

# Imagecube: an Astropy affiliated package

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Astropy is a community python library for astronomy. Imagecube has been developed as an Astropy affiliated package for processing multiwavelength (spectro)-imaging. This module automates tedious steps of image processing and analysis and delivers a science-ready image datacube. The included steps involve converting to common flux units, image registration to a common WCS, and convolution to a common resolution. Individual steps can be performed separately. We test the module using the dwarf galaxy NGC1569 by producing its observed spectral energy distribution (SED) on a pixel-by-pixel basis.

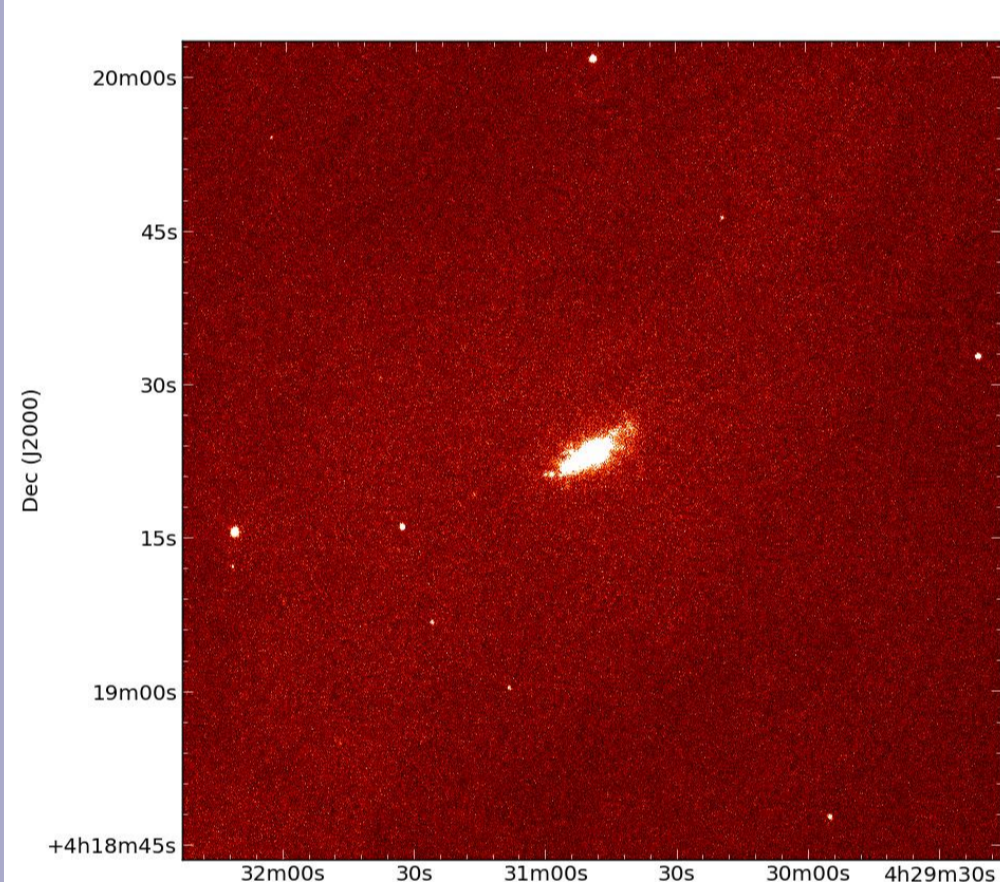
## Astropy

- A community python library for astronomy (Greenfield+ 13)
- To provide a common framework for the core package (The Astropy Collaboration+ 13), and the affiliated packages
- 10 affiliated packages thus far (5 stable)
- More info on: <http://www.astropy.org/index.html>

