



IVA MOMCHEVA

MISSION SCIENTIST, DATA SCIENCE MISSION OFFICE, STSCI

STScI SCIENCE PLATFORMS

SCIENCE PLATFORMS @ STSCI

- ▶ Increase scientific output from our holdings, new and archival
- ▶ Increase turn-around of science (currently ~12 mo)
- ▶ Connect multi-wavelength data
- ▶ Provide tools for reproducible research, integrate in workflows
- ▶ Look forward to future missions (WFIRST)

Credit: Katie Peek; Source: MAST, STSCI (data); Hubble Heritage Team (STScI/AURA)

How to Read the Chart Below

Each dot represents a Hubble observation referenced in a published paper.

Blue dots (nearly 14,000) relate to Hubble's archive: instead of asking for new observations, the researcher answered a question using existing images.

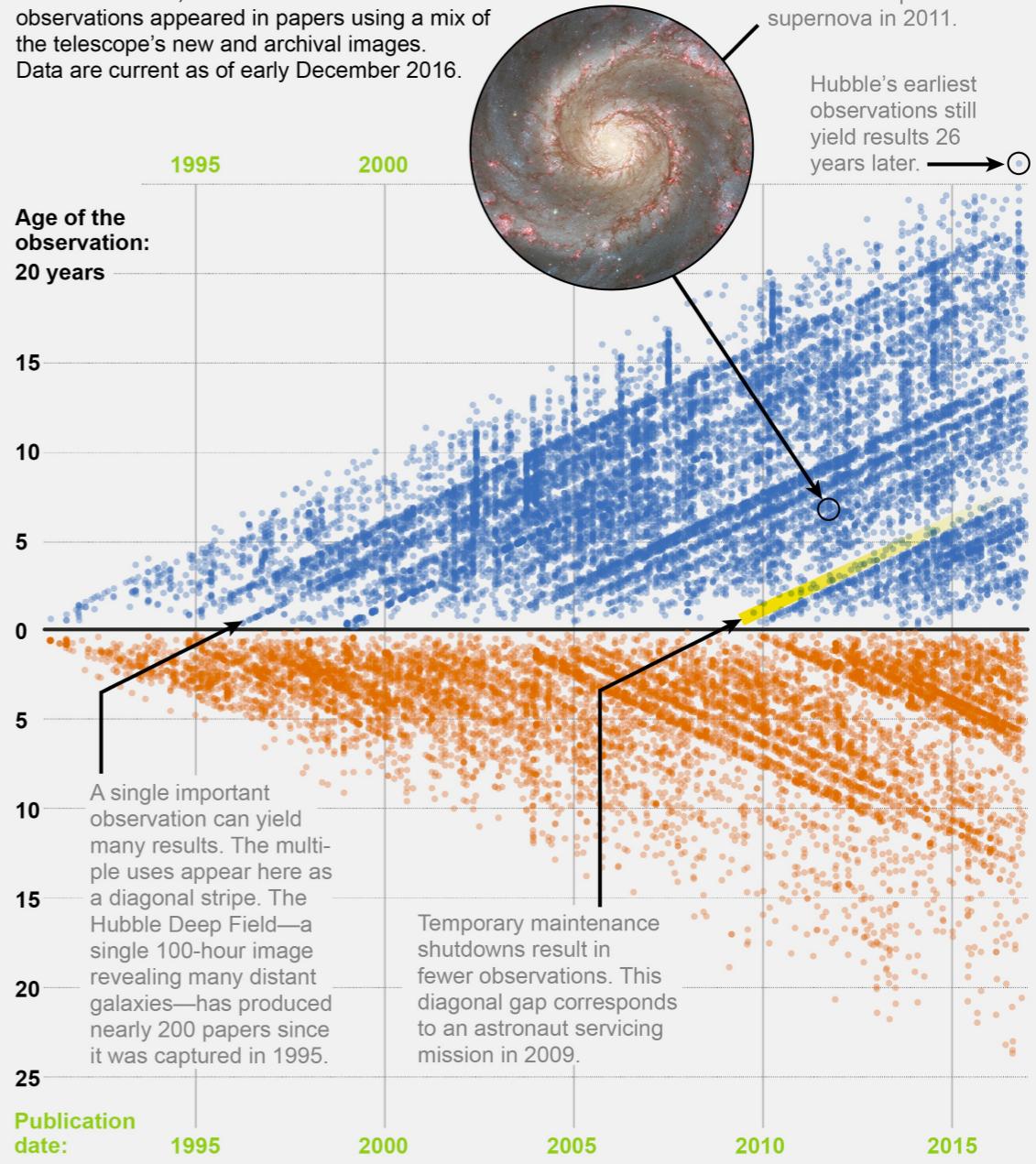
Orange dots (nearly 9,000) relate to new data: a researcher makes a specific observation request to answer a question.

