

Adam Rançon

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Research Experience

Visiting researcher <i>Institut de Physique de Zagreb</i>	Zagreb, Croatie 2022 - 2023
Maitre de Conférences <i>Laboratoire de Physique des Lasers, Atomes et Molécules</i>	Lille, France 2016 -
Postdoctoral Research Fellow. Tommaso Roscilde's group. <i>École Normale Supérieure de Lyon</i>	Lyon, France 2014-2016
Postdoctoral Research Fellow. Kathryn Levin's group. <i>James Franck Institute, University of Chicago</i>	Chicago, USA 2012-2014
PhD thesis under the supervision of Nicolas Dupuis. <i>Laboratoire de Physique Théorique de la Matière Condensée</i>	Paris, France 2009-2012

Education

Université Pierre et Marie Curie <i>PhD in Physics. Obtained with highest honors.</i>	Paris, France 2009-2012
École Normale Supérieure <i>Master's degree in Physics.</i> Major in theoretical quantum physics.	Paris, France 2007-2009
École Normale Supérieure <i>Bachelors degree in Physics.</i>	Paris, France 2006-2007

Awards and Honors

Habilitation à diriger les recherches <i>Université de Lille</i>	Lille, France 2021
Qualification 'Maitre de Conférence' <i>France</i>	2013
Doctoral degree in Physics. Obtained with highest honors. <i>Université Pierre et Marie Curie, Paris, France</i>	2012
PhD fellowship of the French Ministry of Education and Research <i>Paris, France</i>	2009
Diploma of the Ecole Normale Supérieure <i>Paris, France</i>	2009

Grants and fundings

ANR project FuSION <i>Funding of 300k€, member (PI: C. Cherroret)</i>	2025-2029
ANR project Uniq-Rings <i>Funding of 500k€, member (PI: R. Chicireanu)</i>	2025-2029
Consortium PEPR Dyn1D <i>Funding of 2600k€, member (PI: I. Bouchoule)</i>	2025-2030
HRZZ (Croatian funding agency) funding <i>Funding of 200k€, member (PI: I. Balog)</i>	2024-2028
Thèse labélisée de l'Université de Lille <i>Funding of a PhD grant</i>	2022
One year CRCT, CNU section 30 <i>Visiting researcher at the Institute of Physics of Zagerb</i>	2022
CNRS International Emerging Actions 2022 <i>Funding of 5k€/year</i>	2023-2024

PHC Cogito – Ambassade France en Croatie <i>Funding of 2.5k€/year</i>	2023-2024
Thèse Région Hauts-de-France <i>Funding of half a PhD grant</i>	2021
Two demi-délégations CNRS section 04	2021-2022
Funding from l'ISITE Université Nord-Lille-Europe <i>Funding of 150k€</i>	2018-2022

PhD student supervision

- 2023-:** PhD thesis of Yaniss Rabahi
2022-: PhD thesis of Zoubair Daouma, co-supervised with Radu Chicireanu
2019-2022: PhD thesis of Vincent Vuatelet

Referee

Referee for peer-reviewed journals : Physical Review Letter, Nature Communication, Physical Review A, B, E and X, Journal of Physics A
 Referee for the Prix Roberval 2022

Institutional responsibilities

- 2024-:** Directeur des Études de la Licence 3 Physique Fondamentale, Université de Lille
2024-: Member (elected) of the Commission Recherche of the Faculté des Sciences et Technologies, Université de Lille
2022-: Member (elected) of the council PhLAM laboratory, Université de Lille
2022-: Member (elected) of the council of physics department, Université de Lille
2017-2022: Member (nominated) of the Commission mixte of the physics department, Université de Lille

Conference organization

- 2023:** Workshop QuiDiQua, 3 days, Université de Lille
2022: Workshop of the GDR Gaz Quantiques, 3 days, Université de Lille
2018: Workshop ENIQMA II, 3 days, ENS de Lyon
2017: Workshop ENIQMA, 2 days, Université de Lille

