

IDOC Space Mission Data Distribution services

Institut d'Astrophysique Spatiale – Orsay

K. Dassas on behalf of the IDOC team

Outlines

- Context
- IDOC data interfaces
- Tools behind
- Conclusion

Environment



UMR (CNRS and Paris-Sud University) - Orsay France

OSUPS = IAS + GEOPS = Science of Universe Observatory Paris-Sud

Staff : 150 members

IDOC staff : 9 permanent members + 6 contractants

Scientific Teams :

- Solar and Planetary systems
- Interstellar Matter and Cosmology
- Stellar and Solar Physics
- Astrochemistry and Origins

Context :

- Space Mission
 - International Consortia
 - « Astronomical » budget
 - Long terms engagements
 - Time constraints
- Paris – Saclay (P2IO, SPU)

IDOC Integrated Data and Operation Center

IDOC technical head: gilles.poulleau@ias.u-psud.fr

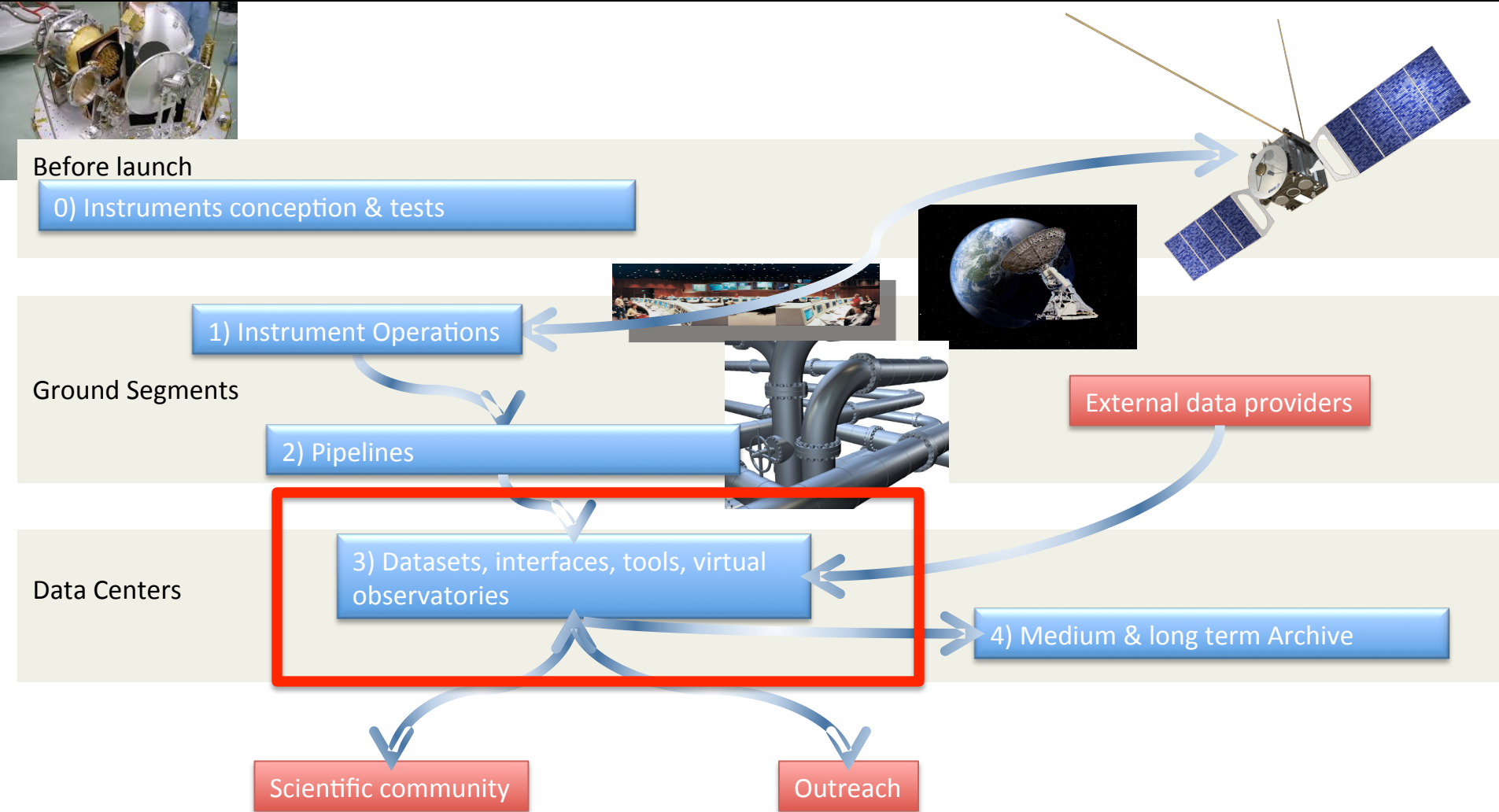
IDOC scientific head: marian.douspis@ias.u-psud.fr

