



University of Crete  
Department of Physics

## Physics Colloquium

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Thursday, 28 November 2019 | 17:00 – 18:00, Seminar Room, 3rd floor

### Engineering Anyons

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#### ABSTRACT

*I will present some topics of research related to synthetic topological quantum matter, and the main focus will be given to synthesis of anyons. Anyons are particles that exist in two-dimensional systems that are neither bosons nor fermions, but something in between. There has been growing interest in these systems because so-called non-Abelian anyons hold promise for fault-tolerant topological quantum computing. I will present a few possible routes to engineer anyons. One route is in a 2D electron gas in a strong magnetic field sandwiched between metamaterials with high magnetic permeability, which induce electron-electron vector potential interactions. In another, I will present a scheme for the experimental realization of synthetic anyons in noninteracting systems. This idea breaks a paradigm that anyons are excitations upon strongly correlated topological states of matter.*