



SkyPy

Lucia F. de la Bella

And the SkyPy Collaboration

Cosmology from Home 2020

24th August - 4th September



<https://orcid.org/0000-0002-1064-3400>
<https://howtoreachthecosmos.jimdofree.com>

Also known as

Lucia F. de la Bella

Lucía Fonseca

Lucía Fonseca de la Bella

Who I am...



PDRA



Weak Lensing
 Unequal-time correlators

arXiv 2009.XXXX
 arXiv 2010.XXXX

Teaching
 2018-2019



PhD

EFToLSS
 RSDs
 Halo bias

2014-2018



M.Sc

EFToDE

2013-2014

B.Sc

Quantum
 Cosmology

2008-2013



**7. RESEARCH
DEVELOPMENT**

1. VISION

**6. DRIVER
CAPABILITIES**

2. STRUCTURE

**5. LAYERED
DEVELOPMENT**

3. MEMBERS



4. THE PACKAGE

1. Vision

- Observational cosmology and extra-galactic observations limited by data access
- Collaborations formed around data access, e.g. Sloan, COSMOS, DES...
- With the upcoming data (LSST, Euclid, WFIRST...) the limiting step is access to **methods**, not data.
- Emerging methods: forward modelling & machine learning.



SkyPy is built around methods

- Open-source off-project high-quality **python** package
- Aim to be **Astropy** affiliated package
- Functionality to make **end-to-end simulations**
- Enable **Forward Modelling** and **Machine Learning** methods

- Do not replicate existing code
- Reuse
 - Astropy-affiliated packages
 - High-quality codes

MANAGEMENT STRUCTURE

- A **Board** manages membership, policies
- **Dynamic team** structures. i.e. minimise permanent SkyPy structures
- Standup teams for specific tasks on short time-scales (3 months)
- Rewards through **citations** of package

<https://github.com/skypyproject/skypy.git>

CODE STRUCTURE

- SkyPy package driven by science projects
- Done as a **GitHub** organisation
 - * **Issues** to request/inform of features, report bugs
 - * **Pull requests**, unit tests, high-standard documentation
 - * **Code review**
 - * Actively involved **infrastructure** team
 - * Semantic versioning / staged releases

