Evolution of galaxy dynamics over the last 10 Gyrs with MUSE/VLT

Author: Mercier Wilfried
Supervisor: CONTINI Thierry
Co-Supervisor: Epinat Benoit

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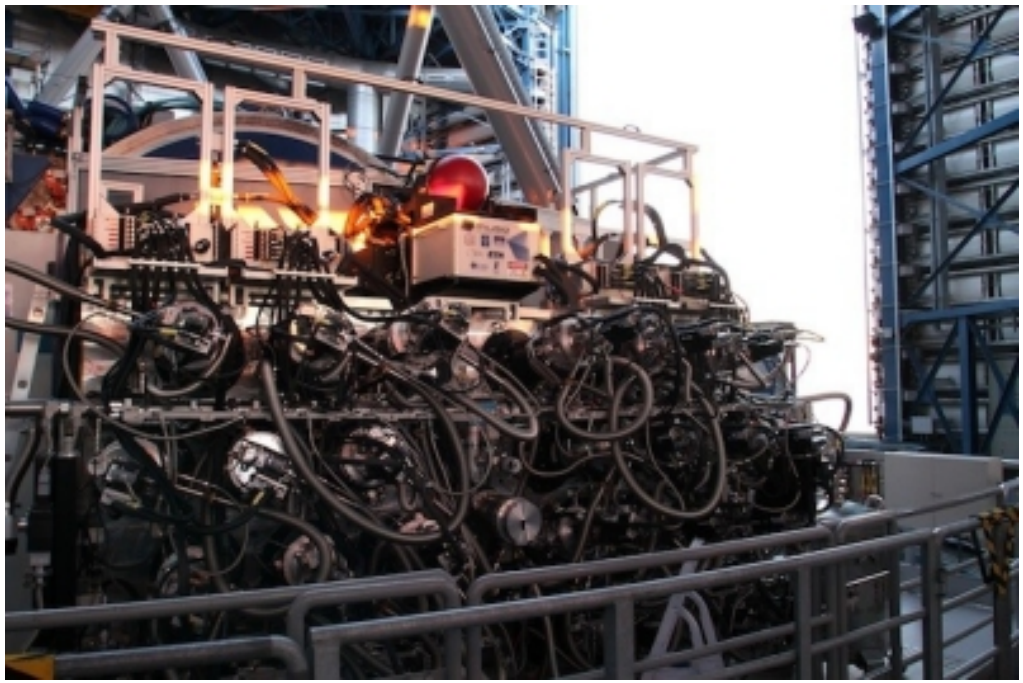
Integral Field Spectroscopy & MUSE

IFS:

- ▷ 3D cubes (2D spatial + 1D spectral)
- ▷ photometry + kinematics

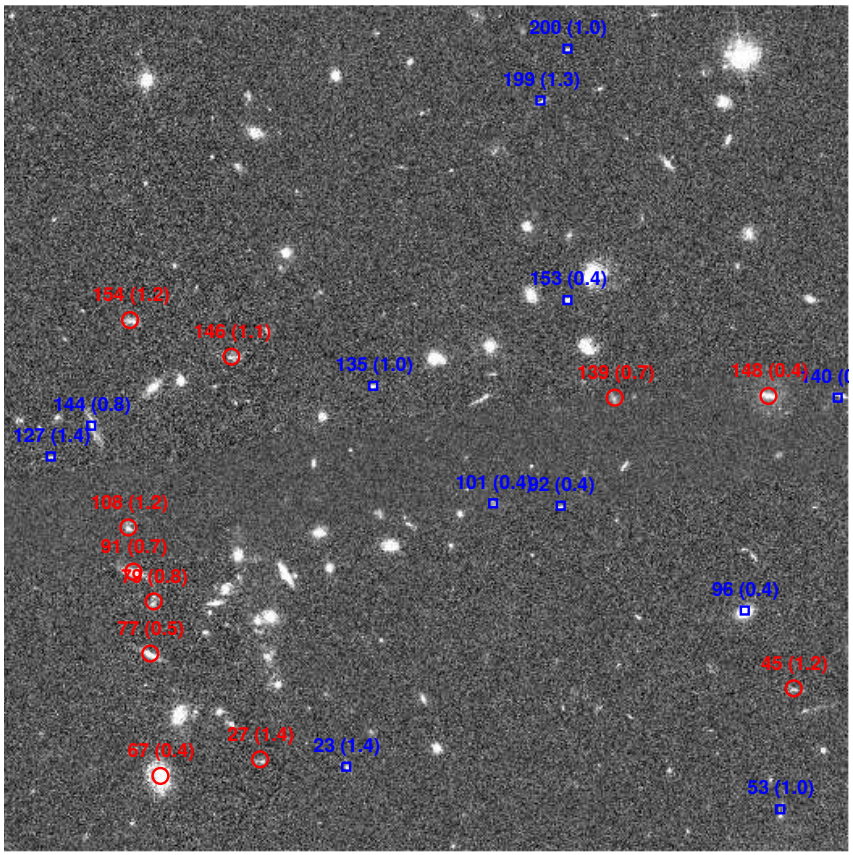
MUSE:

