

AstroBrowser

Yago Ascasibar (UAM)
Fabrizio Giordano (ESAC)

Space astronomy science platforms focus week
10/12/2025

Scientific motivation

Multiwavelength extragalactic astronomy

Thermal emission

- Stars
- Hot/warm/cold gas
- Dust

Non-thermal emission

- Supernovae
- Compact objects
- AGN
- Dark matter

Techniques

- (Multiwavelength) photometry
- (Integral-field) spectroscopy
- Polarimetry
- Time domain

Analysis workflow

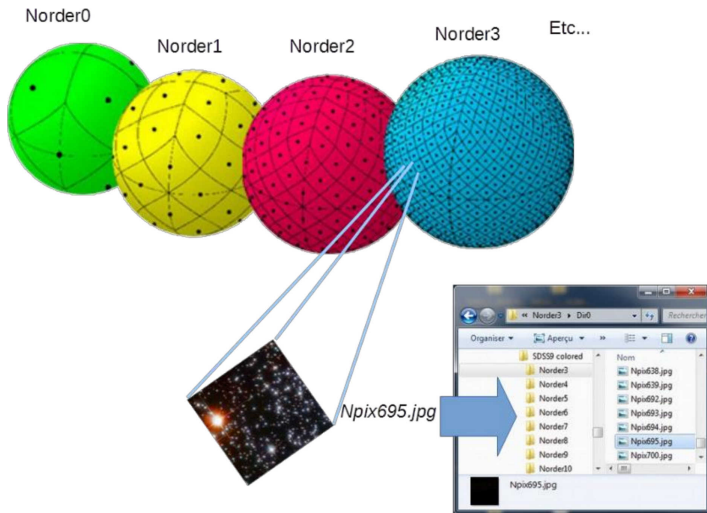
Traditional

- Expert users
- Small samples
- Optimised pipelines
- Thoroughly supervised

Algorithmic

- Non-specialist users
- Large samples
- Standardised pipelines
- Semi-supervised

Hierarchical Progressive Survey (HiPS) standard



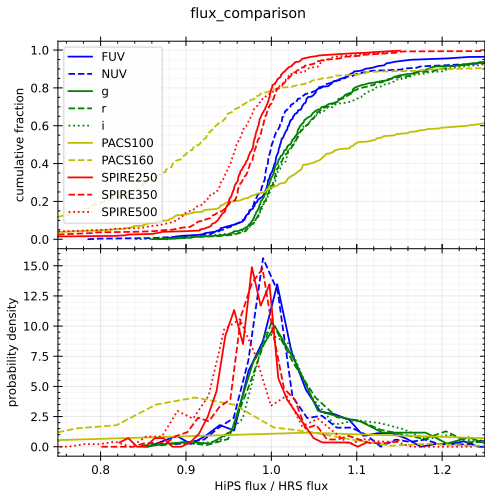
Data quality control

Herschel Reference Sample

- ~ 300 nearby galaxies
- UV, Optical, far IR
- Representative sample
- Well resolved

Aperture photometry

- Differences $\lesssim 10\%$
- A few artifacts
- Realistic uncertainties



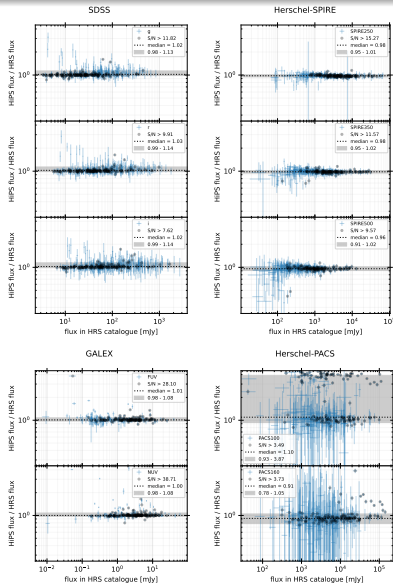
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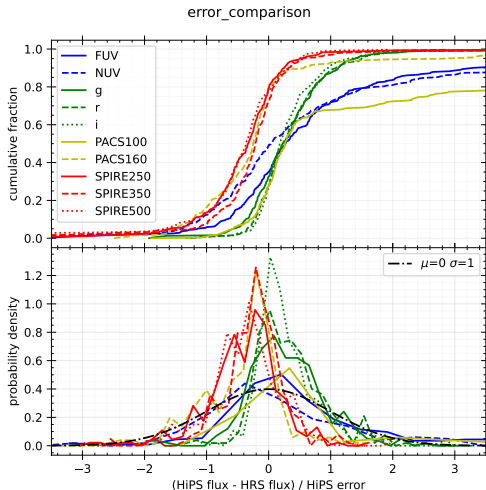
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Metadata

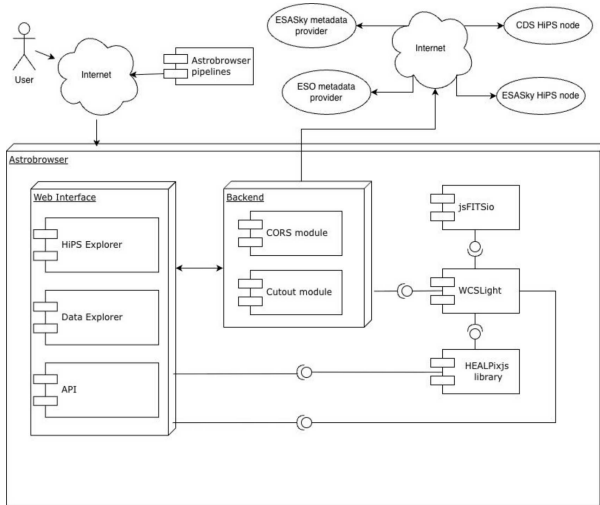
- Units
- Uncertainties
- Filter
- PSF

Conclusions

- $\sim 10\%$ accuracy
- `metadata.fits`
- Peer review

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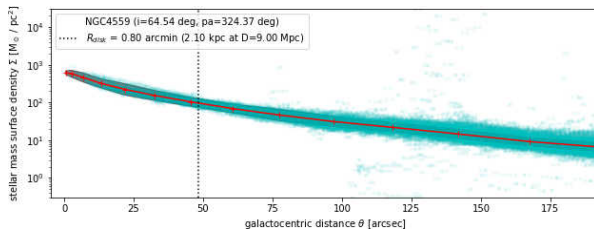
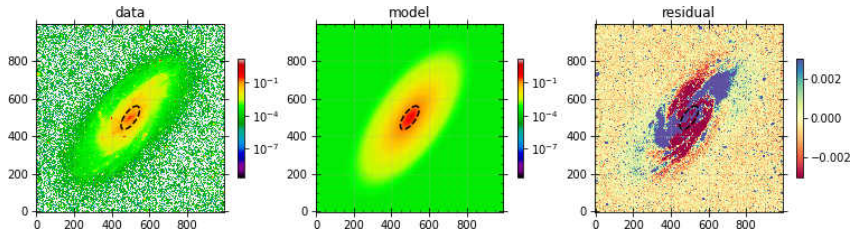
Architecture



Data Explorer



Jupyter Notebooks



Outlook

Science case

- Human supervision
- Intermediate samples ($\sim \text{few} \times 10^3$ targets)
- Live data

Web interface

- Modular pipelines
- Real-time
- Collaborative

Cloud (pre-)computing

- Large tables
- 3D support
- Real-time HiPS

Thank you!