Lab project M1 PPN & QuanTEEM

04/05/2026 – 19/06/2026

Title of the project: Open project in nonlinear optics / wave physics / theoretical physics

Supervisor(s): Theo Torres (theo.torres@ube.fr)

Laboratory / Department / Team : ICB / Photonique / SAFIR

Collaborations:

Summary:

This laboratory project is deliberately open in structure: it comes with no predefined tasks or fixed objectives. Instead, it offers motivated students the opportunity to conceive, design, and carry out their own research project in physics. The core aim is for you to identify, formulate, and investigate a scientific question that genuinely sparks **your** curiosity, and to explore it together. This is an opportunity to transform your own ideas into a structured research project. My role will be to act as a scientific and technical guide—helping you refine a broad intuition into a clear question, define a realistic methodology, and develop a coherent and rigorous line of inquiry.

To ensure that the project is both feasible and scientifically meaningful within the internship timeframe, your proposed topic should align, at least partially, with my research interests and expertise: In a few words, I am a multidisciplinary researcher with interests ranging from nonlinear optics to general relativity and black hole physics. My projects aim at bringing together fundamental gravity-inspired concepts with scalable photonic systems. Here are a few keywords associated with current research topics: Temporal reflection in optical fibres, topological insulators, resonances of Non-Hermitian operators, homogenization method in wave propagation, semiclassical methods. These topics are indicative rather than restrictive: they are starting points for discussion. I strongly encourage interested students to meet with me, or to send me an email (theo.torres@ube.fr) so that we can identify a project that matches both your interests and my expertise.

Beyond deepening your knowledge of physics, this internship is designed to develop essential research skills: critical thinking, problem formulation, creativity, and scientific communication. By the end of the project, you will have gained hands-on experience in shaping and conducting an original piece of research from concept to structured outcome.

Type of project (theory/experiment): I imagine the project to be mainly theoretical/numerical but I am open to discuss experimental projects as well.

Required skills: