch de Traubenberg and P. Simon,
2D– Fractional Supersymmetry for Rational Conformal Field Theory: Application for Third-Integer Spin States Nucl. Phys. B **482**, 325 (1996).
- [2] M. Rausch de Traubenberg and P. Simon, *2D– Fractional Supersymmetry for alternative statistics*, Nucl. Phys. B **517** 485 (1998).
- [3] P. Simon, *Ising transition in the ANNNXY Model*, J. Phys. A **30**, 2653 (1997).
- [4] P. Simon, *The 2D $J_1 - J_2$ XY and Ising-XY models*, Euro. Phys. Lett. **39**, 129 (1997).
- [5] P. Simon, *Spin Liquid Phases In the 2D frustrated XY model*, Phys. Rev. B **56** 10975 (1997).
- [6] P. Simon, *Coupled critical Models: Applications to Ising-Potts Models*, Phys. Lett. B **408**, 293 (1997).
- [7] P. Simon, *Critical Behavior of Coupled q -state Potts Models under Weak Disorder*, Euro. Phys. Lett. **41**, 605 (1998).
- [8] P. Simon, *Coupled Minimal Models with and without Disorder*, Nucl. Phys. B **515**, 624 (1998).
- [9] M-A Lewis and P. Simon, *A RG study of asymmetrically coupled minimal models*, Phys. Lett. B **435**, 159 (1998).
- [10] B. Douçot and P. Simon, *A semi-classical approach of order from disorder*, J. Phys. A **31**, 5855 (1998).
- [11] D. Loison and P. Simon, *A Monte Carlo analysis of the 2D, $J_1 - J_2$ XY model* Phys. Rev. B **61**, 6114 (2000).
- [12] G. Mussardo and P. Simon, *Bosonic S-matrix, CDD factors and Vacuum instabilities*, Nucl. Phys. B **578**, 527 (2000).
- [13] D. Cabra, A. Honecker, A. de Martino, P. Pujol and P. Simon,
Doping-dependent magnetisation plateaux in p -merized Hubbard chains Phys. Lett. A **268**, 418 (2000).
- [14] D. Fioravanti, G. Mussardo and P. Simon, *Universal ratios in the tricritical Ising model*, Phys. Rev. Lett. **85**, 126 (2000).
- [15] P. Simon and F. Ricci-Tersenghi, *Phase diagram of coupled disordered Ising models* J. Phys. A **33**, 5985 (2000).
- [16] D. Fioravanti, G. Mussardo and P. Simon *Universal amplitude ratios of the renormalization group,...*, Phys. Rev. E **63**, 16103.
- [17] D. Cabra, A. De Martino, A. Honecker, P. Pujol and P. Simon,
Emergence of Irrationality: magnetization plateaux in modulated Hubbard chains

