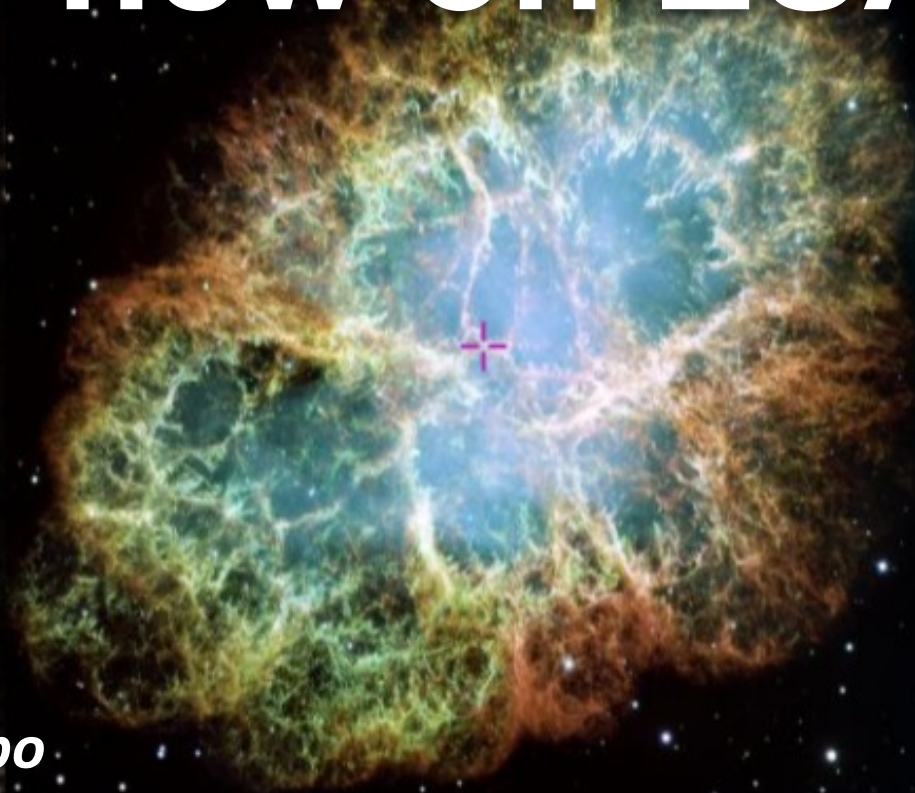




What's new on ESASky 4.0?



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- Multi-wavelength and multi-mission portal
- Designed by scientists with the needs from the scientific community
- User friendly, intuitive.

<http://sky.esa.int>



ESASky

Open ESASky at: <http://sky.esa.int>



A screenshot of the Google homepage in dark mode. The browser address bar shows 'google.com'. The page features the Google logo, a search bar with a microphone icon, and two buttons: 'Buscar con Google' and 'Voy a tener suerte'. Below the search bar, it says 'Ofrecido por Google en: English català galego euskara'. At the bottom, there are links for 'España', 'Publicidad', 'Empresa', 'Cómo funciona la Búsqueda', 'Emisión neutra de carbono desde el 2007', 'Privacidad', 'Términos', and 'Configuración'.



European Space Agency

pyESASky

What can you do with pyESASky?

This notebook shows examples of what a scientist may typically want to do within a Jupyter notebook using pyESASky, e.g.:

- Download and inspect data from ESASky (images, spectra, catalogues, ...)
- Cross-match catalogues available through ESASky
- Upload your own data to ESASky, e.g.:
 - Cross-matched tables
 - Vizier catalogues (astropy tables)
 - User provided tables
 - Footprints
 - HIPS
- Interact with ESASky Functionalities:
 - Set the: FoV, HIPS
 - Go to a target or coordinates
 - Slide through a selection of HIPS
 - See the observations, catalogues and publications count in the current FoV
 - Load the data panel for observations, spectra and catalogues accessible in ESASky
 - JWST planning tool
 - Set the coordinates grid on and off

```
In [2]: # Import the required python modules:
from pyesasky import ESASkyWidget
from pyesasky import Catalogue
from pyesasky import CatalogueDescriptor
from pyesasky import CooFrame
from pyesasky import ImgFormat
from pyesasky import FootprintSet
from pyesasky import FootprintSetDescriptor
from pyesasky import MetadataDescriptor
from pyesasky import MetadataType

import pandas as pd

In [3]: # Instantiate the pyESASky instance
esasky = ESASkyWidget()
```

Astroquery and TAP

ESASky Queries (`astroquery.esasky`)

Getting started

This is a python interface for querying the ESASky web service. This module supports cone searches and download of data products from all missions available in ESASky. You can also use the ESASky Solar System Object crossmatch methods to get all observations (both targeted and serendipitous) of a solar system object.

There are 4 categories of methods, based on the type of data: catalogues, observations, spectra, and SSO. Documentation on the ESASky web service can be found here.

