

Usage of HiPS in outreach softwares

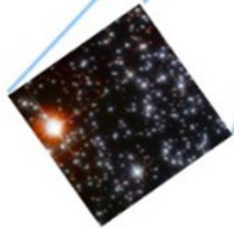
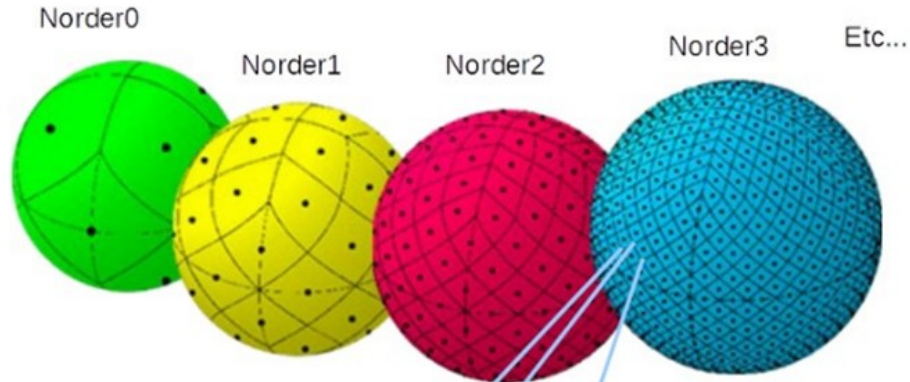


S. Derriere

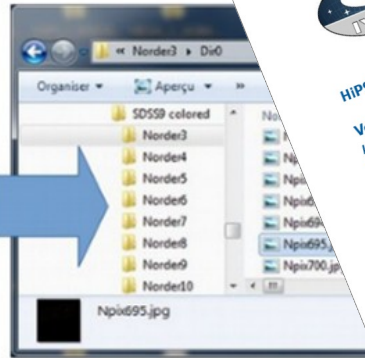
+ T. Boch, P. Fernique, A. Schaaff
+ B. Rota, M. Wendling (Strasbourg Planétarium)



□ HiPS everywhere



Npix695.jpg



International
Virtual
Observatory
Alliance

HiPS – Hierarchical Progressive Survey

Version 1.0
IVOA Recommendation
19th May 2017

This version:
1.0: Recommendation 2017-05-19

Previous version(s):
1.0: Proposal Recommendation 2017-04-06
1.0: Proposal Recommendation 2017-04-07
1.0: Proposal Recommendation 2017-03-17
1.0: Proposal Recommendation 2016-11-22
1.0: Working Draft 2016-06-23

Interested Working Group:
Applications: <http://www.ivoa.net/show/VOA/Workshop>

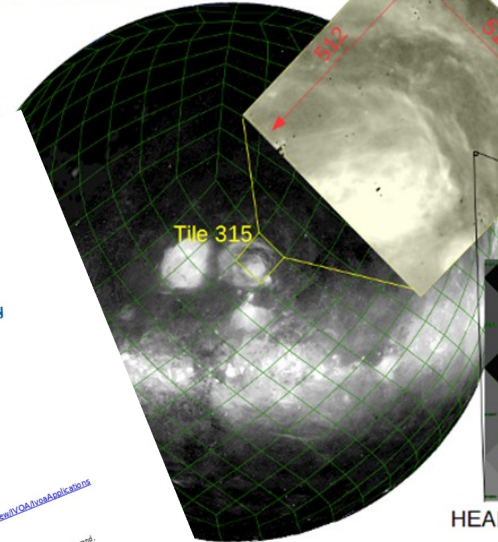
E-Editor:
Paire Ferrero

Authors:
Paire Ferrero, Mark Allen, Thomas Barth, Tom Davidsen, Daniel Duxard,
Ken Esakia, Laurent Michel, Jesse Salsgale, Kai Stroh