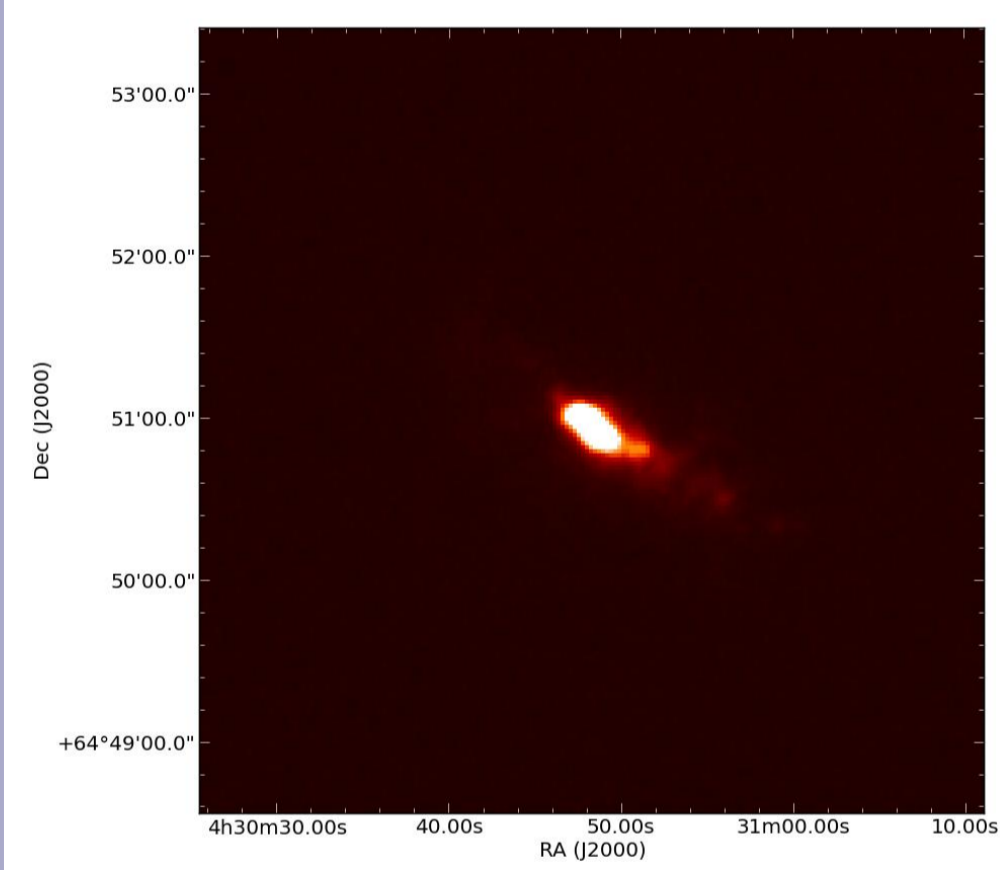
## Imagecube

- Python code that returns science-ready images
- Performs multiwavelength image processing
- Delivers a 3D datacube and pixel-by-pixel SEDs
- Foreseen to run interactively within python
- To submit as an Astropy-affiliated package

