

ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 1 December 2016

17:00 -18:00

3rd Floor Seminar Room

**"Interplay of amplification and dissipation
in complex photonic media"**

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Abstract

For more than thirty years several novel passive and active photonic structures have been investigated for the efficient control and manipulation of light. One fundamental problem in many different areas of photonics is the existence of optical losses due to the inherent absorption of the materials. As the paradigm of parity-time symmetric optics indicates [1, 2], the resolution of this problem is the interplay of gain and loss as an extra degree of freedom for creating a new generation of devices and systems with novel functionalities. The central theme of this talk is that of wave dynamics in non-hermitian photonic media, with emphasis on amplification of light in lossy structures [3], constant-intensity waves [4, 5] and topological bound states in non-hermitian crystals [6].

References

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- [2] C. E. Rüter, K. G. Makris, R. El-Ganainy, D. N. Christodoulides, M. Segev, and D. Kip, *Nat. Phys.*, 6 (2010), 192.
- [3] K. G. Makris, L. Ge, and H. Türeci, *Phys. Rev. X*, 4 (2014), 041044.
- [4] K. G. Makris, Z. H. Musslimani, D. N. Christodoulides, and S. Rotter, *Constant-intensity waves and their modulation instability in non-hermitian potentials Nat. Comm.*, 6 (2015), 7257.
- [5] K. G. Makris, A. Brandstötter, P. Ambichl, Z. H. Musslimani, and S. Rotter, *Submitted*, (2016).
- [6] S. Weimann, M. Kremer, Y. Plotnik, Y. Lumer, S. Nolte, K. G. Makris, M. Segev, M.C. Rechtsman, and A. Szameit, *Accepted to Nat. Mater.*, (2016).