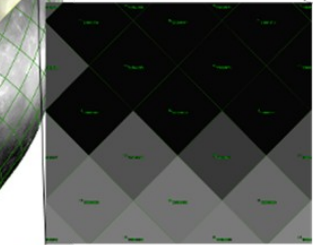
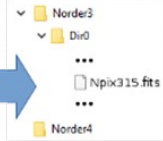
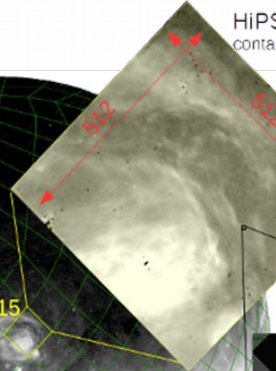
Abstract

This document presents HiPS, a hierarchical scheme for the description, storage and access of sky survey data. The system is based on hierarchical tiling of sky regions at finer and finer spatial resolution which facilitates a progressive view of a survey, and supports multi-resolution zooming and

HiPS (Halpa Finkbeiner)
order 3 = 768 tiles



HiPS tile number 315
containing 512x512 HEALPix cell values



HEALPix grid details

□ Usage of HiPS in the community

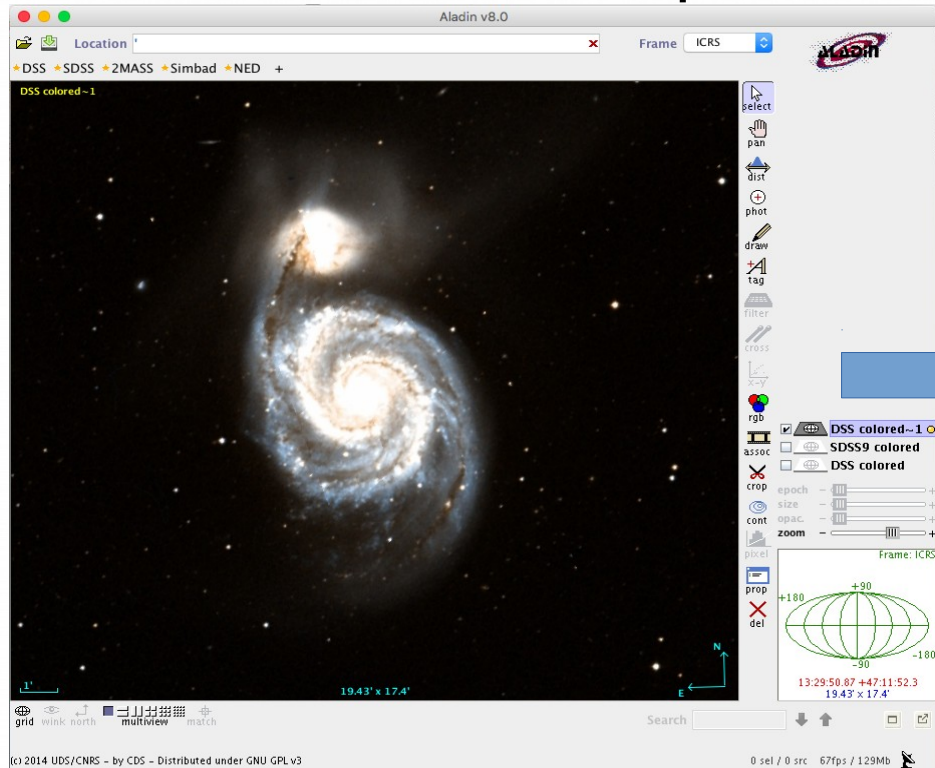
- Aladin
 - Aladin Desktop : maybe not the best suited for outreach.
There was an « undergrad » version until v9. This has disappeared in Aladin desktop v10, with the default usage of HiPS surveys.
 - Aladin Lite : can be embedded in any web page, and controlled with JS
Brings HiPS to the browser !
- ESA Sky
- ESO Archive Science Portal
- Firefly
- Other portals and websites



Can we use HiPS for education / outreach ?

