Stellar and Dark Matter in galaxies
distances and mass scaling relations from the local Universe to z~1.5

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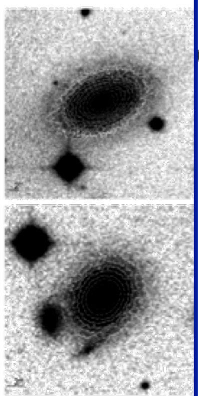
Structural properties of galaxies out to z~1.5

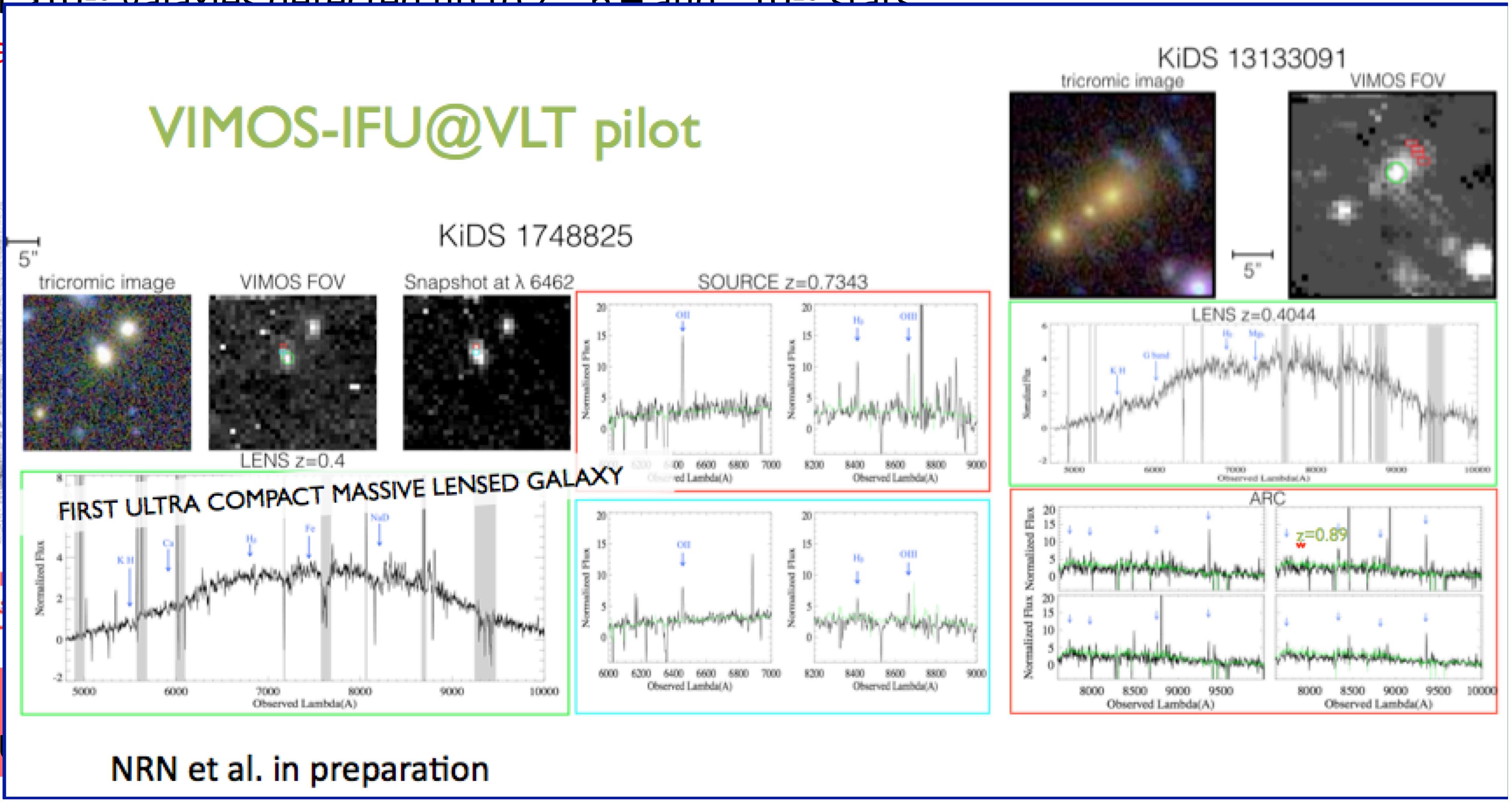
Area: 18,000 deg^2
Single epoch: 5σ pt. source detection limits *u~23.9, g~25.0, r~24.7, i~24.0, z~23.3, y~22.1 AB*
After 10 years: 5σ pt. source detection limits *u~26.3, g~27.5, r~27.7, i~27.0, z~26.2, y~24.9 AB*

- a total of >10^{10} galaxies detected up to z ~ 6 – and ~10^{10} stars
- structura



SB performed over a scal
sub-arcsec to few arc

“Big Data”:
1000gal/FP

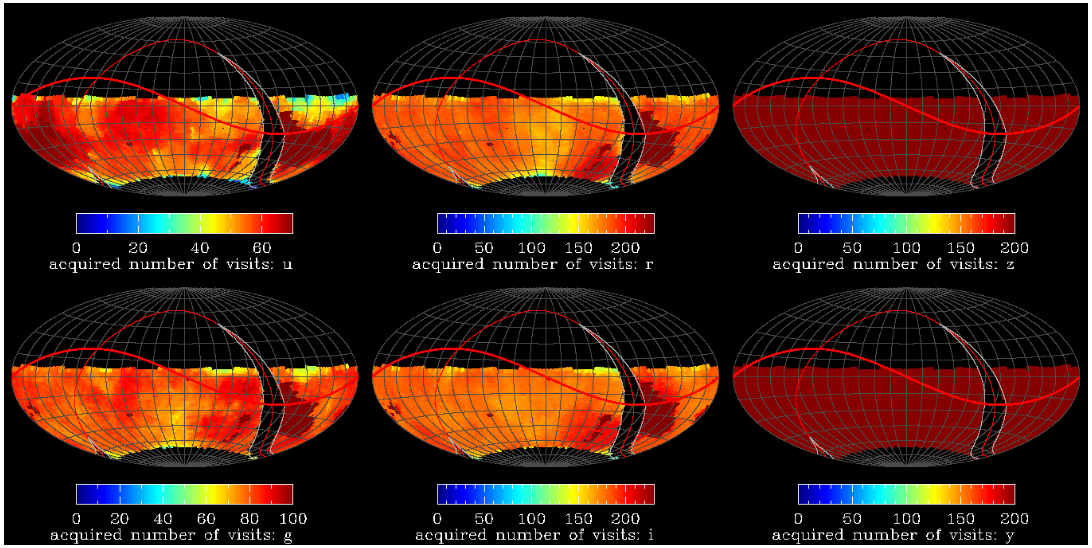


Large Synoptic Survey Telescope

www.lsst.org

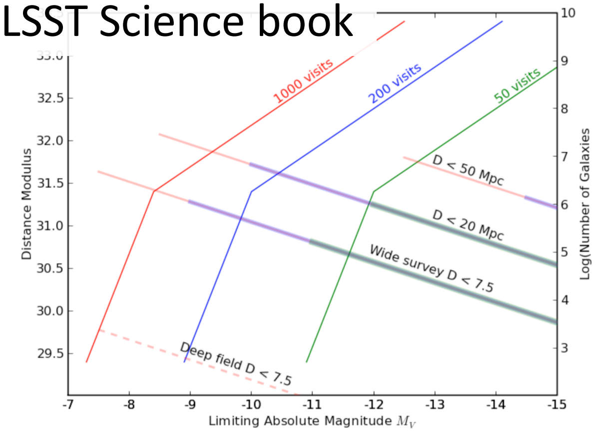
3D map of the stellar matter out to 200 Mpc