- ▷ $1 \times 1\,\mathrm{arcmin}^2$ FoV
- ▷ 0.2 arcsec spatial sampling
- ▷ spectral range $[4650\,\text{Å}, 9300\,\text{Å}]$
- ▷ seeing or AO observations



MUSE instrument. Credit: Ghaouti Hansali (CRAL)

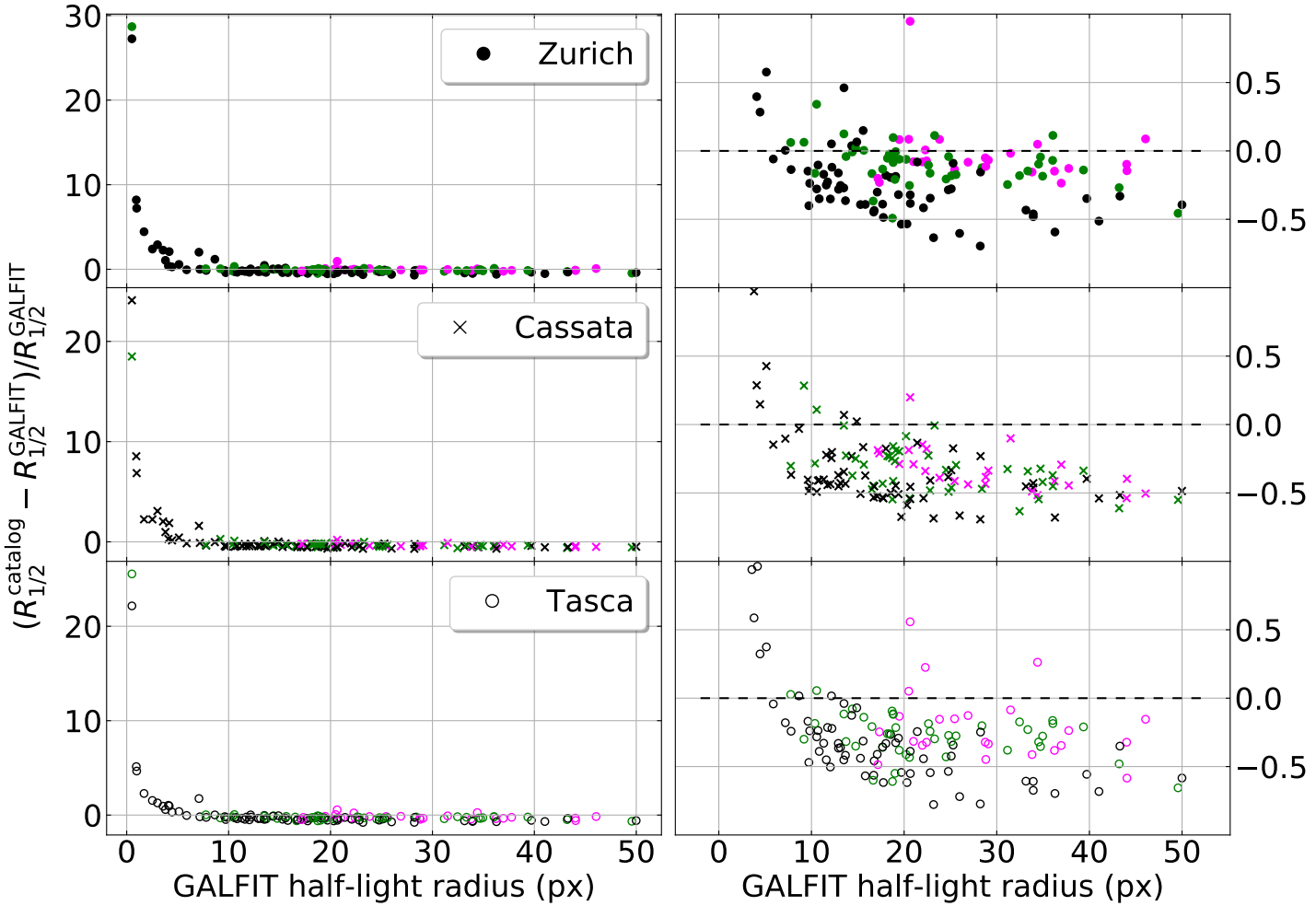
Our sample