v0.2

3. Members

Sarah Bridle

Juan Pablo Cordero

Nicolas Tessore

Ian Harrison

Richard Rollins

Lucia F. de la Bella



Adam Amara

Philipp Sudek

Ginevra Favole



Coleman Ktawczyk

Ian Harry

Laura Nutall

Andrew Lundgren

Andrew Williamson

Brian Nord

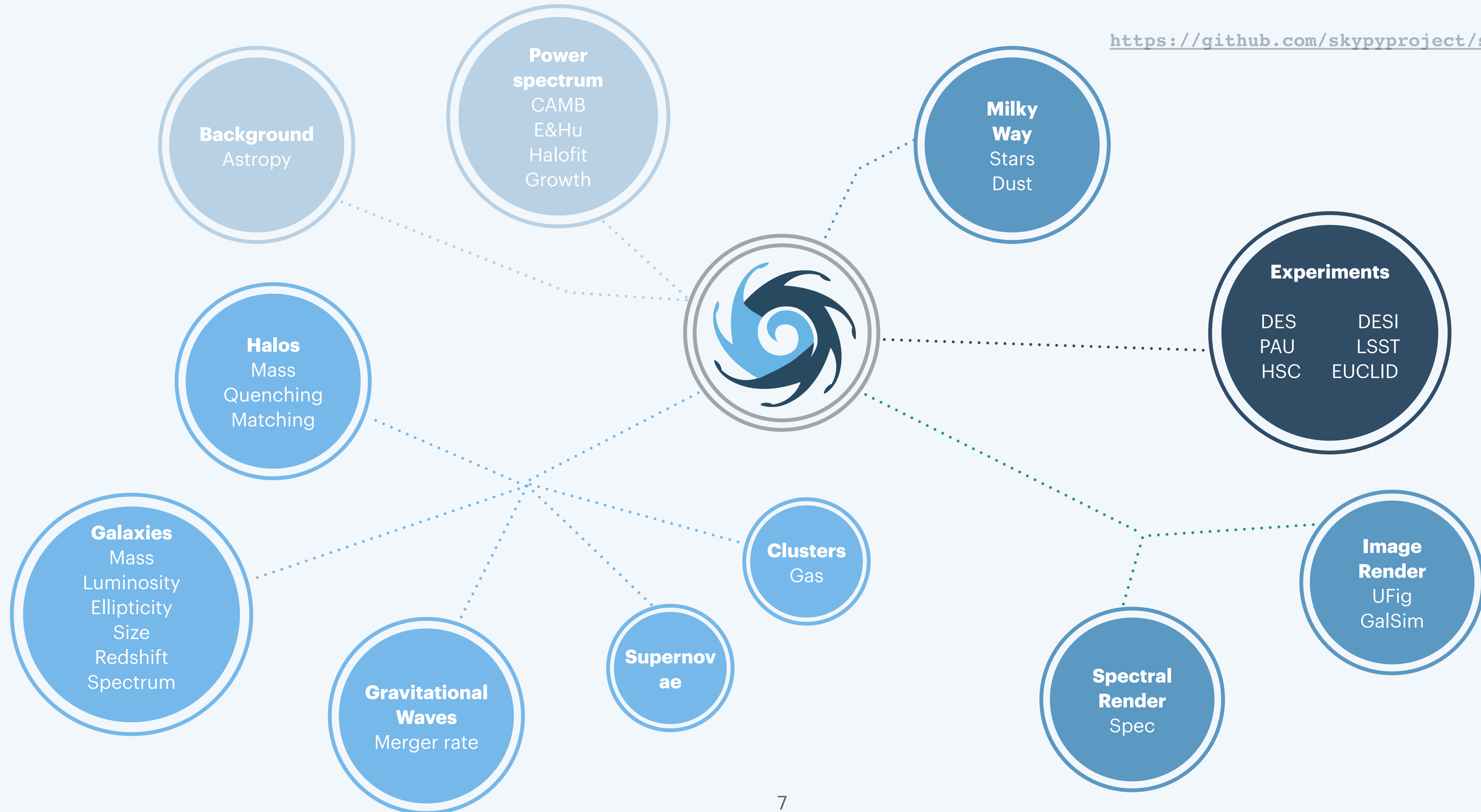
Simon Birrer



