

CURRICULUM VITAE

Fabio Franchini



Personal Information

Date of Birth: April 8, 1976

Place of Birth: Bologna, Italy

Nationality: Italian

Contact Information

Address: C/o The Abdus Salam ICTP – Condensed Matter Group
Strada Costiera 11 ; 34014, Trieste (TS), Italy

Phone (Office): (+39)040-2240-213

Phone (Cell-Phone): (+39)389-1131-625

Fax : (+39)040-2240-354

Email: fabio@ictp.it

Scientific Education

1995-2000 **Laurea Cum Laude** Department of Physics at the University of Bologna,
Faculty of Science (Bologna, Italy).

2003 **Master of Arts in Physics** Department of Physics & Astronomy
State University of New York at Stony Brook (New York, U.S.A.).

July 2005 **Boulder Summer School** in Condensed Matter and Materials Physics ,
Physics of Mesoscopic Systems.

2000-2006 **Ph.D. in Physics** Department of Physics & Astronomy
State University of New York at Stony Brook (New York, U.S.A.).

September 2007 **INSTANS Summer School** at Oxford (U.K.)
(Interdisciplinary Statistical and Field Theory Approaches
to Nanophysics and low-dimensional Systems).

2006-*Present* **Post-Doc Appointment** Condensed Matter Group
The Adbus Salam ICTP (Trieste, Italy).

Awards

2000 **Laurea Magna Cum Laude**,

Graduation with honors and highest GPA of the class.

2003 **Peter B. Kahn Fellowship**,

Student Travel Fellowship, Department of Physics and Astronomy at Stony Brook.

Teaching Experiences

- Teaching Assistant for the laboratories and recitations of introductory level Physics at **Stony Brook University**;
- Teaching Assistant for the recitations of introductory level Calculus at **Stony Brook University**;
- Tutored at different levels of Physics and Calculus;
- Taught a 20-hour class on “*Mathematical Techniques*” for the 2007-2008 and 2008-2009 **Condensed Matter Diploma Program** at **ICTP** (Trieste);
- Coordinated and taught a seminar class for the **Condensed Matter Diploma Program** at **ICTP** (Trieste) in the Spring Semester 2008 and in the 2008-2009 academic year;
- Taught a 15-hour class on “*Introduction to Bethe Ansatz*” for the 2007-2008 **Ph.D. Program in Statistical Physics** at **SISSA** (Trieste) and appointed to repeat for the 2008-2009 program.

Other Experiences

- Coordinated the weekly seminar activities for the join ICTP/SISSA Statistical Physics group.

Spoken Languages

Excellent knowledge of written and spoken English and Italian; High-school level knowledge of German.

Computer Languages

C/C++, Fortran, Mathematica, Turbo Pascal

Fields of research

Strongly Correlated Systems, Integrable Systems (Bethe Ansatz), Spin Chains, Quantum Information, Random Matrices, Mathematical Methods in Field Theory, Conformal Field Theory, Quantum Field Theory in flat and curved Space-Time.

Publications

1. A. G. Abanov and F. Franchini; Phys. Lett. **A 316** (2003) 342-349,
“Emptiness Formation Probability for the Anisotropic XY Spin Chain in a Magnetic Field”
(also available on arXiv:cond-mat/0307001).
2. F. Franchini and A. G. Abanov; J. Phys. **A 38** (2005) 5069-5096,
“Asymptotics of Toeplitz Determinants and the Emptiness Formation Probability for the XY Spin Chain”
(also available on arXiv:cond-mat/0502015).
3. F. Franchini, A. R. Its, B.-Q. Jin, and V. E. Korepin; Proceedings of the Third Feynman Workshop, 2006
“Analysis of entropy of XY Spin Chain”
(also available on arXiv:quant-ph/0606240).
4. F. Franchini, A. R. Its, B.-Q. Jin, and V. E. Korepin; J. Phys. **A: Math. Theor.** **40** (2007) 8467-8478,
“Ellipses of Constant Entropy in the XY Spin Chain”
(also available on arXiv:quant-ph/0609098).
5. F. Franchini, A. R. Its, and V. E. Korepin; J. Phys. **A: Math. Theor.** **41** (2008) 25302,
“Renyi Entropy of the XY Spin Chain”
(also available on arXiv:0707.2534).
6. F. Franchini; Ph.D. Defense Thesis (Stony Brook University),
“On Hydrodynamic Correlations in Low-Dimensional Interacting Systems”
(available on arXiv:0801.2734).
7. F. Franchini and A. S. Goldhaber; Phys. Scr. **78** (2008) 065002 ,
“Aharonov-Bohm effect with many vortices”
(also available on arXiv:0805.1910).

