S. Arnouts : Formation & Evolution of Galaxies

Galaxies Formation
and Evolution with look back time
beyond z-Survey : Photometric Surveys

— **cosmic evolution**: SFRD + Mass Assembly

— **individual evolution**:

* Measurement of SFR , Stellar Mass
* Role of dust: empirical recipes (UV vs FIR)
* Infalls vs outflows + quenching processes

— **Techniques** :

* Photometric Redshift : *Le Phare*
  - photo-z + physical param.
* Multi-wavelength Photometry
  - photometric softwares

— **On-going & future photometric surveys** :

* **VIPERS - MLS**: GALEX+NIR
* **CLAUDS** : U band for HSC Deep Survey

Galaxies in their environment

— **Link between galaxies & the DM distribution**
[photo-z samples]

* clustering : bias(z), HOD models
* SHMR relation: centrales vs satellites

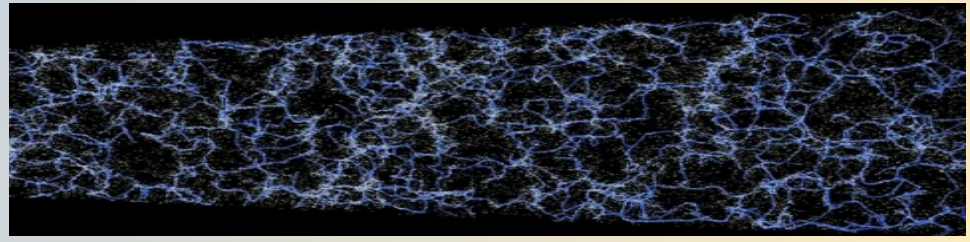
— **catching galaxies in the Cosmic Web**
with current spectroscopic surveys
SDSS, GAMA, VIPERS

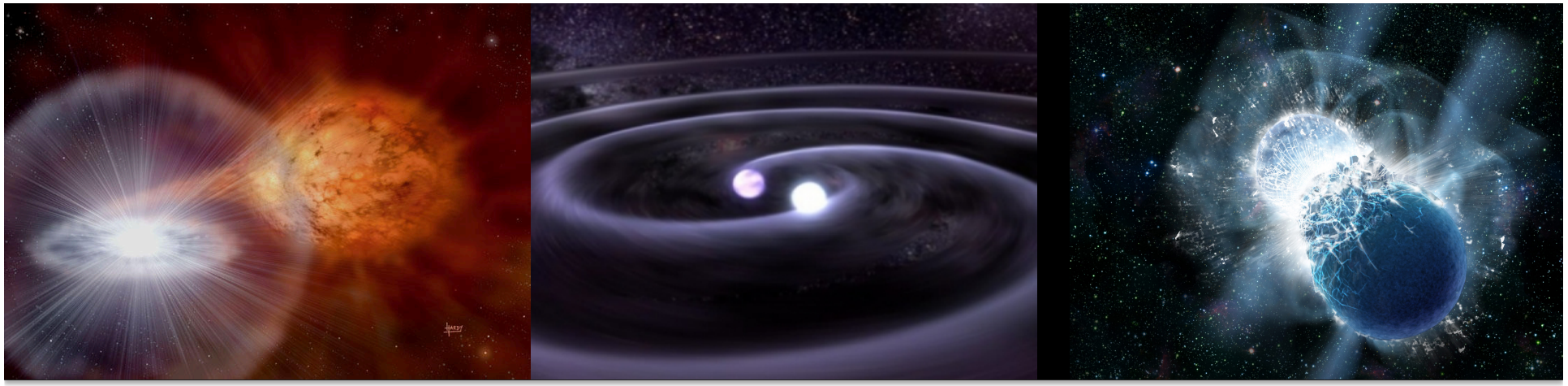
cosmicorigin.org Spine

* **strong envt effects** : groups/clusters [GAMA]
* **weak envt effects** : CW
  - identification of the CW properties
    voids, walls, filaments, nodes
  - galaxy properties vs CW features

— **Preparation for future surveys :**

* in 3D: PFS, DESI/Euclid(?), WFIRST
* in 2D: J-PAS, LSST, Euclid, WFIRST …





Research

Thermonuclear supernovae (SN Ia)
Other thermonuclear transients
Core-collapse supernovae (ANR)

Relevant Projects

MISTRAL, SVOM, ATHENA,
WFIRST, LSST (?)

Stéphane Blondin

CNRS Researcher
@LAM since 2012
Organizer: Transients Circle

Methods

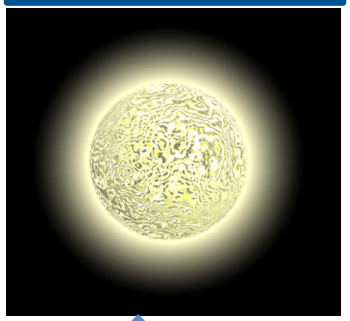
Radiative-transfer simulations
(CMFGEN code)

Main Collaborators

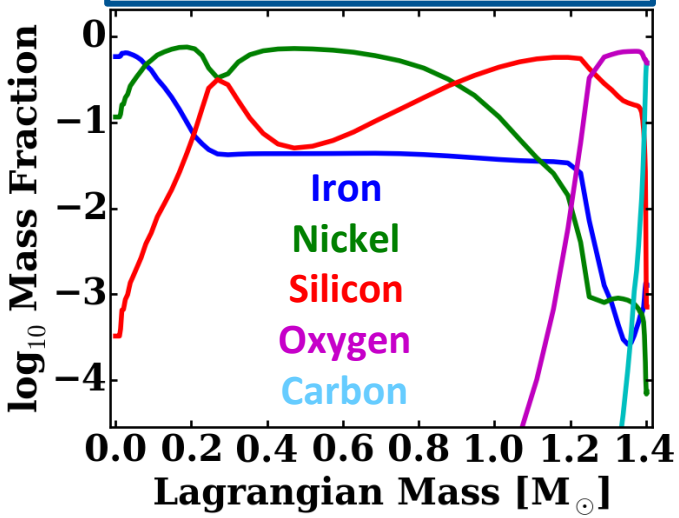
FR: Luc Dessart (OCA)
EU: Domínguez (Granada), Bravo (UPC)
US: Hillier (Pitt), Khokhlov (Chicago)

Numerical Setup for SN Ia Modelling

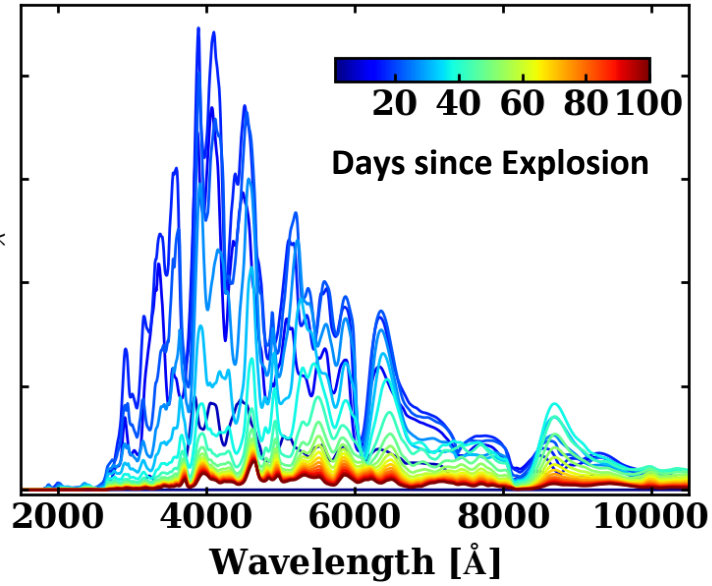
1. C-O WD
Hydrostatic



2. Explosion
1D hydro + burning



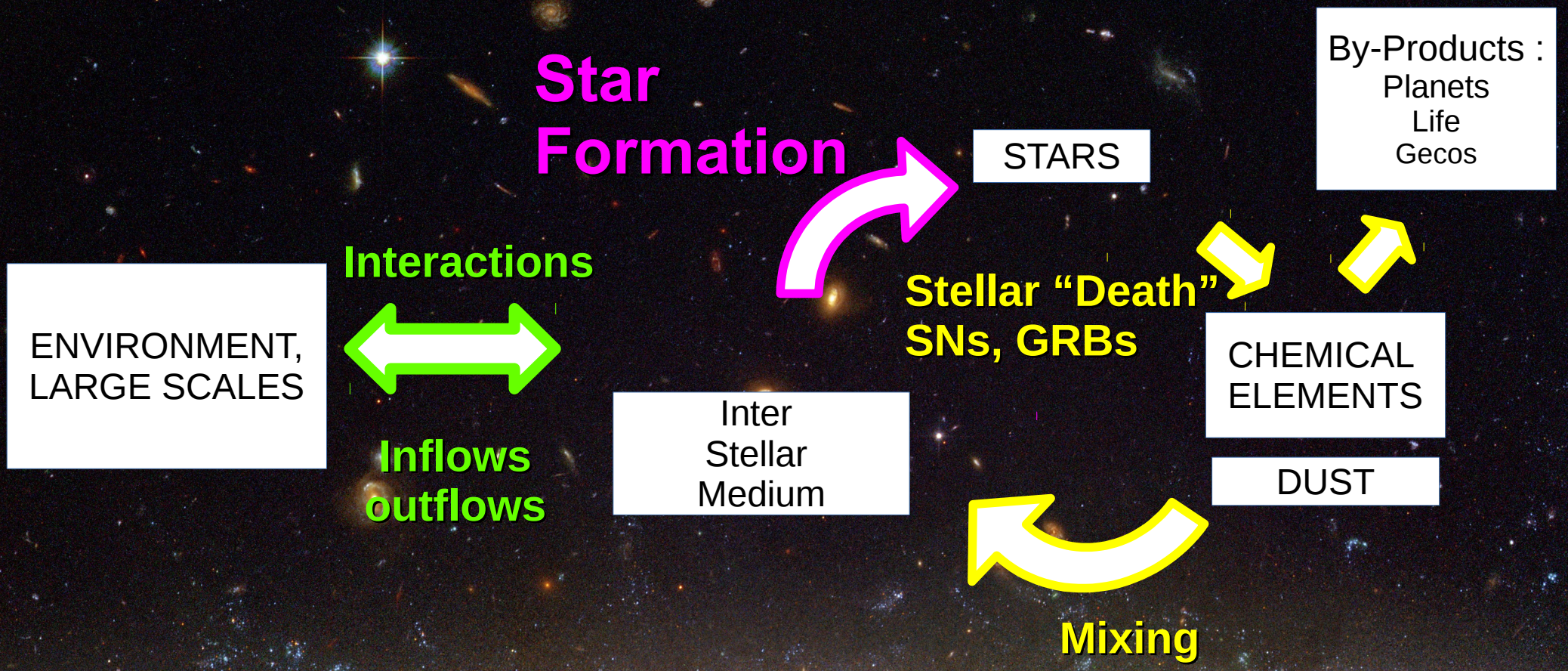
3. Radiative Transfer
1D non-LTE (CMFGEN)
Time-dependent *D/Dt*



0. Stellar Evolution
$M_i \sim 3\text{–}7\ M_\odot$
$Z_i \sim 0\text{–}0.04$
(in progress)

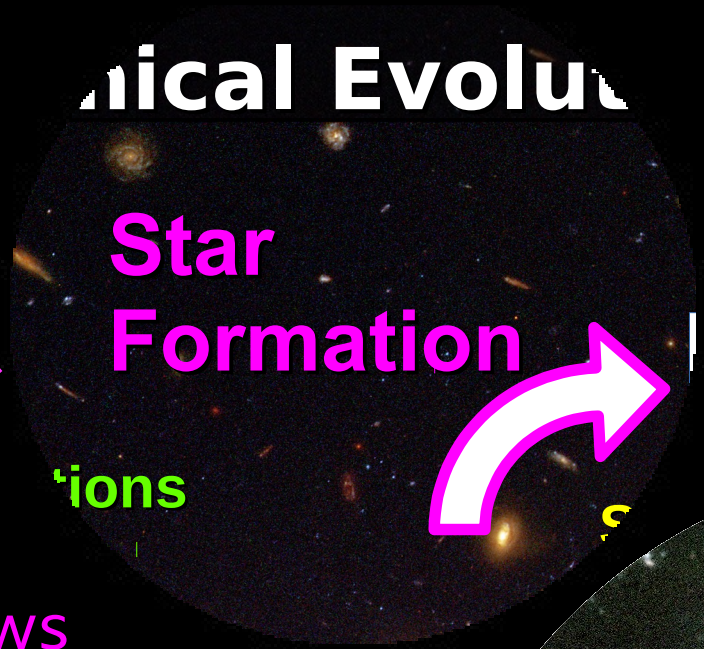
4. Comparison to Observations
Blondin et al. (2013, 2015, 2016)
Dessart et al. (2014abc)

Galactic Chemical Evolution



Simple models to test simple assumptions (environmental effects, nature of Low Surface Brightness Galaxies, and of Gamma Ray Burst hosts)

...ical Evolu...



Star Formation Laws
(Empirical studies of
SFR vs gas density)

Star Formation in the low density regime

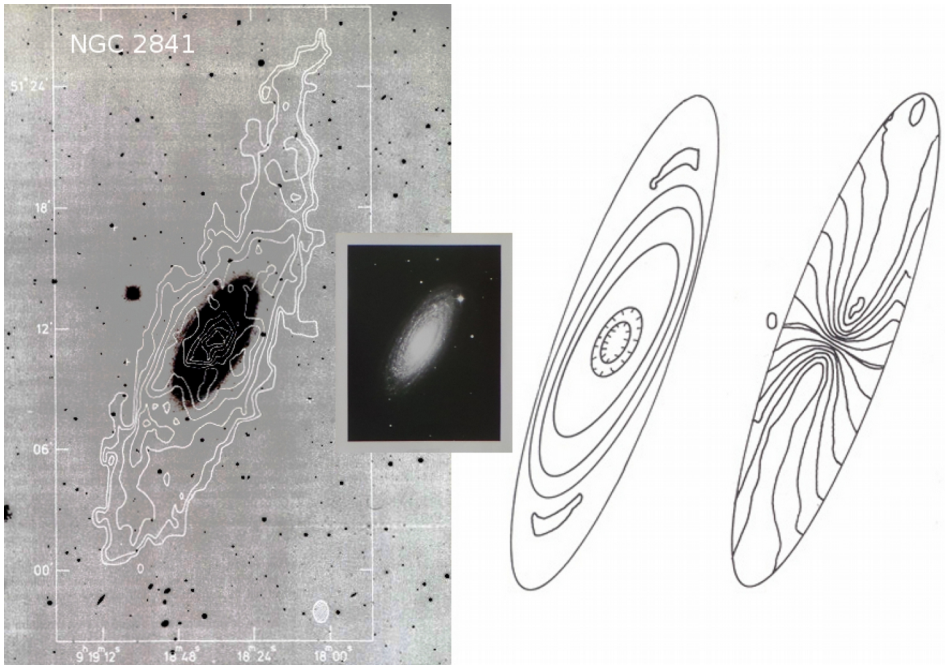
- Outer part of Spirals
- In gas stripped from galaxies
- In Low Surface Brightness Galaxies → Malin 1

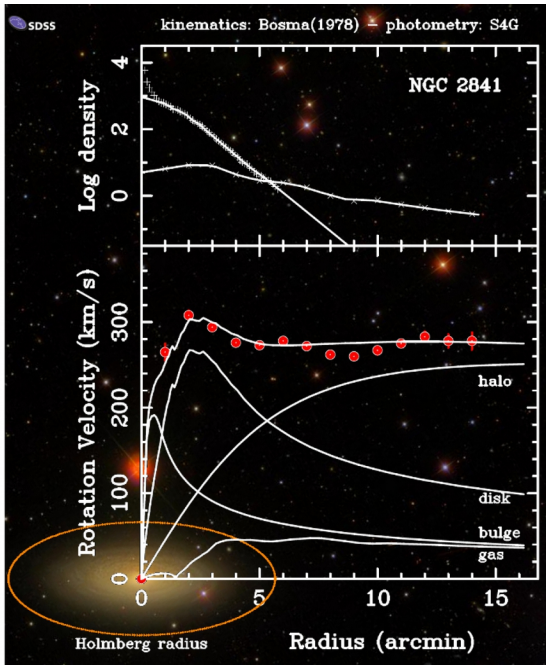
Albert Bosma ex - Dynamique des Galaxies LAM

HI observations - Rotation curves and dark matter distribution
Galactic outskirts, warps, star formation there

IFU data add - Velocity fields of stars and gas in the inner parts
Velocity dispersions of the stellar component
Physical conditions in the ISM, outflows, etc.

Imaging in - Optical, UV, NIR, MIR and FIR

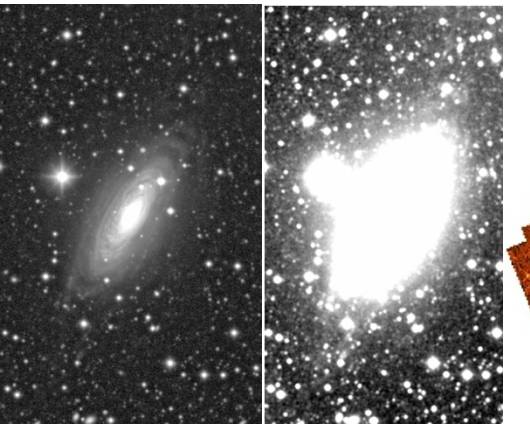




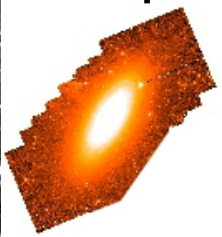
Albert Bosma SKA SWG HI galaxy science LAM

Future Projects: HI surveys with SKA pathfinders/precursors

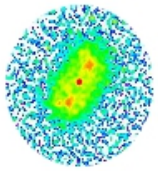
APERTIF	WSRT shallow ~3500 deg2 + deep ~ 350 deg2
WALLABY	ASKAP shallow all-sky below +30deg (?)
MHONGOOSE	MeerKAT very deep imaging of 30 galaxies
MALS	MeerKAT (to map the emission as well)



