

# **Thematic school GWsNS-2026: Gravitational Waves from Neutron Stars**



**Sunday, 28 June 2026 - Friday, 3 July 2026**

**Station Biologique de Roscoff**

## **Scientific Programme**

Neutron star physics requires a broad spectrum of interdisciplinary skills, which are typically not all covered in a single master's program. The school format, with a limited number of teachers, will allow each instructor to develop the topics in detail and support them with exercises and numerical applications.

**Teaching Format:** 5-day residential school with two main sessions per day (3h each). Each lecturer will cover 6h of teaching (theory+practice). The school will host evening discussions. Lectures will run **from Monday morning (29/06/2026) to Friday late morning (03/07/2026)**, ending just before lunch.

**Materials:** All materials (slides, codes, data) released under open licence after the school. The materials of the GWsNS-2023 edition can be found at: <https://indico.in2p3.fr/event/28236/>

**Poster sessions and talks:** Following the format of GWsNS-2023, all participants are warmly encouraged to propose a poster and/or a short flash talk (about 5 minutes). These contributions are a key part of the school: they help everyone introduce their work, spark questions, and create concrete starting points for discussion throughout the week.

Because the number of talk slots is limited, the organisers will confirm flash-talk selections after registration. Posters, however, are strongly encouraged for all participants, and will be featured in daily poster sessions designed for active, informal scientific exchange.

## Lecturers and topics

### Microscopic and macroscopic structure of neutron stars

Lecturer: Prof. **Nicolas Chamel**, Université Libre de Bruxelles

- Composition of the crust and core
- Effects of superfluidity and superconductivity

### Coalescence of binary neutron stars and multi-messenger astrophysics

Lecturer: Prof. **Albino Perego**, Università di Trento

- Electromagnetic counterparts and nucleosynthesis

### Astrophysical parameter estimation and population studies

Lecturer: Prof. **Michele Mancarella**, Aix-Marseille University

- Bayesian inference methods
- Constraints on the equation of state

### Continuous gravitational waves and instabilities

Lecturer: Prof. **Paola Leaci**, University of Rome "La Sapienza"

- Oscillations, normal modes, rotational instabilities
- Observational approaches and astrophysical constraints

### Modeling of dense matter and supernovae

Lecturer: Prof. **Fiorella Burgio**, INFN Catania

- Equations of state at high density and temperature
- Phase transitions and observable implications

Coordination of practical sessions: Dr. Philip Davis (LPC Caen)