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Gravitational lensing in the era of brokers

Monday, May 6, 2024 2:00 PM (30 minutes)

The new era of wide-field time-domain surveys will open a new window to gravitational lensing phenomena, leading to the discovery of strongly lensed transients and enabling the discovery of microlensing events across the celestial sphere. For example, the Vera Rubin Legacy Survey of Space and Time (LSST) is expected to find on the order of a hundred strongly lensed supernovae, which will enable precise and independent measurements of the expansion rate of the Universe, shedding light on the so-called "Hubble tension". On the other hand, the detection of microlensing along new directions in the sky will help to build a census of the distribution of compact objects across the galaxy, including planets, black-holes and dark matter in the form of condensed structures. To fully exploit the applications of the strongly lensed transients as well as the transients from lensing (i.e. microlensing) requires the real time identification of these phenomena. In the case of LSST, this means spotting the few relevant events among the expected ten million alerts per day, which is typically a task delegated to the brokers. In this talk we discuss some of the expectations for lensing in LSST, the needs for real time follow-up observations, and ongoing work to help identify the strongly lensed transients and the microlensing events in LSST data.

Presenter: Dr MAKLER, Martin (UNSAM/CBPF)

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