IV School on Light and Cold Atoms

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ICTP-SAIFR, São Paulo, Brazil

Venue: ICTP-SAIFR/IFT-UNESP
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https://www.ictp-saifr.org/slca2025/

- **Donda Acosta, Inara Yasmin** (Instituto de Física de São Carlos, Brazil): *Levitation system for ultracold atomic cloud of potassium-39*

Ultra-cold gases are produced in highly isolated environments and manipulated using magnetic fields and laser beams. In this context, various types of traps are employed to create atomic clouds with distinct geometries and dimensions. Despite efforts to isolate the system from external perturbations, one unavoidable factor remains: the gravitational force exerted by the Earth. Methods for compensating this force, capable of levitating the atomic cloud, have been widely adopted in ultra-cold gas experiments. They are particularly crucial in setups involving vertical imaging (as in the experiment related to this project), where the free fall of the cloud leads to image de-focusing. In this project, we propose the development of a magnetic levitation system to be implemented in a new experimental setup under construction at IFSC, which aims to produce two-dimensional Bose gases. This system is essential for improving imaging quality and ensuring precise control of the atomic cloud's position during the experiment.