Get the available catalogue names

If you know the names of all the available catalogues you can use `list_catalogs()`:

```
>>> from astroquery.esasky import ESASky
>>> catalog_list = ESASky.list_catalogs()
>>> print(catalog_list)
['LAMOST', 'AllWISE', 'AKARI-IRC-SC', 'TwoMASS', 'INTEGRAL', 'CHANDRA-SC2', 'XMM-EPIC-ST', 'XMM-SLEW', 'Tycho-2', 'Gaia-eDR3', 'Hipparcos-2', 'HSC', 'Herschel-HPPSC-070', 'Herschel-Herschel-HPPSC-160', 'Herschel-SPSC-250', 'Herschel-SPSC-350', 'Herschel-SPSC-500', 'Planck-PCCS2E-HFI', 'Planck-PCCS2-HFI', 'Planck-PCCS2-LFI', 'Planck-PSZ2']
```

Get the available maps mission names

If you know the names of all the available maps missions you can use `list_maps()`:

```
>>> maps_list = ESASky.list_maps()
>>> print(maps_list)
['INTEGRAL', 'XMM', 'Chandra', 'SUZAKU', 'XMM-OM-OPTICAL', 'XMM-OM-UV', 'HST-UV', 'HST-C', 'Herschel', 'AKARI', 'Spitzer', 'ALMA']
```

Get the available spectra mission names

If you know the names of all the available spectra you can use `list_spectra()`:

Javascript API

ESASKY JAVASCRIPT API

INFO:
All commands should be sent to the ESASky element as http postmessages. For example by: `document.getElementById(esaskyFrameName).contentWindow.postMessage(command, 'http://sky.esa.int')`

Where `esaskyFrameName` is the elementId where the esasky page is embedded, `command` is a JSON containing "event" for function name and "content" with all parameters

There are a number of commands that will send back response from ESASky. These will also be sent as http messages directed to the sender element of the command sent to ESASky. Unless otherwise specified this will probably be the main window for you. Add a message listener if you want to handle the data sent back as:

```
window.addEventListener("message",function(e){
  var data = e.data;
  // Code to handle the data
});
```

Available events described here and can be tested in the iframe on this page. Every command has a submit button which will send it to the iframe and paste it to the custom function input below the iframe. Here all responses from ESASky are also displayed:

Click on the headers to expand them

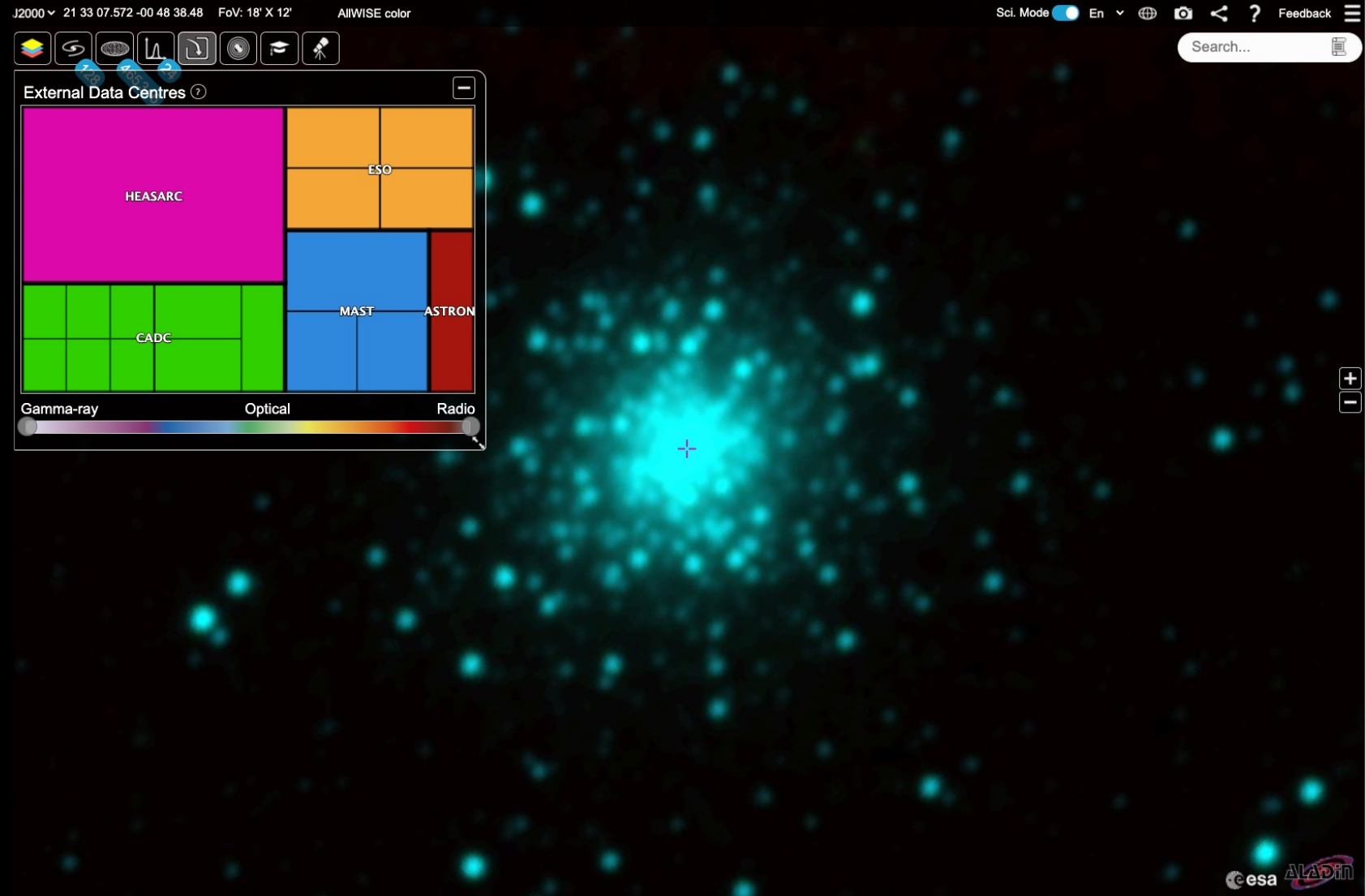
VIEW:

COORDINATE GRID:

Send

Output window
Will show any text returned from ESASky

- External TAPS:
 - ✓ HEASARC
 - ✓ ASTRON



The screenshot displays the ESASky 3.9 web interface. At the top, the header shows coordinates (J2000 21 33 07.572 -00 48 38.48), field of view (FoV: 18' X 12'), and color scheme (AllWISE color). A search bar is located in the top right corner. The main view is a star field with a central bright star marked by a crosshair. An 'External Data Centres' window is open, showing a treemap of data sources: HEASARC (pink), ESO (orange), MAST (blue), ASTRON (red), and CADAC (green). Below the treemap is a color scale legend ranging from Gamma-ray (purple) to Radio (red), with Optical in the middle. The bottom right corner features the ESA and ALADIN logos.

➤ External TAPS:

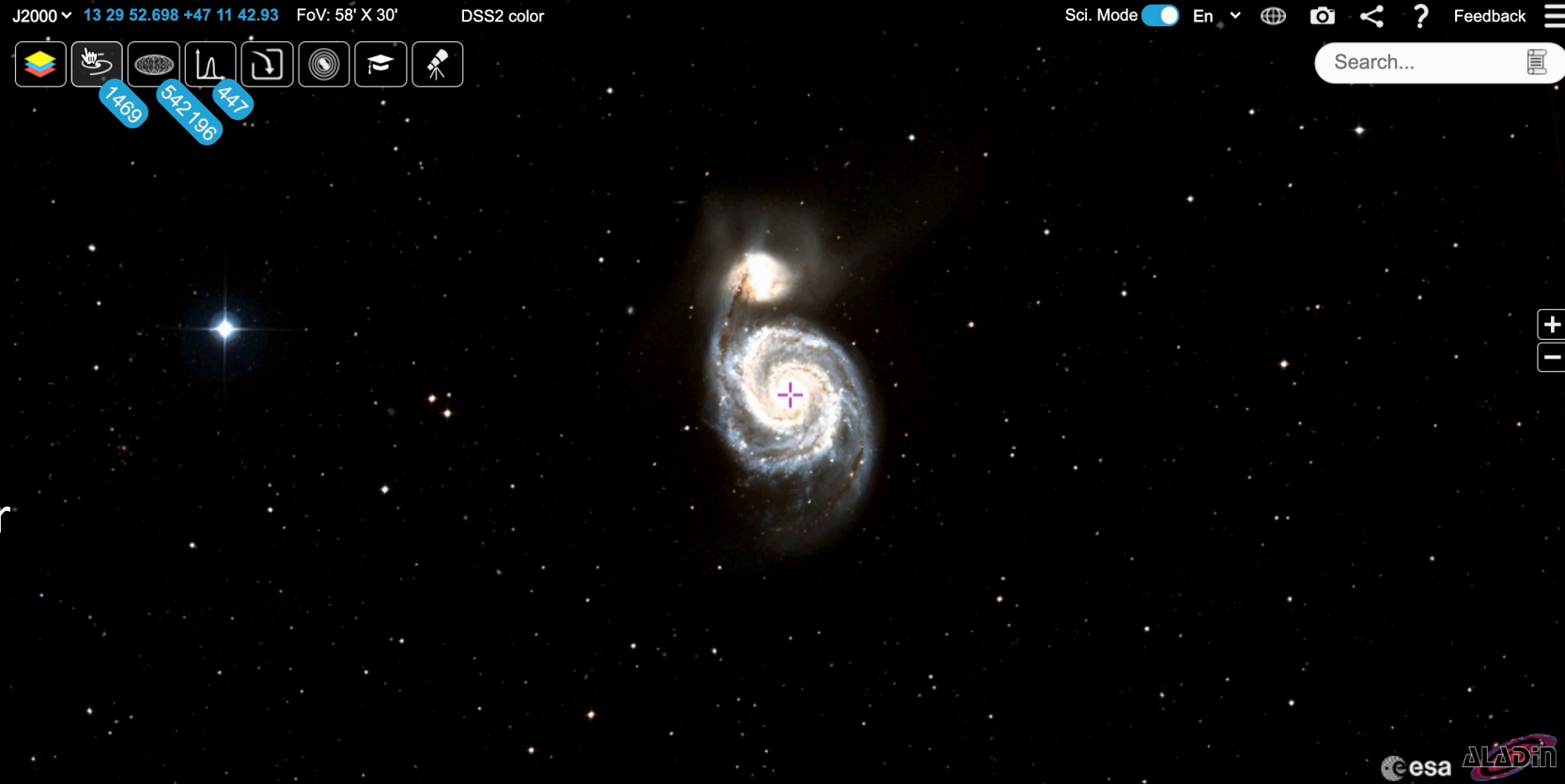
- ✓ HEASARC
- ✓ ASTRON

➤ HiPS:

- ✓ url
- ✓ computer
- ✓ browse HiPS registry for globally available HiPS

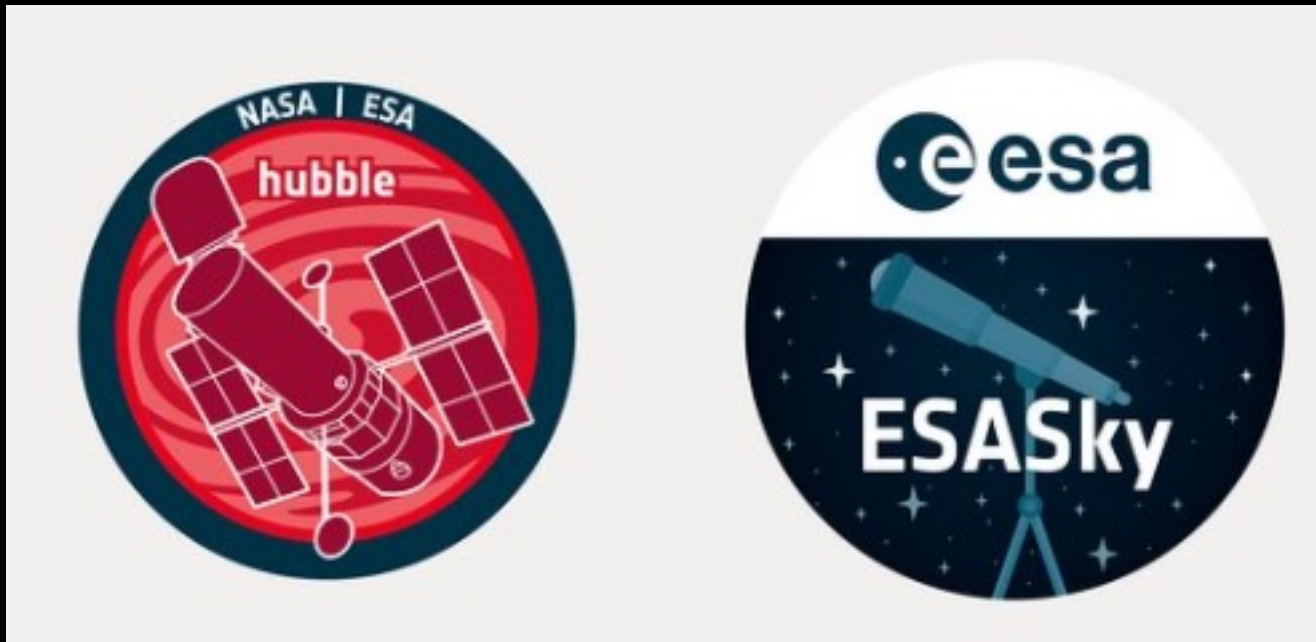
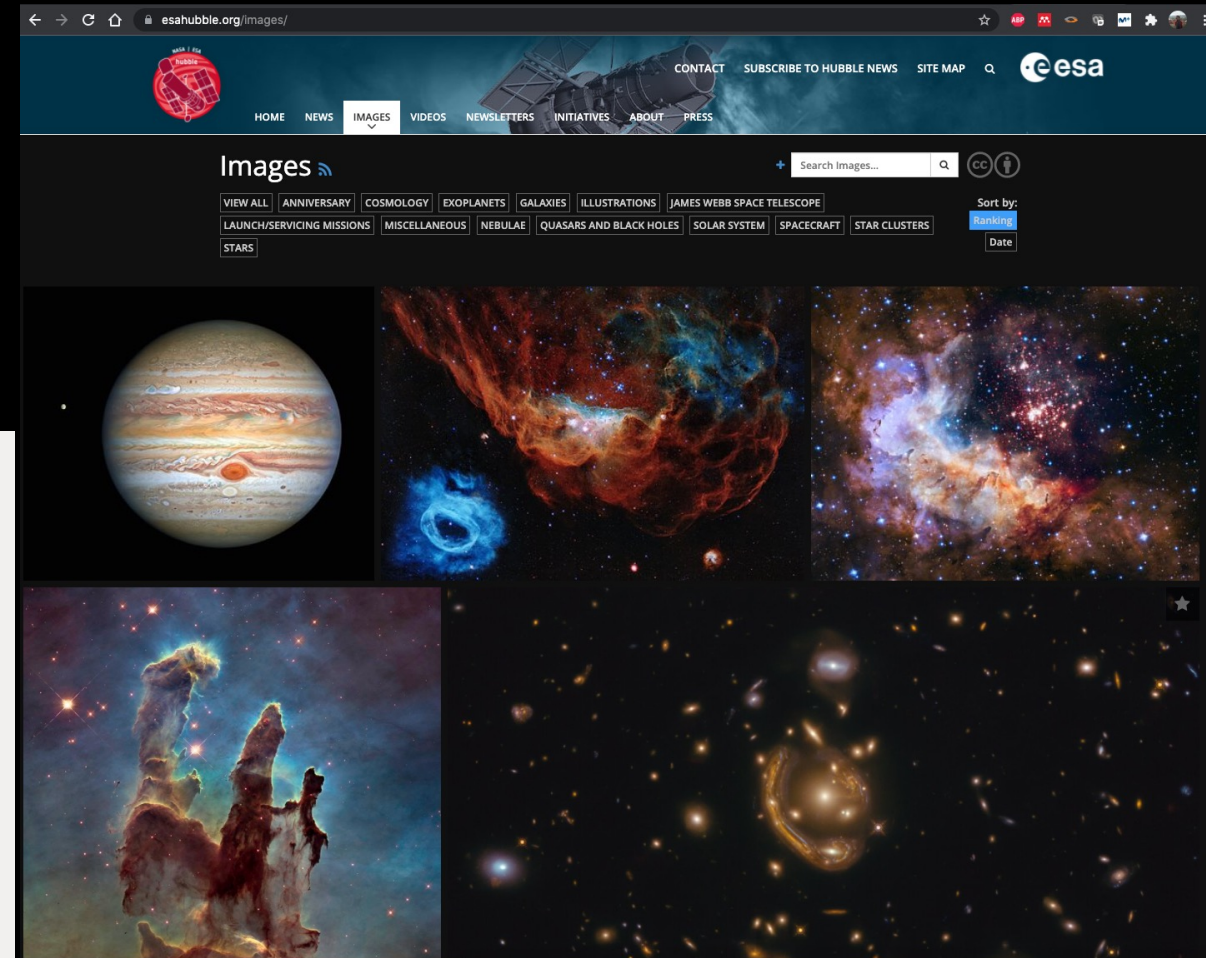


