

Project 124: DESI Strong-Lensing

Secondary Target Program: Spectroscopic Confirmation of Strong Gravitational Lens Candidates in DESI

[Huang et al 2020, 2021](#)

Proposal submitted in Sept 2021 to follow ~ 100 SL sources with VLT & Magellan

Scientific objectives

- Build SL models
- Characterize the density profile of galaxies in groups
- Constrain ML selection function of SL
- Discover new intervening absorbing systems, to study their CGM

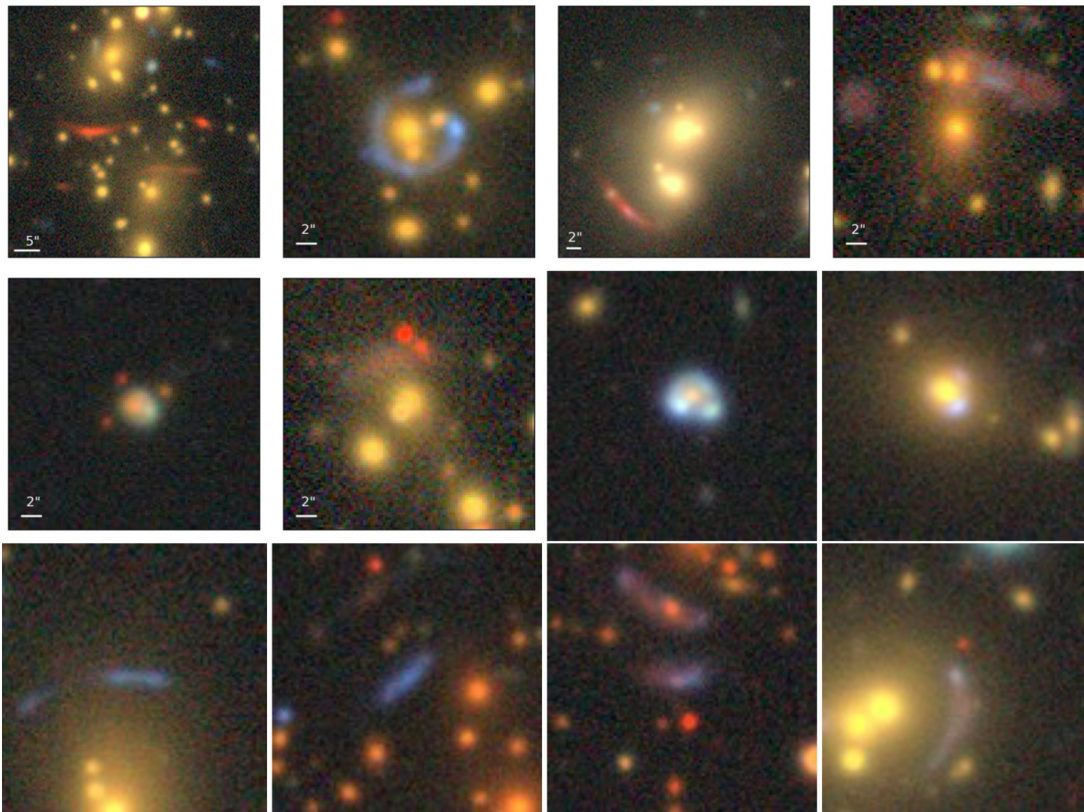


Fig.1 Selection of the brightest $r < 21(AB)$ strong-lensing arcs of the DESI strong-lensing sample, with $\delta < -20$.

