

PhD position on highly-stable broadband optical frequency combs in optomechanical cavities

Nanophotonics Technology Center

(Universitat Politècnica de València, Spain)

Optical frequency combs (OFCs) are key tools for applications like spectroscopy, communications, and signal synthesis. Conventional Kerr-based microcombs in ring resonators on photonic integrated circuits offer wide bandwidth and stability but require high driving power (> 100 mW) as well as large footprints to achieve GHz-level spacing, limiting their practicality. Optomechanical combs (OMCs) provide an alternative, enabling much lower power thresholds and smaller footprints while achieving narrow line spacings. However, they typically generate only a few lines, suffer from higher phase noise, and face material limitations when built on silicon. Despite these challenges, compact and stable OMCs hold strong potential for future use in microwave generation, spectroscopy, and sensing, provided key technical issues are addressed.

We are offering a PhD position at the Nanophotonics Technology Center (<https://ntc.webs.upv.es/>) to work on the design and experimental demonstration of highly-stable broadband OMCs with GHz spacings and sub-mW driving powers (fabricated in-house with silicon and other materials) in the context of the recently awarded *Plan Nacional* project INCEPTION (PID2024-157370NB-I00).

Candidates must have a degree in physics or electrical/telecommunications engineering. Master's studies in optics and/or nanotechnology will be highly valuable. A high level of English is mandatory. Other profiles may eventually be considered. Candidates should also have EU citizenship or a Spanish residence permit. Salaries will be according to standard FPI/FPU grants in Spain.

Interested candidates should send a motivation letter (1 page) and a short CV to both Prof. Alejandro Martínez (amartinez@ntc.upv.es) and A/Prof. Carles Milián (carmien@upvnet.upv.es).

Application deadline: September 15th, 2025

Starting date: October/November 2025