HST image of MUSE group CGr30

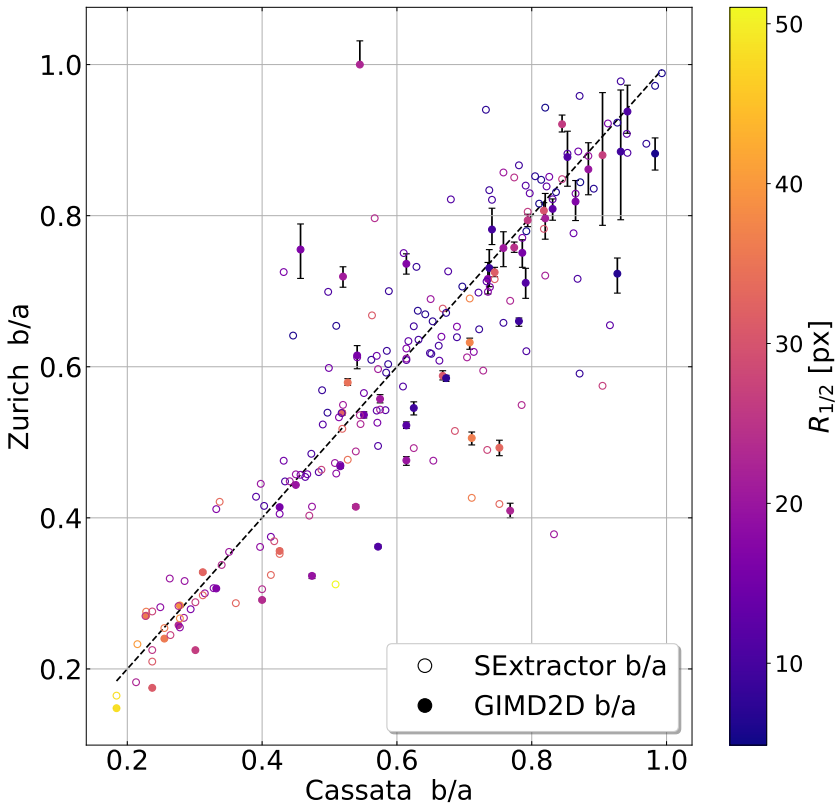
- ▷ 16 MUSE fields in COSMOS area
  - · *deep* and *best_seeing* observations
  - · CGr32 split in 3 parts
- ▷ $\sim$ 500 field galaxies with [OII] detection
  - · HST-ACS counterparts
  - · $0.4 \leq z \leq 1.4$