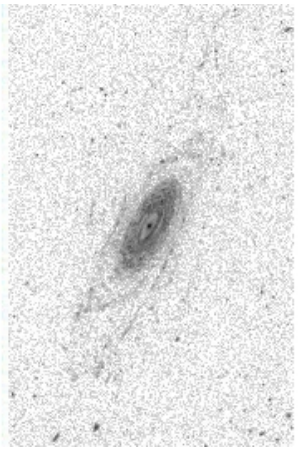
Dragonfly



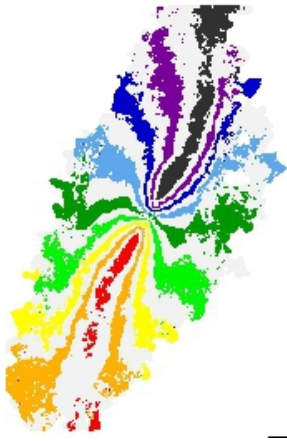
3.6μm



18-cm

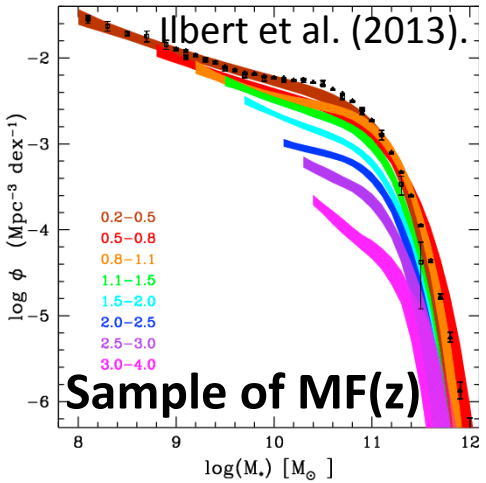


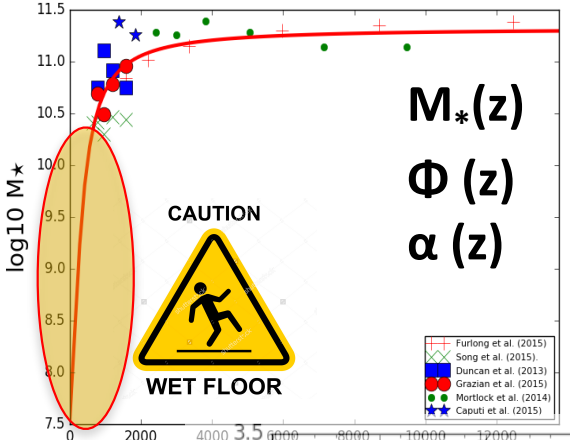
FUV

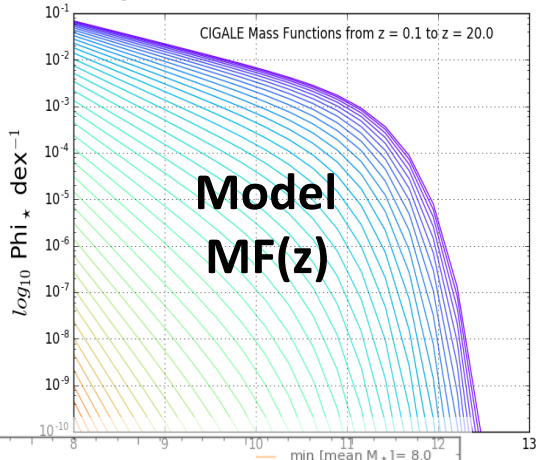


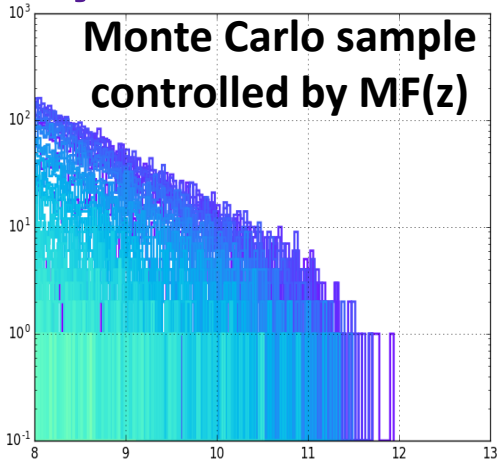
VLA HI & VF

Building a Sample of Modelled Galaxy

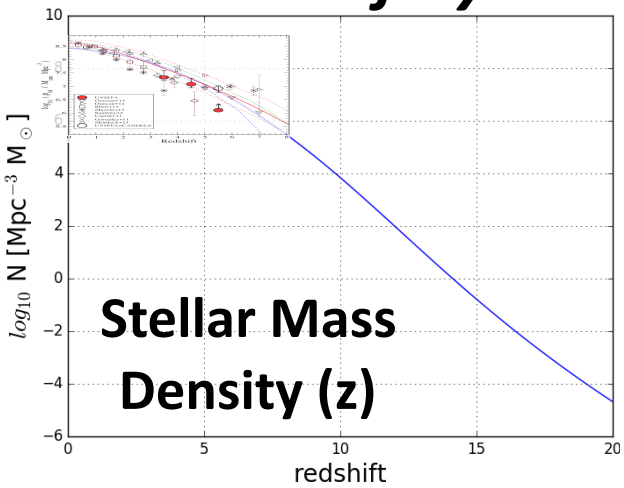


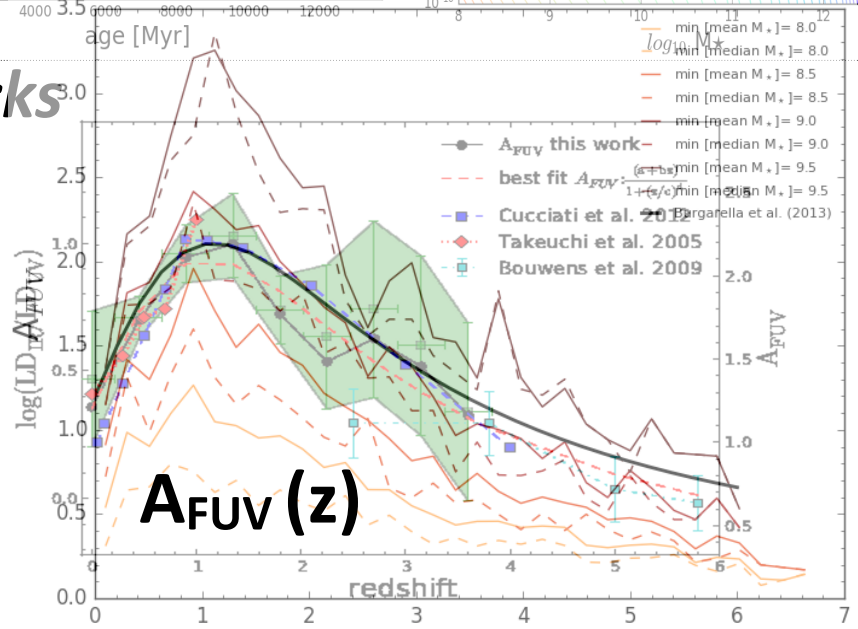






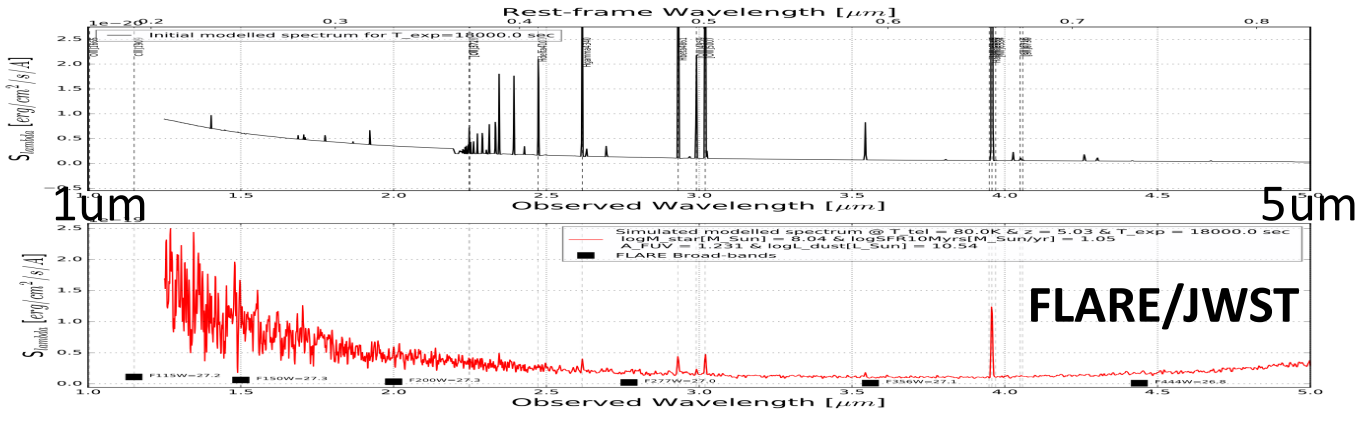
Safety checks





+ SFR Density
+ K-band LFs
+ UV LFs
+ FIR LFs

Results



The ESA M5 FLARE Proposal: Deep and Wide-field 1-5um Imaging and Spectroscopy for the Early Universe

FLARE will detect, identify and study a sample of « first light » objects, in the same 1–5µm range than JWST, but over much larger fields of view, to create **an unbiased census of the objects that dwell in the early universe, before the end of reionisation:**

- **Photometric selection**: wide-field detection and identification of more than **100 candidates "first-light" objects (LBG-like) at z ~ 15 over 100–200 deg^2.**

- **Emission line selection:** detection and identification of ~10 times more **emission line (photometrically faint) objects (Lyα emitter-like) via a blind integral-field spectroscopic survey over a total of 1–2 deg^2**.

- **Pointed observations of quasars and their early black holes before the end of the reionisation epoch** will also be observed via targeted observations. The synergy with ATHENA and the E-ELT will be strong.

SVOM-GFT: Robotic telescope for GRBs

Technical details

- **Diameter M1:** 1m30
- FoV: 26 arcmin
- 2 optical channels (ugrizy) / 1 NIR (J,H)
- Observation **starts 30s max** after trigger

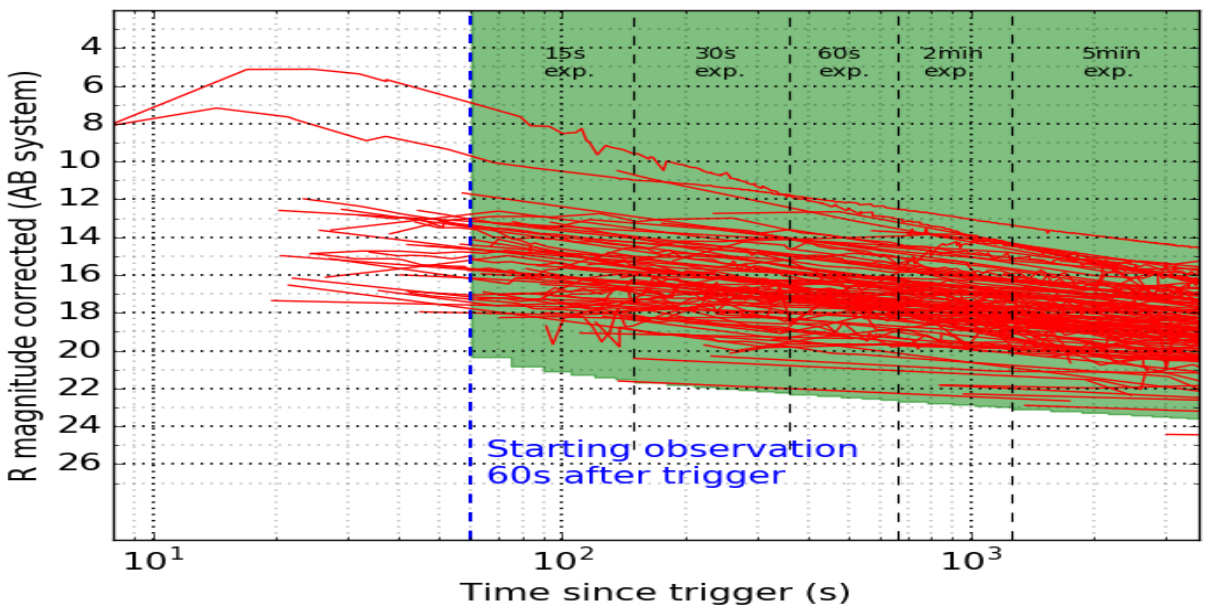
Science

- Provide fast, reliable **GRB positions** ($<$ **0.5"**)
- **Quickly identify** the afterglows of detected **GRBs** that are **highly redshifted** (z$>$5) in order to trigger bigger telescopes
- Measure the **broadband spectral shape** and **temporal evolution** of the early and late afterglow, and of some prompts

Current work

Performance simulations

- Development of an **ETC** for photometric performance
- Simulation of GRB afterglow spectra (from radio to γ-rays)
- **Estimation** of the precision of the **photo-z**
- Exploring the parameter space –> which kind of GRBs can be detected and for which we can deliver a reliable photo-z



Future work

Dust

- Comparing extinction curve of GRB afterglow with attenuation curve of the host galaxy to infer the dust geometry (V. Buat)

Image simulator

- Generate images corresponding to a given observational strategy (*Stuff* + *Skymaker* for optical, tbd for NIR)

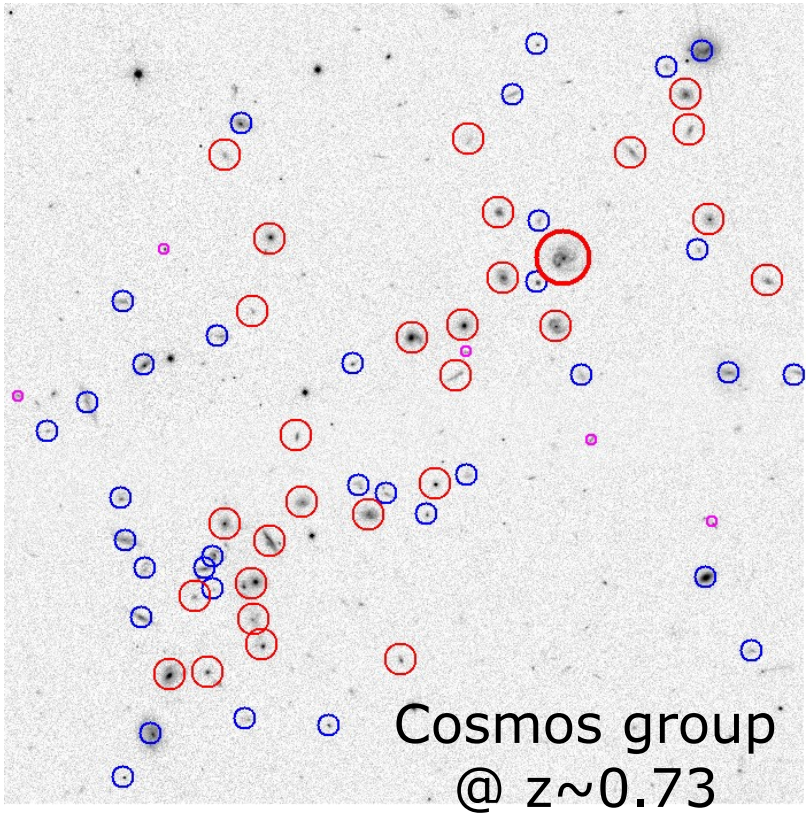
Other type of sciences

- Study the performance of the GFT for other transient phenomena (**GW**, **TDE**, **SN**), **asteroids**, **exoplanets**, and any kind of science which might found some interest in using a 1m30 optical/NIR robotic telescope

Benoît Epinat

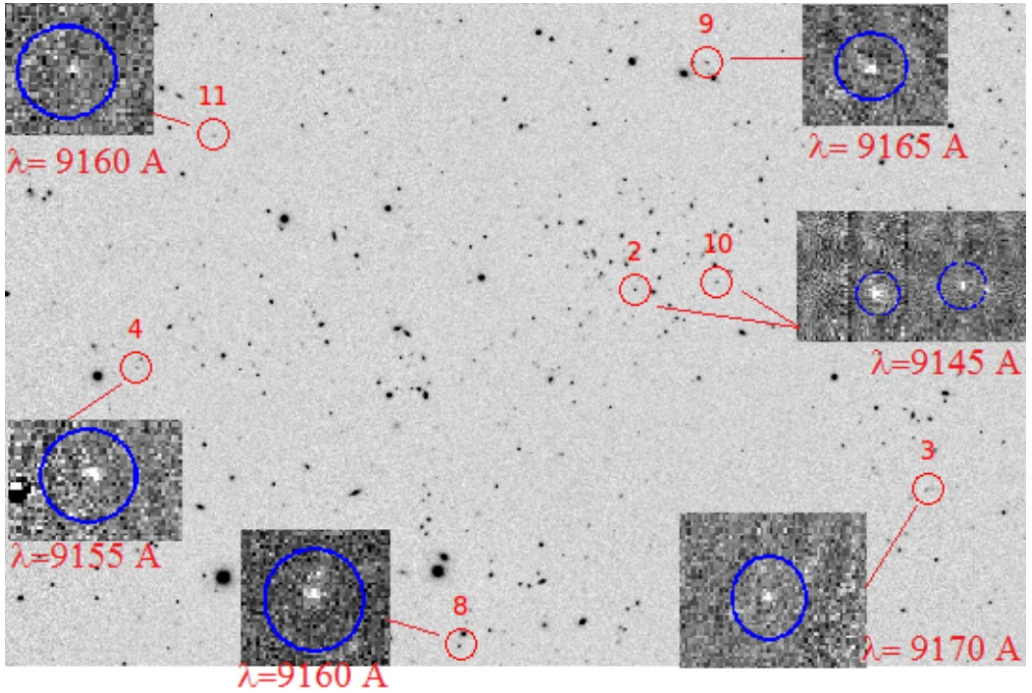
Impact of environment on galaxy evolution @ z~1

Field and group galaxies
MUSE-GTO irap



Cosmos group
@ z~0.73

Cluster galaxies
Tunable-Filter (OSIRIS-GTC)

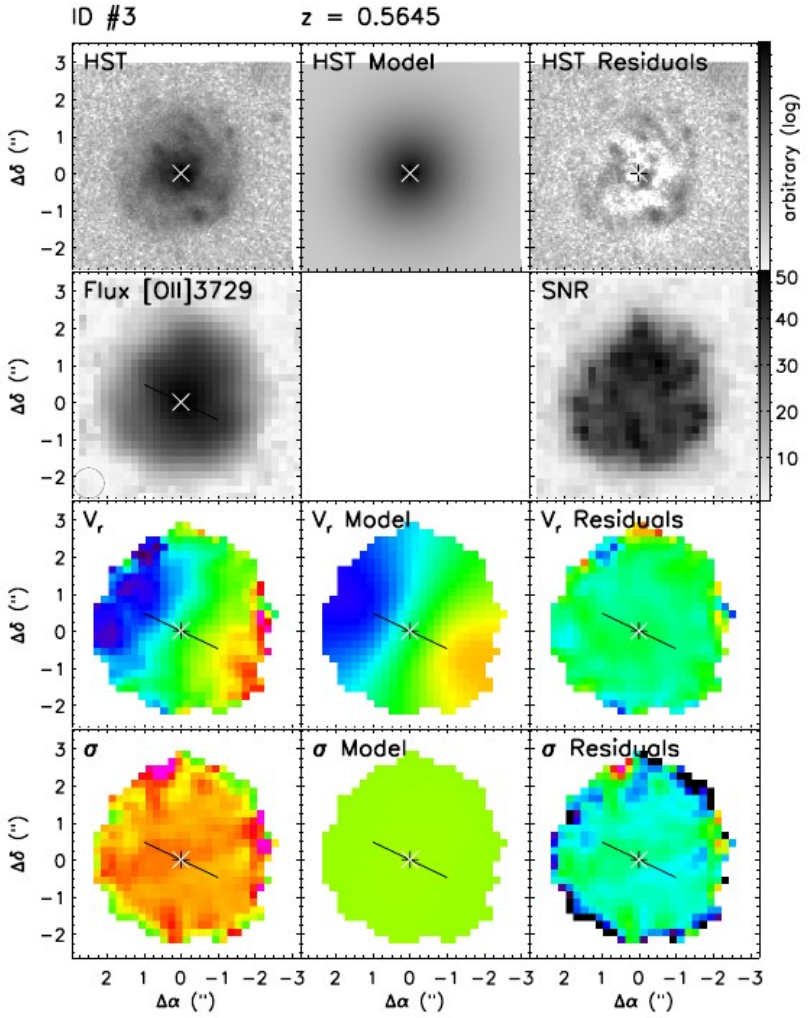


Some [OII] emitters in
XMMU J2215.9-1738 @ z~1.46

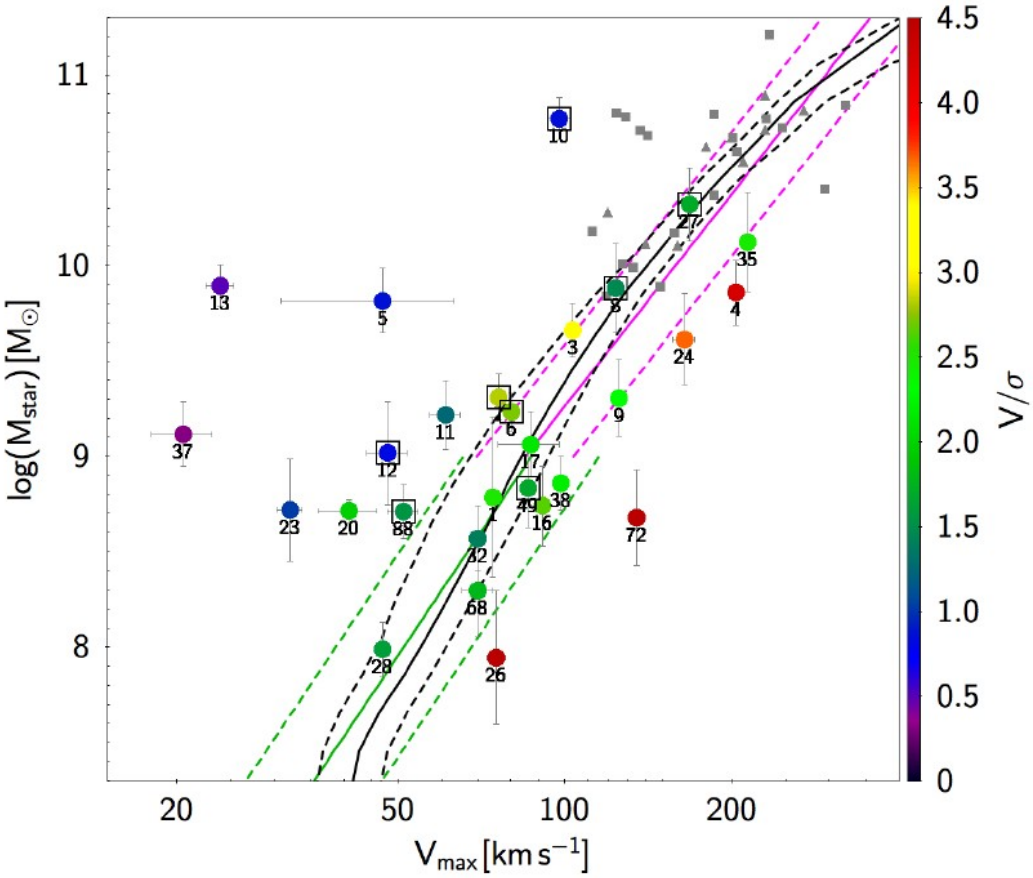
Population of star-forming galaxies down to low mass

Impact of environment on galaxy evolution @ z~1

Galaxy kinematics

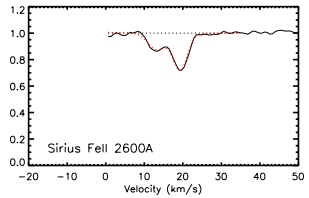


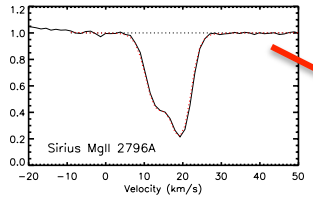
Tully Fisher relation MUSE-HDFS

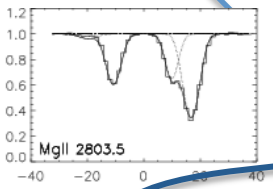


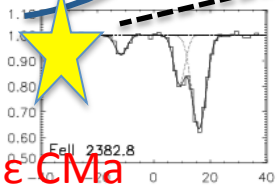
Contini et al., 2016

The diffuse cloud that surrounds the sun

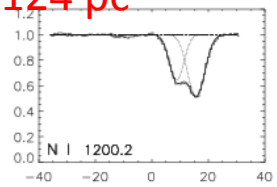








ε CMa
124 pc



N

α Leo
24 pc

Sirius
2.7 pc

Sun

LIC (local interstellar cloud)