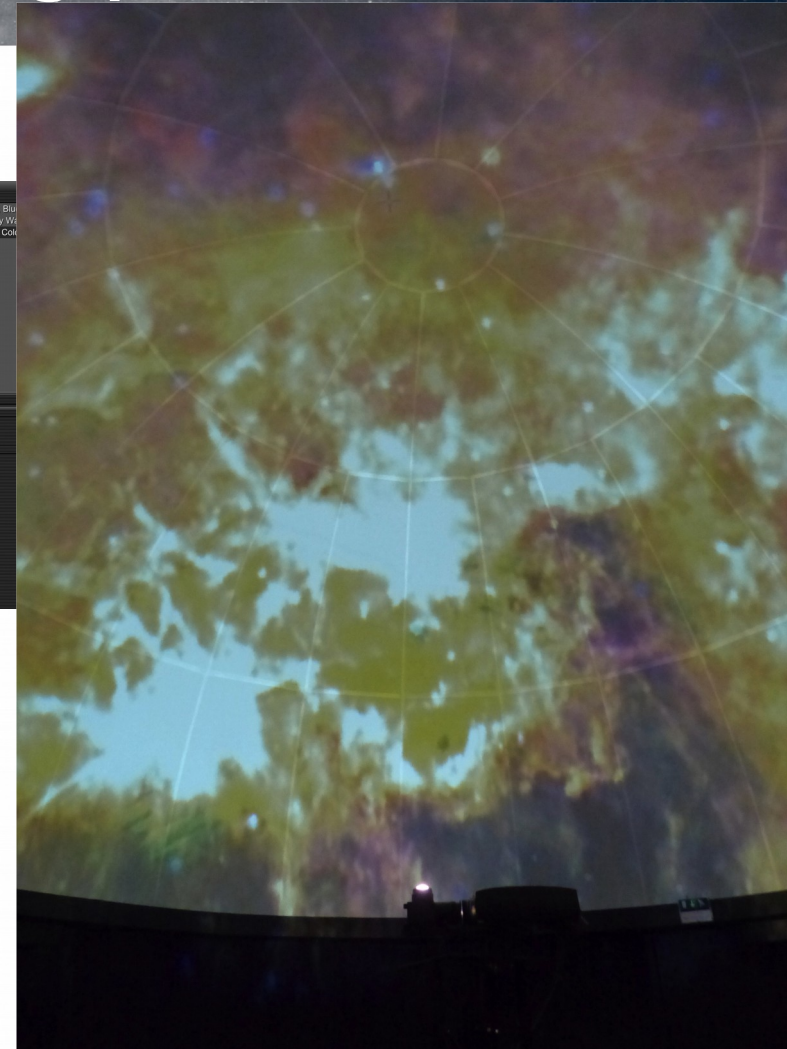
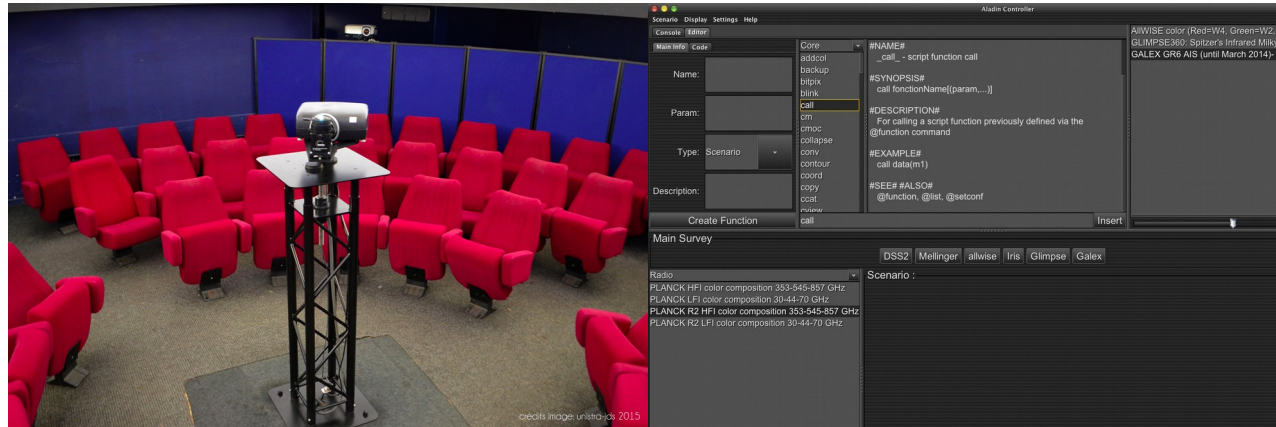
□ Early experiments