The Italian team closely collaborates with the US team



#visit will define the depth of the SBF measurements

LSST Science book



Band	N. of visits (15s)	Max Distance modulus	Max D (Mpc)
u	70	28-30?	4-10?
g	100	>32	>25
r	230	~35	~100
$r_{D.D.}$	1000	~36.5	~200
i	230	~36	~150
z	200	>36	>150
y_2	200	~35	~100
y_4	200	>36	>150

Expected depth: M_{sbf}~5/2.2/0.6/-0.5/-1.8/-2.4 u/g/r/i/z/y_N

Expected number of targets: 10^6

Calibration: ZP_{mag} LSST web-pages (~Ivezich et al. 2010) and theoretical methods (Te/Bo)

NGVS (250 target) as precursor

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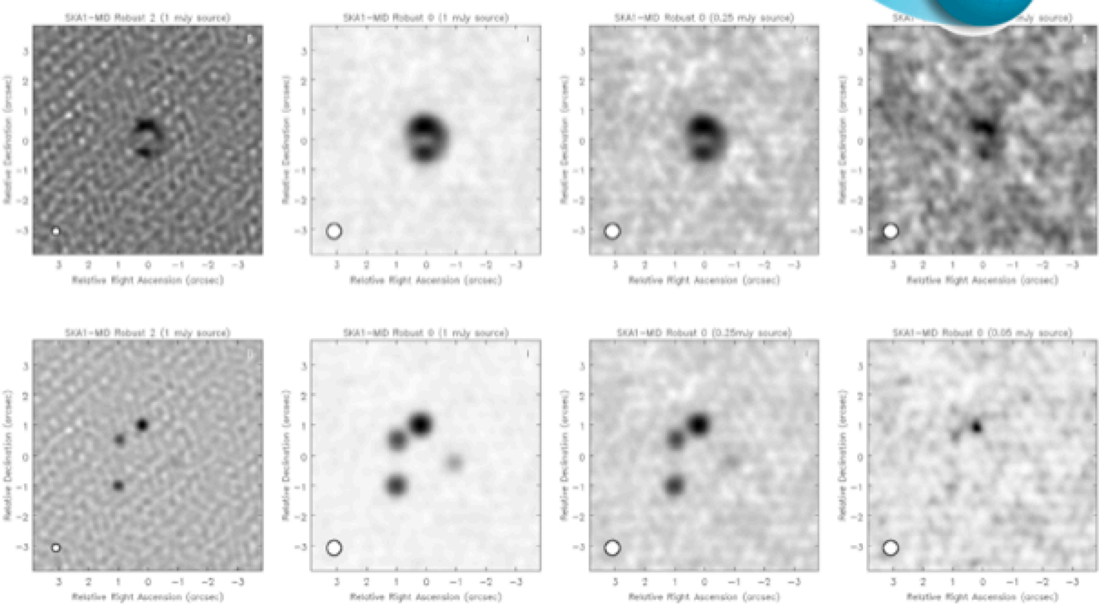
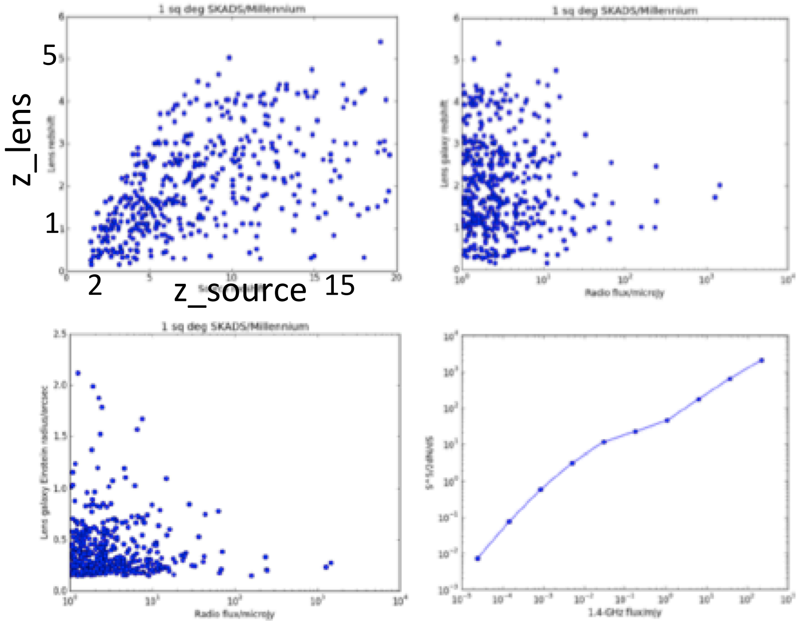
Participant /Institute	Position/Expertise	Survey participation	Type	WP	FTE/yr
N.R. Napolitano/OACNa	PI/galaxy evolution, gravitational lensing, DM	VST-KABS PI/KIDS PI	A	1, 2	0.7
R. Carini /OARoma	Post-doc/ SBF, stellar populations		A	4,5	0.3
M. Sereno/OABO	Post-doc/lensing, astro-statistics, clust. evolution	Euclid, XXL	A	1, 2	0.3
M. Spavone/OACNa	Post-doc/galaxy struct., spectroscopy follow-up	MAORI ST/VEGAS	A	1, 3	0.3
1 PhD /OACNa	PhD/galaxy classif., struct. parameters, tool dev.	SUNDIAL PhD	A	1, 3	0.9
E. Brocato/OARoma	Staff/SBF, stellar populations	GRAVITA/VST	B	5	0.2