An additional 10,000 references to Hubble observations appeared in papers using a mix of the telescope's new and archival images.

Data are current as of early December 2016.

Observations—when Hubble points at an object and collects data—can be beautiful and useful. This image of the Whirlpool galaxy from 2005 helped astronomers identify which star exploded as a supernova in 2011.

Hubble's earliest observations still yield results 26 years later.



After Hubble's eventual demise, results based on new data (orange) will disappear, but those based on the archives (blue) will continue.

Total observations referenced in papers per year



DISCOVERY

► MAST Portal: <https://mast.stsci.edu>

Select a collection... and enter target:
MAST Observations by Object Name or RA/Dec PG 1115+080 Search
[About Collections...](#) [Show Examples...](#) [Random Search](#) [Advanced Search](#)

anonymous
Login... Account Info...

Upload Target List My Download Basket: 0 files User Manual/Help | Leave Feedback | About This Site

Home Page MAST: M101 MAST: PG 1115+080

Displaying 1234 of 3046 Total Rows of Observations MESSIER 101, radius: 0.24000°

Filters

Clear Filters Edit Filters... Help...

Keyword/Text Filter
Filter All Columns

Product Type
Name Quantity
 image (1,028 of 2,005)
 cube (0 of 789)
 spectrum (206 of 252)

Mission
Name Quantity
 HST (1,234 of 1,234)
 HLA (0 of 911)
 SWIFT (0 of 789)
 IUE (0 of 35)
 HLSP (0 of 29)
Show 5 More

Instrument
Name Quantity
 UVOT (0 of 789)
 WFPC2/WFC (388 of 671)

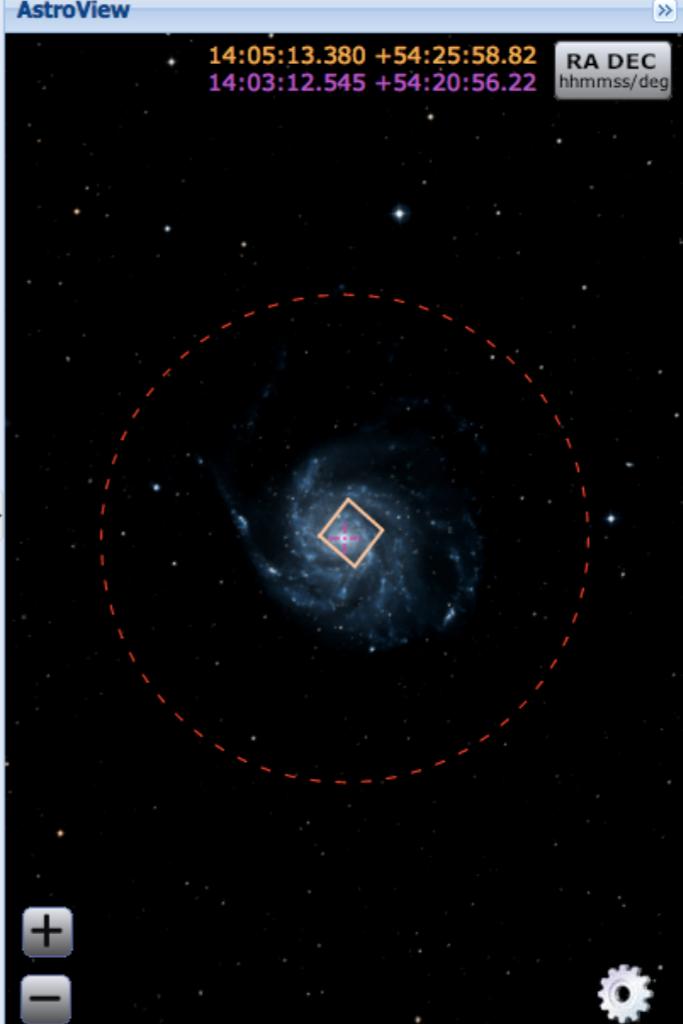
List View **Album View**

Edit Columns... Table Display: All Show Preview: Show Cutout:

	Actions	Mission	Instrument	Project	Filter
<input type="checkbox"/>		HST	WFC3/UVIS	HST	F46
<input type="checkbox"/>		HST	WFC3/UVIS	HST	F50
<input type="checkbox"/>		HST	WFC3/UVIS	HST	F62
<input checked="" type="checkbox"/>		HST	WFC3/UVIS	HST	F54
<input type="checkbox"/>		HST	WFC3/UVIS	HST	F33
<input type="checkbox"/>		HST	WFC3/UVIS	HST	F27
<input type="checkbox"/>		HST	ACS/WFC	HST	F43
<input type="checkbox"/>		HST	ACS/WFC	HST	F55
<input type="checkbox"/>		HST	ACS/WFC	HST	F81
<input type="checkbox"/>		HST	ACS/WFC	HST	F43
<input type="checkbox"/>		HST	ACS/WFC	HST	F55
<input type="checkbox"/>		HST	ACS/WFC	HST	F81
<input type="checkbox"/>		HST	ACS/WFC	HST	F65

AstroView

14:05:13.380 +54:25:58.82 RA DEC
14:03:12.545 +54:20:56.22 hhmmss/deg



+

-

Gear icon



TOOLS

▶ MAST API & astroquery.mast

- ▶ <https://mast.stsci.edu/api>
- ▶ <http://astroquery.readthedocs.io>

▶ Astroconda

- ▶ <https://astroconda.readthedocs.io>

▶ Data Analysis Tools

▶ Hosted services: ExoCTK

- ▶ <https://github.com/ExoCTK>
- ▶ <https://exoctk.stsci.edu/>





Mashup API

Tools for programmatically querying the MAST Portal.

Main Page

Related Pages

Classes

Search

Mashup API Documentation

The Mashup API allows for MAST queries to be performed programmatically. This documentation describes how to create a valid Mashup Query, as well as the Mashup Services of interest to an API user.

Questions/Comments/Feedback: contact archive@stsci.edu

Documentation Organization

The [Mashup Request](#) class documentation provides information for properly formatting a Mashup request to the mast servers.

The [Services](#) documentation provides information about specific services that may be used.

The [Result Dataset Formats](#) page documents possible return types.

The [Examples](#) page contains working code for various Mashup Queries in Python.

There is also a [Tutorial](#) that goes through a basic workflow from initial query to data download.

The Mashup Request Url

The Mashup Request Url is [https://mast.stsci.edu/api/v0/invoke?request=\(Mashup Request Object\)](https://mast.stsci.edu/api/v0/invoke?request=(Mashup%20Request%20Object)).
The Mashup service takes a single request argument, ?request=(Mashup Request Object), a json object.
The Mashup service supports both HTTP GET and HTTP POST request types.

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The screenshot shows the 'AstroConda' documentation page. At the top, there's a header with the STScI logo and the text 'latest'. Below the header is a search bar labeled 'Search docs'. A sidebar on the left contains links to various sections: Getting Started, Selecting a Software Stack, Updating a Software Stack, Further Reading, Pipeline Releases, Compatibility Notices, F.A.Q., Contributing Guide, Packages, Release Notes, Resources, and General Disclaimer. At the bottom of the sidebar is a 'Read the Docs' button. In the footer, there's a 'v: latest' dropdown menu and a 'TRIPLEBYTE' logo.

Docs »

Welcome to AstroConda Channel's documentation!

[Edit on GitHub](#)

a Mashup request to the
sed.

Welcome to AstroConda Channel's documentation!

AstroConda is a free Conda channel maintained by the [Space Telescope Science Institute \(STScI\)](#) in Baltimore, Maryland. This channel provides tools and utilities required to process and analyze data from the Hubble Space Telescope (HST), James Webb Space Telescope (JWST), and others.

jest Object).
.ct), a json object.