- Using Aladin in planetarium : Aladin 360
- See André Schaaff's presentation at IVOA, Trieste (2016)

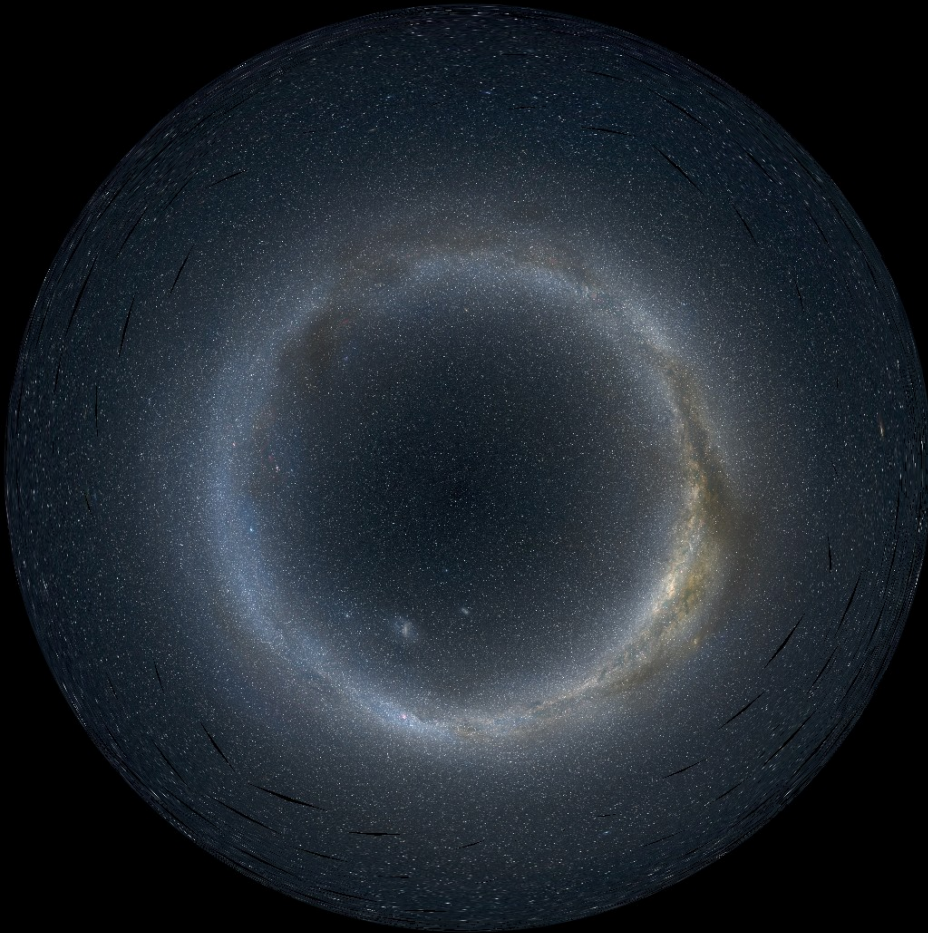


□ Aladin 360 in Strasbourg planétarium

- Planetarium plugin



□ Aladin 360 in Strasbourg planétarium



The screenshot displays the Aladin 360 software interface. The main window is titled "Aladin Controller" and shows a console window with the following text:

```
P/Mellinger/color=get hips(P/Mellinger/color);  
cview P/Mellinger/color
```

Below the console, there is a "Main Survey" section with a dropdown menu showing "Radio" and a list of surveys:

- PLANCK HFI color composition 353-545-857 GHz
- PLANCK LFI color composition 30-44-70 GHz
- PLANCK R2 HFI color composition 353-545-857 GHz
- PLANCK R2 LFI color composition 30-44-70 GHz