The bubble interior contains hot, low density gas
$T \sim 10^6$ K $n_{HI} \sim 0.005$ cm^{-3}
(soft X-ray background)

Cecile Gry

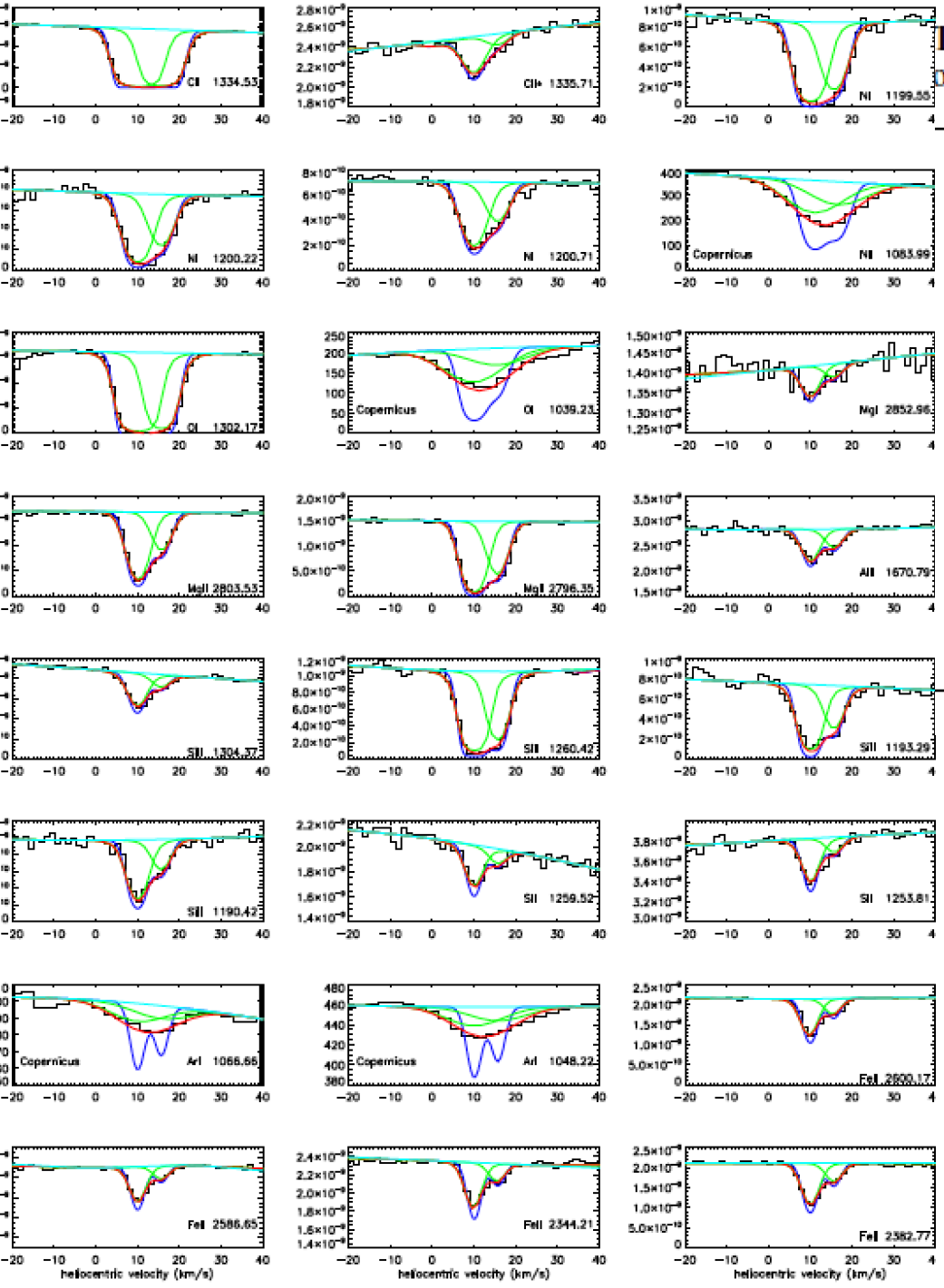


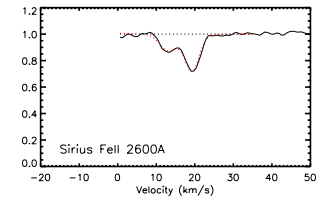
Table 5. Characteristics of the warm interstellar gas in the li
of α Leo

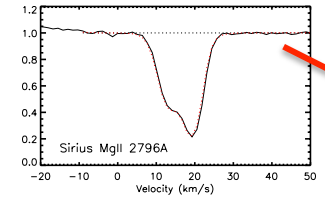
$N(\mathrm{H_{tot}})$ ($\mathrm{cm^{-2}}$)	$2.83^{+1.18}_{-0.69}\,10^{18}$
$N(\mathrm{H\,I})$ ($\mathrm{cm^{-2}}$)	$1.9^{+0.9}_{-0.6}\,10^{18}$
$n(\mathrm{H_{tot}})$ ($\mathrm{cm^{-3}}$)	$0.30^{+0.10}_{-0.13}$
$n(\mathrm{H\,I})$ ($\mathrm{cm^{-3}}$)	$0.20^{+0.08}_{-0.10}$
$n(e)$ ($\mathrm{cm^{-3}}$)	$0.11^{+0.025}_{-0.03}$
T (K)	6500^{+750}_{-600}
Pressure $\log(p/k)$	$3.42^{+0.12}_{-0.22}$
Length (pc)	3^{+5}_{-1}
ioniz. fraction χ	$0.33^{+0.09}_{-0.06}$
depletion strength[a] F_*	0.63

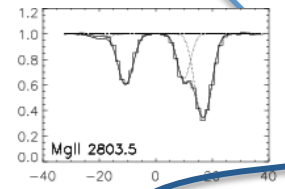
[a] in the sense defined by Jenkins (2009)

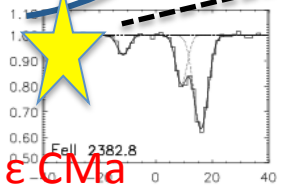
- T and n(e) from Mg I/Mg II and C II*/C II
- Total amount of H from N I + N II
- IS radiation field in the UV, EUV, X-ray
- Ionization model describing the partial ionization of the gas
- N(H I) from ionization model
- Depletion of metals from ionization fractions

Two interesting prospects

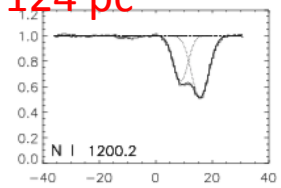








ε CMa
124 pc



N

α Leo
24 pc

α Cen
1.3 pc

Sirius
2.7 pc

LIC (local interstellar cloud)

No signature of the interfaces in the highly ionized ions
→ Reduction of thermal conduction by
→ alignment of magnetic field with the conduction front
Magnetic field of different phases of the ISM with Arago
Nature of second component: kinematic disturbances inside the LIC ? Waves propagating in the cloud ?

Title: *Spectral analysis of the Euclid survey data*

Start: October 2014 **PhD student:** Sara Jamal

Thesis supervisor: Vincent Le Brun **CNES adviser:** Olivier La Marle

Euclid → Large datasets *(~ 50 million expected spectra)*.

→ Fully automated data-processing pipeline

From the survey, the primary feature to measure : the redshift

Photometric redshifts:

$z_{phot,\,estimate}$ *: template fitting, artificial NN, Bayesian inference*

Spectroscopic redshifts:

$z_{spec,\,estimate}$*: cross-correlation,* χ^2 *minimization.*

On-going work: an automated quality assessment of the estimated **spectroscopic redshift** via a Bayesian framework exploiting:

- The posterior pdf P (redshift z | data , I)
- Machine learning algorithms

Understand the Expansion of the Universe

1. Strong and Weak Bayesian modeling of galaxy cluster SL

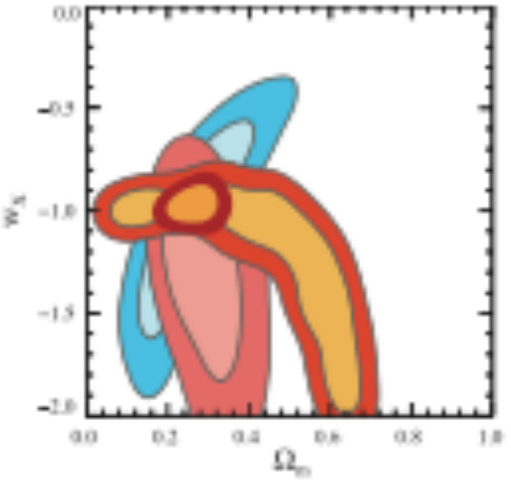
→ Jullo et al. (2007); Jullo & Kneib 2009

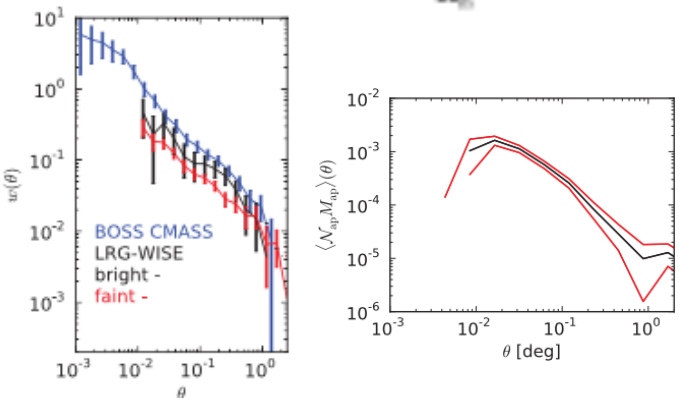
2. Probe Universe expansion and Dark Energy models with SL in Galaxy clusters

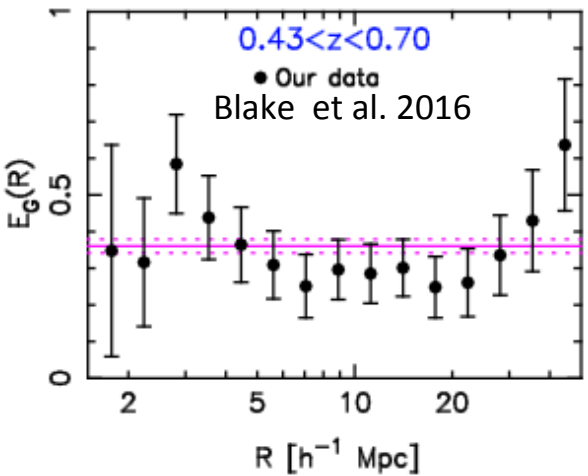
→ Jullo et al. (Science, 2010); Magaña et al. 2015

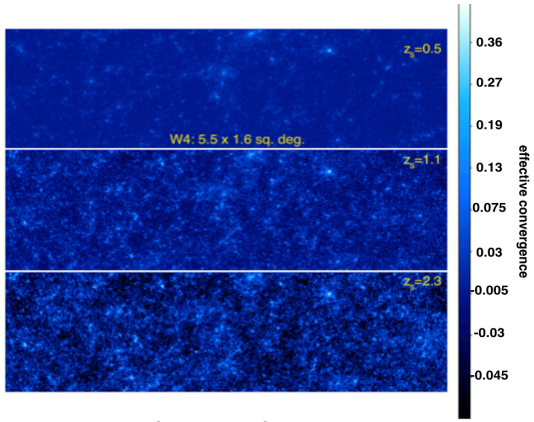
3. Combination of Weak lensing and galaxy clustering in wide field surveys

→ Jullo et al. (2012); Comparat, Jullo et al. (2013)

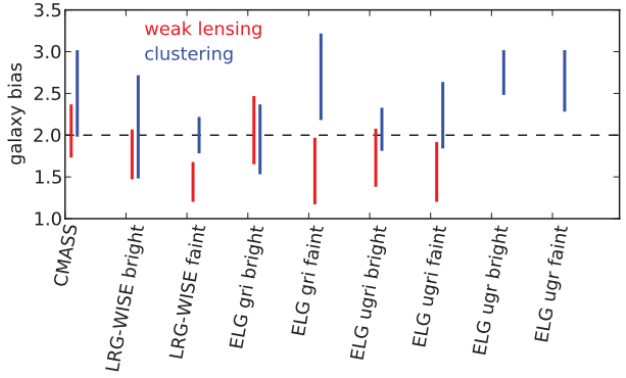








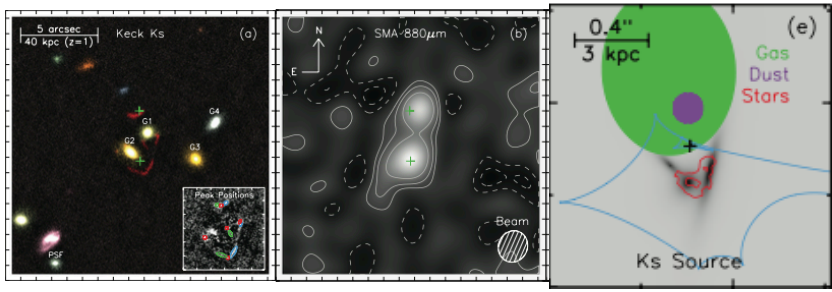
Giocoli et al. 2015



Use Lensing as a Gravitational Telescope

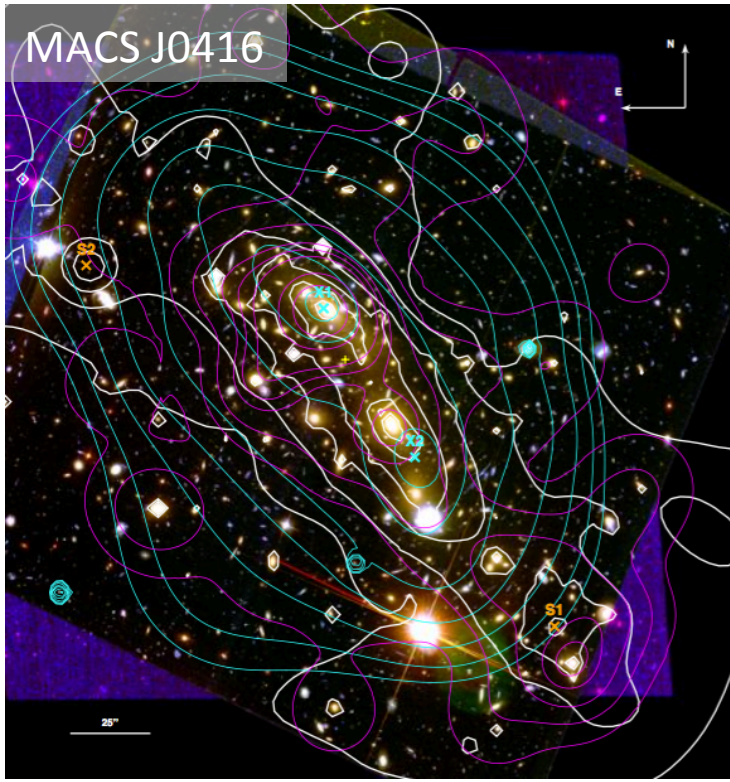
4. Multi-wavelength lens reconstruction of a Planck & Herschel-detected starbursting galaxy

→ Fu H., Jullo et al. (2012); Timmons et al. 2015



5. Hubble Frontier Fields: The Geometry and Dynamics of the Massive Galaxy Clusters

→ Jauzac M., Jullo E. et al. (2015); Jullo E. et al. (2014), Jauzac et al. (2012)



Jauzac et al. 2015

Prepare Euclid mission

a. Simulate pixel-level images for NISP and VIS

b. SLWG: probe cosmological models with SL clusters

c. WLWG: detect clusters with WL in mass maps

The Dusty Universe

- Dusty star-formation at high redshift
  - « High » being z=1 in 1995, z=5-6 today…
  - Dusty => emission between 5 microns and 3 mm
  - Diffuse emission: CIB and its fluctuations (clustering)
  - Galaxies (survey statistics: LF, SFRD)
  - Observations but also modelling (from scaling relations to SAM)

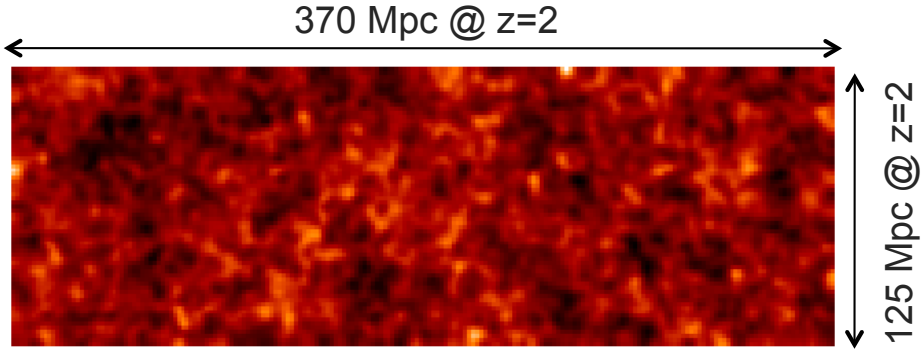
- ISO, IRAS, COBE, Archeops, Spitzer, Herschel, Planck
  - Other diffuse emissions:
    - Galactic dust in the diffuse medium of the MW
    - CMB: foreground contaminations and likelihood
  - Photometric calibration, data reduction pipeline, power spectra

The Dusty Universe

- NIKA2/30 m IRAM
  - Camera 1.2 and 2 mm, FOV 6.5 arcmin, commissioning now
  - Deep fields (PI of the GTO, GOODS-N and COSMOS)
  - DSFG at high-z ; (Link with SPICA/SMI- LRS ?)

- CONCERTO
  - Sub-mm and mm spectrometer, LLAMA telescope
  - Intensity mapping of the CII lines at z>4.5
    - Dusty galaxies and reionisation

- CIB fluctuations as a LSS tracer
  - ISW (CIBxCMB)
  - Foreground to kSZ
  - Cross-correlations (e.g., lensing, tomography)
  - CIB in CMB experiments: PIXIE (MoO CNES/NASA), COrE (M5)



The Three Dimensional Shape of Galaxy Clusters

Limousin et al. 2013, Space Science Review
Morandi, Limousin et al. 2011; 2012a; 2012b

Pretty Much Unexplored Territory (Theory & Obs)

Fundings (OCEVU, CNES, LAM, Italy)

3D Shape : Insights from Simulations [The]

[Bonamigo, Despali, Limousin, Angulo, Giocoli, Soucail, 2015, MNRAS]

Characterizing Strong Lensing Clusters [The]

[Giocoli, Bonamigo, Limousin, et al. 2016, MNRAS, resub.]

How Does Shape vary with Cluster Centric Distance ? [The]

[Despali, Giocoli, Bonamigo, Limousin, Tormen, 2016, MNRAS, resub]

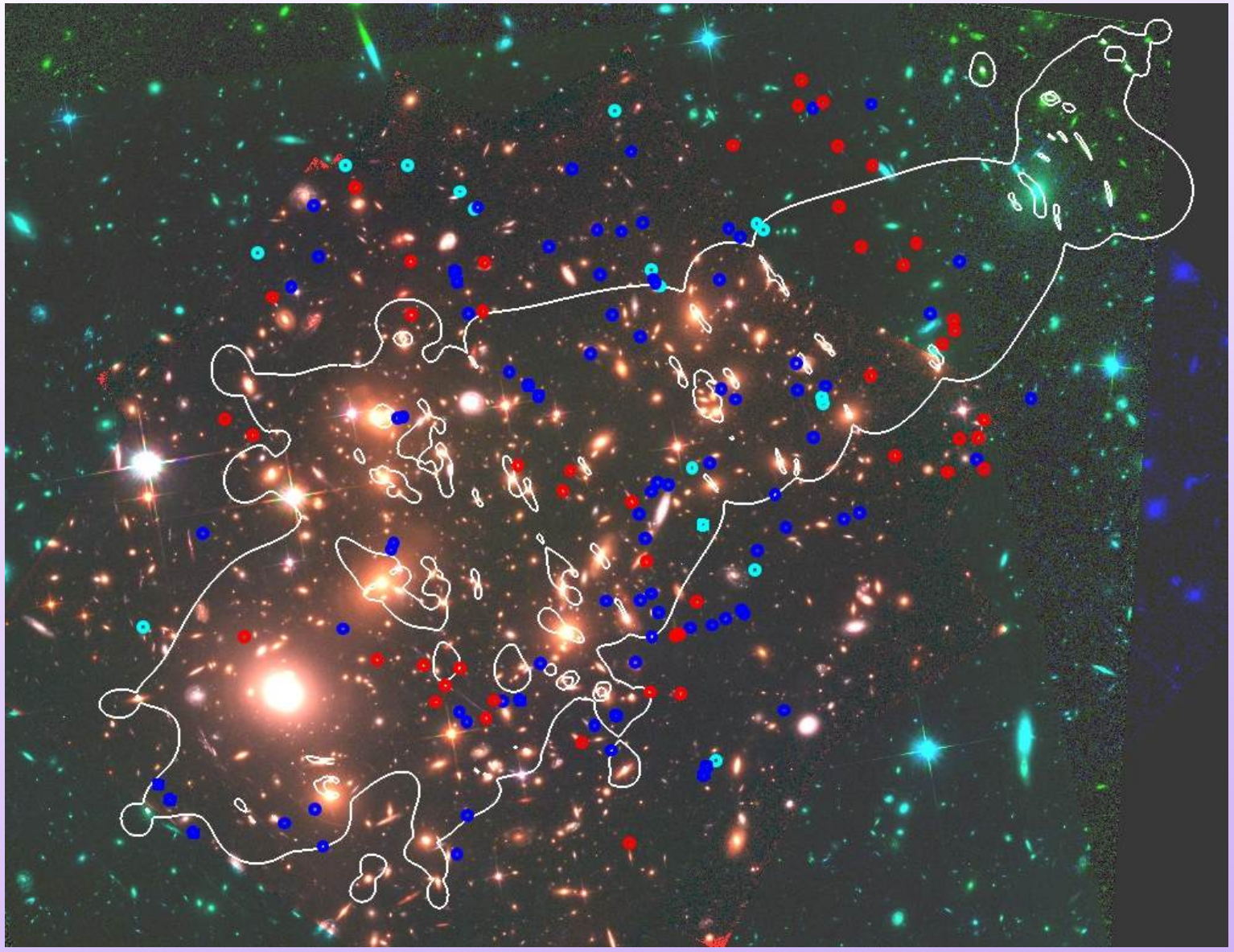
3D Shape : Combining Lensing + Xray Data: Algorithm

[Bonamigo, Limousin, Sereno et al. in prep.]