Invited talks at conferences and workshops

- 2024 **GdR Quantum Gases Annual Workshop**, Toulouse, France.
 “Central Limit Theorem, Large Deviations and Renormalization Group”
- 2024 **Conference “Exact Renormalization Group 2024”**, Les Diablerets, Suisse.
 “Exploring quantum criticality in a 4D quantum disordered system”
- 2024 **Conference “From Solid State to Biophysics XI”**, Paris, France.
 “Universal thermodynamics of the planar Bose gas: Functional Renormalization Group vs experiments”
- 2024 **Conference “Quantum Simulation”**, Paris, France.
 “Exploring quantum criticality in a 4D quantum disordered system”
- 2023 **Conference “Exploring New Topics with Functional Renormalisation”**, Bad-Honnef, Germany.
 “Inference and the inverse problem from a field theory and (F)RG perspective”
- 2021 **Cold-atom On-Line Meeting**, online.
 “Many-body Dynamical Localization and effective thermalization”
- 2021 **Conference on ultracold atoms, localization and beyond**, Paris, France.
 “Many-body Dynamical Localization and effective thermalization”
- 2020 **GdR Complexe Annual Workshop**, Paris, France.
 “Many-Body Dynamical Localization of Bose gases”

- 2014 **Conference Exact Renormalization Group 2014**, Lefkada, Greece.
“Fate of the amplitude mode in the vicinity of a quantum critical point”
- 2014 **Workshop “Higgs Modes in Condensed Matter and Quantum Gases”**, Kyoto, Japan.
“Fate of the amplitude mode in the vicinity of a quantum critical point”
- 2012 **Conference Exact Renormalization Group 2012**, Aussois, France.
“Quantum criticality and universality of a Bose gas near the Mott transition”

Invited seminars

- 2024 **Institute of Physics**, Zagreb, Croatia.
“Observation of quantum criticality in a 4D in an ultracold-atom experiment”
- 2023 **Graduate School of the China Academy of Engineering Physics**, Beijing, China.
“Generalized Central Limit Theorems for strongly correlated variables from a renormalization group perspective ”
- 2023 **Institute of Theoretical Physics, Chinese Academy of Science**, Beijing, China.
“Many Body Dynamical Localization and effective thermalization”
- 2023 **Institute Ruder Boskovic**, Zagreb, Croatia.
“Many Body Dynamical Localization and effective thermalization”
- 2022 **Laboratoire Kastler-Brossel**, Sorbonne-Université, France.
“Tan’s contact of a planar Bose gas: theory vs experiment”
- 2021 **Laboratoire de Physique et Chimie Théorique**, Université de Lorraine, France.
“Many Body Dynamical Localization and effective thermalization”
- 2021 **Laboratoire de Physique et Modélisation des Milieux Condensés**, Université Grenoble Alpes, France.
“Many Body Dynamical Localization and effective thermalization”
- 2021 **Institute of Physics**, Zagreb, Croatia.
“Many Body Dynamical Localization and effective thermalization”
- 2021 **Laboratoire de Physique du Solide**, Université Paris-Saclay, France.
“Many Body Dynamical Localization and effective thermalization”
- 2021 **Institut d’Optique de Paris**, Palaiseau, France.
“Many Body Dynamical Localization and effective thermalization”
- 2018 **Institute of Theoretical Physics**, Universitat Frankfurt, Germany.
“A functional RG approach to the quantum XY model”
- 2017 **Institute of Physics**, Zagreb, Croatia.
“Multiple Transitions of coupled Atom-Molecule Bosonic Mixtures in Two Dimensions”
- 2016 **Laboratoire de Physique des Lasers, Atomes et Molécules**, Lille, France.
“Critical Casimir forces and the equation of state of quantum critical systems”
- 2016 **Laboratoire de Physique Théorique**, Toulouse, France.
“Critical Casimir forces and the equation of state of quantum critical systems”
- 2015 **Laboratoire de Physique du Solide**, Orsay, France.
“A functional renormalization group approach to quantum spins”
- 2015 **Centre de Physique Théorique de l’École Polytechnique**, Palaiseau, France.
“A functional renormalization group approach to quantum spins”
- 2015 **Laboratoire de Physique Théorique**, Toulouse, France.
“A functional renormalization group approach to quantum spins”
- 2014 **Max Plank Institute**, Stuttgart, Germany.
“A functional renormalization group approach to quantum spin models”
- 2014 **Laboratoire de Physique Théorique et Modélisation**, Cergy-Pontoise, France.
“Universal thermodynamics of the superfluid to Mott insulator transition”
- 2014 **Laboratoire de Physique, École Normale Supérieure de Lyon**, Lyon, France.
“Universal thermodynamics and fate of the amplitude mode in the quantum $O(N)$ model”