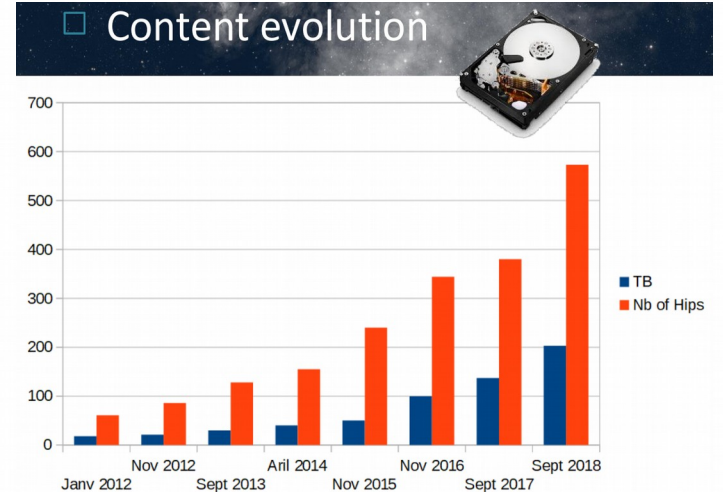
A red box highlights the "Load survey" button. To the right, there is a "Survey selection" section with a dropdown menu showing "DSS2 optical HEALPix survey" and a "Send" button. Below this, there is a "Scenarios" section with a dropdown menu showing "scenario1".

Additional labels on the interface include "Console module" (green text), "Survey selection" (yellow text), and "Scenarios" (blue text).

□ Access to HiPS

- Simple hierarchy of file
 - You just need to know the base URL
- Easy to access
- Easy to include in custom software

- The number of available HiPS increases fast !





YES!

Can we use HiPS for education / outreach ?