Checking a couple of parameters
Half-light radius

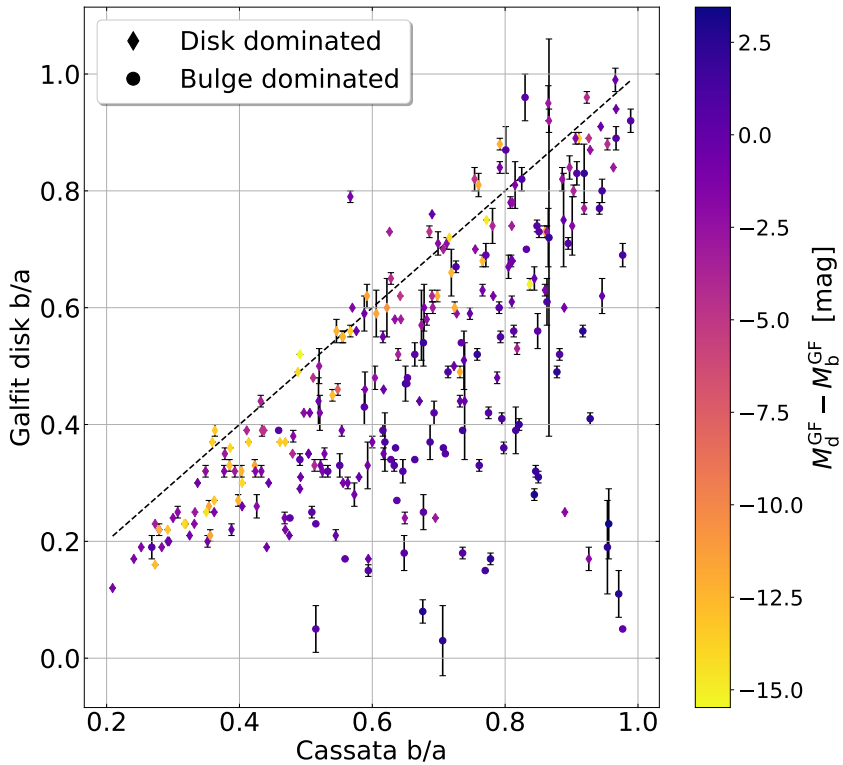


spheroidal disk-like irregulars

Checking a few parameters
Ellipticity

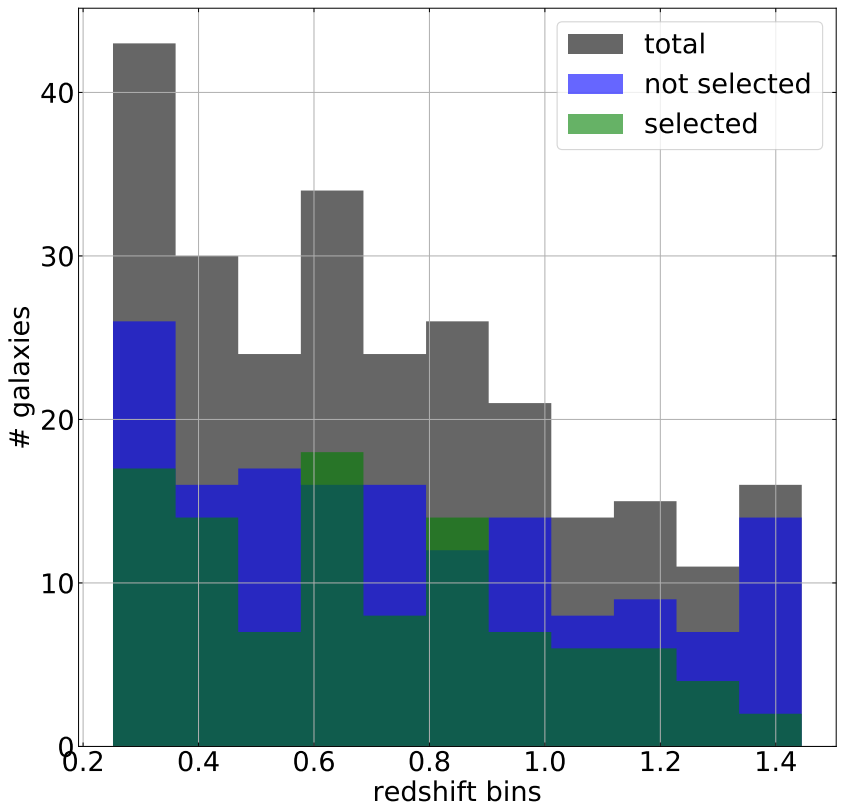


