nano·X invited scientist

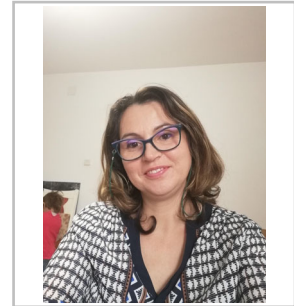## Maria Anastasia Jivulescu

Position   Associate Professor

Affiliation Department of Mathematics, University Politehnica Timisoara
Piata Victoriei, no 2
Romania

Host lab at NanoX   LPT   Team

NanoX contact Ion Nechita

Dates of stay   01.06.2023-31.07.2023

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Brief Biodata

I work in the field of Quantum Information Theory and Mathematical Physics, with focus on the theory of entanglement states and quantum measurements. I have a Phd degree in Mathematics since 2008 and I have published 27 papers in my field of research. I like reading, biking and enjoying sunny days around the nature.
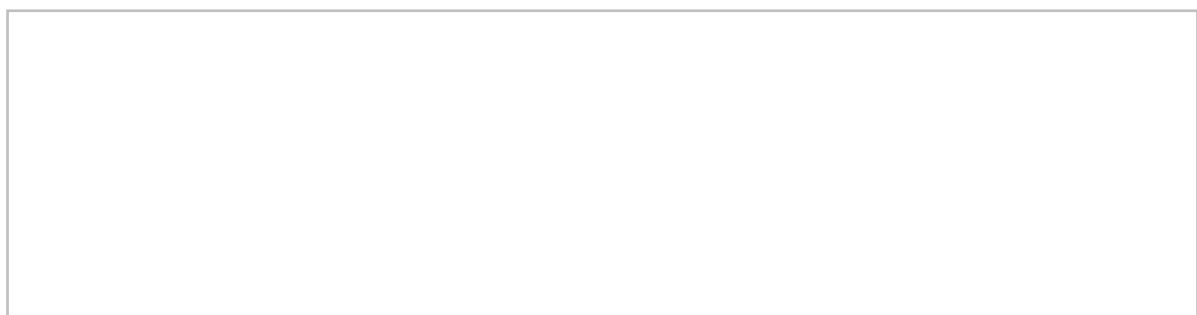
Research project during the visit at nanoX

Detecting entanglement in multipartite quantum states

During my visit to NanoX Lab we plan to apply the entanglement testers theory introduced recently in[MJ22] to more recent entanglement criteria such as the class of correlation matrix criterion and covariance matrix criterion [Kia20]. We aim to put under the same umbrella all these criteria and to unify the theory of entanglement criteria by using our tools. It is worth mentioning that this approach has been proven to be successful in the case of CCRN, enhanced CCRN and entanglement criterion based on SIC POVMs, as we show in our past work [MJ22]. We believe that our approach is beneficial also from the point of view of an efficient way to establish in rigorous manner the relative strength of various computable criteria discussed in the literature. We already had results that our strategy is working in proving hat the conjecture from [SAZG18] is true, showing that SIC-POVM tester is better at detecting entanglement compared to CCRN tester.

[MJ22] M.A. Jivulescu, Cecilia Lancien, Ion Nechita . Multipartite entanglement detection via projective tensor norms. Annales Henri-Poincare, 47, 2022.
[Kia20] H. Kiara. Quantum entanglement: a study of recent separability criteria. Master Thesis, 2020
[SAZG18] J. Shang, A. Asadian, H. Zhu and O. Guhne. Enhanced entanglement criterion via symmetric informationally complete measurements. Phys. Rev. A, 98(2):022309, 2018.

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