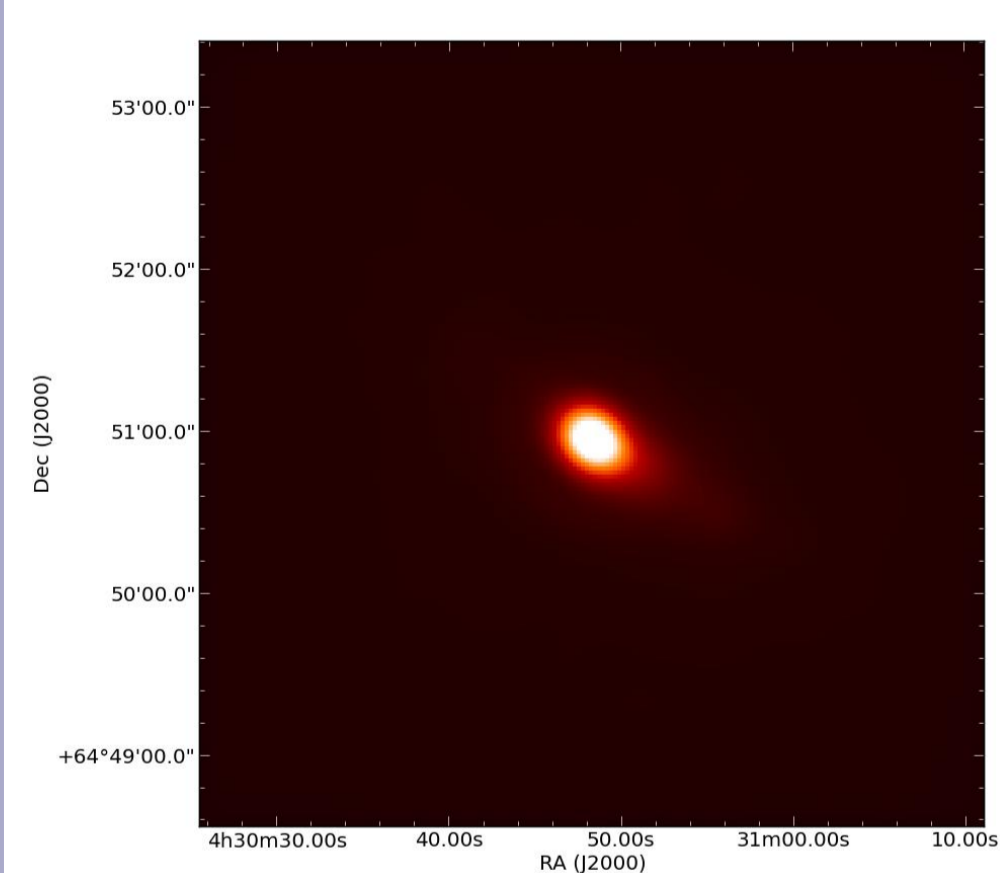
## Individual processing steps



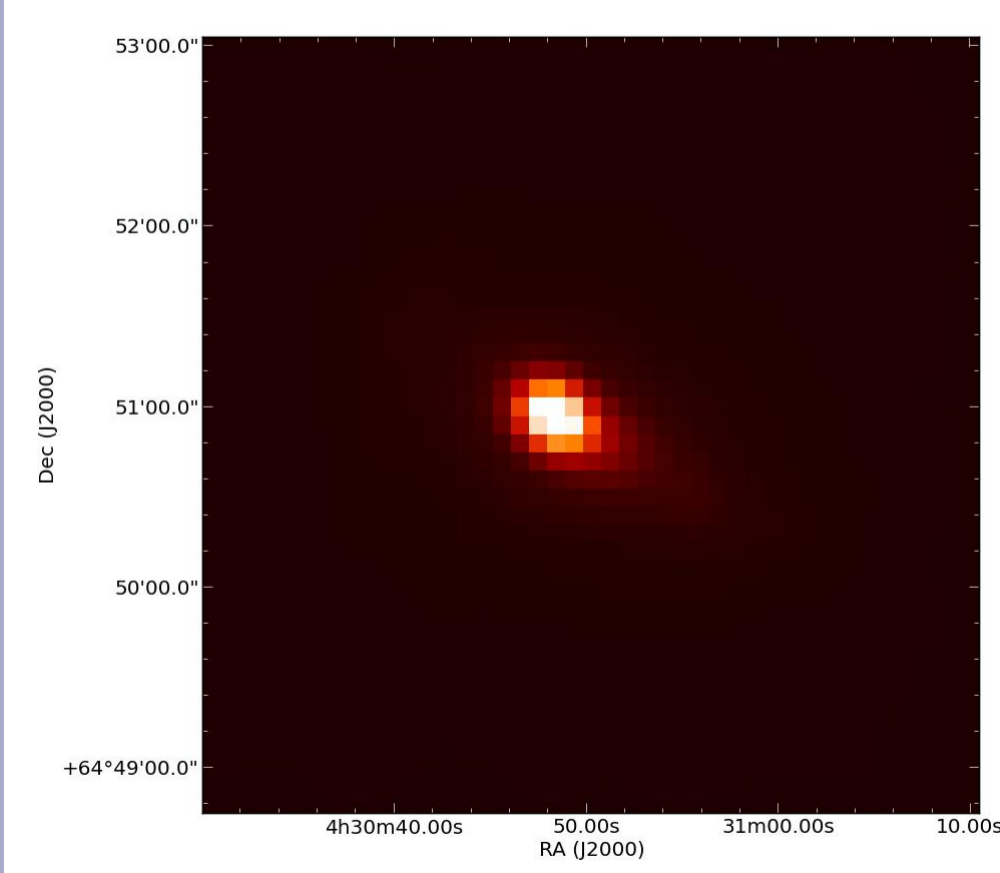
- Input image (left) goes through flux unit conversion
- Wide database included, as well as user-input values, to return the image in Jansky/pixel