M. Cantiello/OATe	**Staff/SBF, stellar populations**	**NGVS/VST-VEGAS**	**B**	**4,5**	**0.3**
G. Clemenini/OABo	Staff/SBF, stellar populations	VST/Strega-STEP	B	5	0.2
G. Covone/UNI-Na	Staff/Galaxy lensing, wide field surveys	VST-KABS/KIDS	B	1, 2	0.3
F. Getman/OACNa	Staff/Data analysis, automatic tools	VST-KABS/KIDS	B	1, 3	0.2
E. Iodice /OACNa	Staff/ galaxy struct., stellar haloes, faint substructures	VEGAS PI	B	1,3	0.3
F. La Barbera /OACNa	Staff/Struct. Param. tools, spectroscopic follow-ups	VST-KABS/KIDS	B	1, 3	0.3
F. La Franca/UNI-Roma Tre	Staff/AGN variabiliy, time domain, multi wavelength	VST-KABS	B	1, 3	0.2
M. Meneghetti/OABO	Staff/ lensing, image simulations	VST-KABS	B	2,3	0.3
L. Morelli/UNI-Pd	Post-doc/ Galaxy evol., structural param., star Pop.	STEPS/WEAVE	B	1,3	0.2
M. Paolillo/UNI-Na	Staff/AGN variabiliy, multi wavelength, X-rays	VST-KABS/KIDS	B	1,3	0.3
G. Raimondo/OATe	Staff/SBF, stellar populations	VST-Strega/VEGAS	B	4, 5	0.3
A. Rifatto/OACNa	Staff/Galaxy evolution, AGN variability, spectroscopy	VST-KABS/KIDS	B	1, 3	0.3
C. Tortora/Kapteyn, INAF-OAC	Post-doc/strong lensing, stellar populations,DM	VST-KABS/KIDS	A	1, 2	0.3
G. Trinchieri/OABR	Staff/ Galaxy haloes, dark matter, X-rays	VST-KABS	B	1,3	0.2