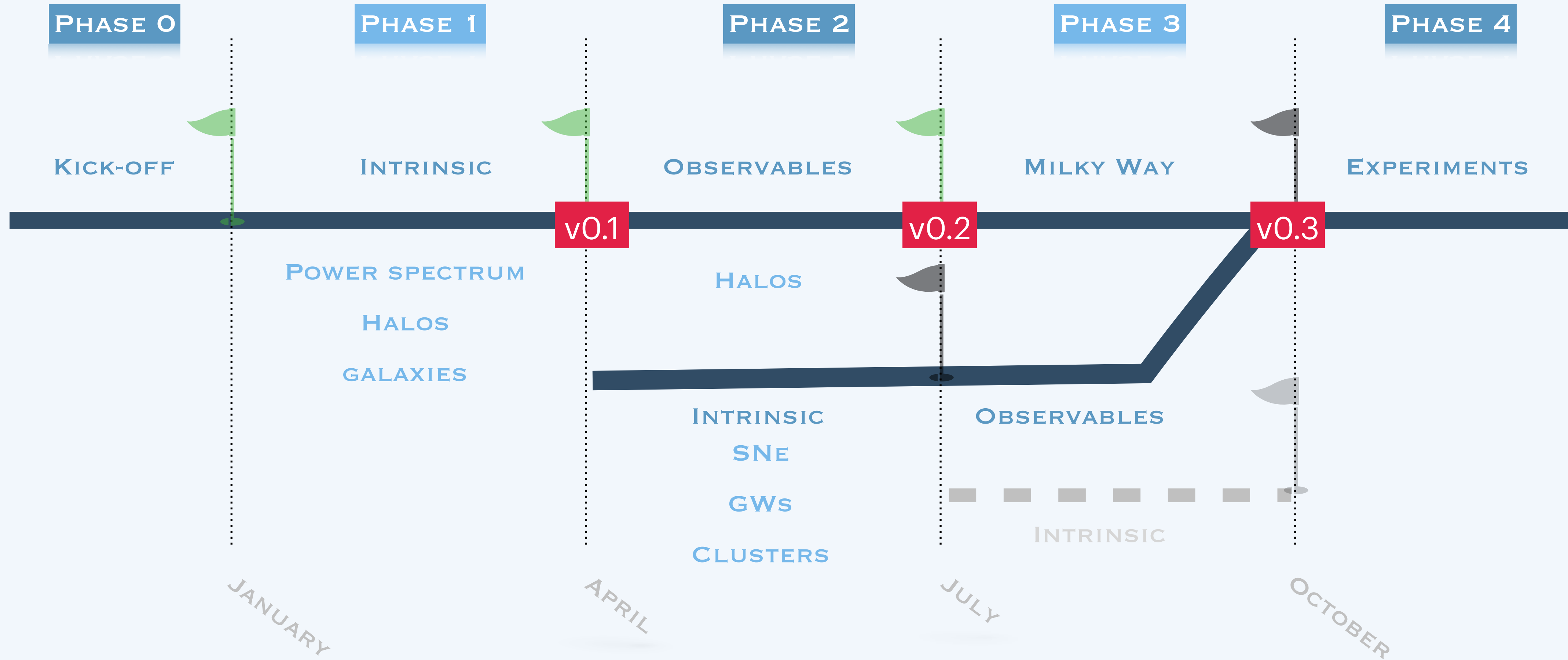
Keiichi Umetsu

4. The package

<https://github.com/skypyproject/skypy.git>



5. Layered development



6. Driver Capabilities

Key

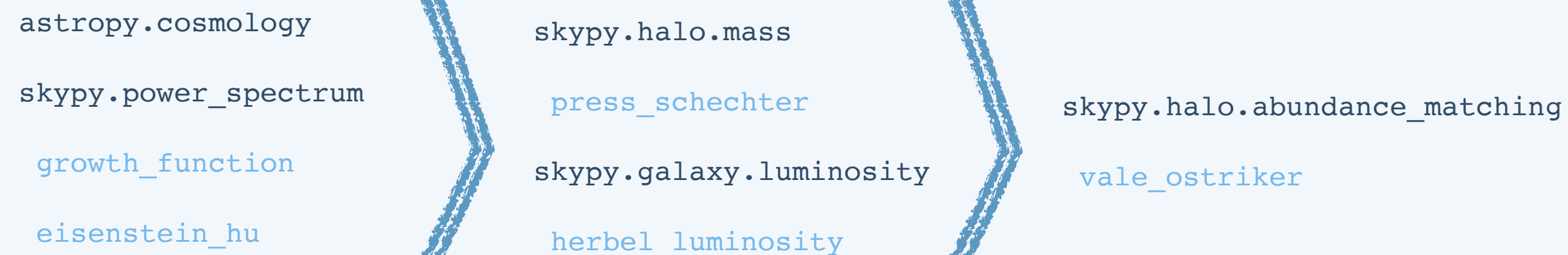
The **SkyPy Driver** runs end-to-end **pipelines** of functions with **dependencies** to generate outputs.

