Departamento de Física de la Materia Condensada

Universidad Zaragoza

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Machine learning with complex quantum systems

Non-conventional computing inspired by the brain, or neuromorphic computing, is a successful approach in a broad spectrum of applications. In the last few years, different architectures have been explored also in quantum systems, as for Quantum Reservoir Computing. Quantum physical reservoirs have the potential to boost the processing performance in temporal tasks by exploiting quantum coherence, not requiring error correction. Furthermore this approach is naturally suited for fully quantum information processing (with quantum inputs). In this talk we will briefly review the state of the art and focus on recent results exploring the potential of different platforms and operation regimes, the role of quantum coherence and entanglement, and how to overcome the challenges of real-time quantum reservoir computing.

Roberta Zambrini is a CSIC senior scientist at the Institute for Cross-Disciplinary Physics and Complex Systems (IFISC). Her research focuses on complex quantum systems, quantum optics and recently on quantum machine learning. She has published more than 90 articles, supervised 4 PhD thesis (5 in progress), coordinated European, national and regional projects, being at present guarantor of the IFISC Maria de Maeztu. In 2020 she lead the CSIC white paper on Digitalization. She has been manager of AEI (Quantum and Matter Physics, 2021-2024) and is associate editor of Physical Review Letters. She is part of the initiative Woman for Quantum.

Con la colaboración de:

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