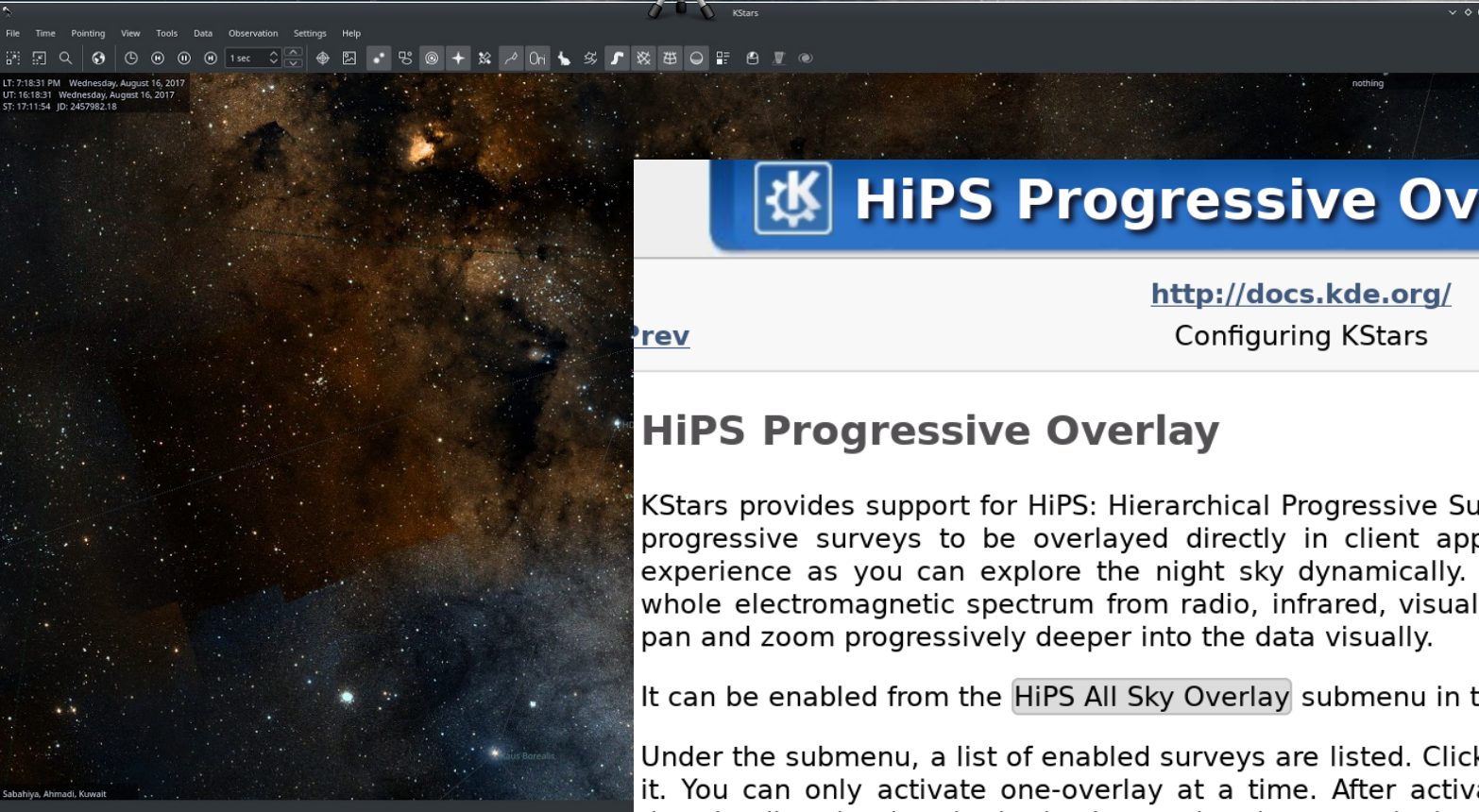




Kstars



<https://edu.kde.org/kstars/>



HiPS Progressive Overlay

<http://docs.kde.org/>

Configuring KStars

[Next](#)