Examples:

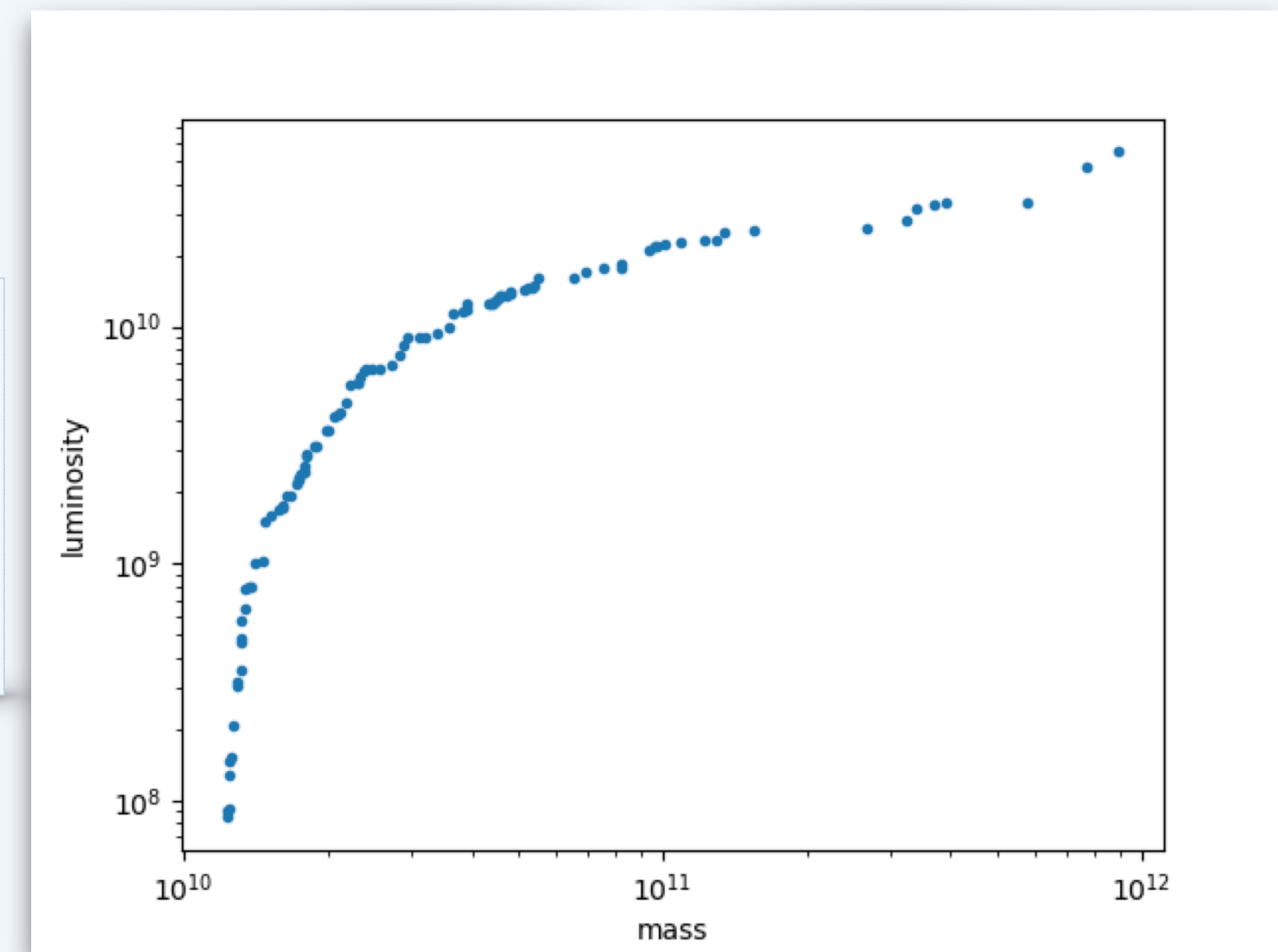
1. A simple **abundance matching** (Vale&Ostriker 2018)
2. Galaxy populations from the Herbel et al. model (2017)
3. Compact binary merger rates