- External TAPS:
 - ✓ HEASARC
 - ✓ ASTRON
- HiPS:
 - ✓ url
 - ✓ computer
 - ✓ browsing HiPS registry for globally available HiPS
- Selection tool

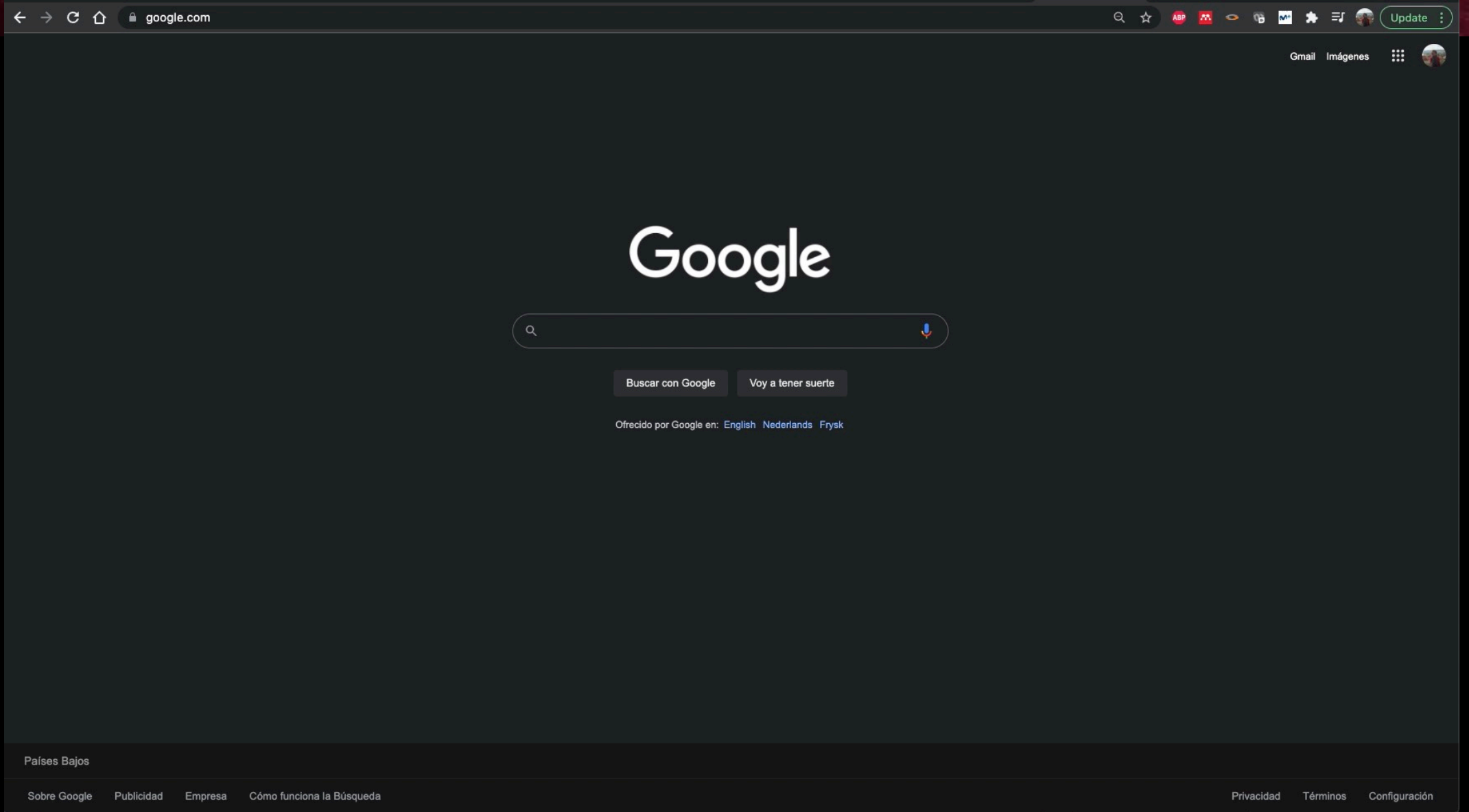


ESASky 4.0: ESA/Hubble Outreach Images

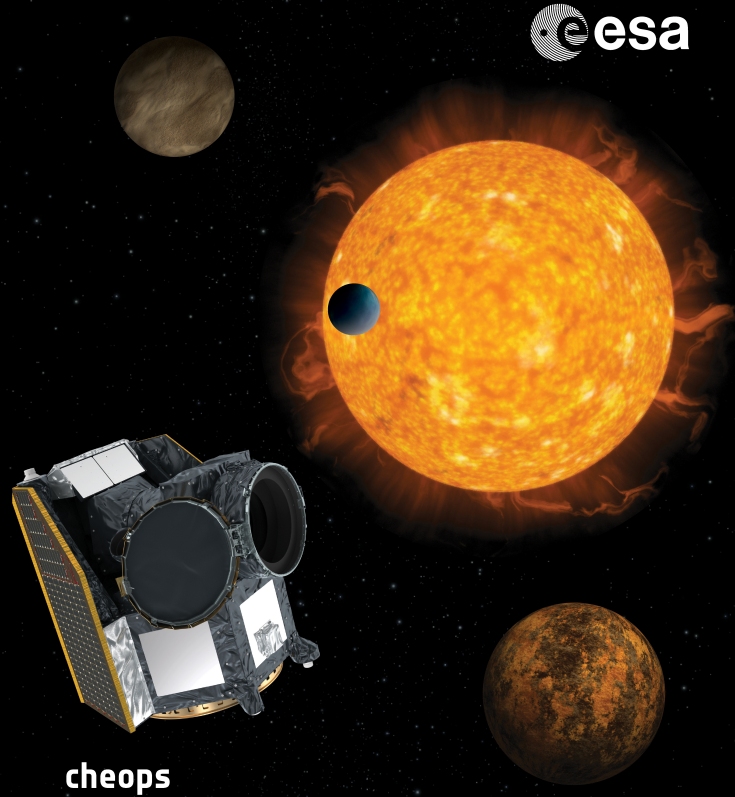
- Launched October 20th
- <https://esahubble.org/images/>
- Over 2,000 outreach images