Project 169: Clustering of DESI galaxies with Uchuu light cones

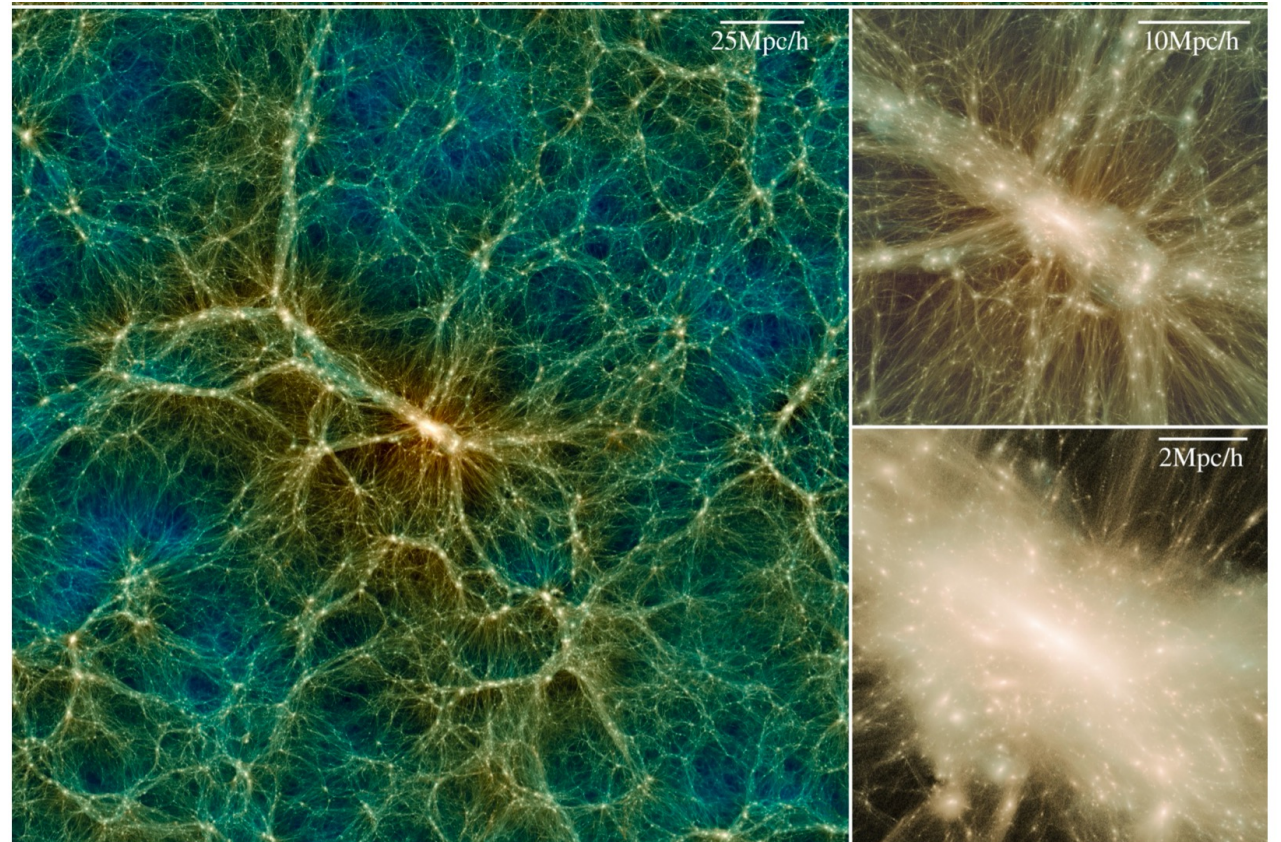
Uchuu DM-only simulation:

$L_{\text{box}} = 2\text{Gpc}/h$, 12800^3 particles, $m_p = 3.27 \times 10^8 \text{ Msun}/h$

