

UNIVERSITÉ
CÔTE D'AZUR



ÉCOLE UNIVERSITAIRE DE RECHERCHE
**SCIENCES FONDAMENTALES
ET INGÉNIERIE**

Master's degree

**FUNDAMENTAL PHYSICS
AND APPLICATIONS**

WAVES, ATOMS AND MATTER

A WORD FROM THE HEAD OF THE PROGRAM



Fabrice Mortessagne
Professor and researcher
Nice Institute of Physics

“The Waves, Atoms and Matter (OAM) pathway is **an academically demanding program taught at the Nice Institute of Physics (INPHYNI) by faculty members, researchers, and research engineers affiliated with this internationally recognized laboratory.**

This **dedicated teaching team** leads a program that combines **high standards with individual support**, preparing professionals in physics who are both successful and well-rounded. Their goal is to help students **reach their full potential** within a dynamic cohort through **weekly group meetings, and project-based teaching methods** (used in at least 40% of the courses).

The team remains available at all times to answer scientific questions or provide personal guidance.

Full immersion in the INPHYNI laboratory gives students access to a vibrant research community working across a wide range of fields and technologies, from complex fluid physics to quantum optics, from the design of microfluidic channels to the control of light-matter interaction with power lasers.

The OAM master's program offers every student the opportunity **to build the foundations of a successful future career through a demanding yet stimulating curriculum**, supported by a committed **and caring teaching staff.**”



fundamental and
applied expertise



project-based
learning



immersion at the Nice
Institute of Physics



a wide range
of careers

A HIGH-LEVEL GENERALIST EDUCATION IN PHYSICS

The Waves, Atoms and Matter program at Université Côte d'Azur aims to **prepare students to become professional physicists, researchers, engineers, or scientific managers capable of applying their skills and expertise across a wide range of business sectors.**

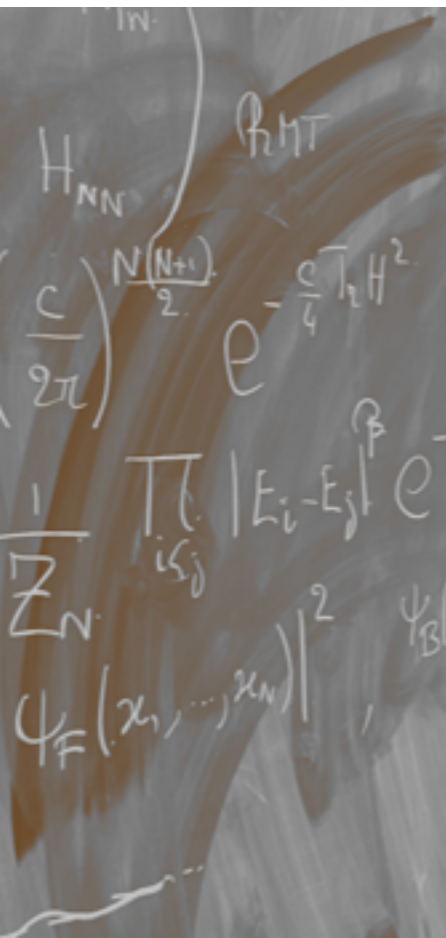
The two-year program is fully embedded in the stimulating professional environment of INPHYNI, **where students interact daily with members of the laboratory.** Many professors, researchers, and engineers from INPHYNI are part of the teaching team.

Strongly rooted in fundamental physics, the program progressively explores more advanced concepts

while maintaining a balance between theoretical approaches and experimental developments. **Students can choose project-based modules and laboratory internships (three to six months)**, which both guide their chosen career path and foster agility, autonomy, and professional networking.

The program is primarily designed to prepare students for doctoral studies and research on a wide range of topics, from fundamental physics to cutting-edge R&D in collaboration with industry or startups.

Graduates have also successfully pursued careers in other areas, such as engineering, secondary education, and even finance.



THE MAIN FOCUSES OF THE PROGRAM

Advanced theoretical physics

- **Key multidisciplinary and theoretical concepts:** quantum fluids, statistical physics, dynamical systems, hydrodynamic waves and instabilities, quantum physics, etc.

Mathematical and digital methods

- **Essential tools for studying and modeling physical phenomena:** molecular dynamics, Monte-Carlo methods, stochastic processes, complex analysis, etc.

Experimentation and laboratory techniques

- **Experimentation, laboratory work and practical application of concepts:** hydrodynamics, nonlinear optics, laser physics, biophysics and condensed matter.
- **Training in a professional setting with laboratory engineers and technicians** to learn specific experimental techniques

Professional development

- **Scientific communication:** communicating research results effectively (writing and speaking)
- **Laboratory internships:** immersion in a public or private research environment, in France or abroad
- **Contemporary physics workshop:** a different theme every year. Over the last three years: active matter, time, artificial intelligence



100% EMPLOYABILITY RATE

Of the students who have completed the program: **60% were accepted into doctoral programs** in France and abroad, in leading laboratories and across all physics disciplines; **30% were hired as engineers**, in roles ranging from innovation consultants to design engineers in micro-electronics; **10% pursued careers in secondary education**.

[Observatory of Student Life and Professional Integration - Université Côte d'Azur](#)

3 MAJOR PARTNERSHIPS WITH DEEP TECH

To provide internship and thesis opportunities in applied research and R&D, the **Waves, Atoms and Matter** master's program has developed key collaborations with **Fastlite** (specialist in the control and measurement of ultrafast laser pulses), **Klearia** (microfluidics applied to chemistry), and the startup **Ncodin** (optical interconnections).



EXAMPLES OF CAREER OPPORTUNITIES

Researcher or faculty member

Heads fundamental and applied research, supervises research and/or academic programs, coordinates research projects, drafts grant proposals, and contributes to the dissemination of knowledge (publications, conferences).

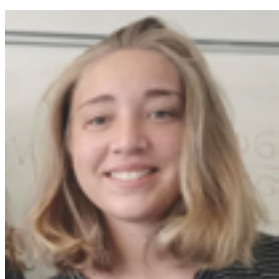
Research engineer or project engineer

Contributes to research, collaborates with public and private teams in commercializing research results in fields such as optics, materials, fluid mechanics and quantum physics; coordinates research and development projects.

Technological innovation project manager

Leads projects straddling science and industry, manages teams and implements technical solutions in a variety of sectors (renewable energies, telecoms, optics) that combine research and industrial applications.

AN ALUMNI SHARES HER EXPERIENCE



Theoretical physics researcher
University of Northern British Columbia

“ The Master’s program in Waves, Atoms and Matter is highly relevant in the context of contemporary research. **It gradually prepared me for my career and allowed me to specialize in quantum physics while staying open to a wide range of fields.** The depth and variety of the curriculum were invaluable. The program’s strength lies in its breadth: **it leads equally to research, both theoretical and experimental, and to careers in industry.** Through the projects and internships included in the program, I gained hands-on experience working with the research teams of the Nice Institute of Physics **and learned to work independently.** At the end of my final internship, the solid foundations I had acquired opened the door to a doctorate in theoretical physics at Université Côte d’Azur, followed by a postdoctoral position abroad at the University of Northern British Columbia (Canada). ”



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CONTACT

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