Application on Abell 1703 [Obs]

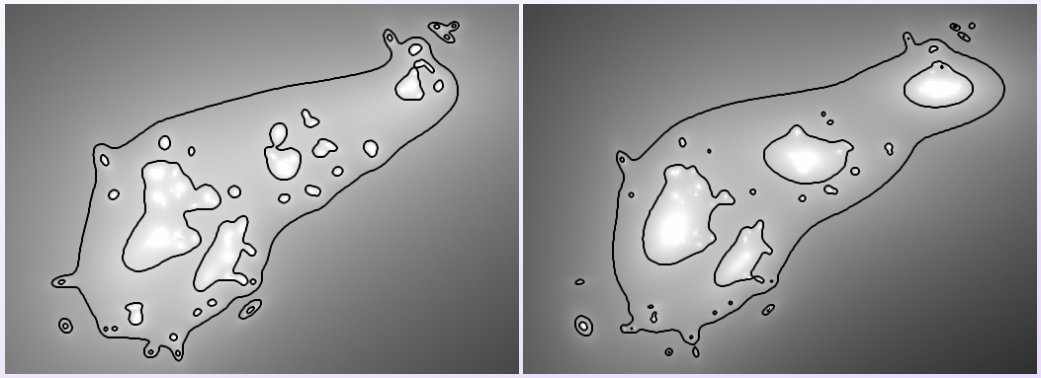
[Bonamigo, Gastaldello et al. in prep.]

Hubble Frontier Field : MACS 0717 (amongst others)

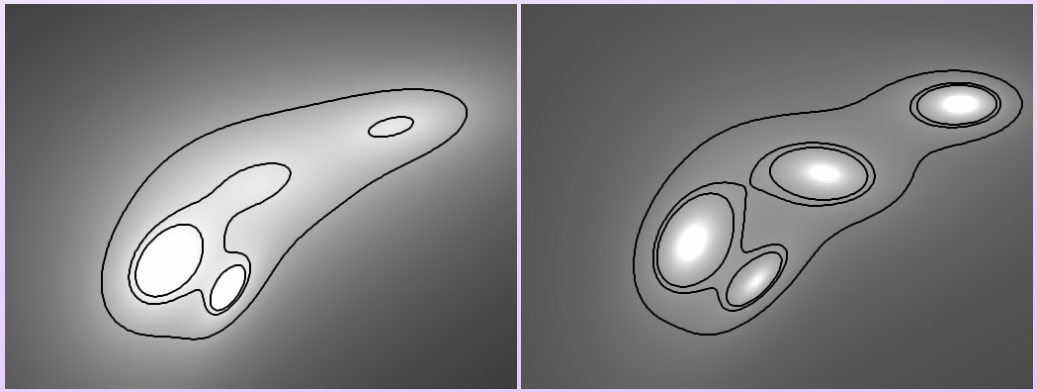


red: preHFF (48 images, Limousin et al. 2012)
blue+cyan: postHFF (117 images)
white: z=7 critical lines, Limousin et al. 2016

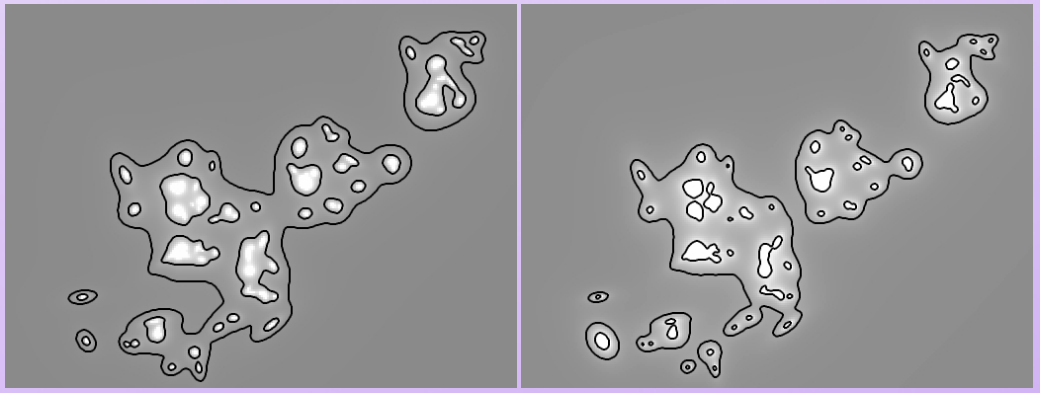
DM Distribution are *Very* Different [2D Mass Maps]



Total Mass Distribution
(Smooth + Subs)
Follows Light



Smooth Only
DM Distribution



Galaxy scale
Substructures

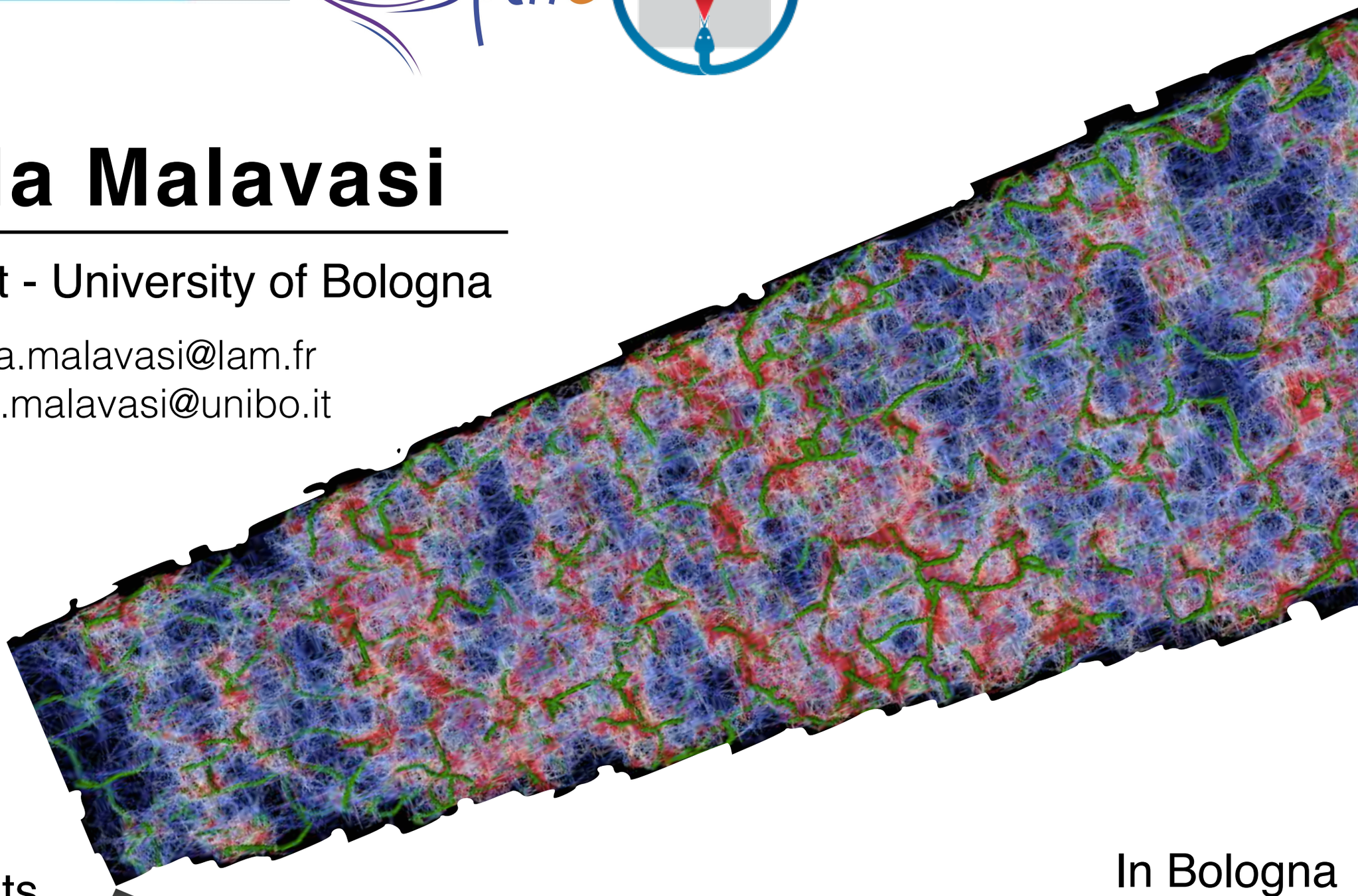
Limited Insights into the DM Distribution ?
Implication for Magnification Estimate

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
DEPARTMENT OF PHYSICS AND ASTRONOMY

Nicola Malavasi

PhD student - University of Bologna

nicola.malavasi@lam.fr
nicola.malavasi@unibo.it



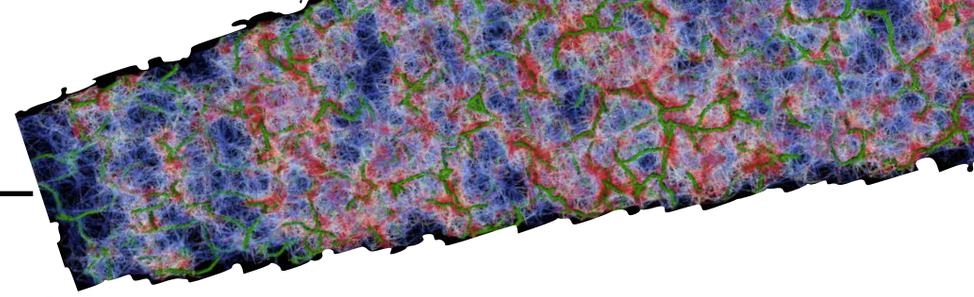
Visiting **LAM**
since January

working with

Stéphane Arnouts
Sylvain de la Torre
Didier Vibert
Iary Davidzon
Olivier Ilbert

In Bologna

Andrea Cimatti
Lucia Pozzetti
Sandro Bardelli
Olga Cucciati

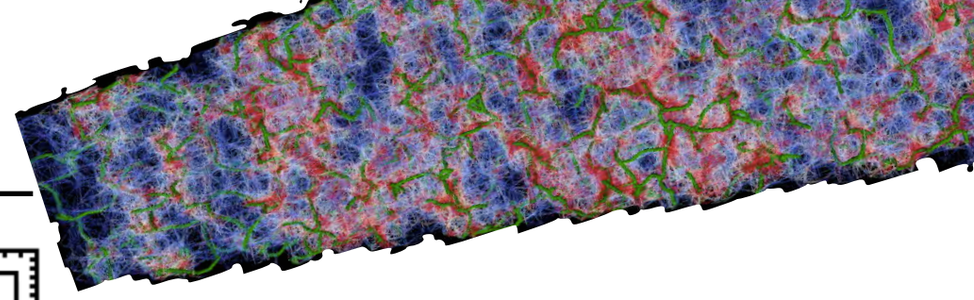


Galaxy formation and evolution

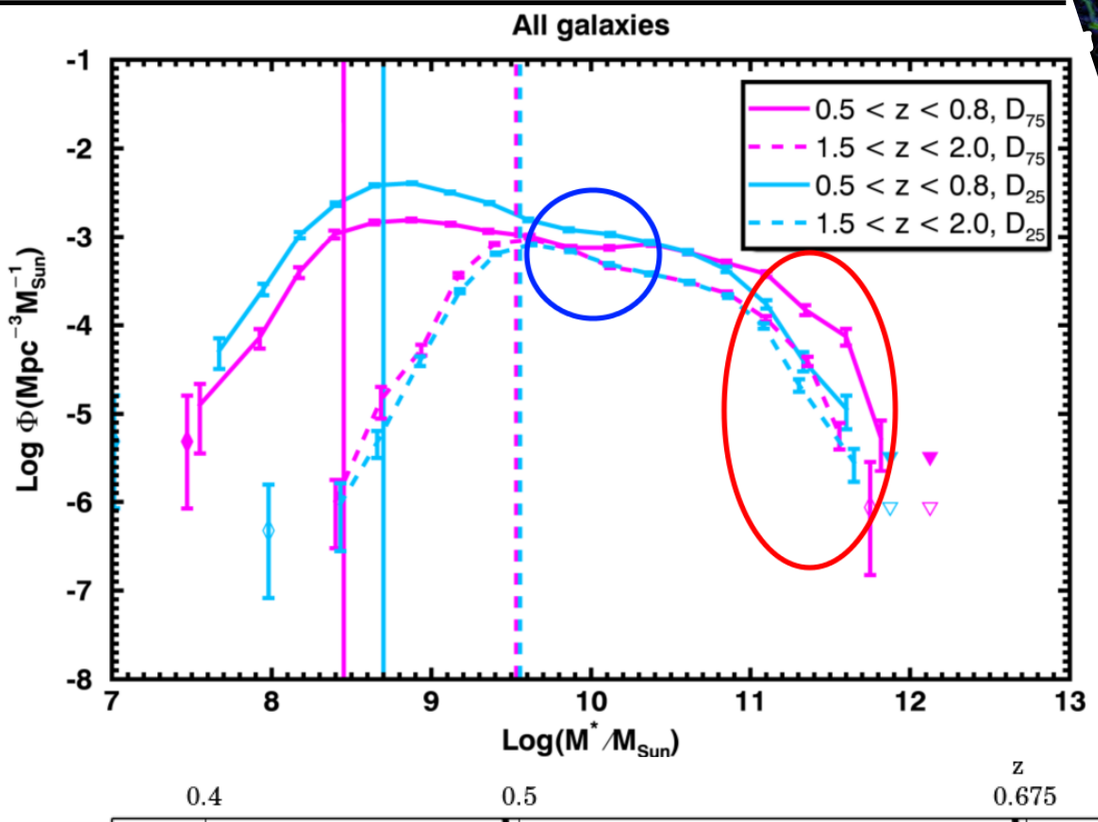
from the observational side

- When and how did **massive galaxies** form?
- How did they stop to form stars?
- What is the role of (local) **environment** in galaxy formation?
- How to measure the environment at **high redshift**?
- What is the role of **large scale structure** in galaxy formation?
- How to detect large scale structure?
- What is the role of Active Galactic Nuclei in galaxy formation?

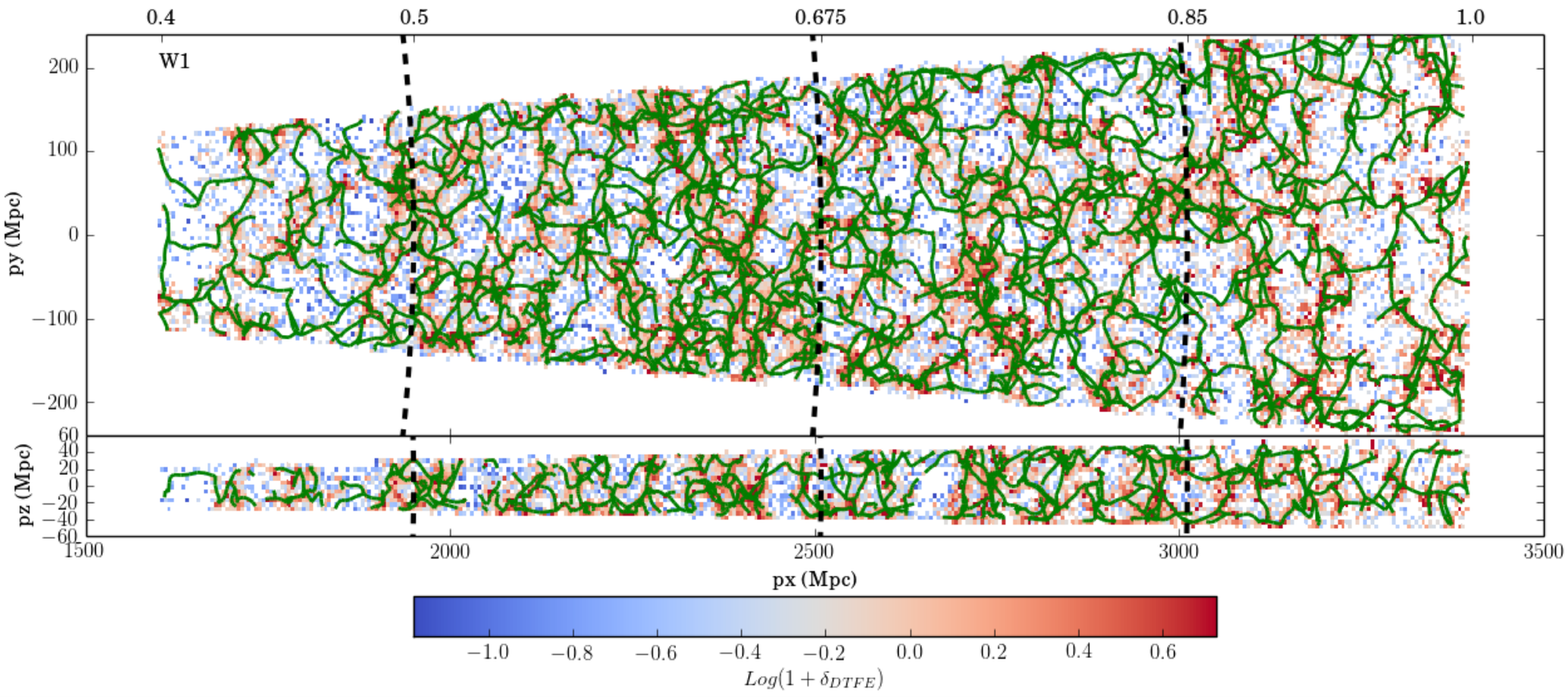
Ongoing work



GSMF
in different
environments
with
UltraVISTA

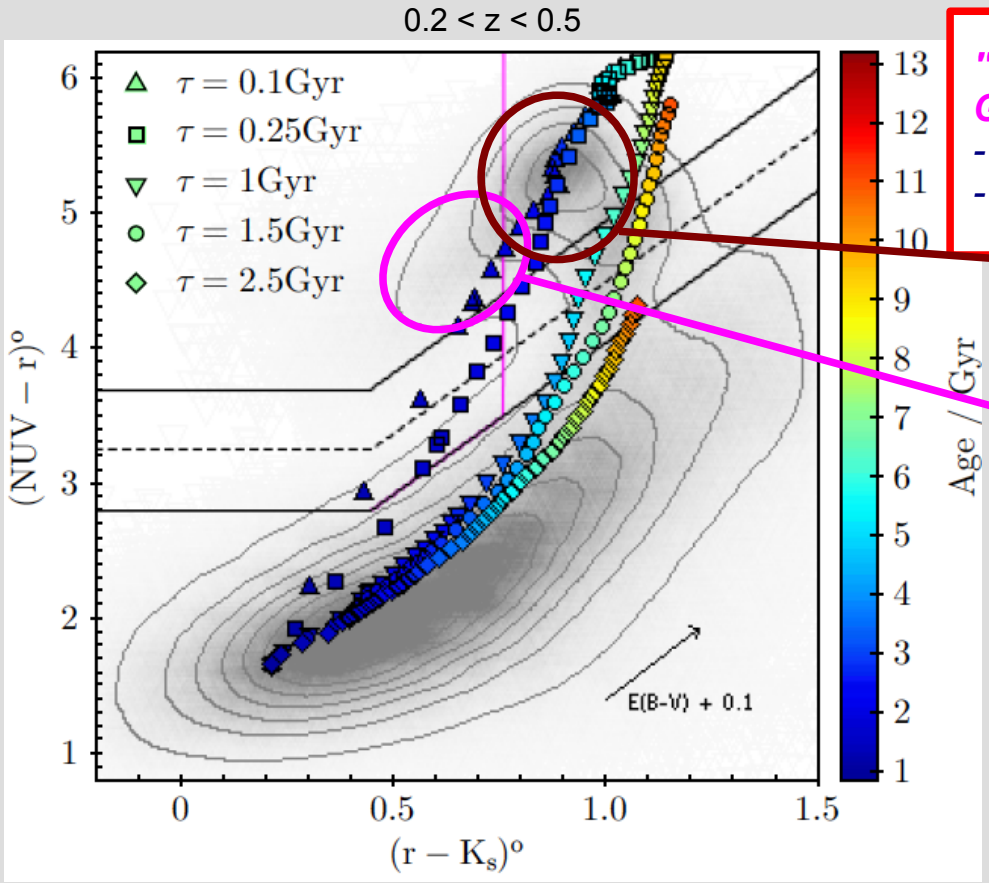


Detecting
filaments
in
VIPERS



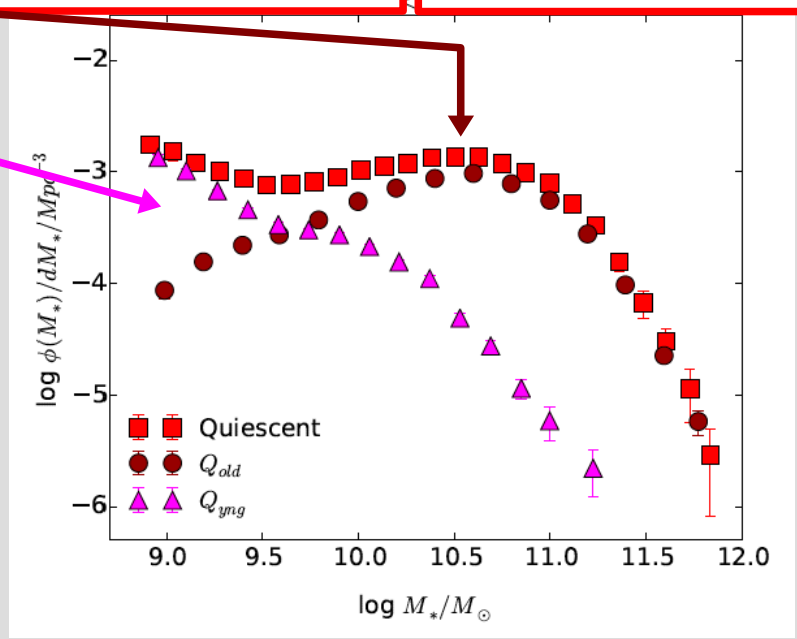
Diving in the midst of galaxies: several ways for the taming of the star-formation

