

ALICE SINATRA - CURRICULUM VITAE (2025)



Work address

Laboratoire Kastler Brossel, École Normale Supérieure
24 rue Lhomond, 75321 Paris

Tel. and e-mail : + 33 (0)1 44 32 25 72; [alice\[dot\]sinatra@lkb\[dot\]ens\[dot\]fr](mailto:alice[dot]sinatra@lkb[dot]ens[dot]fr)

Education

- Laurea in Physics, University of Milan, Italy, 1993. Grade : 110/110 cum laude
- Doctorate in Physics, University of Milan, Italy, 1997 ; Supervisor : Luigi Lugiato “Quantum noise control in nonlinear optical systems using two-photon transitions”
- Habilitation, Université Paris VI, 2006 [tel\[dot\]archives-ouvertes\[dot\]fr/tel-00117282](http://tel.archives-ouvertes.fr/tel-00117282).

Positions

- INFN postdoctoral fellowship, University of Milan, 1996–1997
- Marie Curie Individual Fellowship, ENS Paris, 1997–1999
- Lecturer at the Collège de France (Cohen Tannoudji Chair) 1999–2000
- Senior Lecturer at Pierre and Marie Curie University, 2000–2016
- Professor at Sorbonne University, Paris 2016–present.
- Promoted to PR1 (first class) on the CNU national contingent in 2022.

Nominations

- Member of the CNU (National Committee for Universities) 2012–2015.
- Member of the ANR Scientific Evaluation Committee 2017.
- Head of studies of the Quantum Physics programme of the ICFP International Master’s programme at ENS 2013-2018.
- Board member of EGAS European Group on Atomic Systems 2019-2023.
- HCERES expert 2019 and 2024
- Member of the CNRS National Committee, section 04, January 2023 - September 2025.

Research topics and notable results

- Atomic physics **Optical pumping of helium-3 for pulmonary imaging (experiment)**
 - new technique : strong field metastability exchange optical pumping which works at high pressure : 25% polarisation at 67 mbar at 1.5T.
- Quantum optics **Squeezed states of light, quantum non-demolition measurements**
 - world record for QND measurement in optics.
- Quantum gases **Bose-Einstein condensates : phase coherence properties, multimode description, non-perturbative classical fields**
 - Classical fields/Wigner for condensates dynamics at non-zero temperature.
 - Intrinsic coherence time of a condensate at non-zero temperature.
 - Coherence time of fermion pairs condensate in various interaction regimes.
- Quantum metrology **Phonon damping in superfluids**
 - Calculation of Landau-Khalatnikov damping by four-phonon processes.
- Quantum metrology **Spin-squeezed states, entangled states, ecoherence**
 - First achievement of spin-squeezed states in a condensate.
 - Theoretical limit of multimode spin squeezing in a condensate.
- Quantum metrology **Multiparameter quantum metrology**
 - Optimal multiparameter estimation with a set of spin-squeezed atoms.
 - First experimental demonstration (article currently under review).

Teaching

For 15 years, I taught quantum mechanics and quantum statistical physics at master's level. For 10 years, I promoted and organised exchange semesters abroad for university students. Currently, I teach Lagrangian mechanics and am co-head of the second year of the Bachelor's degree in Physics.

Publications and Conferences

I have published : 65 articles in peer-reviewed international journals, 2 popular science articles, and 2 book chapters. I have given 59 invited lectures at international conferences and 14 general seminars, departmental or laboratory seminars, including 5 colloquia (2 at Max Planck Munich, Saarland University, LENS Florence, 2 at Hannover University), 1 conversatorium at IPAN Warsaw, and 1 seminar at the Collège de France.

Personal page

[www\[dot\]phys\[dot\]ens\[dot\]fr/~sinatra/](http://www[dot]phys[dot]ens[dot]fr/~sinatra/)