Lensing products

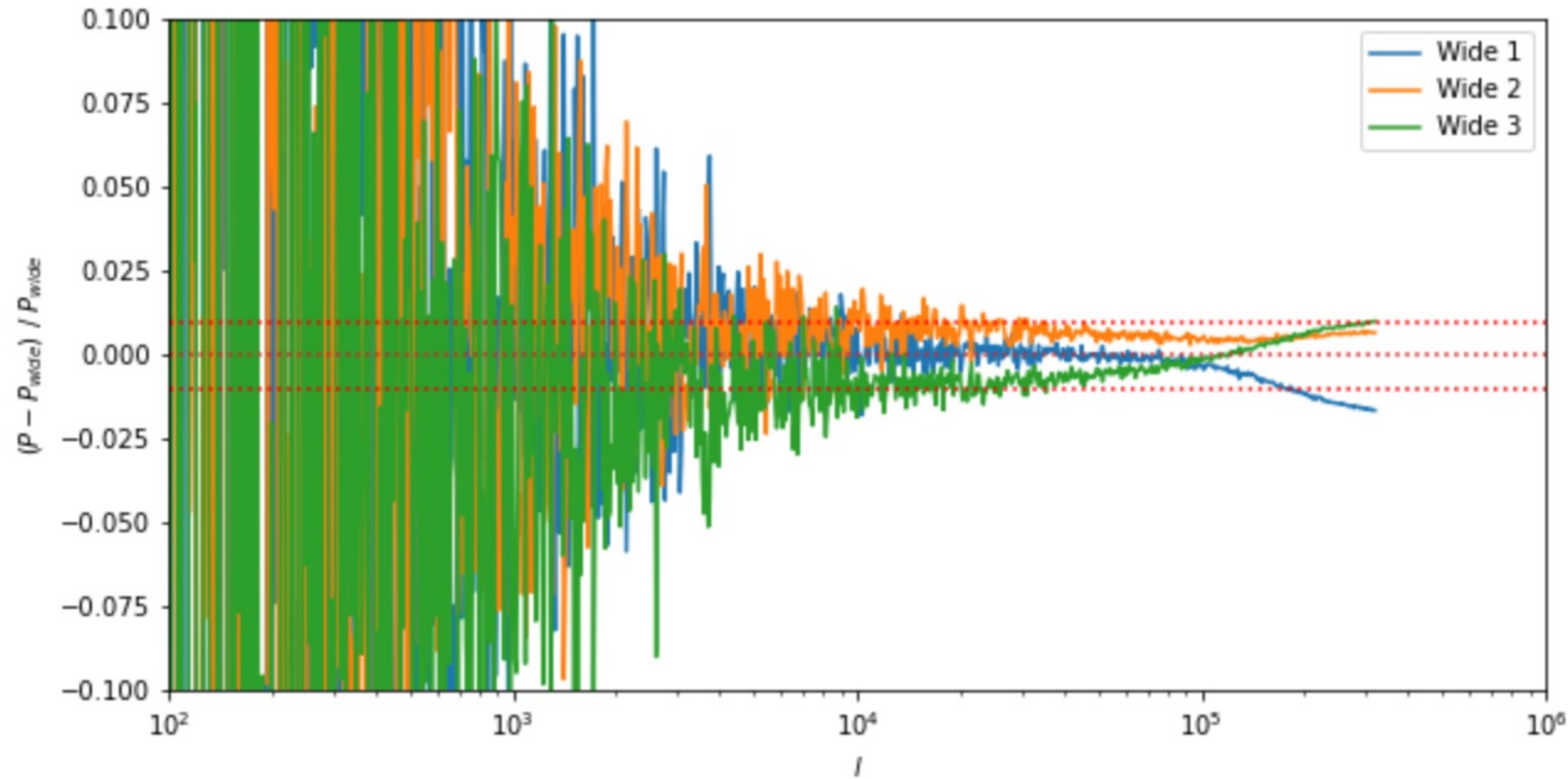
Remapping	Redshift coverage	Field Size deg x deg	Area deg ²	Storage (x Planes x Rot)
Wide	$0 < z < 1.85$	27x23	640.46	33Gbx22x3 = 2.1Tb
Deep	$0 < z < 3$	12x26	454.31	16Gbx29x3 = 1.4Tb
Ultra Deep	$0 < z < 7$	9x13	122.76	6Gbx39x3 = 702Gb

On-going: BGS mocks (w/ Paco Prada, Chi-An Dong, Alex Smith)



Project 169: Clustering of DESI galaxies with Uchuu light cones

Building & validating lensing maps. Issues with small scale precisions



Additional projects

Project 58: Void lensing with DESI (see Renan's talk)

Project 69: A lensing mock challenge for DESI-combined-probe analysis

Run lensing γ_t and $w(\theta)$. Prepare Uchuu BGS for Covariance matrix tests

Project 149: Intrinsic alignment studies with DESI galaxy and DESI imaging shape

Project 150: Galaxy-galaxy Lensing with DESI galaxies and DESI imaging shears

Shear calibration with DESI image simulations

Project 196: Galaxy Clustering & lensing properties of the eBOSS ELG and LRG tracers in DECaLS

Computation of mock lensing galaxies with Uchuu following DECaLS $n(z)$