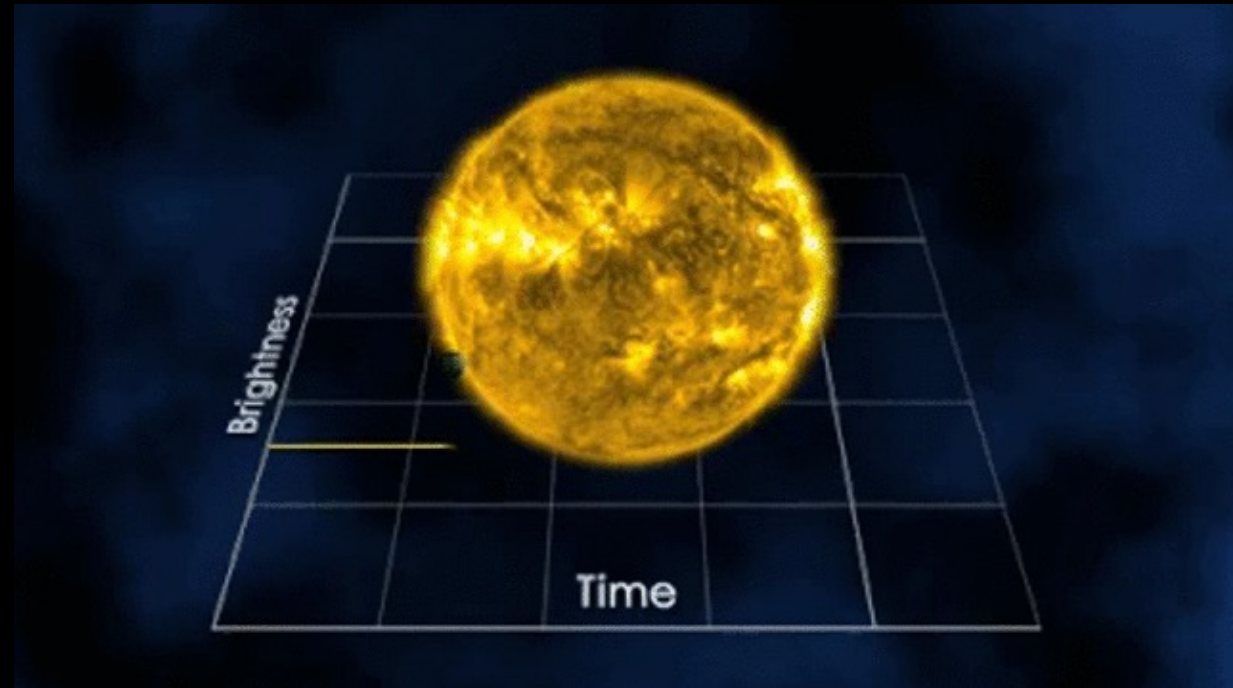
ESASky 4.0: ESA/Hubble Outreach Images



ESASky 4.0: CHEOPS light-curves



→ SIZING AND FIRST CHARACTERISATION OF EXOPLANETS



Credit: NASA

www.esa.int

European Space Agency



European Space Agency

ESASky 4.0: CHEOPS light-curves



J2000 10 09 06.599 -25 48 38.56 FoV: 6.0' X 3.0' DSS2 color

Sci. Mode En Feedback

HD88111

0 189 7

+
-

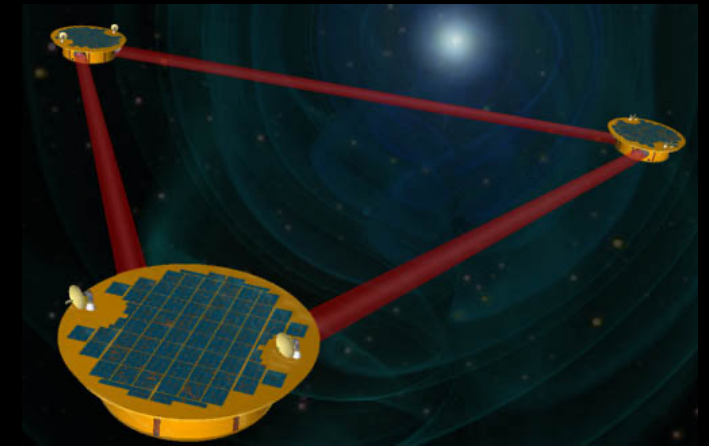
esa ALADIN



Multi-messenger Astronomy



- Historically, scientists have relied on electromagnetic radiation to study the Universe.
- Multi-messenger astronomy: "messenger" particles: photons, neutrinos, cosmic rays and gravitational waves.
- Archival data can be used to identify already known sources among the various EM counterpart candidates.
- ESASky: common platform to store and analyse multi-messenger data. Combine information from multi-messenger detections and find EM counterparts.

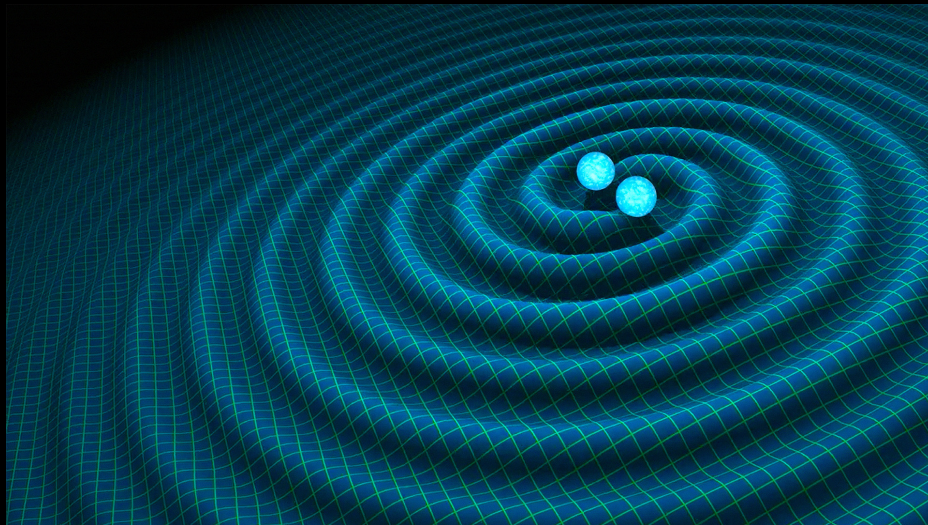


ICECUBE
GEN2



ESASky 4.0: Gravitational Waves

- First step: Gravitational Waves into ESASky
- 56 O3 observing run LIGO/VIRGO public events (not rejected)