→ *Two kinds of quiescent galaxies in the NUVrK (UVJ) diagram at low z*



"YOUNG" QUIESCENT GALAXIES:
- *RAPID QUENCHING*
- *log $M_*/M_\odot$ < 9.5*

M* QUIESCENT GALAXIES:
- *SLOW QUENCHING*
- *10.5 < log $M_*/M_\odot$ < 11.5*



→ *Mechanism(s) at play?* ***merging/hotAGN/gaz-stripping? vs choc-heating/radio-AGN strangulation?***

→ *What about higher redshift?* ***both channels already present at z ~ 3?***

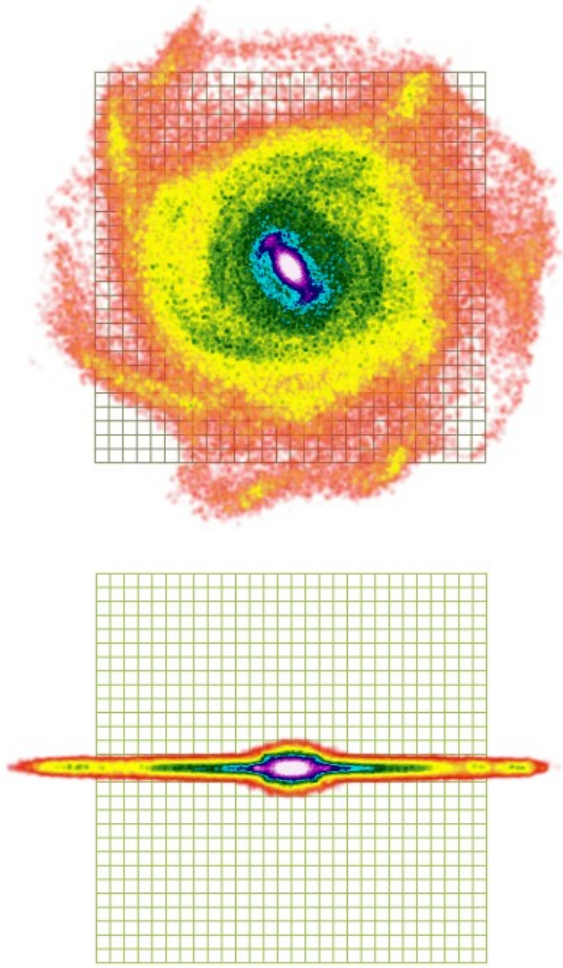
Quick Introduction

- Last year PhD student (defense : November 2016)
- Supervisor : Lia Athanassoula

- Studying the formation and evolution of disc galaxies in simulations

- I use the simulations presented by E. Athanassoula, where a spiral galaxy is created by a major merger between two gas-rich disc galaxies.

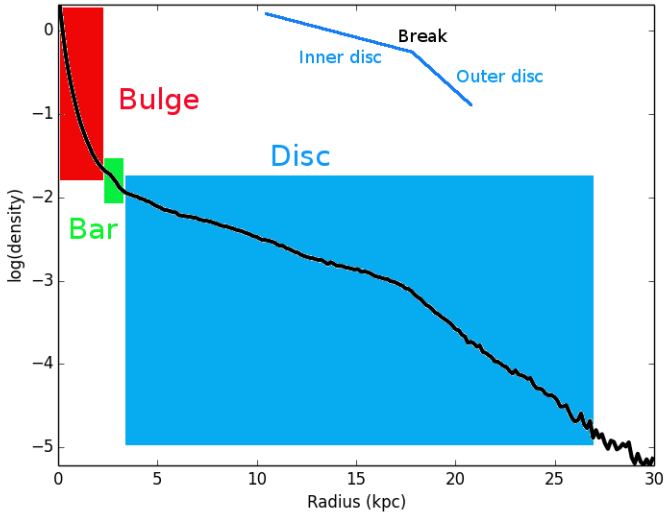
- I analyze the remnant spiral galaxy after the merger :
  - Morphology
  - Dynamics
  - Surface density profile



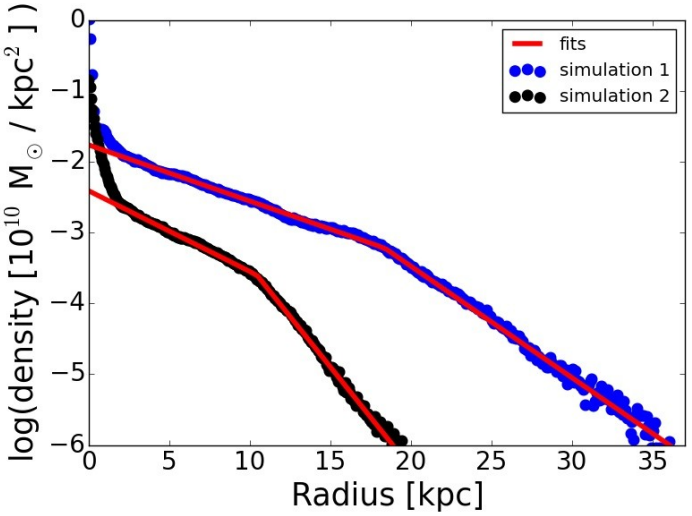
Athanassoula et al. 2016

Surface density profile of disc galaxies

- 1D density profile can be decomposed into several parts :
  - Bulge
  - Bar (if there is one)
  - Disc : inner + outer



- Fitting the disc profile with 2 exponential functions, to get :
  - Inner disc scalelength
  - Outer disc scalelength
  - Break radius



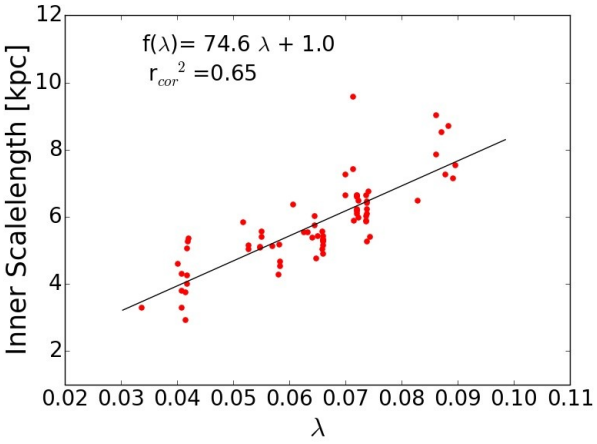
- Values very different from one simulation to another

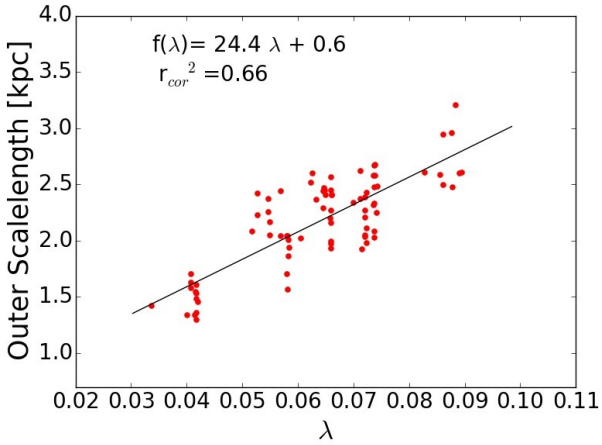
Angular momentum and scalelengths

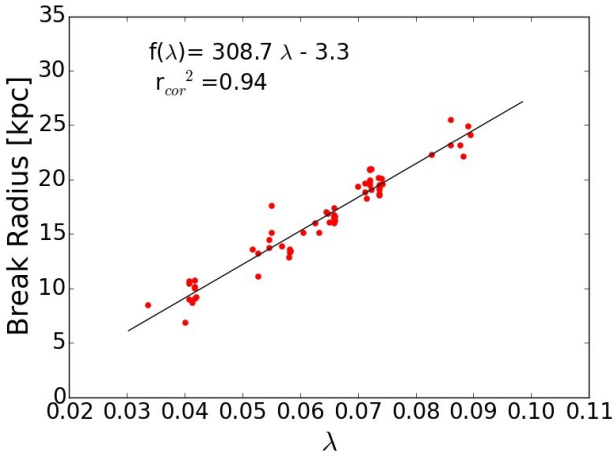
- Linking the scalelengths (and break radius) to the total angular momentum

- Spin parameter (Peebles, 1969) : $\lambda = \frac{J|E|^{1/2}}{GM^{5/2}}$
  - J : total angular momentum
  - E : total energy
  - M : total mass

- → Good correlations : both scalelengths and the break radius increase with the spin parameter







Searching for high-z quasars in the CFHQSIR survey

- **Why ?**

  - High-z quasars are key probes of the early Universe :

  Cosmic Reionization **Formation of primordial black holes**

- **How ?**

  → **The CFHQSIR Survey**

- Canada-France High-z Quasar Survey in the near Infrared
- Carried out at CFHT with the Wide field IR camera WIRCam
- Y-band imaging of the CFHTLS Wide fields down to a limiting magnitude Y_{AB} ~ 22.0
- Totaling ~ 150 sq.deg.

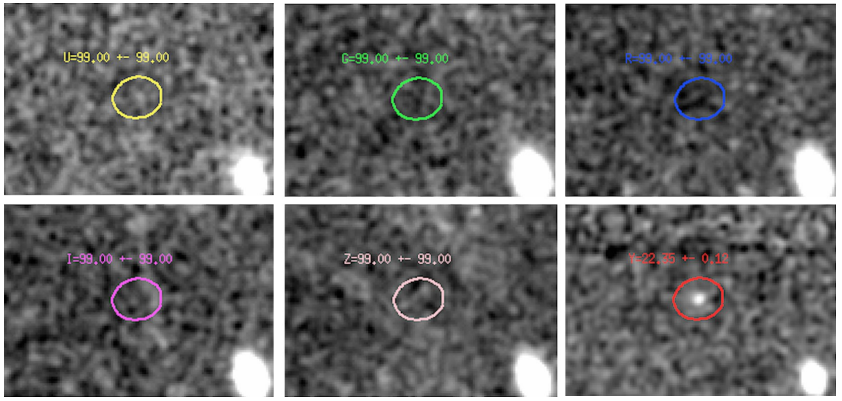
Goal : search for z ~ 7 quasars

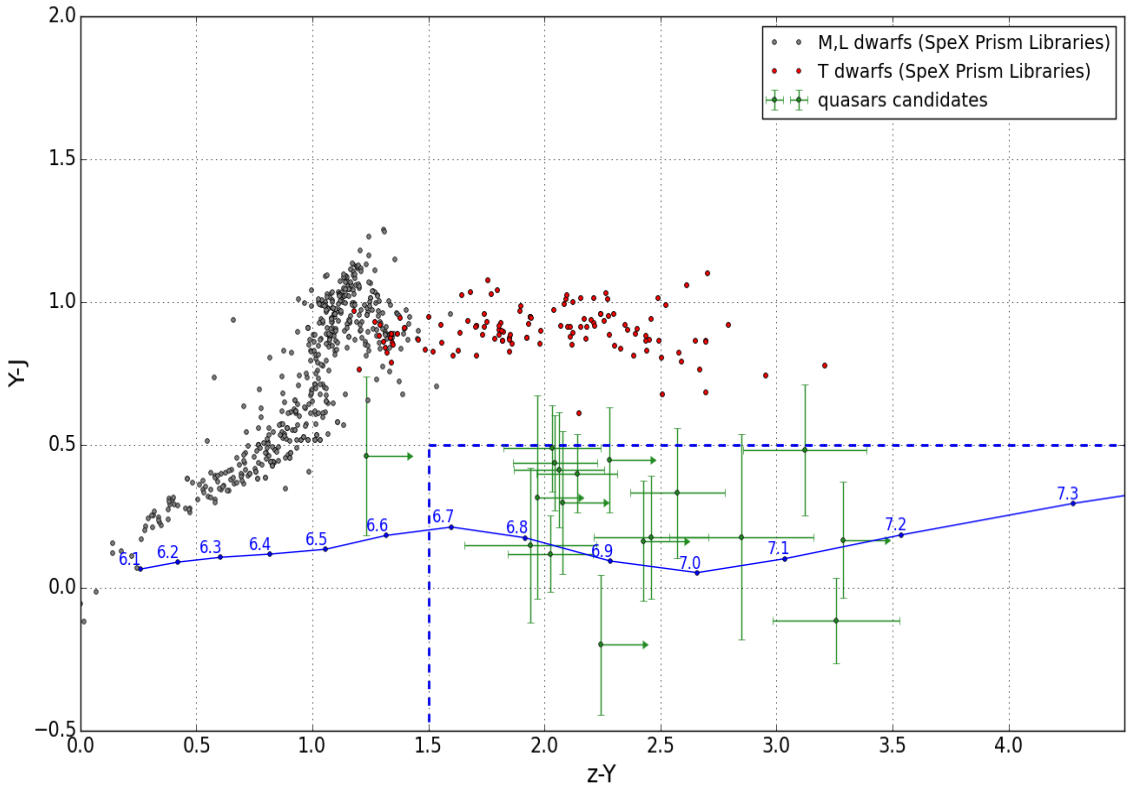
- **Data analysis**

  - Photometric calibration of the WIRCam images
  - Survey completion rate
  - Noise properties (correlated noise)
  - Image quality, analysis of PSF

- **Selection of qsos candidates**

  - Color selection
  - Double analysis of NIR (Y band) and optical (u, g, r, i, z) data from the CFHTLS
  - Multiwavelength (J, H, CH4) observations of the most promising candidates to discriminate them from the main source of contamination : the brown dwarfs





Color-color diagram :

Possible high-z candidates

- **Work in progress …**

  - Bayesian analysis : probabilistic selection
  - Expanding our analysis to the z ~ 6.5 quasars

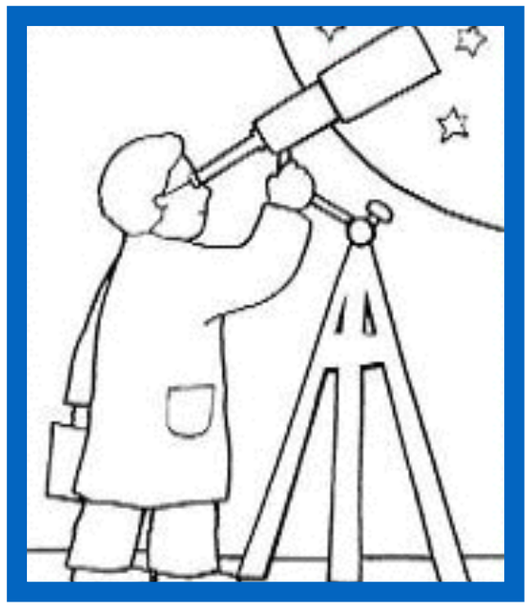
- **Later on …**

  - Exploitation of our T-dwarfs data : search for late type brown dwarfs
  - Constraints on the space density of high-z quasars, luminosity function

Who I am

Bruno Ribeiro 3rd year PhD student, office S207

Supervised by Olivier Le Fèvre



Science Expertise (galaxies)

Morphology of star-forming galaxies

High redshift morphology

Ly-α extent/shape

Technical Expertise (python)

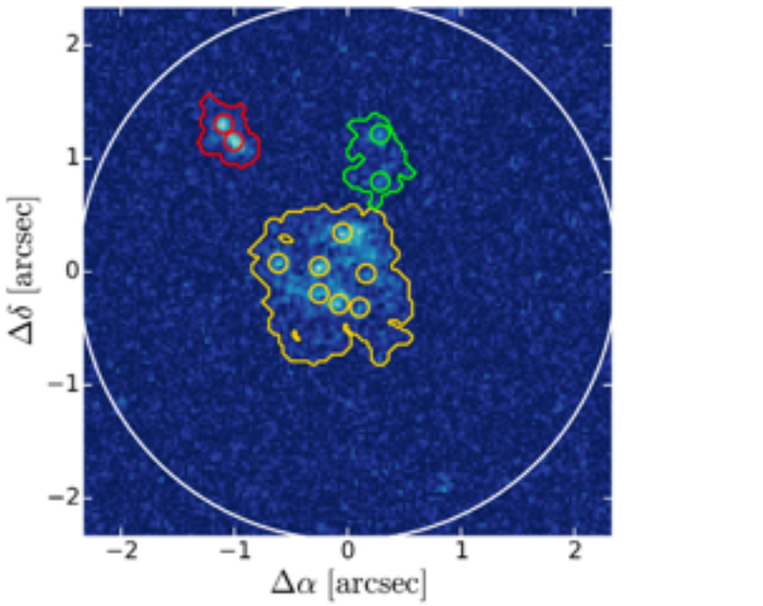
Making “good looking” plots

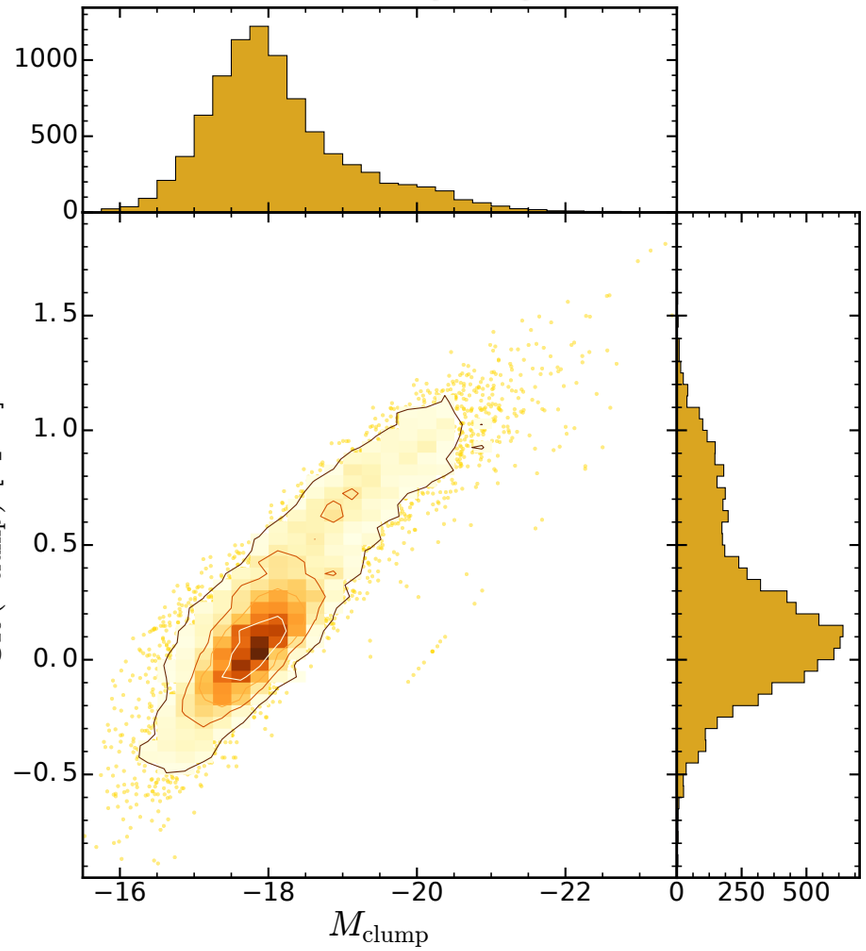
Creating Interactive tools for data analysis

