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☐ **Contexte scientifique**

The Vera Rubin Observatory is a new large telescope which will achieve first-light in early 2025. It will perform the Large Survey of Space and Time (LSST) starting end of 2025 for a duration of 10 years. LSST will provide an unprecedented snapshot of the Small Bodies of the Solar System which are to the study of the solar system the equivalent of radiogenic isotopes to the study of rocs.

☐ **Objectif(s)**

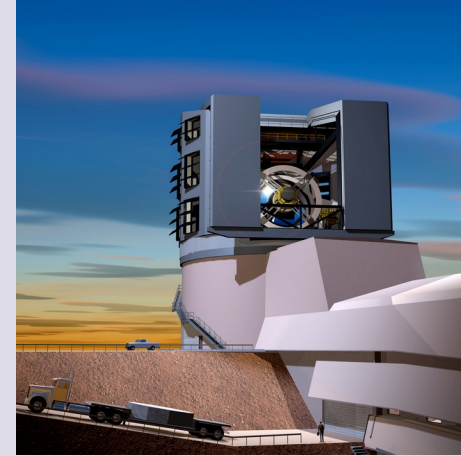
[OSSSB@LSST](#) will use the survey to better understand the populations of OSSSB by increasing by an order of magnitude the size of the known sample. OSSSB are the less evolved populations of the solar system and contain invaluable clues on its formation and early evolution.

☐ **Approche, méthodes, verrou/défi scientifique**

The full scientific exploitation of the [OSSSB@LSST](#) survey requires to provide 2 pieces of processing pipelines:

Detection: optimize and parallelize on GPU our detection algorithmes, relying on 2 separate detection methods to drastically decrease the number of false positives;

Caractérisation: since the survey CANNOT be complete at small sizes, we must determine our detection efficiency as a function of observing parameters inorder to connect to the real populations; we invision developping new *Machine Learning* methods to process this huge dataset.



❑ Expected results

A 10 times large sample of OSSSB with exquisite dynamical classification. This will provide strong constraints on models of formation and primordial evolution of the outer solar system.

❑ Socio-economical and society impacts

[OSSSB@LSST](#) will place us in the future of astronomical observations, which will allow us to attract new smart students and colleagues from all over the world and open new teaching opportunities at the Graduate and PhD thesis level.

❑ Link Teaching/Research, Public Outreach

The new LSST data and related scientific issues will challenge the students of the international CompuPhys master during the very numerous numerical projects and internships of the curriculum. Notably, we'll propose internships of image analysis coupled with machine learning methods.

❑ National and international collaborations

national: thanks to this project, we apply for an ANR project to gather the French efforts in the study of OSSSB at LSST;

international: LSST is by essence an international project. [OSSSB@LSST](#) will durably strengthen the place Besançon astronomy in the international landscape.