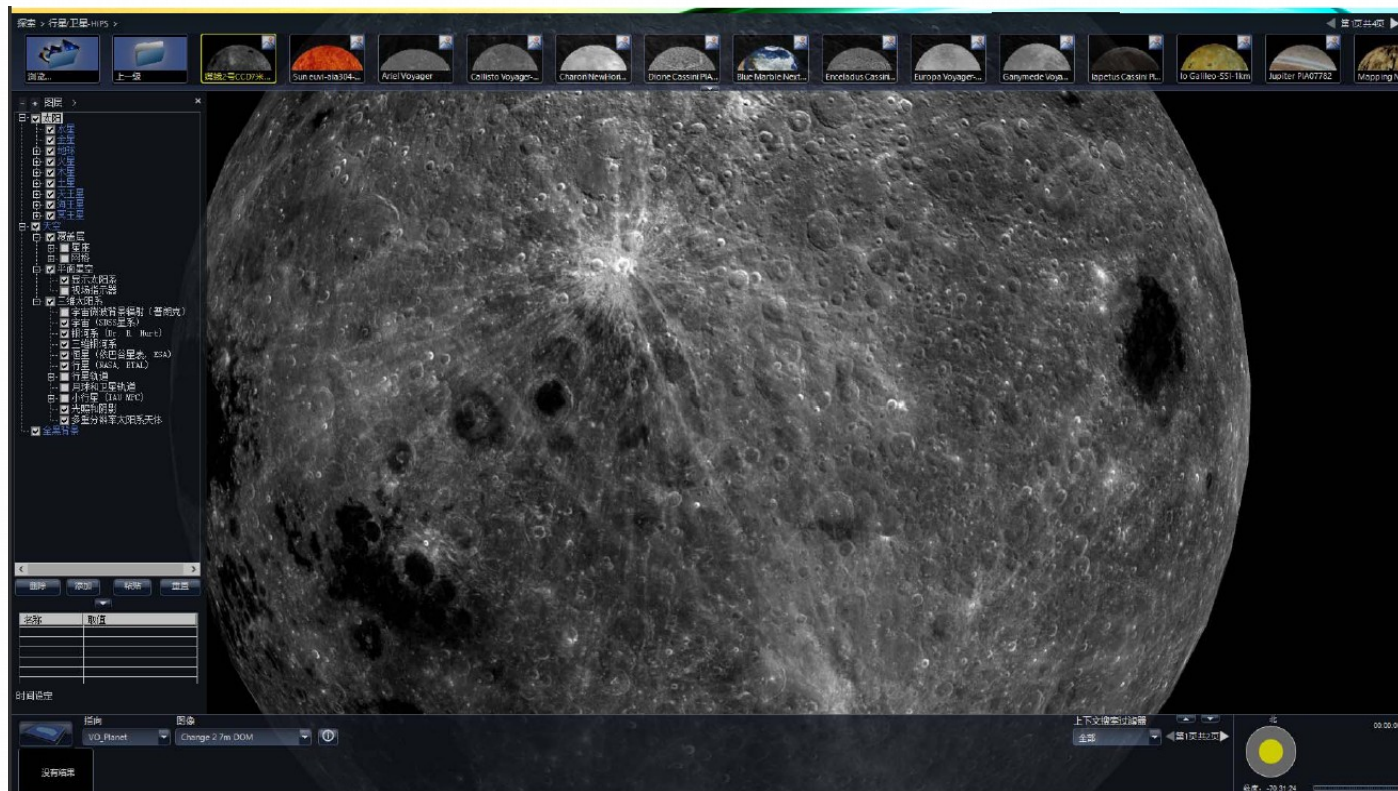
HiPS Progressive Overlay

KStars provides support for HiPS: Hierarchical Progressive Surveys. HiPS provides multi-resolution progressive surveys to be overlaid directly in client applications. It provides an immersive experience as you can explore the night sky dynamically. With over 200+ surveys across the whole electromagnetic spectrum from radio, infrared, visual, to even gamma rays, the user can pan and zoom progressively deeper into the data visually.

It can be enabled from the **HiPS All Sky Overlay** submenu in the **View** menu.

Under the submenu, a list of enabled surveys are listed. Click on the survey of interest to activate it. You can only activate one-overlay at a time. After activating the survey, KStars shall begin downloading the data in the background and progressively overlay the images onto the sky map as they become ready. Zooming in usually requires another patch of images that should trigger another download cycle.

- See Chenzhou's talk ([Apps I, Tuesday 9:00-10:30](#))



□ Stellarium

- Large number of surveys in Stellarium (F4 → Surveys)
 - Even Planetary texture maps !

Type: étoile double

Magnitude: 6.45 (atténué à: 6.58)

Magnitude absolue: 1.42

Index de couleur (B-V): 0.19

AD/Déc (J2000.0): 14h18m55.88s/+54°51'49.5"

AD/Déc (de la date): 14h19m34.92s/+54°46'27.0"

AH/Déc: 1h06m46.45s/+54°46'21.8" (apparent)

Az./Haut.: +307°15'31.3"/+77°59'03.3" (apparent)

Long./lat. gal.: +99°03'02.7"/+58°01'11.4"

Long./lat. supergal.: +62°45'13.6"/+24°49'12.1"

Long./lat. écl. (J2000.0): +177°02'26.8"/+61°43'52.8"

Long./lat. écl. (de la date): +177°19'15.1"/+61°43'52.5"

Obliquité de l'écliptique (de la date): +23°26'09.1"

Temps sidéral moyen: 15h26m23.8s

Temps sidéral apparent: 15h26m22.7s

Constellation UAI: Boo

Distance: 330.79 al

Type spectral: A4V

Parallaxe: 0.00986"

Angle de position (2007): 8.00°

Séparation (2007): 0.090"

Mouvement propre par axe: -17.0 -5.2 (mas/a)

Angle de position du mouvement propre: 253.0°

Vitesse angulaire du mouvement propre: 17.8 (mas/a)

Affichage



Paysage



Culture céleste



Surveys

Ciel Profond

 CFHTLS-D-color-ugi CFHTLS-D-g CFHTLS-D-i CFHTLS-D-r CFHTLS-D-u CFHTLS-D-z CFHTLS-W-colored-ugi CFHTLS-W-g CFHTLS-W-i CFHTLS-W-r CFHTLS-W-u CFHTLS-W-z CO composite survey CO High Resolution Survey (HARP/JCMT) DSS colored DSS2 Red (F+R) EGRET Dif 100-150MeV EGRET Dif 1000-2000MeV EGRET Dif 150-300MeVAstellus Primus.
CFHTLS-W-colored-ugi

The Canada-France-Hawaii Telescope Legacy Survey is a 5-year program carried out jointly by the Canadian and French agencies. It will use the Megaprime/Megacam instrument mounted at prime focus of the 3.6m CFH telescope during the period 2003-2008. The WIDE survey concerns 4 patches, 3 of about 7x7 square-degrees each and 1 of about 4x4 square-degrees. All will be observed in u,g,r,i and z, with about 1 hr exposure time per filter.