`skypy/examples/abundance_matching.yaml`



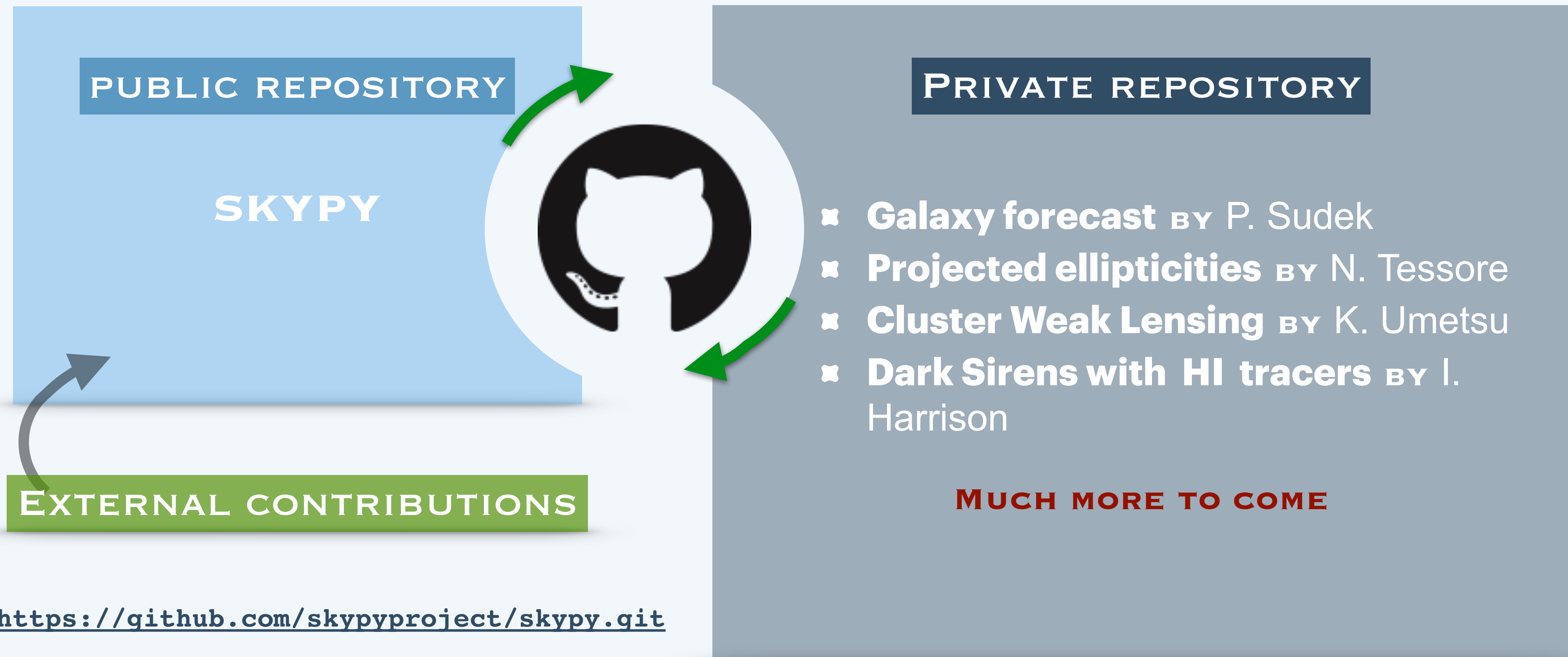
<https://github.com/skypyproject/skypy.git>



7. Research Development

Key

SkyPy is driven by science projects



Summary

- SkyPy is a legacy project
- Open-source high-quality **python** package
- Driven by science projects
- Aims to be **Astropy** affiliated package
- Does **not replicate** existing high-quality code
- With functionality to make **end-to-end simulations**
- Enabling **Forward Modelling** and **Machine Learning** methods

What's next

- **v0.3** release in October 2020
- Applying for funding
- Equality, Diversity and Inclusion projects

Open your terminal...

```
my-pc: -$ pip install skypy * or
```

```
my-pc: -$ git clone https://github.com/skypyproject/skypy.git
```

```
my-pc: -$ ipython
```

```
...
```

```
[1]: import skypy
```

* Coming soon: conda install skypy