- 50% and 90% contours and probability map (HiPS)



ESASky 4.0: Gravitational Waves



Browser address bar: sky.esa.int/?target=18.990170833333334%205.17875277777778&hips=DSS2+color&fov=0.0998472699340097&coofram...

Navigation: Apps, Bookmarks, Zimbra: Compose, ONE ESA, Pulse Connect Se..., Log in to Overleaf..., SAO/NASA ADS C..., arXiv.org e-Print a...

Page Info: J2000 01 15 54.247 +05 09 31.78 FoV: 6.0' X 2.9' DSS2 color Sci. Mode En Feedback

Tools: Layer, Rotate, Zoom, Plot, Download, Zoom In, Zoom Out, Telescope

Search: Search...

Zoom: + -




Future plans



Future plans



**GODDARD SPACE FLIGHT CENTER**

[GCN Help/FAQ](#)
[GCN What's New](#)
[NASA Homepage](#)

SEARCH NASA

[GCN HOME](#) | [ABOUT GCN](#) | [BURST/TRANS INFORMATION](#) | [MEMBERSHIP](#) | [ARCHIVES](#) | [SEARCH GCN FOR BURSTS](#)

GCN: The Gamma-ray Coordinates Network (TAN: Transient Astronomy Network)

The voevent cloud server atlantic was down from 10:45 UT to 16:32 UT Sep 12, 2021 (down-time was 5.47 hrs) due to network connection problems. The other 8 voevent cloud servers were fine.

