

PHD POSITION IN EXPERIMENTAL PHOTONICS

Coherence and phase ordering dynamics in mode-locked lasers

What we look for

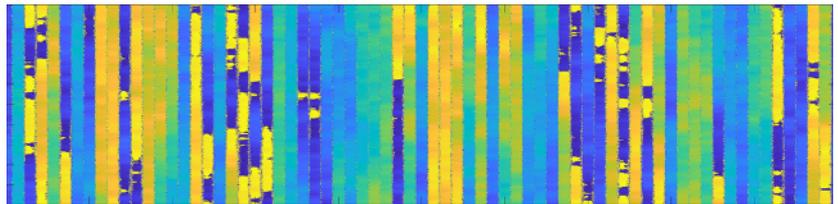
- Highly motivated PhD students
- Capable of adopting an international role mediating between experiment & theory
- Passion for nonlinear physics
- Strong background (master) in either photonics, electrical engineering, nonlinear science, or theoretical nonlinear physics
- Good speaking and writing skills in English

What we offer

- 48 months of funding
- International attractive training ground involving Spain (UIB), Germany (WWU) and France (INPHYNI)
- An exciting project in a great research framework

Formalities

- Starting date: **01/09/2023**
- Open to applications until position is filled, tentatively until **15/12/2022**
- Application submission to **julien.javaloyes@uib.es**



Detailed description:

Phase transitions and self-ordering processes are ubiquitous in nature and control the synchronisation of clocks or fireflies to cite but a few. Similar processes may occur in the dynamics of mode-locked lasers. The research work will consist in building up and performing the full characterisation of a fibre-based semiconductor laser actively mode-locked by a Lithium Niobate modulator and studying the phase dynamics of the pulses circulating in the cavity.

This position is funded for a period of 48 months by a FPI grant within the framework of the Spanish national project KEFIR (KErr Frequency combs in Injected dispersive bRoad area micro-cavities) recently funded by the Spanish ministry of science and innovation (PID2021-128910NB-I00).

The starting date is the first of **September 2023** and the research work will be experimental. The research will be conducted in our laboratory situated at the campus of the University of the Balearic Islands in Palma de Mallorca, Spain. It will be developed in close collaboration with our experimental and theoretical colleagues from the Institut de Physique de Nice (INPHYNI), France, and from the University of Münster, Germany.

This PhD work will integrate in the larger framework of an experimental study of frequency combs in optical microcavities. The latter recently received an international funding from both France and Germany (ANR-DFG) in which the University of Balearic Islands is an official partner.

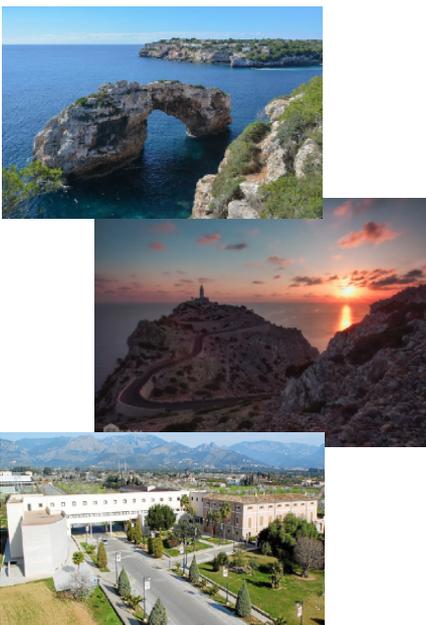
Your application:

Your application should contain

- curriculum vitae
- Master & bachelor transcripts (incl. marks)
- letter of motivation
- contact information of two referrals

Beyond work:

Mallorca is one of the Spanish Balearic islands in the Mediterranean sea. It is famous for its seaside resorts, protected coves, limestone mountains and Moorish and Roman ruins. Palma, its capital, offers nightlife spots, the Moorish Royal Almudaina Palace and the 13th-century Palma de Mallorca Cathedral. Among the stone villages are Pollença, with its art galleries and music festival, and Fornalutx, on the hillside and surrounded by citrus groves.



Source: [Wikipedia](#)

What we offer:

The Nonlinear Waves Group (ONL) possesses an internationally recognised expertise on the dynamics of semiconductor mode-locked lasers, time delayed systems and soliton dynamics. The latter can be assessed from the consistent and high quality scientific output of the group, see Refs. [1–10], or our complete list of [publications](#). His principal investigator, Dr. Julien Javaloyes, has been involved into the analysis and the modelling of semiconductor lasers for more than 20 years.

The ONL group at the University of Balearic Islands is part of the Institute of Applied Computing & Community Code, the IAC₃. The IAC₃ comprises six groups with topics ranging from nonlinear dynamics, high performance computing, mathematics, general relativity and stellar physics.

Conditions & Comments:

Having finished the Master degree at the time of the application is not mandatory but the candidate must have completed the Master degree by the start date of the grant on the **first of September 2023**.

We strongly encourage international applications. The University of Balearic Islands is an equal opportunity employer. We explicitly encourage female researchers to apply for the offered position. Among equally qualified applicants, disabled candidates will be given preference.

References:

- [1] J. Javaloyes et al. *Technical Report*, 2012. [[link](#)].
- [2] M. Marconi et al. *Phys. Rev. Lett.*, 112:223901, 2014, [[link](#)].
- [3] M. Marconi et al. *Nat. Photon.*, 9:450, 2015. [[link](#)].
- [4] J. Javaloyes. *Phys. Rev. Lett.*, 116:043901, 2016, [[link](#)].
- [5] J. Javaloyes et al. *Phys. Rev. Lett.*, 119:033904, 2017, [[link](#)].
- [6] D. Chaparro et al. *Photon. Res.*, 5:37–40, 2017, [[link](#)].
- [7] M. Marconi et al. *Phys. Rev. X*, 8:011013, 2018, [[link](#)].
- [8] D. Chaparro et al. *Phys. Rev. Lett.*, 120:064101, 2018, [[link](#)].
- [9] C. Schelte et al. *Phys. Rev. Lett.*, 123:043902, 2019, [[link](#)].
- [10] T. G. Seidel et al. *Phys. Rev. Lett.*, 128:083901, 2022, [[link](#)].

<https://onl.uib.es/publications.html>