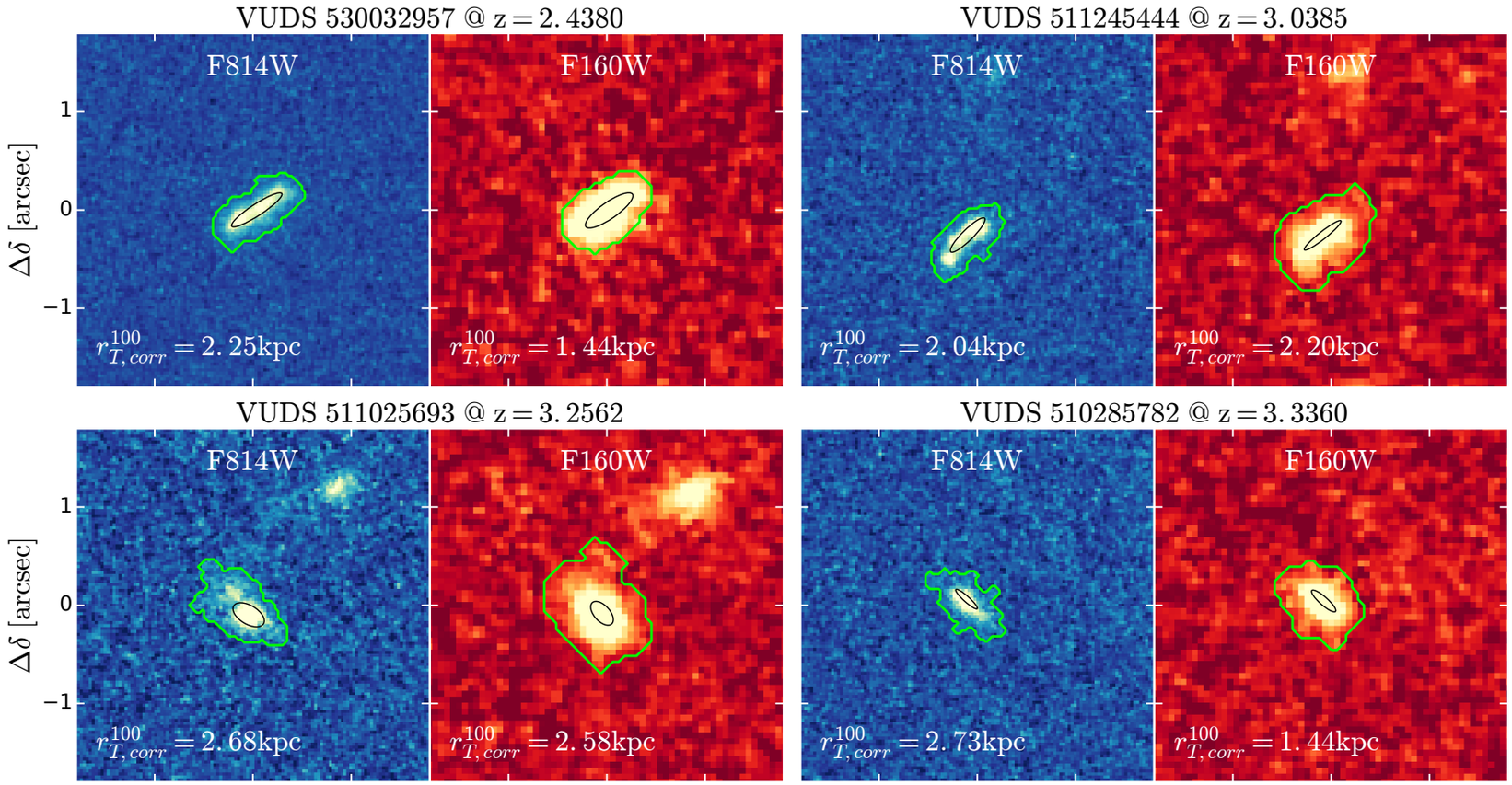
Team member

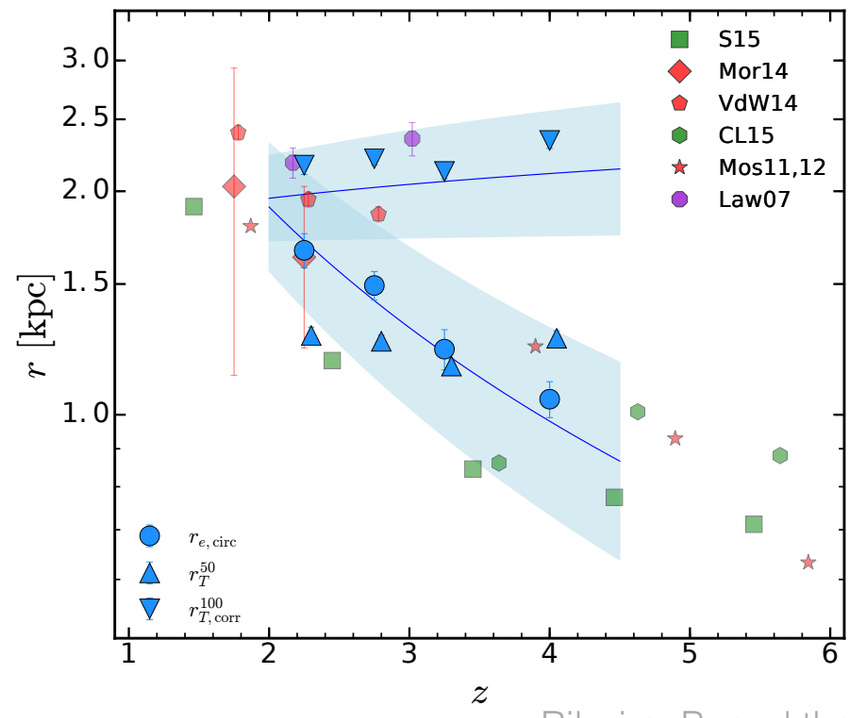
What I do

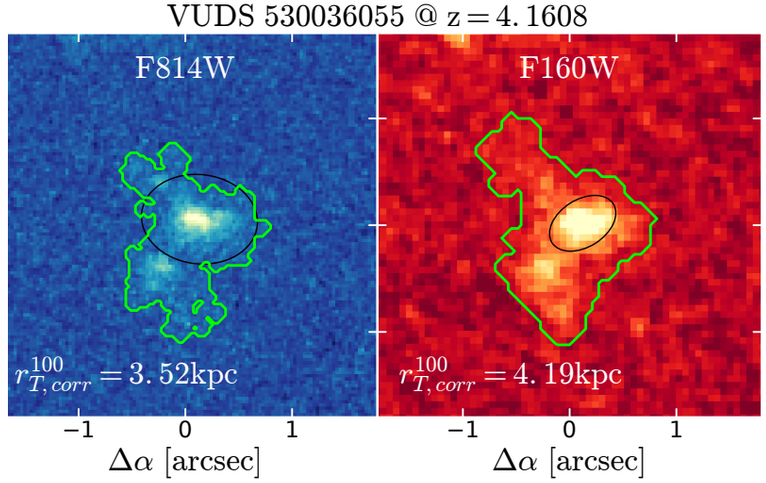
Clumpy Galaxies in VUDS (to be submitted)





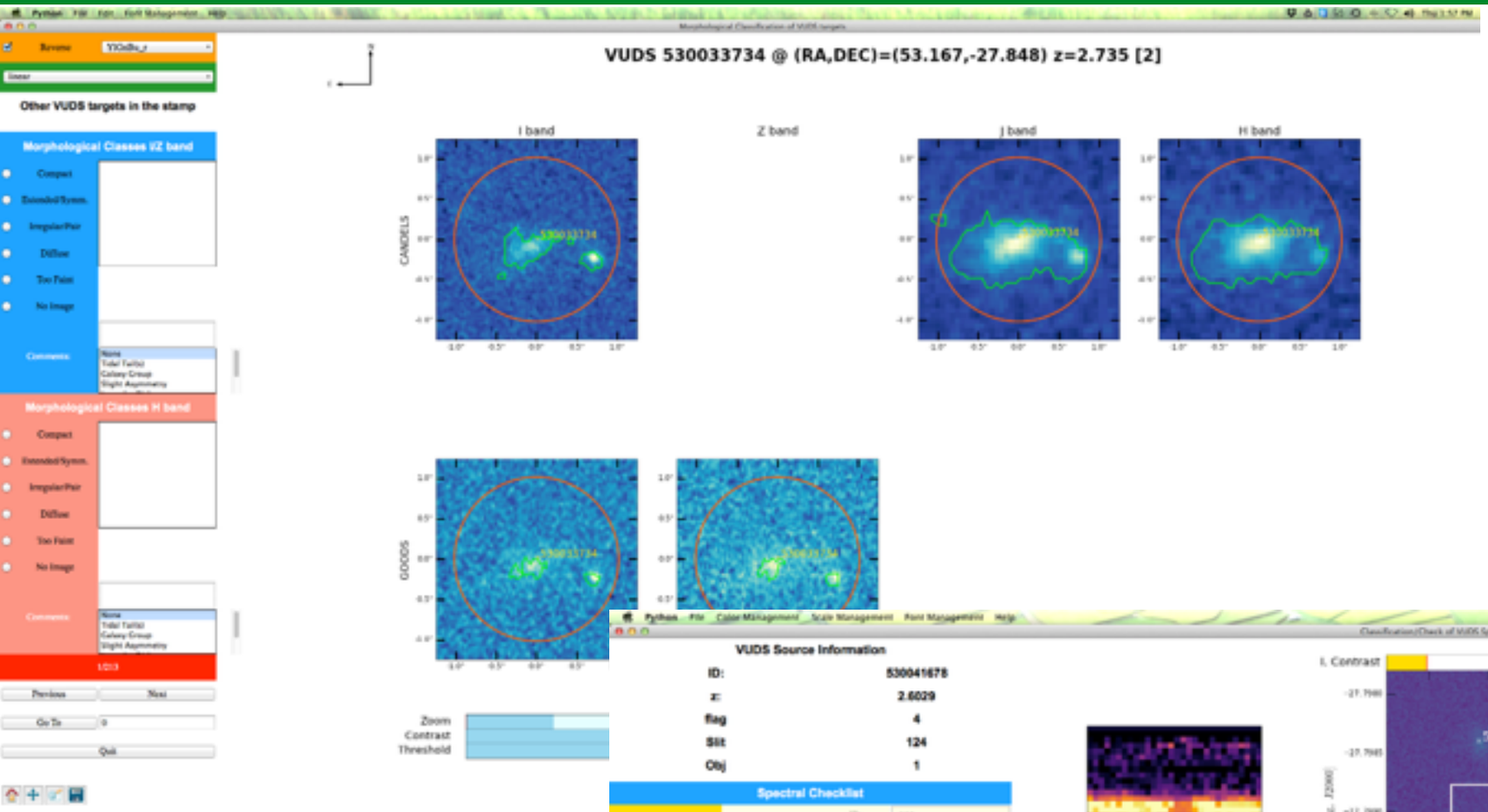






Galaxy Size Evolution: Parametric and Non-Parametric arXiv:1602.01840 (accepted in A&A)

What I do



Interactive Morphological Classification Tool

- Interactive segmentation maps
- Automated distance display
- Link images across different surveys
- Easy navigation through object list
- …

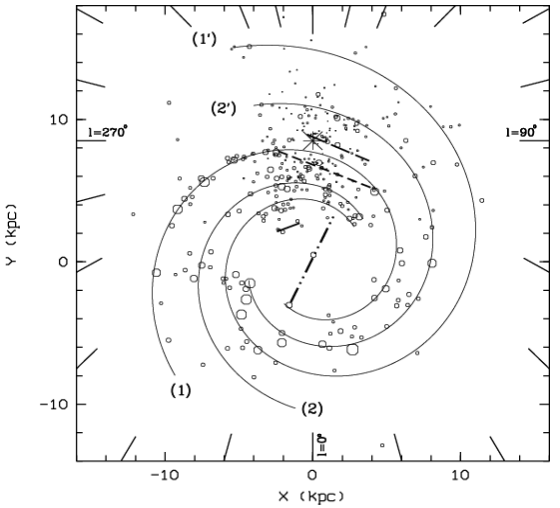
SpectroPhotometric Visual Check Tool

- Map the slit position in the image
- Quick extraction from 2D slit
- Link 1D + 2D + Sky spectra
- Easy navigation through object list
- …

Delphine Russeil
Maitre de conf. AMU.
Co-resp. L1 PC saint-Jerome

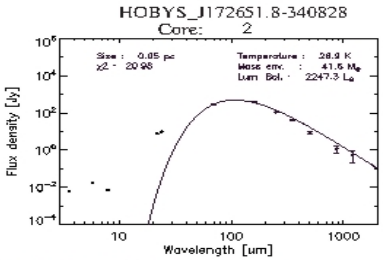
Main projects :
Herschel-Hobys
Herschel-HiGAL - Vialactea
PF- HII regions - kinematics

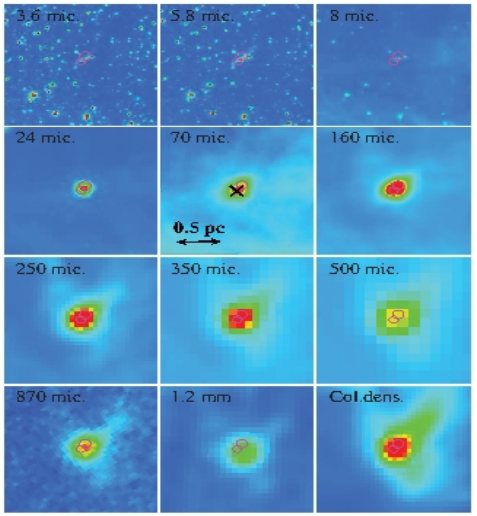
Milky-Way study



A&A 2007

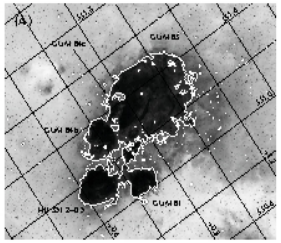
Formation of massive stars
HOBYS regions : NGC 6334, NGC 6357

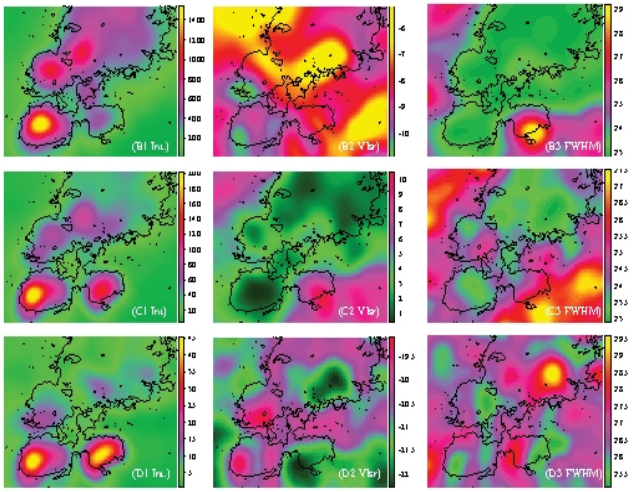




Vialactea Hi-GAL
Distance determination group

HII region kinematics
Hα line
(PFinterferometer)





Carlo Schimd

Maître de Conférence

- Teaching activity

  algebra, EM waves @ 2nd yr Polytech
  astrophysics project @ 3nd yr Physics (CTES)
  computing project @ 1st yr Master SPaCE
  statistical methods, physical cosmology @ 2nd yr Master P3TMA

- Research activity

  #1 Geometry & topology of LSS by Minkowski functionals
  in 3D @ VIPERS (global morphology; segregation of gal' types) >>> on hold! <<<
  @ XXL (local morphology) w/ data/catalogs by Valentina Guglielmo
  @ GAMA (partial morphology .vs. minimal spanning tree) >>> on hold! <<<
  in 2D @ weak-lensing κ-maps; DEMNUni, ...
  ...collaboration: Eric J, Carlo G + Kilbinger (CEA), Vicinanza/Maoli/Cardone (Rome), Carbone (Brera)

  #2 BAO science (Euclid): optimization by non-linear reconstruction methods of...
  ...collaboration: E. Branchini (Rome), A. Nusser (Haifa), S. Matarrese (Padua)

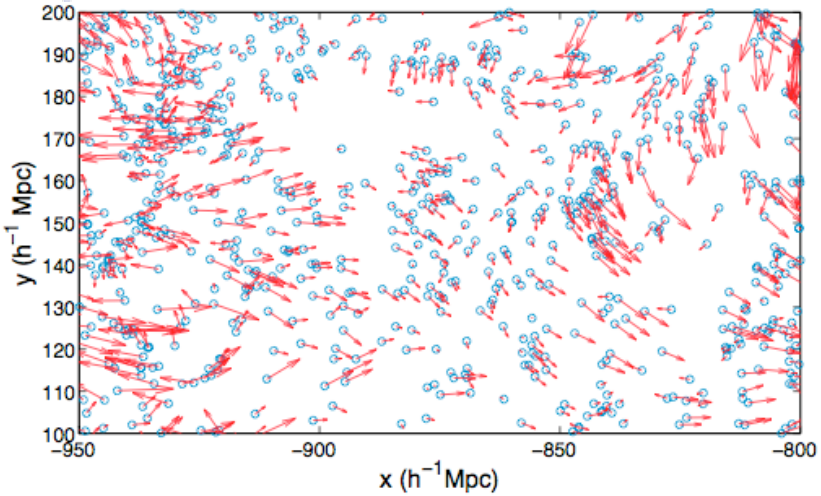
  #3 Velocity surveys: future instruments, e.g. ✟♤☠ *...collaboration: H. Courtois (Lyon)*

- Supervisor of

  1. Stéphane D'Ascoli (ENS Paris; L3 internship, 4 weeks): Can BATMAN be used to efficiently measure the spin of thousands of z~0.5-1 galaxies?!? *...kinematic lensing, TFR/velocity maps*
  2. Thomas Grassi (M1 Physique, AMU): MFs analysis of DEMNUni simulations
  3. David Benazra (w/ Eric J; M2 P3TMA): MFs of κ-maps from DEMNUni simulations
  4. Elena Sarpa (Erasmus+, PhD > Dec 2016): ...

GC-SWG

WP "Reconstruction" (N. Padmanabhan & F. Kitaura)
task: define and test methods for reconstruction (for BAO)
priority: medium



Baseline reconstruction algorithm (~ZA)

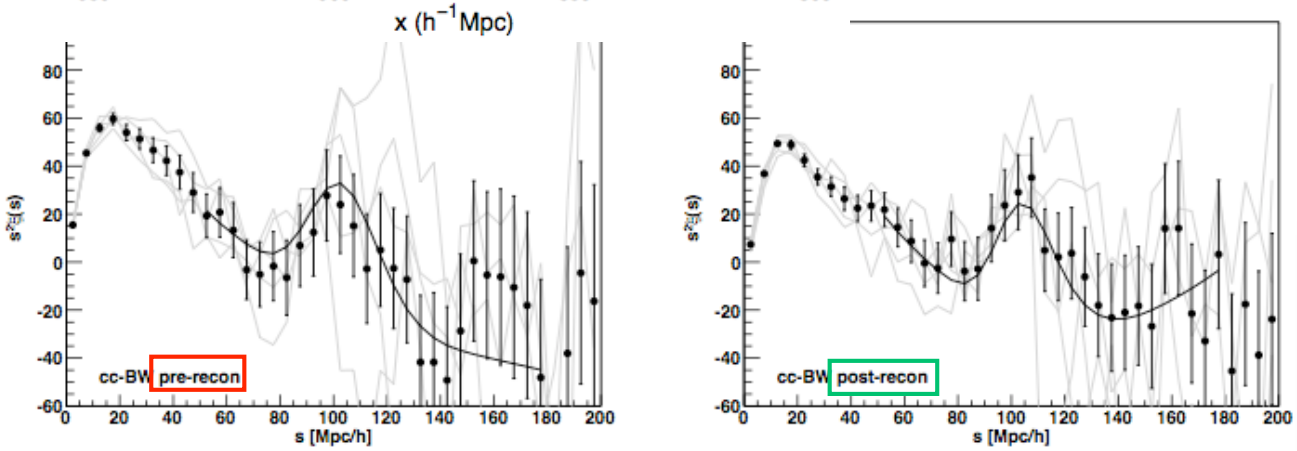
How do we handle with the large Euclid volume?
sub-volumes w/ buffering? Poisson solvers?

Alternative reconstruction algorithms

1. Fingers-of-God
2. Using improved density field?
3. Fully Bayesian method?
4. Use lensing information to calibrate?
5. Can fit higher-order functions?

Long-term tasks: Validation and systematic tests

1. What mocks? approximate?
2. Test Gaussianity of reconstructed field; 1-, 2-, n-PCF, ... MFs
3. Effect of (distance) cosmology, pNG.



Elena's (Master thesis &) PhD project

1. Fast Action Minimization method (Nusser & Branchini 1998+)
2. Euclid mocks (by M. Crocce, Barcelona)
3. "benchmark": BOSS / eBOSS
4. by-product: Cosmocflows-3 (Courtois+)

Table 1. Measurements from SDSS reconstructed galaxy surveys

Reference	Data Sample	Pre Reconstruction Error	Post Reconstruction Error	improvement
Anderson et al. (2014)	DR11 CMASS	1.5%	0.9%	x 1.7
Tojeiro et al. (2014)	DR11 LOWZ	2.7%	1.9%	x 1.4
Ross et al. (2014)	DR10 red sample	2.7%	2.0%	x 1.3
Ross et al. (2014)	DR10 blue sample	3.1%	2.6%	x 1.2
Anderson et al. (2014)	DR10 CMASS	1.9%	1.3%	x 1.5
Tojeiro et al. (2014)	DR10 LOWZ	2.6%	2.5%	x 1
Anderson et al. (2012)	DR9	1.7%	1.7%	x 1
Padmanabhan et al. (2012)	DR7 LRG [a]	3.5%	1.9%	x 1.8

GECO

Lidia Tasca

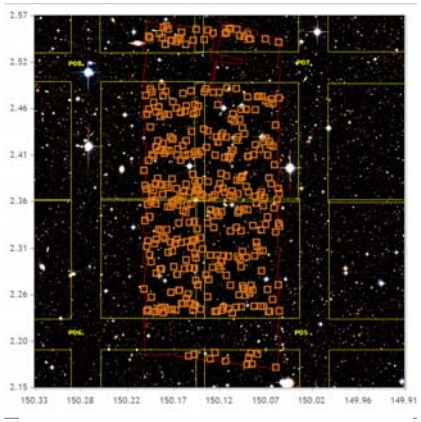
Main expertise: spectroscopy (MOS & 3D),
multi-λ photometry,
galaxy morphology, etc...

