Scheda LSS@IASF-Milano

Galaxy and AGN Evolution Studies with Large Spectroscopic Surveys

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IASF Milano

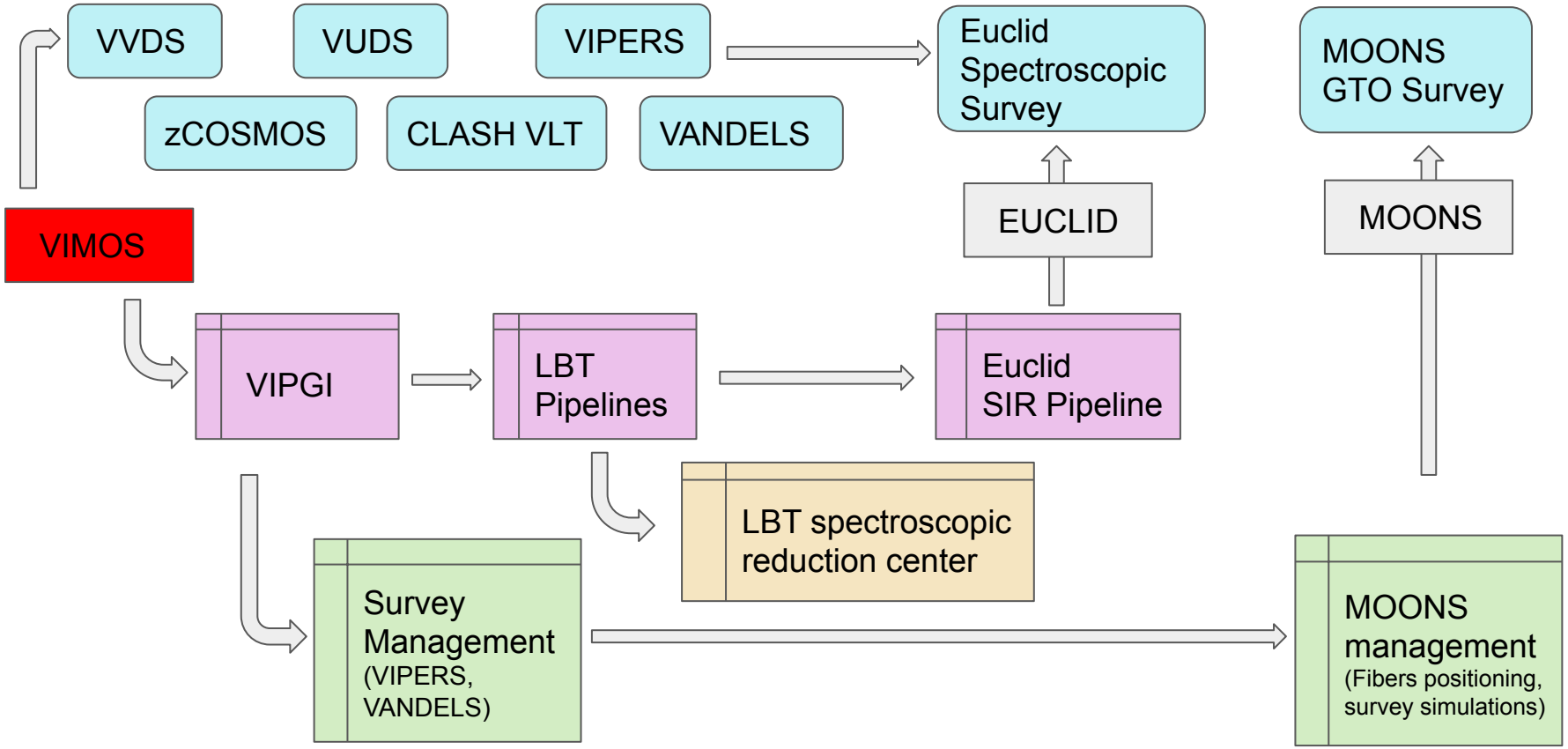
Who is in the team?

