

# **Euclid-Rubin France joint workshop**

## **Rapport sur les contributions**

ID de Contribution: 1

Type: **Non spécifié**

## **Rubin-Euclid DDPs**

*jeudi 5 décembre 2024 10:00 (30 minutes)*

**Orateur:** JULLO, Eric (LAM)

**Classification de Session:** Presentations

ID de Contribution: 2

Type: **Non spécifié**

# Probabilistic characterization of blending in Rubin/LSST: application to cluster lensing cosmology

*jeudi 5 décembre 2024 10:45 (15 minutes)*

The upcoming deep optical surveys, such as the Vera C. Rubin Observatory Legacy Survey of Space and Time (LSST), are set to explore the Universe to unprecedented depths, uncovering billions of galaxies. This amount of detection from the ground will lead to the apparent superposition of galaxies in the images, a phenomenon known as blending. This poses a significant challenge for the precise measurement of individual galaxy properties, especially shapes and redshifts, which are crucial for estimating the masses of large-scale structures, such as galaxy clusters, through weak gravitational lensing.

This talk will introduce an innovative matching approach to properly detect and characterize blended systems in simulated catalogs, in preparation for the future LSST data. The technique employs new metrics —probability of matching and blending entropy— to distinguish recognized and unrecognized blends. It is implemented in the friendly algorithm, developed for the major and international Dark Energy Science Collaboration (DESC) of LSST.

We use it to address the issue of blending in galaxy cluster mass estimates, demonstrating its efficiency. We find that cutting on blending entropy excludes the third of detected galaxies that are strongly impacted by blending from the dataset. We thus demonstrate that blending can cause a low bias in the amplitude of cluster weak lensing profiles, affecting the mass estimates of galaxy clusters. Furthermore, the broader impact of blending on the cosmological parameters  $\Omega_m$  and  $\sigma_8$  from cluster lensing, and how the friendly procedure can mitigate these effects will be discussed.

**Auteur principal:** RAMEL, Manon (LPSC / IN2P3)

**Orateur:** RAMEL, Manon (LPSC / IN2P3)

**Classification de Session:** Presentations

ID de Contribution: 3

Type: **Non spécifié**

## Joint Rubin/Euclid image deconvolution

*jeudi 5 décembre 2024 11:00 (15 minutes)*

We present a novel multi-band deconvolution technique aimed at improving the resolution of ground-based astronomical images by leveraging higher-resolution space-based observations. Our method focuses on the joint deconvolution of LSST and Euclid images, effectively utilizing the overlapping spectral coverage of the Rubin r,i, and z-bands with the Euclid VIS band. We also describe the performance of DRUNet to further denoise the deconvolved images.

**Auteur principal:** AKHAURY, Utsav (EPFL)

**Co-auteurs:** COURBIN, Frederic (EPFL); STARCK, Jean-Luc (CosmoStat, CEA Paris-Saclay); JABLONKA, Pascale (Observatoire de Paris / EPFL)

**Orateur:** STARCK, Jean-Luc (CosmoStat, CEA Paris-Saclay)

**Classification de Session:** Presentations

ID de Contribution: 5

Type: **Non spécifié**

## Euclid and Rubin Cluster and protocluster detection and cosmology

*jeudi 5 décembre 2024 11:15 (15 minutes)*

We will describe the research work in galaxy cluster science of the APC Rubin/Euclid team, focusing on the team of students and postdocs supervised by Simona Mei and Jim Bartlett. We developed classical and ML algorithms for cluster detection, and the estimation of algorithm selection function. We also focus on the study of galaxy evolution in galaxy clusters and protoclusters

**Auteur principal:** MEI, Simona

**Co-auteurs:** WIDMER, Anaïs; MURRAY, Calum (APC , University of Paris); CLELAND, Cressida (APC); BOUTIGNY, Dominique (LAPP); BARTLETT, James (APC); GRISHIN, Kirill (Université de Paris); Dr AGUENA, Michel (APC); MAI, Nicolas (APC); GALLEGGO, Sofia; ILIC, Stéphane (IJ-CLab); TRAN, Vinh-Phat

**Orateur:** MEI, Simona

**Classification de Session:** Presentations

ID de Contribution: 6

Type: **Non spécifié**

## Flash talks from DDP members

*jeudi 5 décembre 2024 10:30 (15 minutes)*

**Classification de Session:** Presentations

ID de Contribution: 7

Type: **Non spécifié**

## **Status and current plans for Euclid and Rubin data hosting and processing at CC-IN2P3**

*jeudi 5 décembre 2024 14:45 (20 minutes)*

**Orateur:** LE BOULC'H, Quentin (CC-IN2P3)

**Classification de Session:** Plenary discussions

ID de Contribution: **8**

Type: **Non spécifié**

## **1-slide reports from science discussions**

**Classification de Session:** Plenary discussions