

Curriculum vitæ
Federico Becca

Nationality: Italian
Address: Dipartimento di Fisica, Università di Trieste

Education

- October 1990 - December 1995: Undergraduate studies in Physics, University “La Sapienza”, Roma (Italy).
- January 1996: Degree in Physics 110/110 *cum laude*, University “La Sapienza”, Roma (Italy). *Charge instabilities in strongly correlated electron systems*, [REDACTED]
- October 1997: “Magister Philosophiæ”, Scuola Internazionale Superiore di Studi Avanzati, Trieste (Italy). *Charge-density waves in semiconductor surfaces*, [REDACTED]
- October 2000: “Doctor Philosophiæ” *cum laude*, Scuola Internazionale Superiore di Studi Avanzati, Trieste (Italy). *Electronic properties from strong correlation*, [REDACTED]

Employments

- November 2000 - August 2002: Post-doctoral research assistant at Institut de Physique Théorique, University of Lausanne (Switzerland).
- September 2002 - October 2004: Research associate position at Istituto Nazionale per la Fisica per la Materia (INFM), Trieste (Italy).
- November 2004 - March 2008: Tenure-track position at the INFM DEMOCRITOS National Simulation Center, Trieste (Italy).
- April 2008 - December 2018: Researcher at Consiglio Nazionale delle Ricerche (CNR), Istituto Officina dei Materiali, Trieste (Italy).
- Since January 2019: Assistant professor (RTDb) in Theoretical Condensed-Matter Physics, University of Trieste (Italy). On leave of absence from CNR (since August 2020: Senior Researcher).

Academic Habilitation

- October 2014: Italian habilitation for full professor in Theoretical Condensed-Matter Physics (02/B2), valid until October 2023.
- August 2018: Italian habilitation for full professor in Theoretical Condensed-Matter Physics (02/B2), valid until August 2027.

Professional Services

- April 2010 - December 2018: Member of the Council of Istituto Officina dei Materiali, Consiglio Nazionale delle Ricerche (CNR).
- January 2013 - December 2016: Member of the Board of Directors for the Centre Européen de Calcul Atomique et Moléculaire (CECAM), Lausanne (Switzerland).
- Since November 2019: Member of the Academic Board of the Ph.D. in Physics, University of Trieste (Italy).
- Referee for Physical Review Letters, Physical Review A, B, E, and X, Science, Nature Physics, Nature Communications, Scientific Reports, New Journal of Physics, and others. Outstanding Referee of the American Physical Society (2015).
- Referee for grant applications to the American National Science Foundation (NSF), the Department of Energy (DoE), and the European Research Council (ERC).

Research Appointments

- Invited scientist for several collaborations in different universities.

Teaching Experience

- November 2002 - December 2018: Courses for the Ph.D. in Condensed Matter at Scuola Internazionale Superiore di Studi Avanzati, Trieste (Italy).
- Since October 2019: Courses for Bachelor's Master's degree at the University of Trieste (Italy).
- Since May 2020: Courses for the Ph.D. in Physics at the University of Trieste (Italy).

Supervision of Undergraduate and Ph.D. Students

- 5 Master students, among them:
 [REDACTED] King's College, London.
- 13 Ph.D. students, among them:
 [REDACTED] École Polytechnique, Paris.
 [REDACTED] Vector Institute, Toronto.
 [REDACTED] École Polytechnique Fédérale de Lausanne.
 [REDACTED] Indian Institute of Technology, Chennai.
 [REDACTED] Politecnico di Torino.

Organization of Schools and Workshops

- 13 workshops and school organized, including 6 editions of the CECAM School on "Atomistic Simulation Techniques for Material Science, Nanotechnology, and Biophysics".

Invited Talks and Seminars

- About 50 invited talks (including 2 at the American Physical Society and 1 at the IUPAP Conference on Computational Physics) and 50 seminars at research institutes and universities.
- Short courses at international schools.

Publications

- About 100 papers in international referred journals, among which 1 Science, 1 Scientific Report (Nature Publishing), 16 Physical Review Letters, 2 Physical Review X, and 79 Physical Review A, B, and E (17 Rapid Communications).
- One book (286 pages), published by Cambridge University Press (November 2017).

Research Interests

I am a condensed matter theorist and my main research interests lie in the study of strongly correlated materials. These are systems where the interaction effects play a crucial role and lead to novel phenomena that cannot be explained by independent-particle theories. Examples include the Mott insulators, spin liquids, and topological phases. Current efforts are devoted to the identification of spin-liquid phases with gapless excitations or topological degeneracy in Mott insulators with magnetic frustration; I am also investigating superconducting phases emerging from strong electron-electron correlations in d orbitals. By using numerical methods (classical and quantum Monte Carlo, Lanczos and exact diagonalizations, density-matrix renormalization group) and analytic approaches (slave particles, Gutzwiller approximation, and spin waves), I worked on:

- Charge and spin instabilities in strongly correlated systems.
- Frustrated magnetic systems.
- Metal-insulator and superfluid-insulator transitions.
- Correlated systems in presence of disorder.
- Thermalization and out-of-equilibrium dynamics for quantum systems
- Classical and quantum Monte Carlo methods.
- Lanczos and exact diagonalizations.

Citations indexed on Web of Science: more than 4000.

H-index: 35.

Source: <https://publons.com/researcher/2605419/federico-becca/>

Citations indexed on Google Scholar: more than 5000.

H-index: 41.

Source: <http://scholar.google.com/citations?user=3u-o5PQAAAAJ>