A hybrid (and not-so-common) reality in INAF : software & science

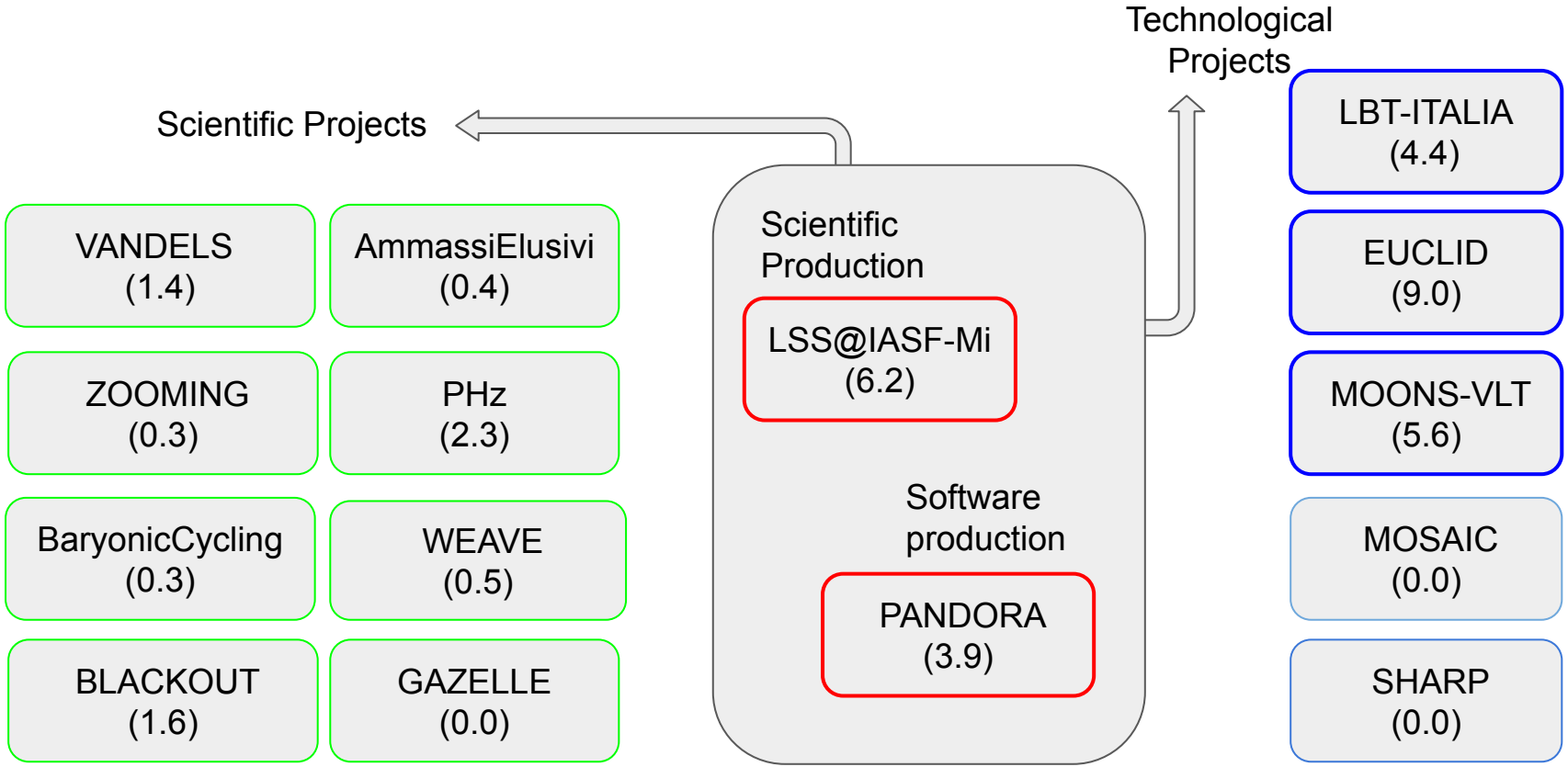
Name	Position	Mean FTE/yr
Dario Bottini	STAFF	0.5
Letizia Cassarà	STAFF	0.5
Paolo Franzetti	STAFF	0.1
Bianca Garilli	STAFF	0.1
Adriana Gargiulo	STAFF	0.3
Mari Polletta	STAFF	0.1
Marco Scodeggio	STAFF	0.2
Susanna Bisogni	POST-DOC	0.0
Chiara Mancini	POST-DOC	0.3
Giustina Vietri	POST-DOC	0.1

Tot = 2.1 FTE/yr

How did we get here ?



Our connections (with other projects/schede)



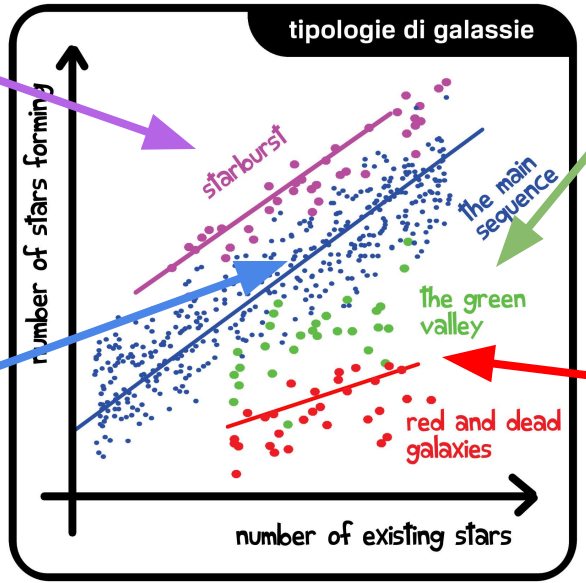
A complete view of the galaxy formation & evolution

