SEMINAR: Topological light for communicating, sensing, and trapping

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Seminarios

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Hora: Desde 16:30h a 17:30h
Lugar: Seminar Room

Comparte

Topological complex electromagnetic waves give access to nontrivial light-matter interactions and provide additional degrees of freedom for information transfer. For instance, topologically stable quasiparticles or skyrmions have been demonstrated in quantum fields, solid-state physics, and magnetic materials, but only recently observed in photonic fields, triggering fast expanding research across different spectral ranges and applications. Here I introduce an extended family of photonic skyrmions within a unified framework, starting from fundamental theories to experimental generation and topological control in spatiotemporally structured light. I will further highlight generalized classes of structured wave topological quasiparticles beyond optical skyrmions and outline their exotic topological robust properties, emerging applications, future trends, and open challenges.

Refs: ***Nat. Photonics*** **18**, 15-25 (2024); ***Nature*** **638**, 394-400 (2025); ***Adv. Opt. Photonics*** **17**(2) 295-374 (2025); ***Optics & Photonics News*** **36**, 26-33 (2025); ***Nat. Electron.*** **9**, 479–488 (2026)