

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 and a public lecture by Éric Gourgoulhon (CNRS – Observatoire de Paris).

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/>

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: Philip Davis (LPC Caen)