- Image registration to a common WCS (left)
- User provides a reference image & desired angular size



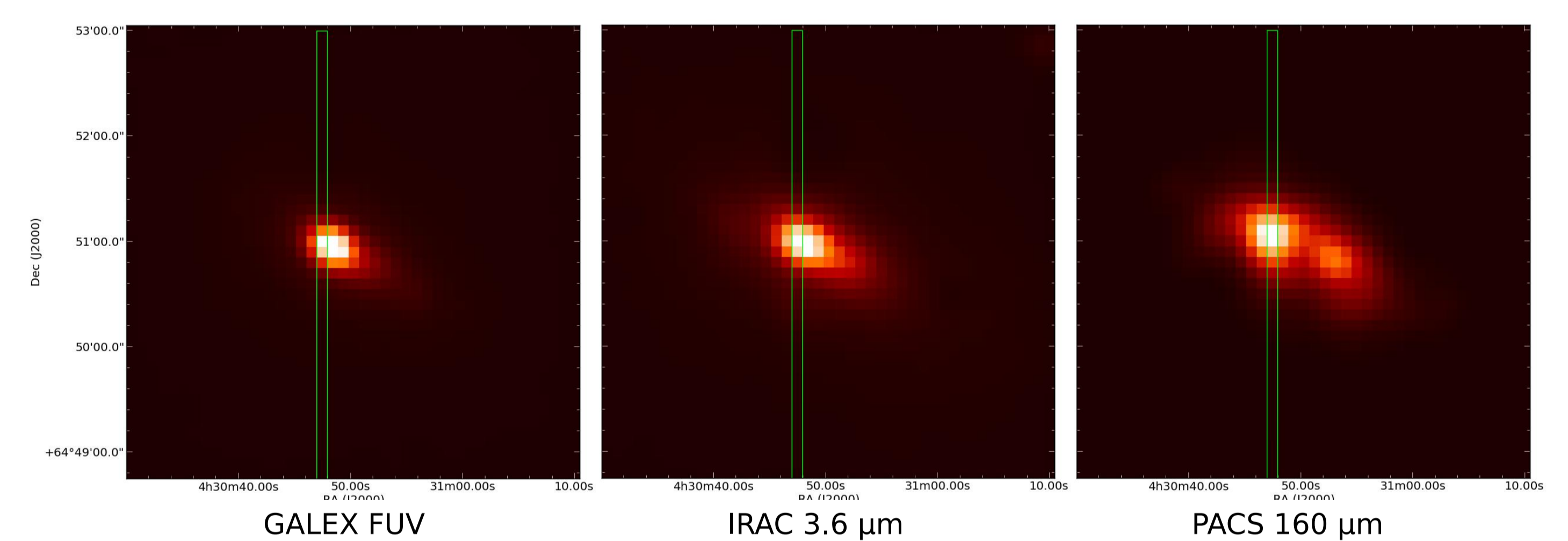
- Convolution to a common PSF (left)
- Gaussian and/or PSF kernel (Aniano+ 11)



