

QUANTUM FIELD THEORY, HOLOGRAPHY AND AdS/CFT

Background and motivation

Anti de Sitter / Conformal Field Theory (AdS/CFT) correspondence gives us a unique opportunity both to study strongly coupled field theory systems in a controlled setting and to address fundamental questions in quantum gravity with quantum field theory tools. Candidates are expected to carry out a PhD in Theoretical Physics in Quantum Field Theory and Gauge/Gravity duality.

The main goals of the project are to acquire a solid knowledge in theoretical physics in order to conduct independent research in the following topics:

- Renormalization group flows in quantum field theory and holography,
- Non-relativistic field theories and their holographic duals,
- Supersymmetric theories at strong coupling,
- Black Holes and gravity duals of quantum information concepts such as entropy and complexity,
- Conformal field theories and anomalies.

The candidate is also expected to proactively carry out the research project, interacting with the theory staff of UCSC, KU Leuven and other Universities (e.g. University of Milano Bicocca, University of Pisa, and possibly others).

Profile

- Diploma: Master's degree or comparable qualification in Physics, Mathematical Physics and adjacent fields. The title must be obtained before OCTOBER 31ST 2018.
- A strong interest for multidisciplinary research is required.
- A solid background in Quantum Mechanics and Quantum Field Theory is required.
- Experience in AdS/CFT, Black Holes, will be considered as an advantage.
- Good knowledge of the English language, both spoken and written, is essential.
- Strong commitment, ability to work in a team, and eager for international mobility is desired.

Opportunities

- Perform theoretical research in an interdisciplinary research environment and actively participate to the international collaboration between research groups in Italy and KU Leuven, with the aim of achieving a doctorate diploma under the joint supervision by KU Leuven and UCSC. The overall tutoring activity will be conducted by Roberto Auzzi and Giuseppe Nardelli, staff members at UCSC and Nikolay Bobev, staff member at KU Leuven.
- Gain didactical experience by being involved in teaching duties for a limited amount of time (e.g. guiding Bachelor and Master students with their research).

Supervisors

- Roberto Auzzi and Giuseppe Nardelli, Università Cattolica del Sacro Cuore (Italy)
- Nikolay Bobev, KU Leuven (Belgium)

Info

Applications will appear [HERE](#)

Pre-applications available at <http://scuoledidottorato.unicatt.it/phdschools/science-home>

Application deadline: September 28th, 2018

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