System Requirements

- 64-bit Intel/AMD processor (x86_64)
- 64-bit Linux (glibc ≥ 2.12) or Mac OS X (≥ 10.7)
- BASH or ZSH as your default shell environment (T/CSH is NOT supported)

Powered by Conda

Conda is an open-source software package management system provided and maintained by [Continuum Analytics](#). Many software packages, provided both by Continuum and through third parties, are able to be quickly and easily installed using the Conda utility. AstroConda serves as a third-



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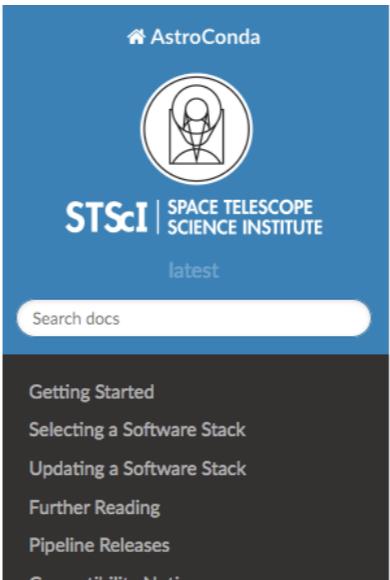
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System Requirements

Repository	Purpose	Maturity
Astropy	A community python library for astronomy (astropy.org)	
glue	A Python library to explore relationships within and among related datasets. (glueviz.org)	
ginga	A toolkit designed for building viewers for scientific image data in Python. (docs)	
Photutils	Tools for detecting and performing photometry of astronomical sources. (docs)	
psfutils	Convenience tools for working with point-spread functions (PSFs)	
astroimtools	Convenience tools for working with astronomical images. (docs)	
imexam	Tool for simple image examination, and plotting, with similar functionality to IRAF's imexamine. (docs)	
specviz	An interactive astronomical 1D spectra analysis tool with similar functionality to IRAF's splot. (docs)	
mosviz	A quick-look analysis and visualization tool for multi-object spectroscopy. (docs)	
cubeviz	Interactive analysis tool for 3-d spectroscopy (coming soon)	
asdf	Advanced Scientific Data Format is a next generation interchange format for scientific data (docs)	
gwcs	Generalized World Coordinate System tools for dealing with image and spectral geometries (docs)	
synphot	Synthetic photometry toolkit for building model spectra and estimating count-rates. (docs)	

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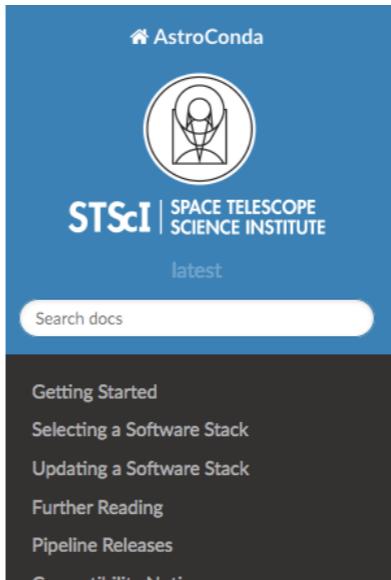
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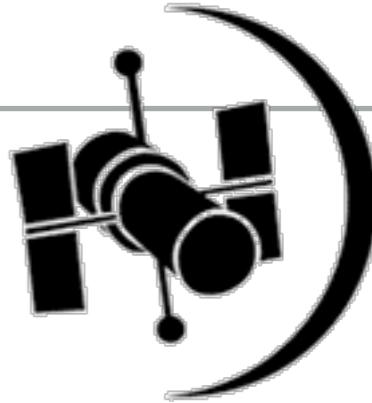
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SCIENCE PLATFORMS



- ▶ Hubble Public Data on AWS
 - ▶ 120TB to 140TB of data
 - ▶ AMIs with tools & notebooks NEXT TO DATA
- ▶ JupyterHub Project
 - ▶ AMIs → Docker containers
 - ▶ User authentication
 - ▶ Kubernetes container orchestration
 - ▶ How can we support collaboration?