▷ values are consistent between catalogues



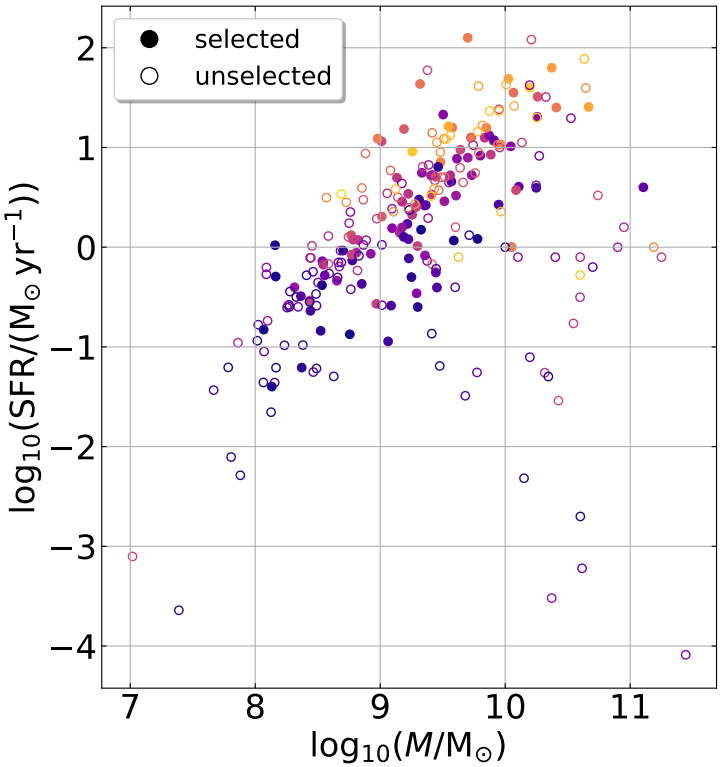
▷ scatter is due to bulge dominated (spherically symmetric) systems

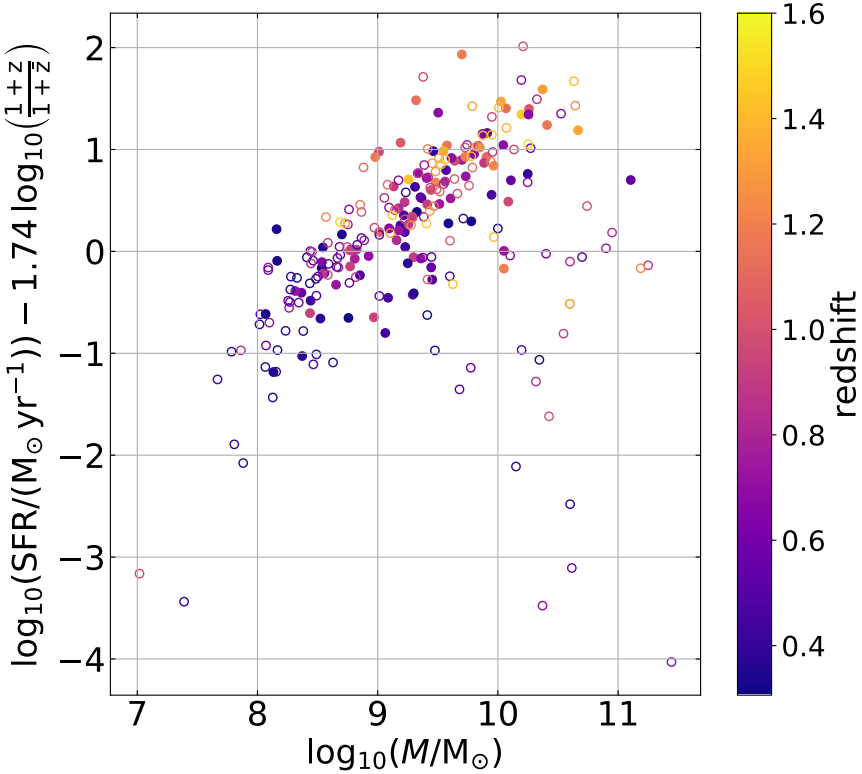
Characteristics of our sample
Redshift distribution