WP1. Galaxy classification for galaxy evolution studies
WP2. Gravitational Lensing
WP3. Development of general Automatic Tools
WP4. SBF pipeline development and testing
WP5. Stellar population modeling and zero-point/calibration

strong lensing

McKean et al.2015





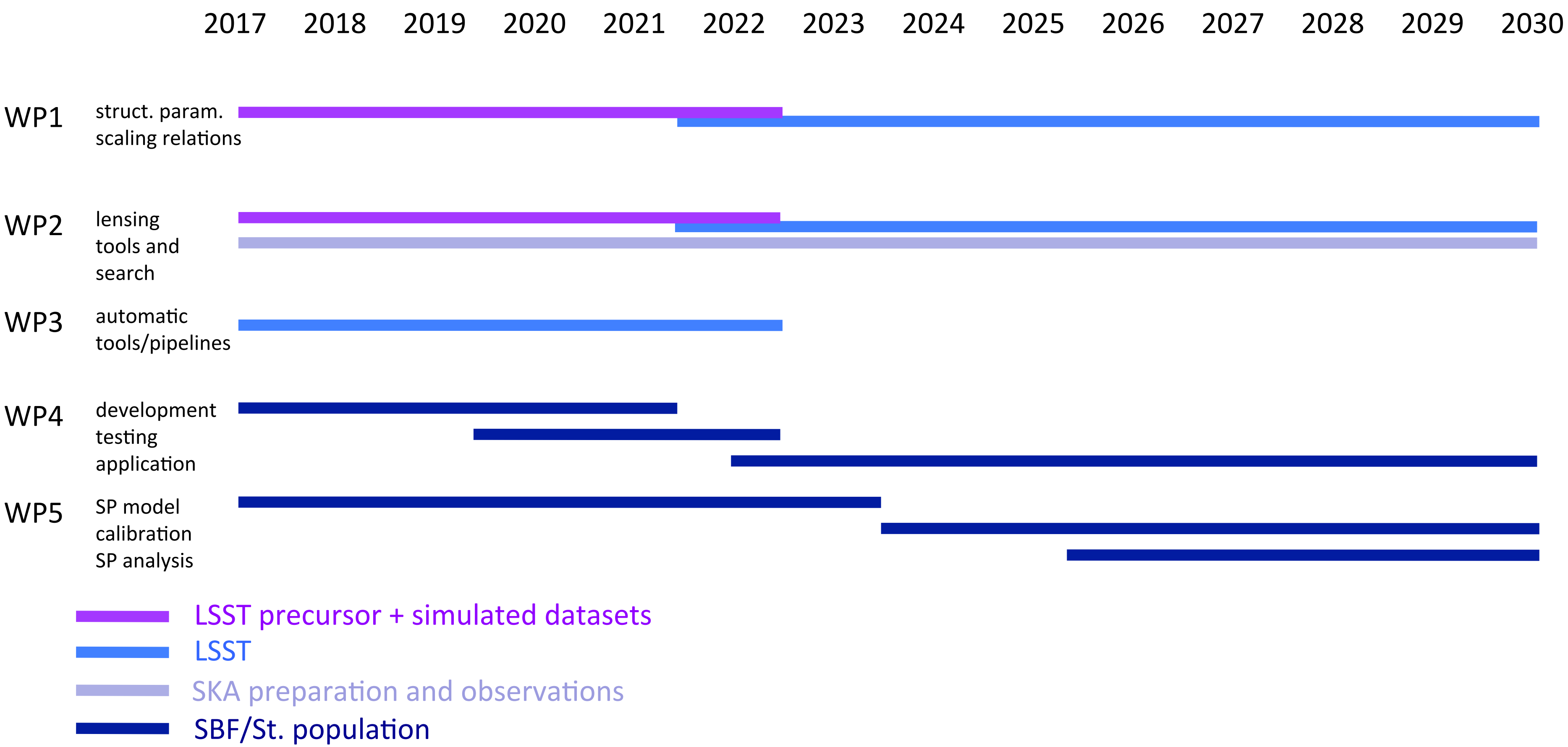
- SKA: lensing at z>2 (LSST provide the SED of the lenses)

SBF: same methodology/pipeline can be used for the EUCLID dataset.

JWST (deep) as complement LSST (wide). Calibration in the near/mid IR (an ERS will be submitted)

EUCLID will also give access to SBF for a large number of galaxies on partly different sky regions. Our effort in deriving an optimized procedure for SBF measurements will also be devoted to secure some degree of flexibility, so to guarantee the test and use of the procedure on EUCLID data.

Project break-down and schedule



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