- 2014 **Institut d'Optique de Bordeaux**, Bordeaux, France.
 “Quantum phase transition and universal thermodynamics of a Bose gas”
- 2012 **Condensed matter theory seminars at the École Normale Supérieure**, Paris, France.
 “Quantum criticality of a Bose gas near the Mott transition”
- 2012 **Institut d'Optique de Paris**, Palaiseau, France.
 “Quantum phase transition and universality in Bose gases”

Oral and poster contributions at conferences, workshops and schools

- 2022 **CEMPI days**, Université de Lille, France.
 “Small and large deviation of strongly correlated random variables from a renormalization group perspective”
- 2021 **PCHW conference**, *Talk*, Lyon, France.
 “Critical fluctuations and renormalization group fixed points”
- 2019 **Seminar day on path integral**, *Talk*, Université de Liège, Belgique.
 “Making the coherent state path integral great again: insights from stochastic calculus”
- 2018 **Conference Exact Renormalization Group 2018**, *Talk*, Paris, France.
 “FRG for systems with local non-linear constraints”
- 2016 **Conference Exact Renormalization Group 2016**, *Talk*, Trieste, Italy.
 “Critical Casimir forces and the equation of state of quantum critical systems”
- 2016 **Journées de la Matière Condensée 15**, *Talk*, Bordeaux, France.
 “Critical Casimir forces and the equation of state of quantum critical systems”
- 2015 **Workshop “Topological phases in Condensed Matter and Cold Atoms systems”**, *Poster*, Cargèse, France.
 “A Tensor Renormalization group approach to the Fully Frustrated Quantum Ising Model”
- 2014 **APS March Meeting 2014**, *Talk*, Denver, USA.
 “Equilibrating Dynamics in Quenched Bose Gases” and “Universal thermodynamics of the superfluid to Mott insulator transition”
- 2013 **APS DAMOP Meeting 2013**, *Talk*, Quebec City, Canada.
 “Interaction quench in presence of a thermal bath”
- 2013 **APS March Meeting 2013**, *Talk*, Baltimore, USA.
 “Interaction quench in presence of a thermal bath”
- 2012 **Workshop “Lyon Bose-Einstein Condensate 2012”**, *Poster*, Lyon, France.
 “Universal thermodynamics of a Bose gas near the Mott transition”
- 2011 **Cargese summer school “Disordered Systems: From Condensed-Matter Physics to Ultracold Atomic Gases”**, *Poster*, Cargese, France.
 “Strongly correlated superfluid near the Mott transition”
- 2011 **Les Houches summer school “Strongly correlated electronic systems, beyond Fermi liquid theory”**, *Poster*, Les Houches, France.
 “Strongly correlated superfluid near the Mott transition”
- 2010 **Conference Exact Renormalization Group 2010**, *Talk*, Corfu, Greece.
 “A Non-Perturbative Renormalization Group approach to lattice bosons : the superfluid to Mott insulator transition”