- Phys. Rev. B **63**, 094406 (2001).
- [18] I. Affleck and P. Simon, *Detecting the Kondo screening cloud around a quantum dot* Phys. Rev. Lett. **86**, 2854 (2001).
- [19] P. Simon and I. Affleck, *Persistent currents through a quantum dot* Phys. Rev. B **64**, 085308 (2001).
- [20] D. Cabra, A. De Martino, P. Pujol and P. Simon, *Hubbard ladders in a magnetic field*, Euro. Phys. Lett **57** 402 (2002).
- [21] I. Affleck and P. Simon, Comment on “Kondo resonance in a mesoscopic ring ...” Phys. Rev. Lett. **88**, 139701 (2002).
- [22] P. Simon and I. Affleck, *Finite size effects in Conductance Measurements on Quantum Dots*, Phys. Rev. Lett. **89**, 206602 (2002).
- [23] K. Le Hur and P. Simon, *Smearing of charge fluctuations in a grain by spin-flip assisted tunneling*, Phys. Rev. B **67**, 201308R (2003).
- [24] P. Simon and I. Affleck, *Kondo screening cloud effects in mesoscopic devices*, Phys. Rev. B **68**, 115304 (2003).
- [25] K. Le Hur, P. Simon and L. Borda, *Maximized Orbital and Spin Kondo effects in a single-electron transistor*, Phys. Rev. B **69**, 045326 (2004).
- [26] D. Feinberg and P. Simon, *Splitting electronic spins with a Kondo double dot device*, Appl. Phys. Lett. **85**, 1846 (2004).
- [27] R. Lopez, D. Sanchez, M. Lee, M.-S. Choi, P. Simon, K. Le Hur, *Probing spin and orbital Kondo effects with a mesoscopic interferometer* Phys. Rev. B **71**, 115312 (2005).
- [28] P. Simon, R. Lopez and Y. Oreg, *RKKY and magnetic field interactions in coupled Kondo quantum dots*, Phys. Rev. Lett. **94**, 086602 (2005).
- [29] P. Simon, *Kondo screening cloud in a double-quantum dot*, Phys. Rev. B **71**, 155319 (2005).
- [30] B. Lazarovits, P. Simon, G. Zarand, L. Szunyoth, *Exotic Kondo effect from magnetic trimers*, Phys. Rev. Lett. **95**, 077202 (2005).
- [31] L. Borda, G. Zarand, P. Simon, *Dissipation-induced quantum phase transition in a quantum box*, Phys. Rev. B **72**, 155311 (2005).
- [32] P. Simon, O. Entin-Wohlmann, A. Aharony, *Flux-dependent Kondo temperature in an Aharonov-Bohm interferometer with an in-line quantum dot*, Phys. Rev. B **72**, 245313 (2005).
- [33] P. Simon, J. Salomez, D. Feinberg, *Spectroscopy of finite size Kondo effects in a multi-terminal geometry*, Phys. Rev. B **73**, 205325 (2006).
- [34] P. Durganandini et P. Simon, *underscreened kondo impurities in a Luttinger Liquid*,

- Phys. Rev. B **74**, 205304 (2006).
- [35] G. Zarand, C.-H. Chung, P. Simon, and M. Vojta, *Quantum criticality in a double quantum-dot system* Phys. Rev. Lett. **97**, 166802 (2006).
- [36] P. Simon and D. Feinberg, *Electronic spin precession and interferometry from spin-orbital entanglement in a double quantum dot*, Phys. Rev. Lett. **97**, 247207 (2006).
- [37] P. Simon, P.S. Cornaglia, D. Feinberg, C.A. Balseiro, *Kondo effect with non collinear polarized leads: a numerical renormalization group analysis*, Phys. Rev. B **75**, 045310 (2007).
- [38] P. Wahl, P. Simon, L. Diekhoner, M. A. Schneider, V. S. Stepanyuk, P. Bruno, K. Kern, *Determining the exchange interaction between single magnetic atoms*, (cond-mat/0611716) Phys. Rev. Lett. **98**, 056601 (2007).
- [39] K. Le Hur, P. Simon, et D. Loss, *Transport through a quantum dot with $SU(4)$ Kondo entanglement*, Phys. Rev. B. **75**, 035332 (2007)
- [40] P. Simon, D. Loss, *Nuclear spin ferromagnetism in an interacting 2D electron gas*, cond-mat/0611292, submitted to Phys. Rev. Lett.
- [41] S. Florens, P. Simon, S. Andergassen, et D. Feinberg, *Is the Kondo effect in quantum dots affected by electromagnetic noise ?*, cond-mat/0612175, submitted to Phys. Rev. **B**.
- [42] S. Andergassen, P. Simon, S. Florens, and D. Feinberg, *Orbital Kondo effect under electromagnetic noise*, to be submitted.

Other publications

- [1] P. Simon, *Des systèmes bidimensionnels frustrés aux modèles minimaux couplés*
Thèse de l'université Paris XI (Orsay), (1998).
- [2] P. Simon, *Effets du nuage d'cran Kondo dans les systèmes microscopiques*
Thèse d'habilitation de l'université Joseph Fourier (Grenoble), (2003).
- [3] P. Simon et D. Feinberg, *Spectroscopic analysis of finite size effects around a quantum dot*
proceeding of Les Houches school "Quantum Magnetism".