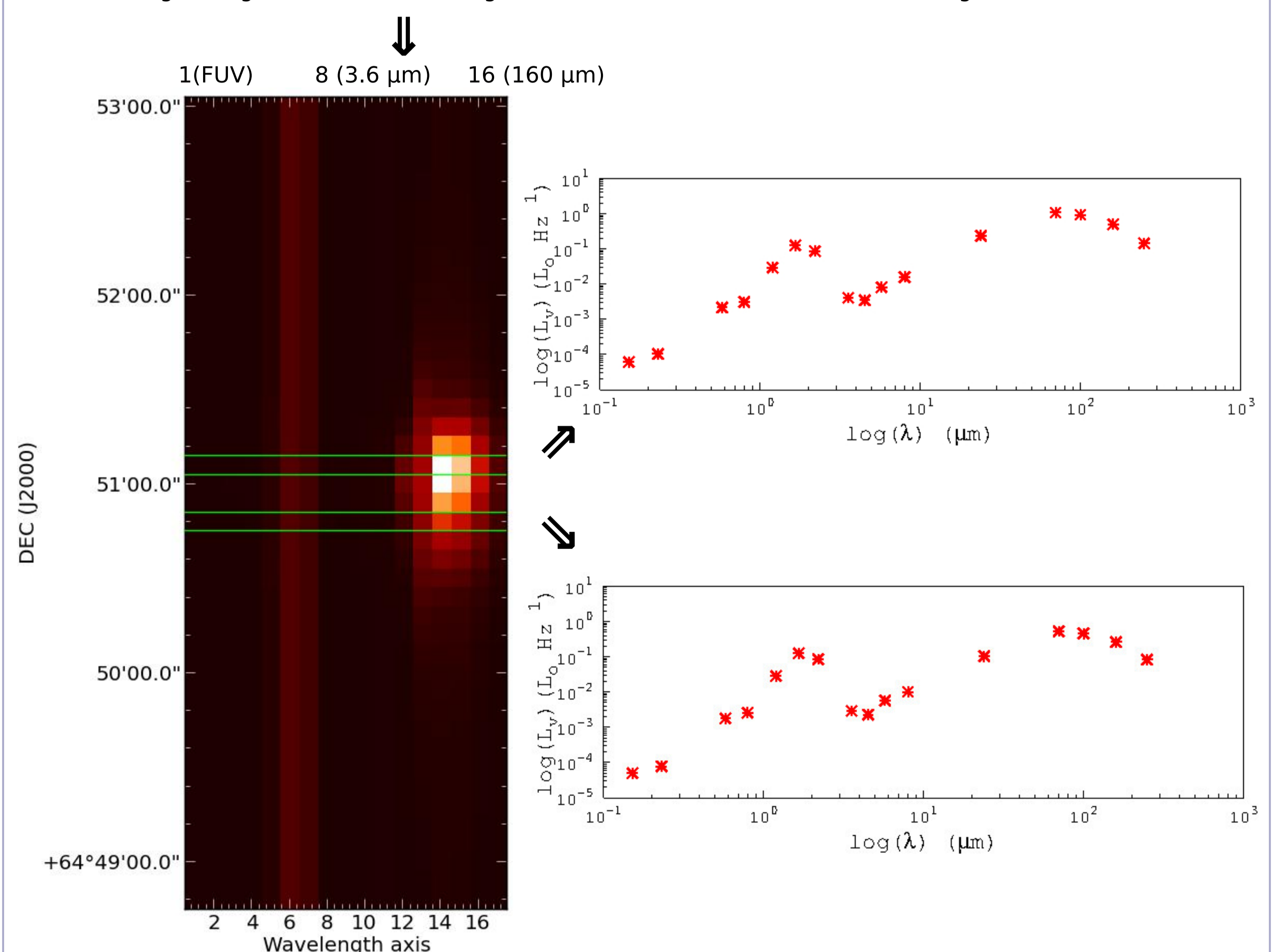
- Re-sampling to a same pixel size, with pixel size value a user-input

## Testing on NGC1569

- Imaging in 17 wavelengths from the ultraviolet to the far-infrared
- Imagecube processing and delivering a 3D datacube and SEDs on a pixel-by-pixel basis



Slicing through the whole wavelength-axis for the RA-DEC column marked in green above



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## References:

- Greenfield P, et al. 2013, ascl:1304.002  
The Astropy Collaboration 2013, A&A, in press (arXiv:1307.6212)  
Aniano G., et al. 2011, PASP, 123, 1218