Presentations at Conferences and Seminars

(**O** –: Oral Presentation; **I** –: Invited Oral Presentation; **P** –: Poster Presentation)

- O – *International Workshop and Seminar on Quantum Phase Transitions* (June 23rd-25th 2003; **Max-Planck Institut fur Physik Komplexer Systeme** – Dresden, Germany).
“Emptiness Formation Probability for the XY Spin Chain in a Magnetic Field”.
- P – *Third Stig Lundqvist Conference on Advancing Frontiers of Condensed Matter Physics* (August 11th-15th 2003; **The Abdus Salam ICTP** – Trieste, Italy).
“Emptiness Formation Probability for the XY Spin Chain in a Magnetic Field”.
- P – *International Workshop on Field Theory in Correlated Nanoscale Systems* (September 1st-5th 2003; **Brookhaven National Laboratory** – New York, U.S.A.).
“Emptiness Formation Probability for the XY Spin Chain in a Magnetic Field”.
- O – *APS March Meeting* (March 22nd-26th 2004; Montreal, Canada).
“Emptiness Formation Probability for the XY Model”.
- O – *APS March Meeting* (March 21st-25th 2005; Los Angeles, California).
“Hydrodynamic description of correlations in Quantum Fluids”.
- P – *The Boulder School in Condensed Matter and Materials Physics: Physics of Mesoscopic Systems* (July 4th-29th 2005; **University of Boulder** – Colorado, U.S.A.).
“Hydrodynamic Description of Correlators in Quantum Fluids: The Emptiness / Depletion Formation Probability”.
- I – **University of Minnesota** (March 7th 2006; Minneapolis, U.S.A.).
“Hydrodynamic Description of Correlators in Quantum Fluids”.
- O – *APS March Meeting* (March 13th-17th 2006; Baltimore, MD, U.S.A.).
“Coupling of Spin and Charge Degrees of Freedom in a Hydrodynamic Two-Fluid Approach”.
- I – *Thesis Defense* (July 21st 2006; **Stony Brook University**, U.S.A.).
“Hydrodynamic Correlations in Low-Dimensional Interacting Systems”.
- I – **The Abdus Salam ICTP** (November 30th 2007; Trieste, Italy).
“The Emptiness Formation Probability: going beyond the Luttinger Liquid Model”.
- I – **Firenze University** (February 14th 2007; Florence, Italy).
“Ellipses of Constant Entropy in the XY Model”.

- I – **SISSA / ISAS** (February 27th 2007; Trieste, Italy).
“Ellipses of Constant Entropy in the XY Model”.

- I – **The Abdus Salam ICTP** (April 12th 2007; Trieste, Italy).
“Ellipses of Constant Entropy in the XY Model”.

- I – **EPFL** (May 16th 2007; Lausanne, Switzerland).
“Ellipses of Constant Entropy in the XY Model”.

- P – *School and Workshop on Highly Frustrated Magnets and Strongly Correlated Systems: From Non-Perturbative Approaches to Experiments* (July 30th - August 17th 2007, **The Abdus Salam ICTP** – Trieste, Italy).
“Quantum Entropy of the XY Model”.

- I – **Stony Brook University** (December 7th 2007; Stony Brook, New York, U.S.A.).
“Quantum Entropy of the XY Model: Ellipses of constant Entropy and Modular Transformations”.

- O – *Workshop on Quantum Phenomena and Information: From Atomic to Mesoscopic Systems* (May 5th-16th 2008; **The Abdus Salam ICTP** – Trieste, Italy).
“Entanglement Entropy in the XY Model”.

- I – **Bologna University** (June 5th 2008; Bologna, Italy).
“Entanglement Entropy in the XY Model”.

- P – *Workshop on Correlations and Coherence in Quantum Matter* (November 10th-14th 2008; vora, Portugal).
“Hydrodynamic description of the spin Calogero-Sutherland Model”.