



## Giulia Maniccia



### WORK EXPERIENCE

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#### PhD Student

*Sapienza University of Rome* [ 01/11/2020 – Current ]

PhD Programme in Theoretical Physics: Quantum Gravity and Primordial Cosmology

Currently working on: study of quantum gravity corrections to quantum field theory via canonical quantization and the WKB expansion, with the separation of fast matter variables in a Born-Oppenheimer approach; construction of a proper time parameter that corresponds to a unitary dynamics for the matter system with quantum gravity corrections.

#### Orientation and Tutoring Support Program

*Department of Physics, Sapienza University* [ 01/01/2019 – 01/07/2020 ]

Address: Rome (Italy)

Providing information and technical support for students' requests regarding the following topics: admission, enrolment, tutoring support, lessons timetables and organization, training paths, exams registration, graduation process, additional projects and services for students.

Communication with foreign students and future students in English language. English translation of specific documents and presentations of the department, such as the brochure for future students.

### PUBLICATIONS

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#### Non-Unitarity Problem in Quantum Gravity Corrections to Quantum Field Theory with Born-Oppenheimer Approximation: New Proposal

[2021]

<https://arxiv.org/abs/1912.09945>

F. Di Gioia, **G. Maniccia**, G. Montani, J. Niedda. *Non-Unitarity Problem in Quantum Gravity Corrections to Quantum Field Theory with Born-Oppenheimer Approximation: New Proposal*.

Article published on arXiv e-print 1912.09945 (gr-qc, hep-th). Submitted and accepted for publication on Physical Review D.

### EDUCATION AND TRAINING

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#### SIGRAV International School 2021

*SIGRAV - Società Italiana di Relatività Generale e Fisica della Gravitazione* [ 01/02/2021 – 05/02/2021 ]

Attended and completed the SIGRAV International School 2021, focusing on Gravity of Compact Astrophysical Objects and Gravitational Waves. Event held online due to the pandemic.

## Master's Degree in Theoretical Physics

*Sapienza University* [ 01/09/2019 – 23/10/2020 ]

Address: Rome (Italy)

Final grade : 110/110 cum laude

Master's Degree programme (2 years) in Theoretical Physics.

Graduated on 23/10/2020 with final grade 110/110 cum laude.

**Thesis title:** The kinematical action as a clock for quantum matter on a WKB expanded gravitational background The aim of the thesis is to construct a self-consistent theory of the quantum matter dynamics on WKB developed background metric. The kinematical action is used to construct the time parameter for the evolution of the system. The WKB expansion is performed leading to the calculation of quantum gravity corrections to the functional Schrodinger equation for the matter fields. Applications to cosmological models are expected. Supervisor: prof. G. Montani

## Bachelor's Degree in Physics

*Sapienza University of Rome* [ 01/09/2015 – 25/07/2018 ]

Address: Rome (Italy)

Final grade : 110/110 cum laude

Bachelor's Degree in Physics (3-year course)

Graduated on 25/07/2018 with final grade 110/110 cum laude.

Thesis title: Magnetic monopoles: theoretical and experimental aspects

Admission to and completion of the Excellence Programme during the degree course.

## Excellence Programme in Physics

*Sapienza University* [ 01/09/2016 – 01/07/2018 ]

Address: Rome (Italy)

Selected in and successfully completed the Excellence Programme in Physics at Sapienza University, reserved to the best 30 students of the course.

Topics of study:

- Origin and characterization of the CMB radiation with Stokes parameters, expansion in spherical harmonics, possible explanations for primordial fluctuations related to cosmic inflation. Tutor: prof. De Bernardis , Sapienza University
- Introduction to group theory: properties of  $U(N)$ ,  $SU(N)$ , and  $O(N)$  groups, generators and representations of Lie groups, concept of representation equivalence, decomposition of representations obtained with tensorial product, methods of decomposition into invariant subspaces. Tutor: prof. S. Patri, Sapienza University
- In-depth electromagnetism: use of analytical functions for 2d electrostatic configurations, solutions of Laplace equations for 2d problems, method of image charges for dielectrics, limit on the photon mass, resonating cavity and Feynman paradox. Tutor: prof. F. Lacava, Sapienza University

## High School Graduation

*Liceo Scientifico Francesco Severi* [ 01/09/2010 – 01/07/2015 ]

Address: Frosinone (Italy)

Graduated from "Liceo Scientifico Francesco Severi" of Frosinone (scientific oriented high school) on 09/07/2015

Final grade: 100/100 cum laude

## Summer School Course in English

*Liverpool School of English* [ 08/2013 – 08/2013 ]

Address: Liverpool (United Kingdom)

Attended and completed a 2-week Intensive English Language Course during August 2013.

Course level: Advanced

## Summer School Course in English

*Emerald Cultural Institute* [ 07/2012 – 08/2012 ]

Address: Dublin (Ireland)

Attended and completed an Intensive English Language Course from 24/07/2012 to 3/08/2012

Course level: Upper-Intermediate

## DIGITAL SKILLS

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Microsoft Word / Microsoft Powerpoint / Microsoft Excel / ECDL Certificate / Procedural and object-oriented programming

### Programming languages used

C and C++ / Python / Wolfram Language + Wolfram Mathematica / Matlab / LateX Document preparation

## LANGUAGE SKILLS

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Mother tongue(s):

**Italian**

Other language(s):

**English**

**LISTENING C1 READING C1 WRITING B2**

**SPOKEN PRODUCTION B2 SPOKEN INTERACTION B2**

**French**

**LISTENING A1 READING A1 WRITING A1**

**SPOKEN PRODUCTION A1 SPOKEN INTERACTION A1**

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CV redatto al fine della pubblicazione.

Roma, 19/04/2021

F.to GIULIA MANICCIA