Dust Content: its impact on SF estimates and other physical properties

Letizia Cassarà
Mari Polletta
Marco Scodeggio

Green Valley Galaxies: SFHs and quenching timescales

Chiara Mancini
Marco Scodeggio
Dario Bottini
Adriana Gargiulo



AGN: its role in quenching the star formation in host galaxies

Giustina Vietri
Susanna Bisogni
Mari Polletta
Dario Bottini
Bianca Garilli

Massive passive galaxies: mass assembly histories

Adriana Gargiulo
Chiara Mancini
Paolo Franzetti

Time “consumed” by our management activities

SURVEY	**Year of survey “start”** (first paper)	**Δtime** (years) (2nd paper - survey start)	**Total papers** (within Δtime)
VVDS	2005	3	36
zCOSMOS	2007	2	24
VIPERS	2013	1	11

The time we get to publish two papers decreases as time goes on: with the same involvement in support/software activities, we are getting more efficient at scientific production for two main reasons:

- participation in surveys more aligned with our scientific interests and expertise;
- accurate balance between support/software activities and scientific ones (due to appropriate resources on both sides).

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VANDELS	2018	≥ 3	(12)

Over the last few years we “suffered” for two main reasons:

1. support/software activities more demanding than in the past (shifted deadlines → overlapping projects, binocular mode at LBT, ...);
2. lack of manpower.

How to restore balance - 1

1. Re-sizing and tuning the workload on software/support activities

- **Actions already taken: LBT pipeline release**
  Since 2017/2018 binocular mode @LBT → spectroscopic data reduction activities doubled → ~ 2-persons full time work per year vs. just one LBT fellowship with 60% duties on reduction;

  ⇩

  In 2020/2021 we have been working on our LBT pipelines release → huge amount of work (still) “subtracted” to pure science activities but preparatory for a brand new start;

- **Actions for the future: better tuning of projects selection and science**
  Expression of interest in projects that:
  - ❖ require an active participation in software/support activities from 2023;
  - ❖ have scientific goals closer to our main interests and expertise (e.g. high-z galaxies, spatially resolved infos → MOSAIC e SHARP)

How to restore balance - 2

Increase the manpower with expertise on galaxy formation and evolution. In the last three years:

- **Two more staff researcher joined our group.**
  (should have been more but over the last few hiring cycles candidates selections did not match well the pre-defined Institute assignment);

- **Hired three post-docs, all of them with scientific background in galaxy formation and evolution.**
  Two of them have significant project support duties (LBT/EUCLID) → time invested in training them, but strong return in terms of a broader and stronger scientific expertise in our group.

CRITICALITIES:

- **No funds for pure science activities (only exception Premiale MITIC - PI (B. Garilli).**
  Financial support for the pure science activities would be needed, even just to maintain the group richness at this current level (*and to face the EUCLID and MOONS data coming soon*)

Leadership INAF

- **Papers:** in the last 5 years: 188 published papers (14 as first author), with a total of 4191 citations, and an H-index of 37;
- **Role in the main extragalactic surveys:** 4 survey data release papers;
- **Meeting:** In the last three years, “The art of measuring galaxy physical properties” (APP) conference and the “Science with multi-object spectrographs: perspectives and opportunities for the Italian community” workshop;
- **Coordination:** Coordinamento Spettroscopia INAF (CSI).

Does a hybrid reality correspond to a winning one?

REASONS TO SAY YES	REASONS TO SAY NO
Participation to the most important extragalactic European surveys (possibility to define survey goals, sample, etc…)	**A lot of time invested in "less visible" activities** (...but ***necessary*** to allow researchers to do the science they want)
Deep knowledge of the data produced by those surveys (that unique insight one gets when personally processing a ton of raw data)	"Less visible" quite often translates in a **CV that is overlooked during the "Valutazione Titoli" phase of job hirings**
Easy access to software development skills (possibility of creating ad-hoc solutions for data analysis needs)	Our **group might be considered less attractive** by young researchers feeling the pressure of publishing as many papers as possible
Access to a somewhat larger pool of financing sources (i.e. salary/travel)	

Perspectives

We are in a unique position: we have (tons of) data, we have the manpower to work on them, we have full support for software development for scientific analysis. Starting from this, we will focus on:

- Deep VANDELS spectra + deep proprietary LBT/LUCI spectra to spatially resolve the stellar population properties in passive massive galaxies at z ~ 1.2;
- LEGA-C deep spectroscopy + VIPERS larger statistics to constrain the quenching timescales, and the percentage of rejuvenated galaxies in the green-valley, and passive populations at intermediate z;
- spectrophotometric VIPERS data + proprietary LBT/LUCI spectra to obtain robust estimates of the internal extinction, Z, and amount of SF in a statistically significant sample of star-forming galaxies at intermediate z;
- Exploiting large spectroscopic surveys in which we are involved (VIPERS, zCOSMOS, VANDELS, VVDS) to investigate whether and how the AGN is affecting the gas content and, likely, regulating the star formation in the hosts.

Thanks for the attention