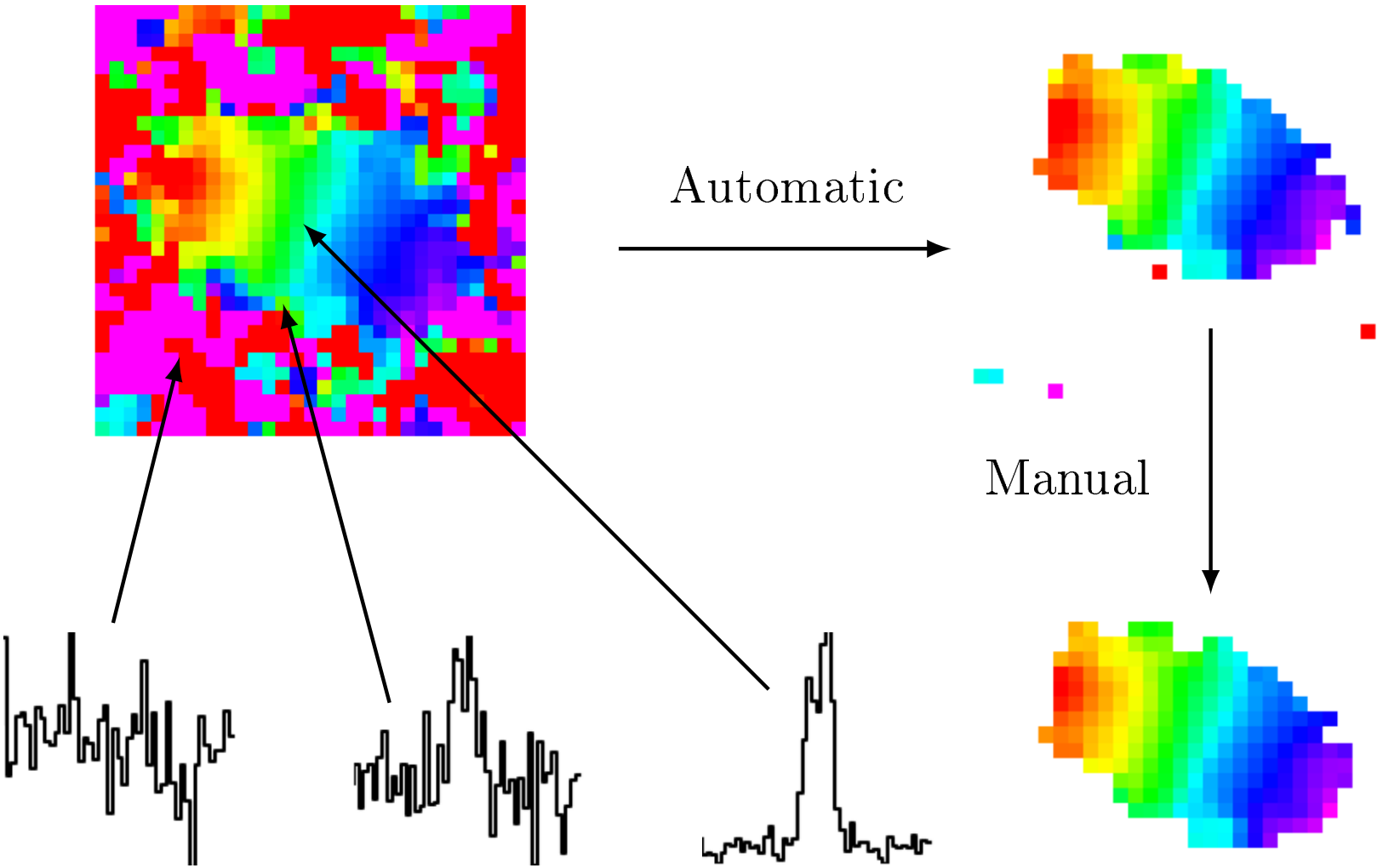
- ▷ sample of **103 galaxies** with $R_{1/2} > 0.35$" and SNR > 5
- ▷ we loose galaxies at $z \approx 1.4$
- ▷ redshift distribution is not drastically changed

Characteristics of our sample
Mass-SFR relation





- ▷ we recover the main sequence
- ▷ massive quiescent galaxies are lost
- ▷ redshift correction from [paper] does not improve the scatter


Automatic
Manual

First results
$V_{\mathrm{max}}/\sigma_{\mathrm{v}}$ distribution

Overleaf users

Warning

You can ignore this slide if you're **not** working with Overleaf.

Overleaf, Beamer and Biber do not always get along well together. For this reason, if you make a mistake while writing this presentation, in the drop-down error message you'll **always** get Biber-related error messages.

Luckily, you just have to click on "`go to first error/warning`" and the UI will scroll to the line containing your mistake.

Compiling

Warning

You can ignore this slide if you **are** working with Overleaf.

To compile this deck you'll need the `biber` package. Probably your TEXeditor already supports it; if not, you will easily find online the instructions to install it.

If you're not using an editor, you can compile this presentation using the command line by running:

```
$ pdflatex main.tex
$ biber main.bcf
$ pdflatex main.tex
$ pdflatex main.tex
```

Colors

For this template we defined four colors, following the graphic profile of Umeå University:

`UmUBlue`

`UmUGreen`

`UmUPink`

`UmUGold`

You can use these colors as you want in your presentation. For example, you can **color the text in gold** by writing `\{UmUGold}{my gold text}`.