Posted 23 Mar 2020 (last updated 18 Oct 20):
Due to the policies and constraints during the CoronaVirus pandemic, my response to your requests and questions may not be as fast as normal.
Example: changes to your site_configuration may take up to 7 days (instead of the usual 2-4 days).
Being at home teleworking, requires making the site_config file change a remote operation instead of the normal on-site operation. Which is doable, but I try to keep that method to a minimum. I will wait longer to do the file change or I will use a weekly 4-hr pass to do work on-site.

The GCN system distributes:

- Locations of GRBs and other Transients (the Notices)** detected by spacecraft (most in real-time while the burst is still bursting and others are that delayed due to telemetry down-link delays).
- Reports of follow-up observations (the Circulares)** made by ground-based and space-based optical, radio, X-ray, TeV, and other particle observers.

These two functions provide a one-stop shopping network for follow-up sites and GRB and transient researchers.

The GCN system can be explored using the links above and below.

- [About GCN/TAN](#) provides a number of 'Introductions' from different points of view. 'Technical Details' (found on the [About GCN/TAN](#) page) describes the various services and products of GCN/TAN and how they are generated.
- 'Burst Data Archives' are available under [Burst & Transient Information](#), which record the inputs and outputs of GCN/TAN automatically and are updated in real-time.
- You can also [Search for past Bursts/Transients and webtext](#).

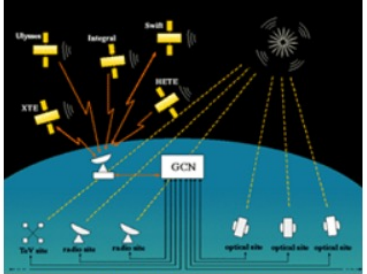
Invitation to [subscribe to the Notices or Circulares here](#). [unsubscribe here](#).
Make a [modification to an existing Notices site configuration here](#).
Invitation to producers to incorporate your events into GCN [here](#).

System Status

[System Status: Latest update: 17 Mar 2021 \(UT\)](#)

What's New

[What's New: Latest update: 31 Jul 2020 \(UT\)](#)



The physical GCN network. (Click to enlarge.)

Latest Gamma-Ray Bursts

[GCN Circulares Archive](#) | [Circs by Burst](#)
[GCN Reports Archive](#)

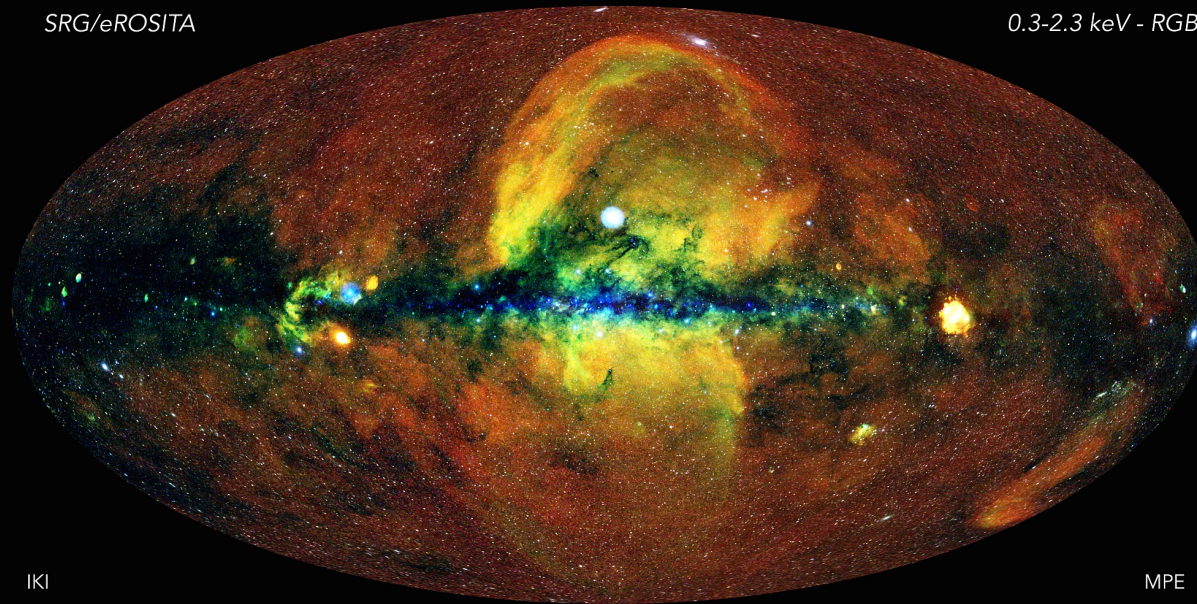


Future plans



SRG/eROSITA

0.3-2.3 keV - RGB



IKI

MPE



Thanks



J2000 06 16 25.401 -21 22 06.26 FoV: 5.4' X 3.3' AllWISE color

Sci. Mode En ? Feedback

FEEDBACK

Poster: News from ESASky (Henrik Norman)

Image Opacity