properties

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- coordsys C
- creator_did ivos://CDS/P/CFHTLS/W/Color/ugi
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- dataproduct_type image
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- em_min 3.266e-7
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- hips_order 11
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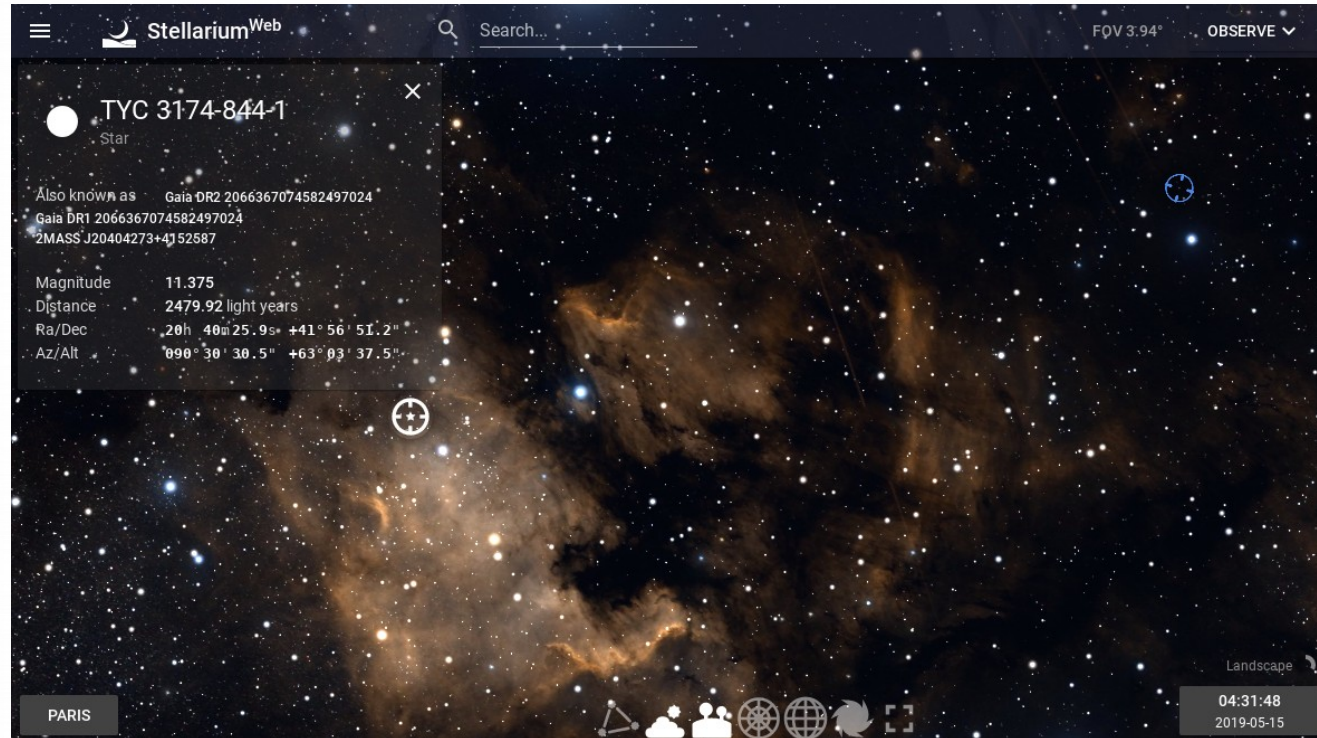
Astellus Primus.

Astellus Tertius

CFHTLS-W-colored-ugi

☐ Stellarium web

- <https://stellarium-web.org/>
- Uses DSS color HiPS



□ CDS & Strasbourg planetarium

- New planetarium to be built in Strasbourg
- Present science data / results to the public
 - Data2dome
 - HiPS
- Use the Planetarium infrastructure for research
 - Full-dome visualization



□ Conclusions & perspectives

- Planetariums are eager to use state-of-the-art surveys
 - Show real data / images to the public !
- There are amateurs / groups willing to share their images
- HiPS will probably be used more and more
 - Stellarium = ~10 % of image tiles usage at CDS, for 7000 unique users/day
 - Be careful with bandwidth usage...
 - Need to provide good metadata !
- Be careful with interpretation : mediation is needed !