Main international collaborations in large surveys: VUDS, VIPERS,
VANDELS, zCOSMOS,
Euclid, COSMOS,
FMOS-COSMOS,
UltraVISTA, MASSIV, etc..

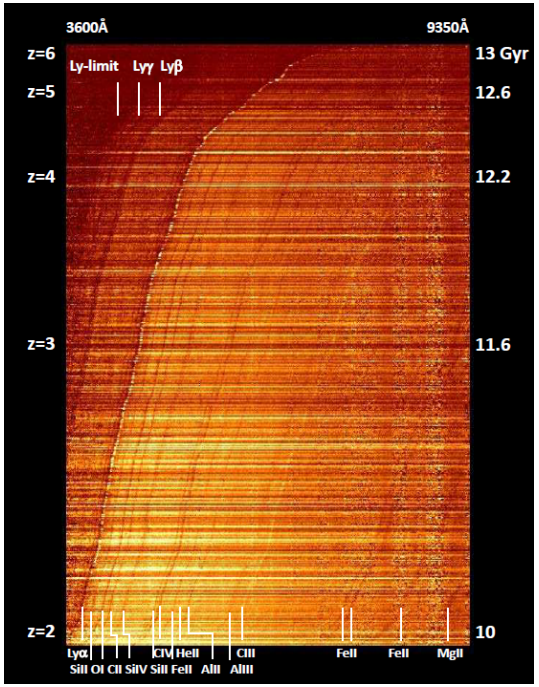
Scientific interests: galaxy formation & evolution,
galaxy morphological transformation,
role of the environment,
main physical mechanisms,
first objects,
progenitors of compct massive quiescent galaxies,
etc...

Responsibilities: member of the ESO OPC cosmology panel,
scientist manager of various information systems
hosted at CESAM

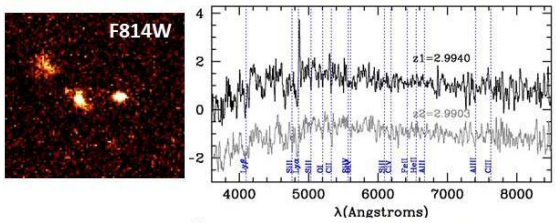
Recent results



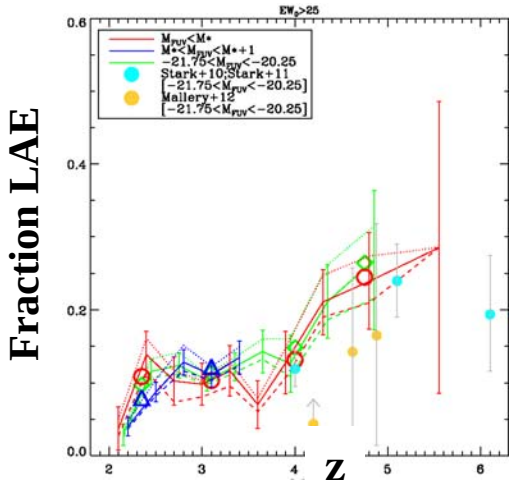
Tasca et al. in press
DR1: public data



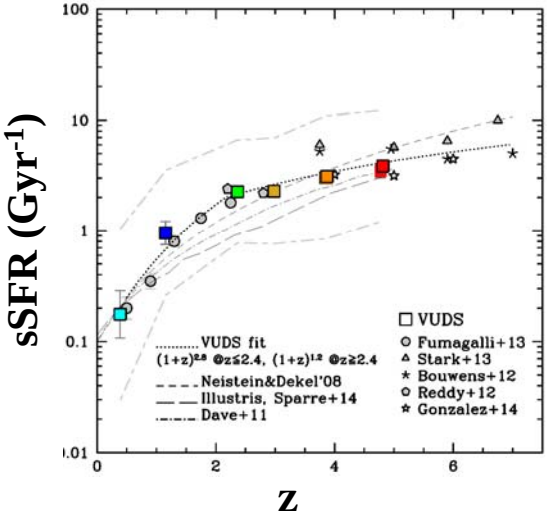
Le Fèvre, Tasca et al. 2015



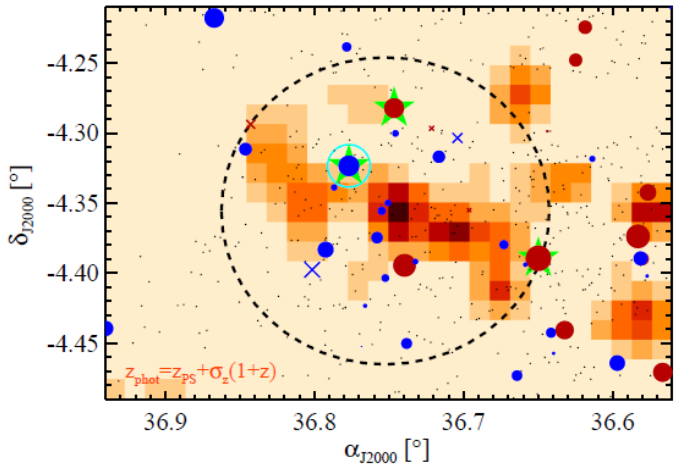
Tasca et al. 2014b



Cassata, Tasca et al. 2015

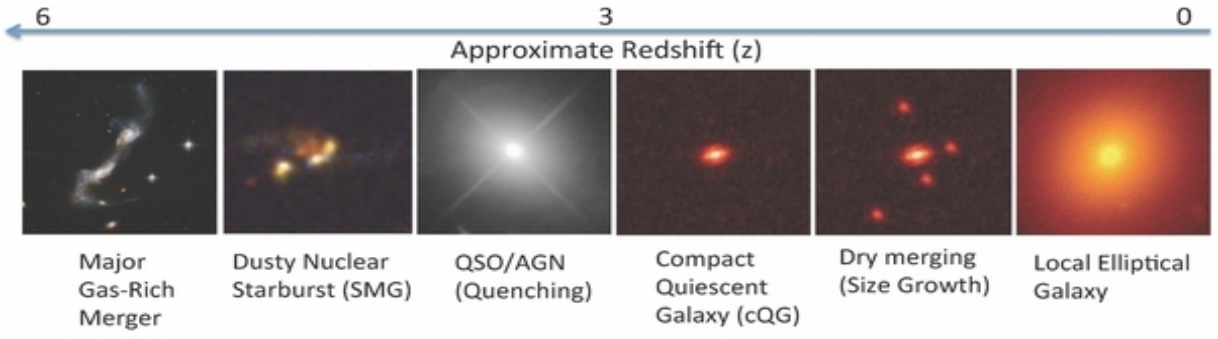


Tasca et al. 2015

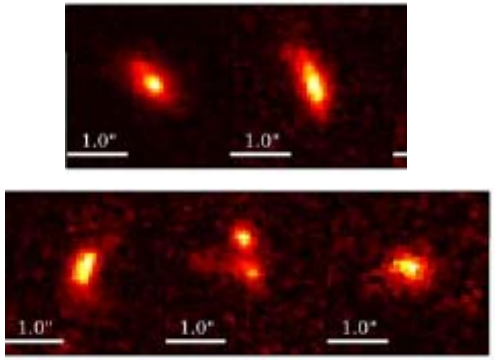


Lemaux, Cucciati, Tasca et al. 2014

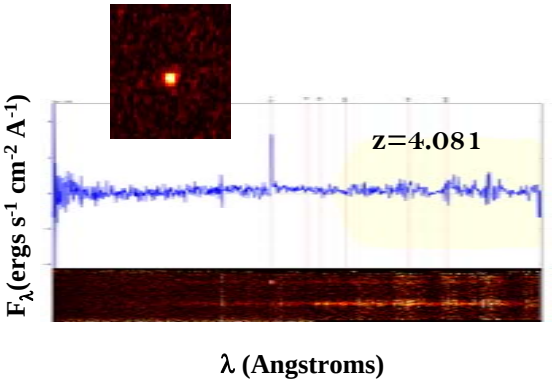
Work in progress



Progenitors of massive quiescent galaxies



Discovery of Extremely Compact galaxies



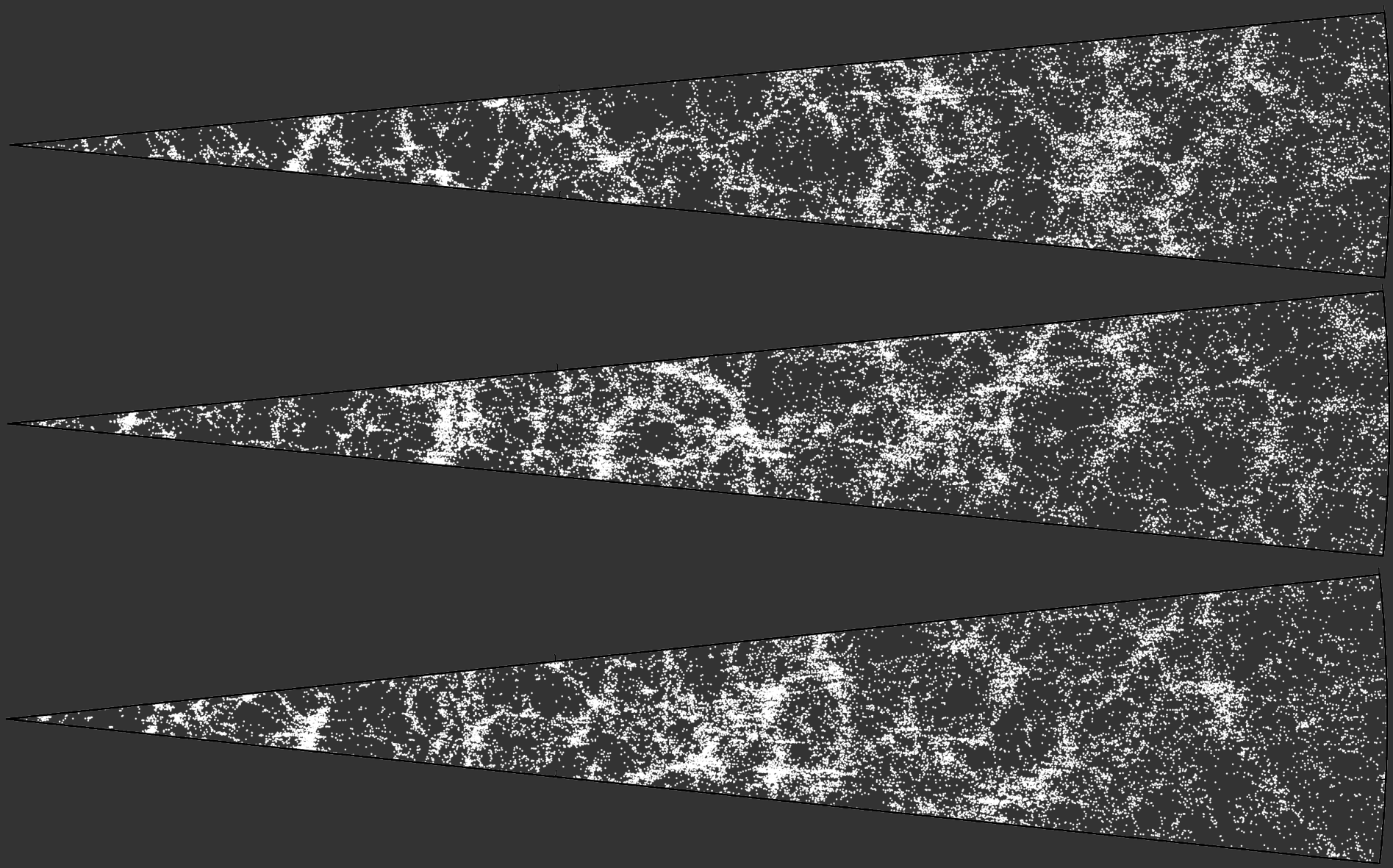
Environmental effects at z<0.2: Groups

Marie Treyer & Katarina Kraljic

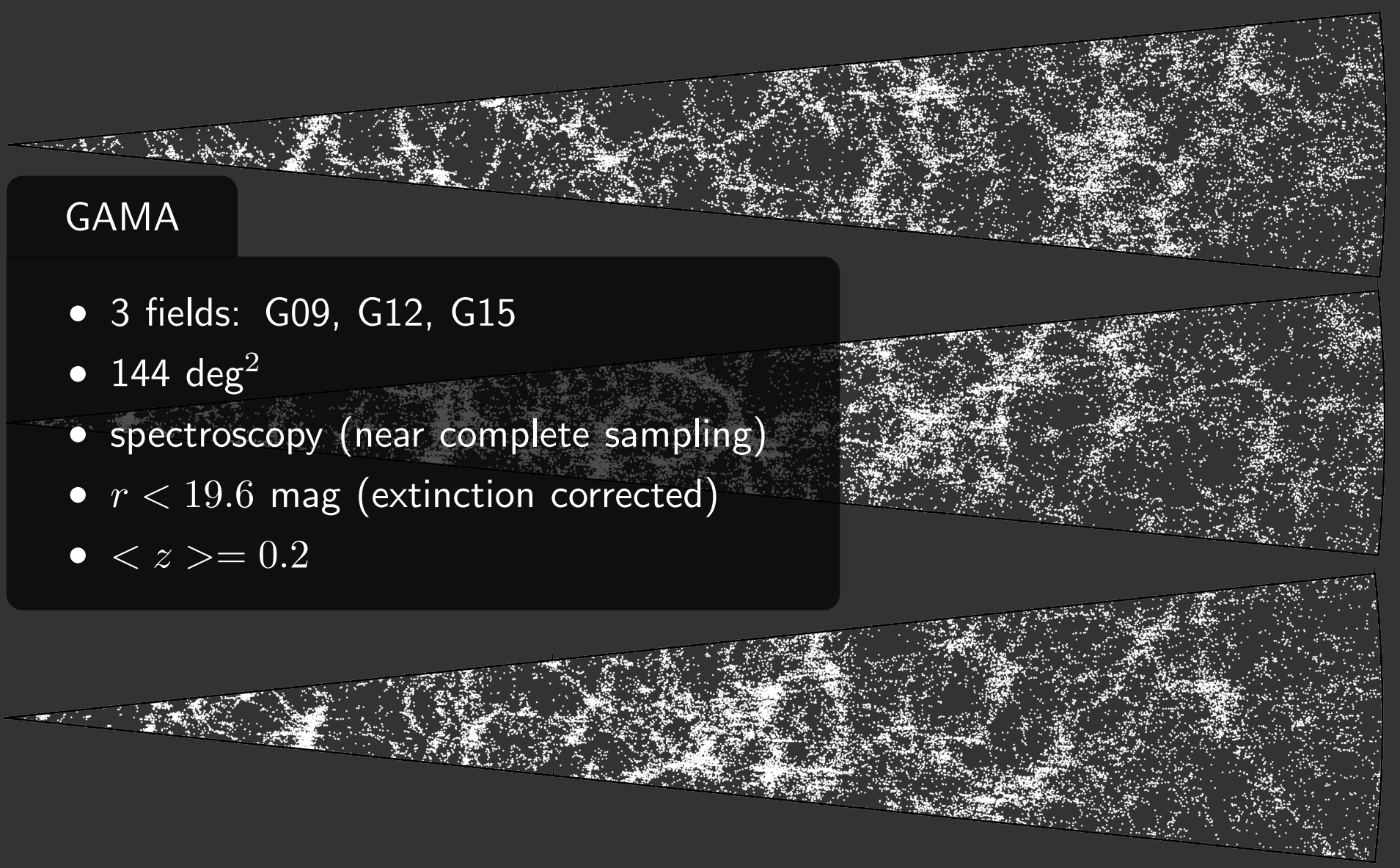
with

Stéphane Arnouts

Sylvain de la Torre, Didier Viber, Bruno Milliard



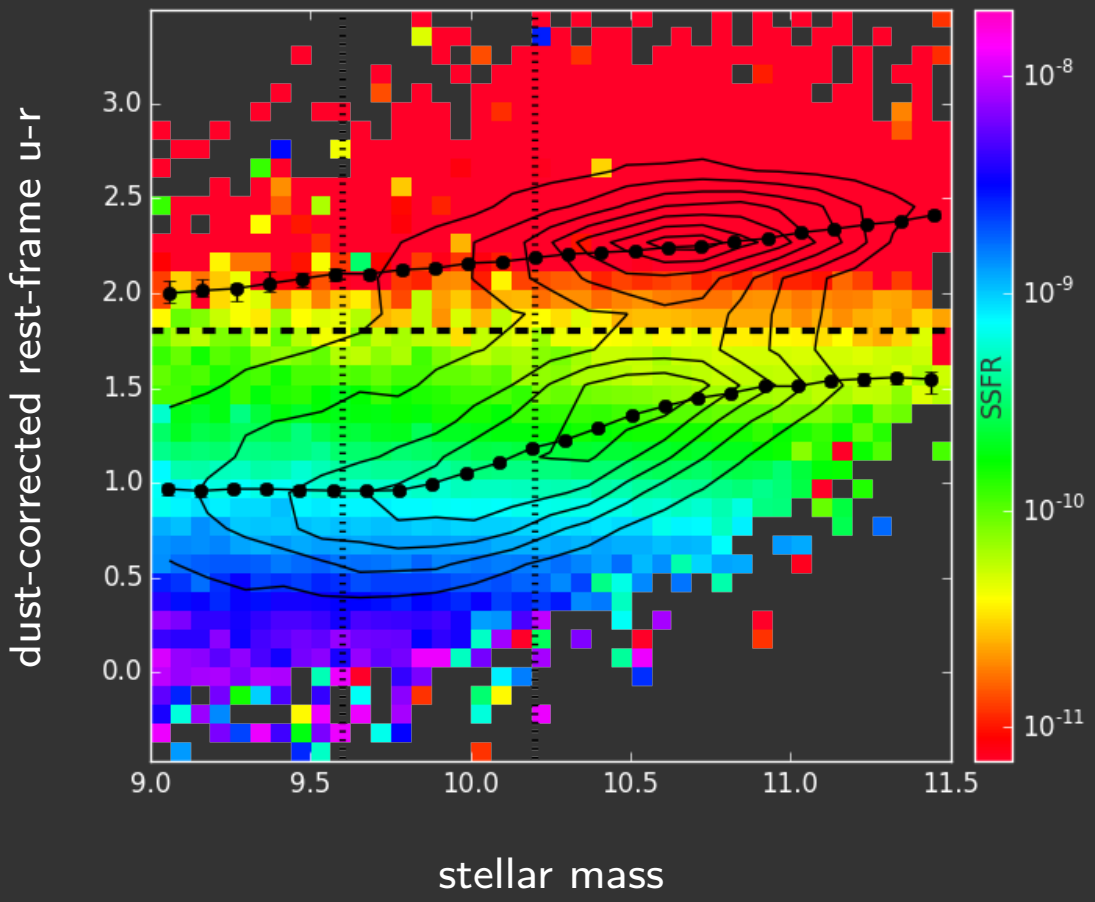
Data



GAMA

- 3 fields: G09, G12, G15
- 144 deg^2
- spectroscopy (near complete sampling)
- $r < 19.6$ mag (extinction corrected)
- $< z >= 0.2$

