

## **Cosmology @EOSC: the HPC Universe in the Cloud**

The new generation of upcoming galaxy surveys will measure the effect of dark energy on the expansion history of the universe. They will obtain in the next decade dozens of millions of galaxy data, constructing a 3-D map spanning the nearby universe to 10 billion light-years, and will provide an accurate determination of the distance-redshift relation. Extracting cosmological information on the nature of the dark matter-energy components of the universe and unveiling new physics from these experiments requires to run highly demanding HPC cosmological simulations with extraordinary high numerical resolution for a huge volume. The new Uchuu N-body simulation (Universe in Japanese) meets all these requirements. The simulation is finished and we have been able to obtain all necessary results from the extensive analysis of the Uchuu raw particle data (more than 6 petabytes!) to generate galaxy formation semi-analytical models and gravitational lensing maps in order to produce high-fidelity galaxy mocks that are close to what will be observed by those large surveys. The final Uchuu products can only be disseminated to the public in a Cloud Computing Platform. I will give an overview about the science context, impact of the project, description of the products, analysis tools, dissemination plan and cloud support needs.

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**Session Classification:** IBERGRID Contributions

**Track Classification:** Cooperation between Iberian Research Communities