Ulyana Dupletsa | Curriculum Vitae et Studiorum

+39 3288371953 • u.dupletsa@campus.unimib.it

Personal Information

Name: Ulyana Dupletsa
Date of Birth: 1^{st} January 1994
Citizenship: Italian, Ukrainian
Actual position: Master's student in Theoretical Physics at the University of Milan-Bicocca
Personal webpage: `ulyanadupletsa.github.io`

Education

- **University of Milan-Bicocca**
  Master's degree in Theoretical Physics, Milan *2017–now*
  - *Final degree grade*: in fieri
  - *Average class grade*: $29.8/30$
  - *Thesis advisors*: Alberto Zaffaroni, Alessandro Tomasiello
  - *Thesis title*: 'Thermodynamic Aspects of AdS_4 Black Holes in $N = 2$ Gauged Supergravity'

- **University of Milan-Bicocca**
  Bachelor's degree in Physics, Milan *2013–2017*
  - *Final degree grade*: $110/110$ cum laude
  - *Average class grade*: $29/30$
  - *Thesis advisor*: Monica Colpi
  - *Thesis title*: 'Supermassive Binary Black Holes and their Dynamics in Galactic Nuclei'

Research Activity

Master's thesis
The project analyzes thermodynamic properties of a class of static magnetically charged AdS_4 black holes resulting as solutions of $N = 2$ gauged supergravity theory. Particular focus is devoted in investigating the existence and validity of an extremization principle for the entropy of such black holes. The principle states that the gravitational on-shell action evaluated at its BPS limit equals minus the entropy of the black hole, calculated as the area of the event horizon. Since holographic dictionary establishes a correspondence between the gravitational action and the dual field theory living on the AdS conformal boundary partition function, the extremization principle provides an explanation for the black hole microscopic degrees of freedom by directly relating them to states in the corresponding CFT.

Bachelor's thesis
The project deals with the analysis of the coalescence time of supermassive black hole binaries. The aim is to investigate whether such systems are able to coalesce in less than the Hubble time. If so, they would

become a promising source of gravitational waves for space based gravitational detectors. The results vary according to the binary mass ratio and to the type and the density profile of the hosting galaxy, giving an overall range between 0.1 to some tens of Gyrs.

Minor Computational Projects
These are two programs written in C that implement Markov Chain algorithms to solve problems in physics

- A numerical resolution for the simple harmonic oscillator energy for the calculation of the energy gap between the fundamental and the first level (`https://github.com/ulyanadupletsa/HarmonicOscillator`)
- Analysis of observables dependent on magnetization for a scalar field theory on lattice with quartic interaction. A Hamiltonian approach in Monte Carlo methods is used (`https://github.com/ulyanadupletsa/LatticePhi4Theory`)

Skills

Programming languages: C/C++, Python
Other scientific tools: ROOT, Matlab, Mathematica, LaTex
Languages: Italian (mother tongue), Ukrainian (mother tongue), English (fluent)