We also redefined many of the most common LaTeX and Beamer commands, like `itemize`, `block`, etc. You will see samples of these commands in the following slides.

This is a page with a title and a subtitle

And also some blocks.

Goal of the mission

Shoot in the Death Star's exhaust port and destroy it before it can fire on the Rebel base.

Take care!

TIE Fighters may chase you while approaching the target.

Use the force you must

Remember your training with Obi-Wan, and use the Force to make the perfect shot.

Description

This is an example of `description`.

Luke No. No! That's not true! **That's impossible!**

Description

This is an example of `description`.

Vader *I am* your father.

Luke No. No! That's not true! **That's impossible!**

Description

This is an example of `description`.

Vader *I am* your father.

Luke No. No! That's not true! **That's impossible!**

And while we're here, let's have a look to `verbatim` as well, to see how we made items appear in arbitrary order:

```
\begin{description}
  \item<2->[This is the first item] one
  \item<1->[This is the second item] two
\end{description}
```

Maths

A formula will look like this:

$$x^2 + y^2 = z^2$$

You can number equations as well:

$$1 + 1 = 2 \tag{1}$$

$$1 + 1 = 2 \qquad \text{(custom label!)}$$

If you want to use the default LaTeX math fonts, just go to `beamerfontthemeumu.sty` and uncomment the line containing '`\usefonttheme[onlymath]{serif}`'.

Theorems

The usual `theorem`, `corollary`, `definition`, `definitions`, `fact`, `example` and `examples` blocks are available as well.

Theorem

There exists an infinite set.

Proof.

This follows from the axiom of infinity. □

Example (Natural Numbers)

The set of natural numbers is infinite.

Other blocks

Here we display examples of `abstract`, `verse`, `quotation`, and `quote`.

Abstract

This is an abstract.

This is a verse.

> *This is a quotation.*
>
> *-Han Solo*

> *A quote this is.*
>
> *-Yoda*

Bibliography

You can cite an article

normally using `\cite`, e.g.: (**article1**)

or display the full citation using `\fullcite`, e.g.: **article1**

(n.d.) stands for "no date". `year={A long time ago...}` *is not a date that can be specified in* `bibliography` *anyway.*

Look at the code of the following slide to see how to automatically split the bibliography on many slides. You can also use `\nocite{*}` to display the non-cited publications as well.

Bibliography I

Framecard

You can display a frame with a colored background and a huge text in the center using the command `\framecard`.

For example, you can write:

```
\framecard{A SECTION\\TITLE}
```

This will display a frame with a orange background and the phrase "A SECTION TITTLE" in the center. You can also use a custom color with `\framecard`:

```
\framecard{A SECTION\\TITLE}
\framecard[UmUGreen]{A SECTION TITLE\\
WITH A CUSTOM COLOR}
```

You can see the results of the commands above in the following slides.

A SECTION TITLE

A SECTION TITLE WITH A CUSTOM COLOR

Framepic

You can display a frame with a background image using the command `\framepic`. The image will be **adapted vertically** to fit the the frame.
For example, you can write:

```
\framepic{graphics/darth}{
\framefill
    \textcolor{white}{Luke,\\I am your supervisor}
    \vskip 0.5cm
}
```

Alternatively, to make the background 50% transparent, you can write `\framepic[0.5]{graphics/darth}...`
You can see the results of the commands above in the following slides.

Luke,
I am your supervisor

Right-aligned text with
Semi-transparent background

Other bonus commands I

We provide two other bonus commands:

pdfnewline you can use **\pdfnewline** to avoid the annoying **hyperref** related warnings when using newlines in the document's title, author, etc. For example, in this presentation the author is defined as:

```
\author[Luke Skywalker]{
  Luke Skywalker, Ph.D.
  \pdfnewline
  \texttt{luke.skywalker@uniud.it}
}
```

marker you can use **\marker** to highlight some text. The default color is pink, but you can also use a custom color. For example:

```
\marker{Default color}
\marker[UmUGold]{Custom Color}
```

Other bonus commands II

`framefill` you can use `\framefill` to put the text at the bottom of a slide by filling all the vertical space.