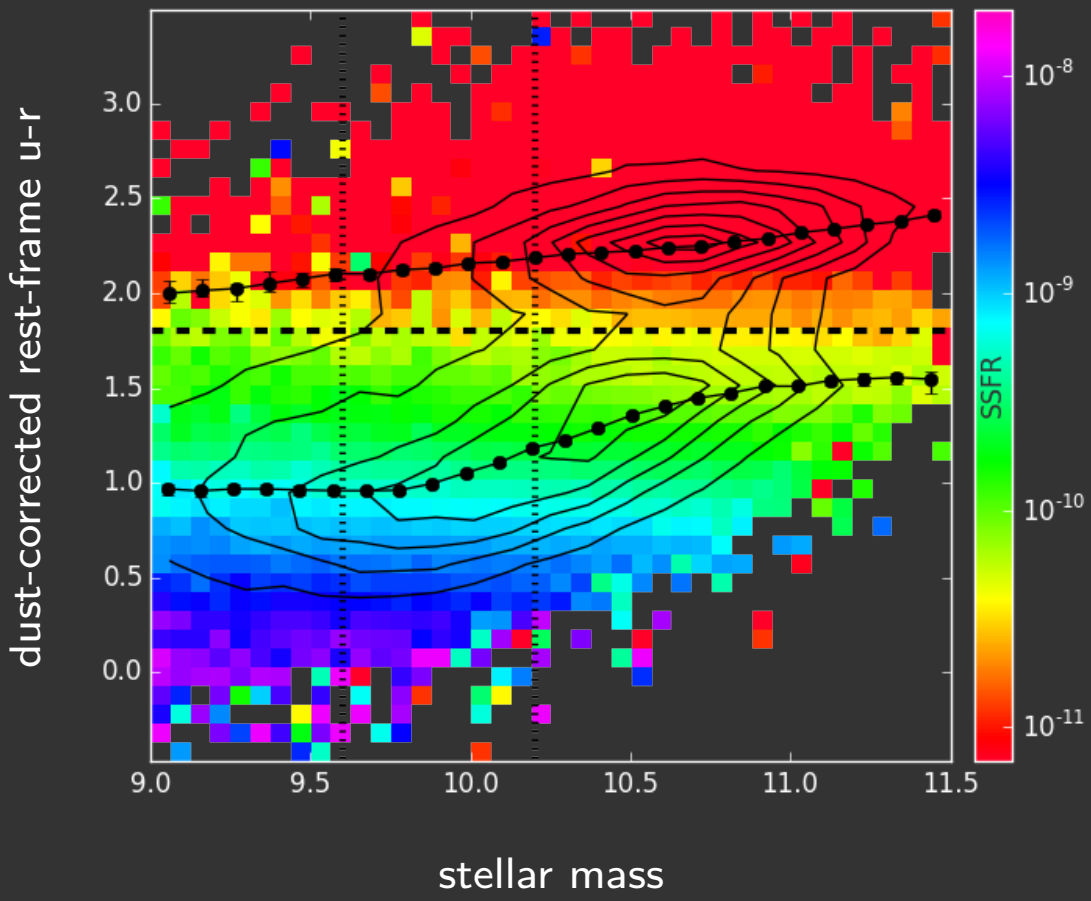
Data



LePhare

- 59000 galaxies ($z < 0.2$)
- SED fitting

Data



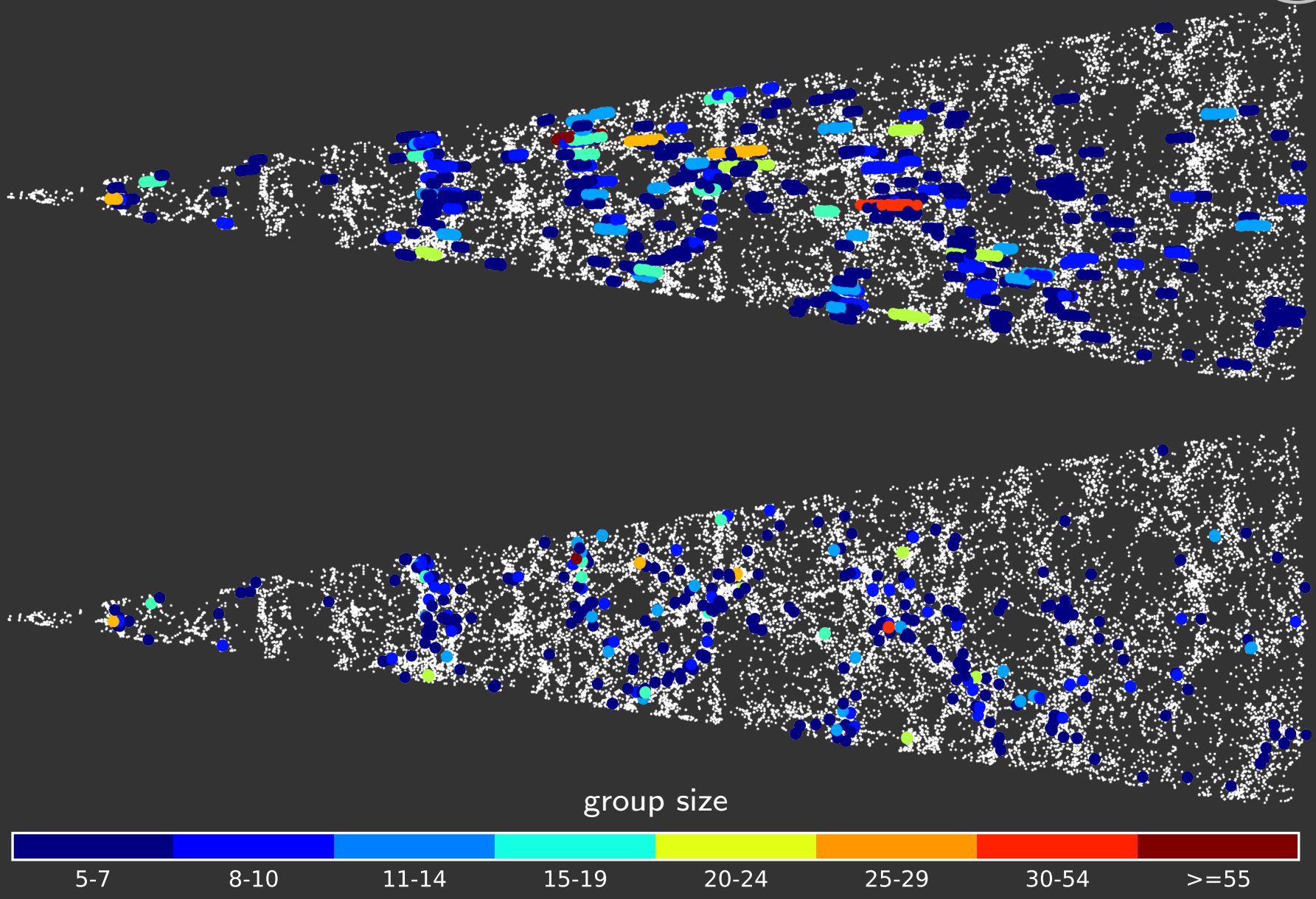
LePhare

- 59000 galaxies ($z < 0.2$)
- SED fitting

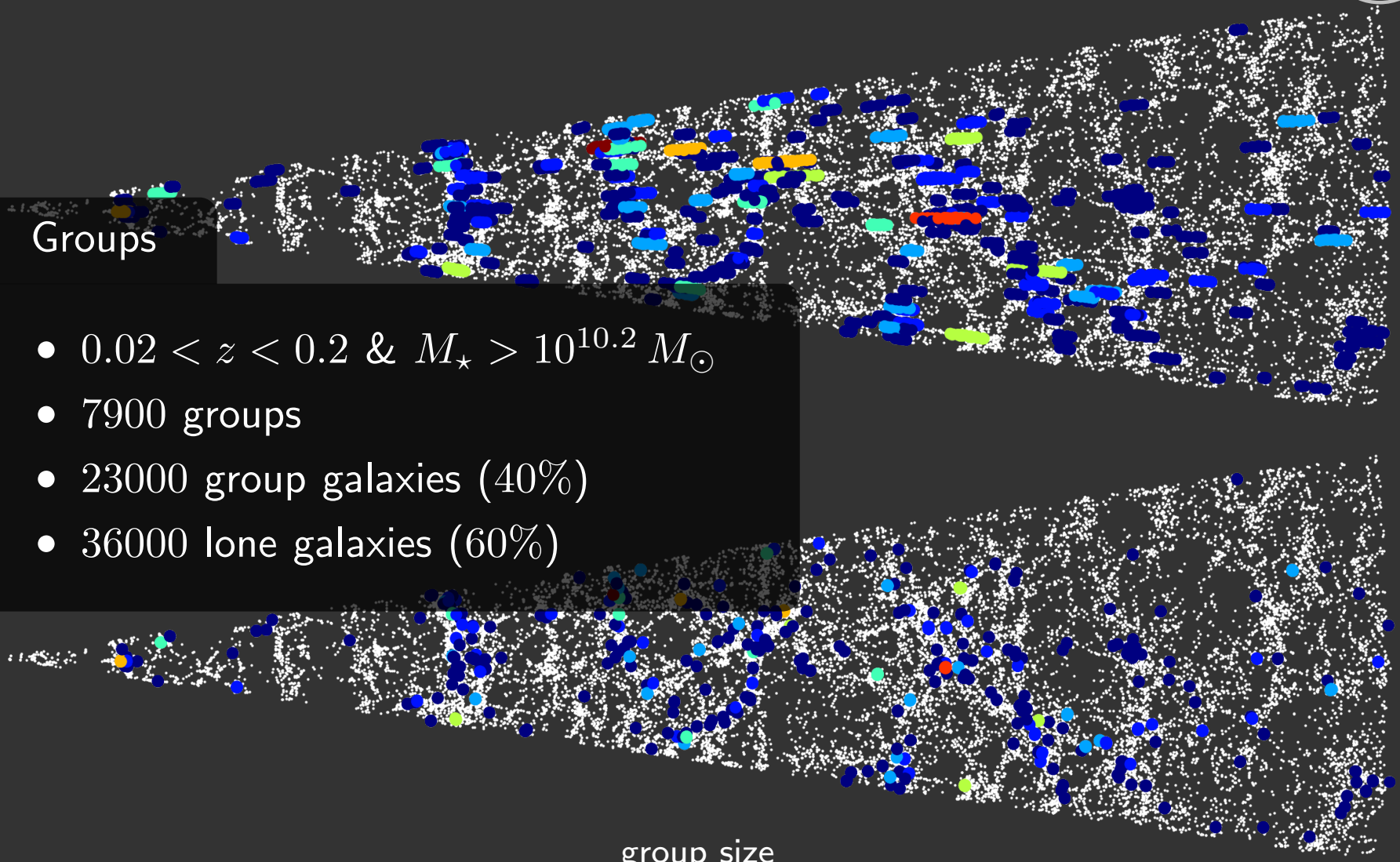
Parameters

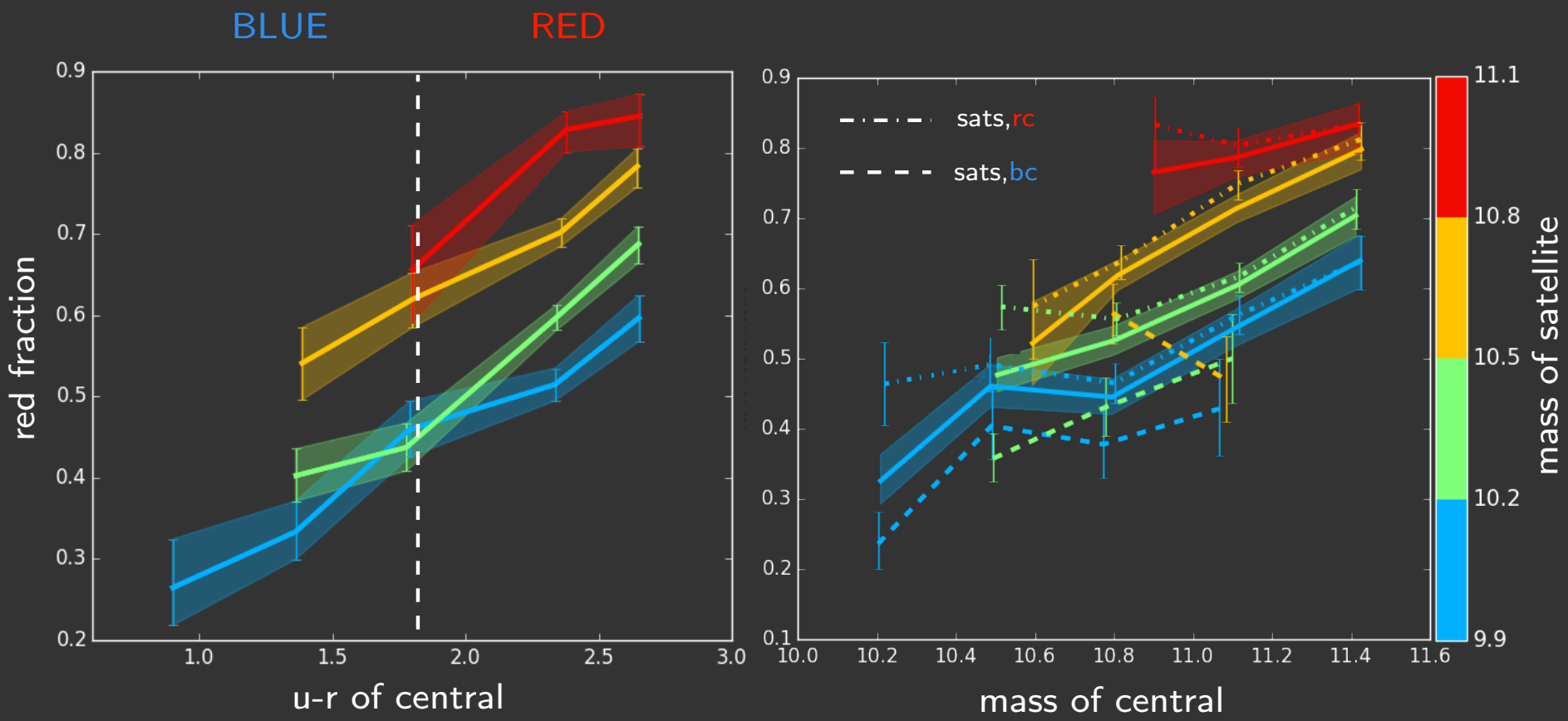
- absolute mag
- $M_\star$
- SFR
- L_{dust}
- ...

Group catalogue

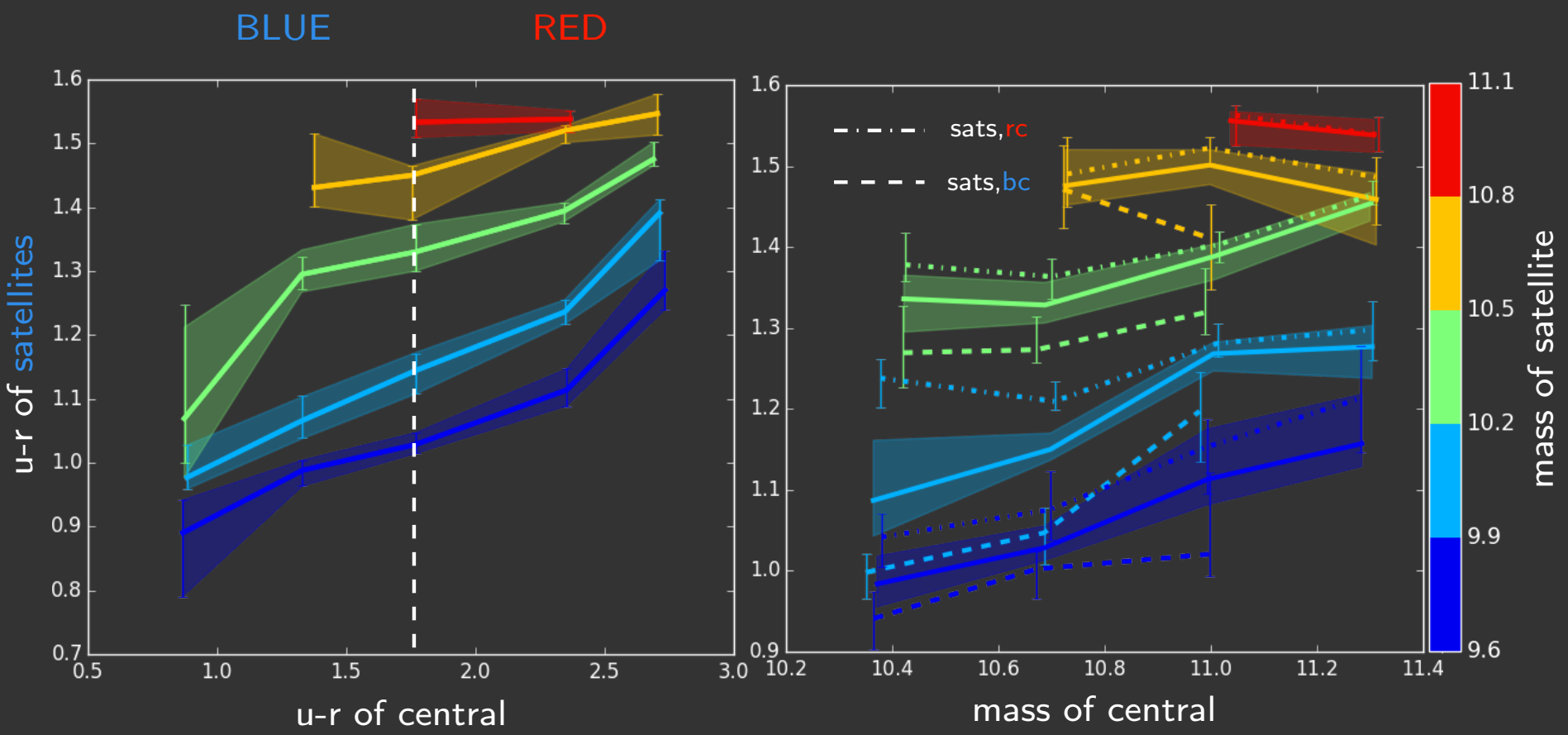


Group catalogue



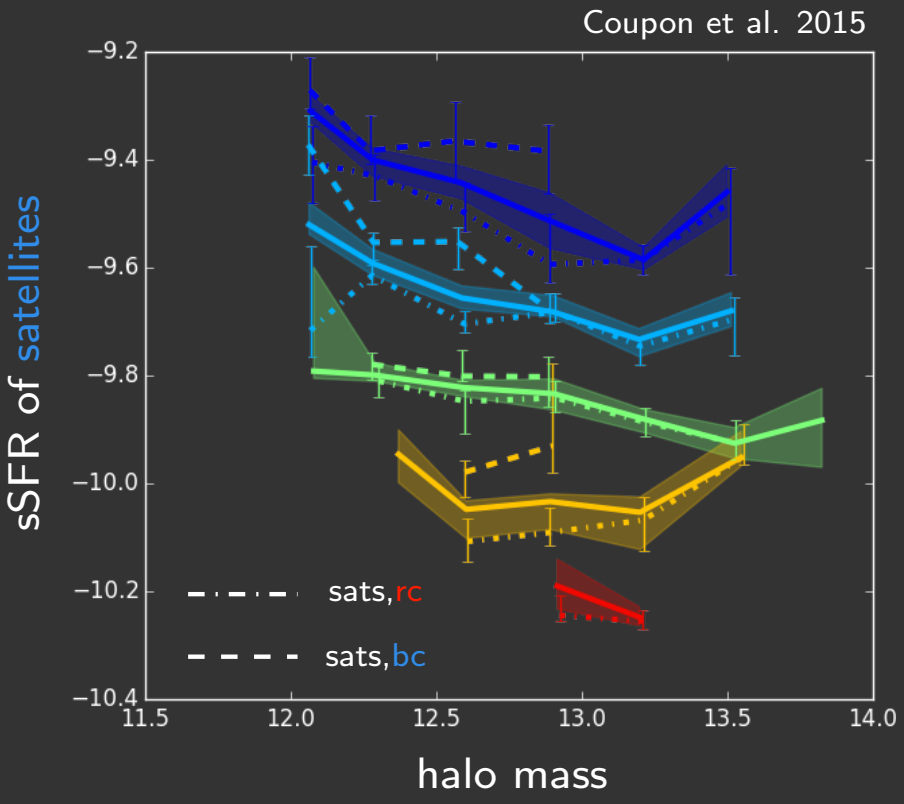

BLUE
RED
red fraction
u-r of central
sats,rc
sats,bc
mass of central
mass of satellite

Results

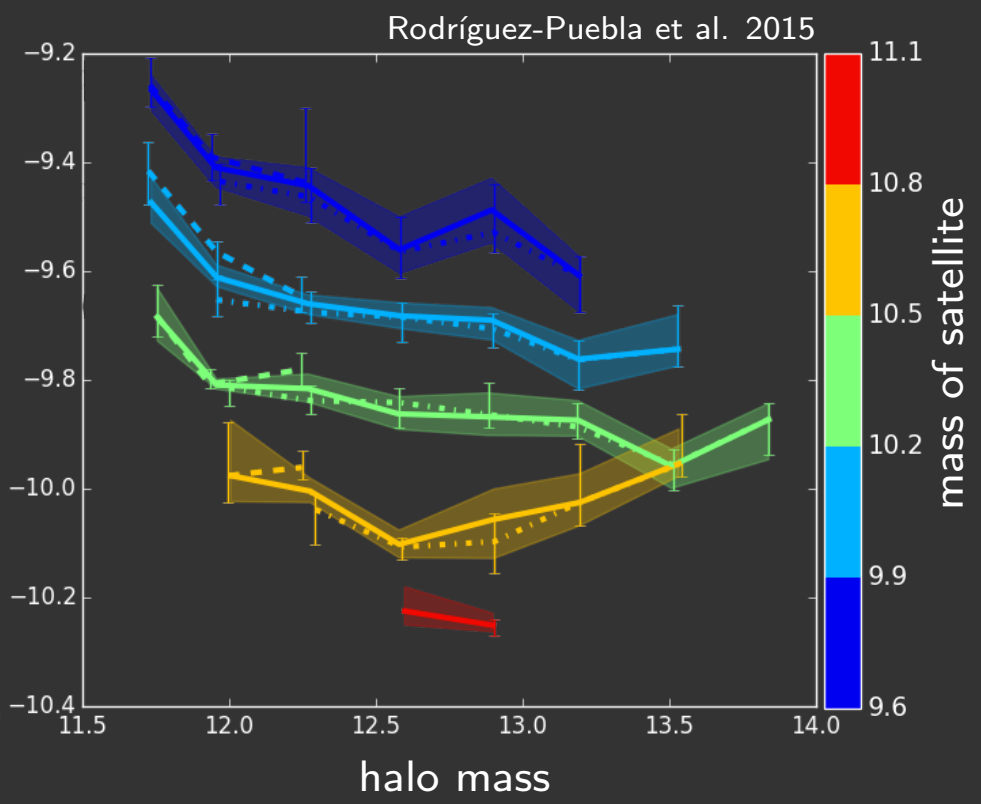

BLUE
RED
u-r of satellites
u-r of central
sats,rc
sats,bc
mass of central
mass of satellite

Results

MASS



MASS + COLOR



Kraljic, Treyer, Arnouts et al., in prep.

Annie ZAVAGNO

- PhD 1993 - HDR 2002
- Senior Lecturer AMU / Deputy director of LAM January 2012- January 2018
- High mass star formation –Feedback from massive stars
- IR/submm astronomy
- *Herschel* data (HOBYS, Hi-GAL survey of the Galactic Plane)
- Future:
  - High resolution in the IR (AO) and (sub)mm (ALMA, NOEMA)
  - JWST
  - E-ELT
- Interests: Star Formation, SFR, SFE, First stars, massive clusters