<https://idoc.ias.u-psud.fr>

Partners :

- Others laboratories French or foreign
- Space agencies : CNES, ESA, NASA, JAXA, CSSAR, FKA,...
- Industry (IT or Space)
- Airbus, Leonardo-Finemeccanica,Thales-Alenia...

IDOC in the different space mission phases



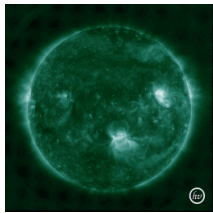
Space Missions

IDOC Activity fields	Futures Mission	On-going	Past
Before flight			
0) Instrument design & tests	Euclid 0/2,		Rosetta 0/1/2,
Ground Segment			
1) Instrument Operations	JWST 2/3/4,	Mars-express 0/1/2/3/4,	CoRot 2/3/4,
2) Pipelines	Plato 2/3/4,	SoHo 0/1/2/3/4,	Planck 0/1/2/3,
Dataset Management			
3) Dataset interfaces, access and tools	Juice 0/1/2/3,	Stereo 3/4,	Herchel 3/4,
4) Medium and long term archive	Bepi-Colombo 0,	SDO 3/4,	Trace 3/4,
	Solar Orbiter 0/1/2/3/4	Fripon 1/2	Coronas 3/4,
			Picard 3/4,
			Iras 2/3/4



Galaxy, INterstellar matter and Cosmology (GINCO)

<https://idoc.ias.u-psud.fr/ginco>



Multi Experiment Data & Operation Center (MEDOC)

National Center for Space Solar Physics Data

<https://idoc.ias.u-psud.fr/MEDOC>



Planetary Operation & Data Center (IPOD) new name : PSUP

<https://idoc.ias.u-psud.fr/ipod>



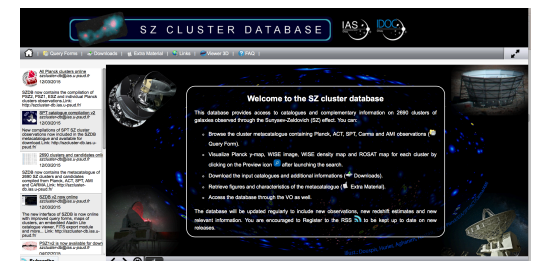
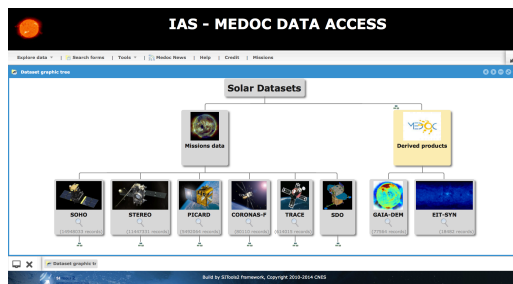
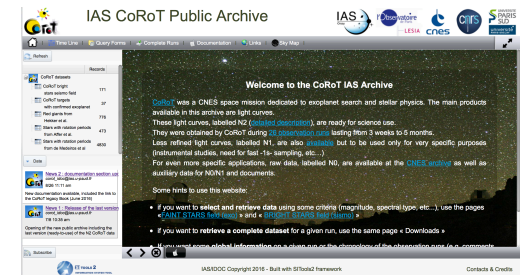
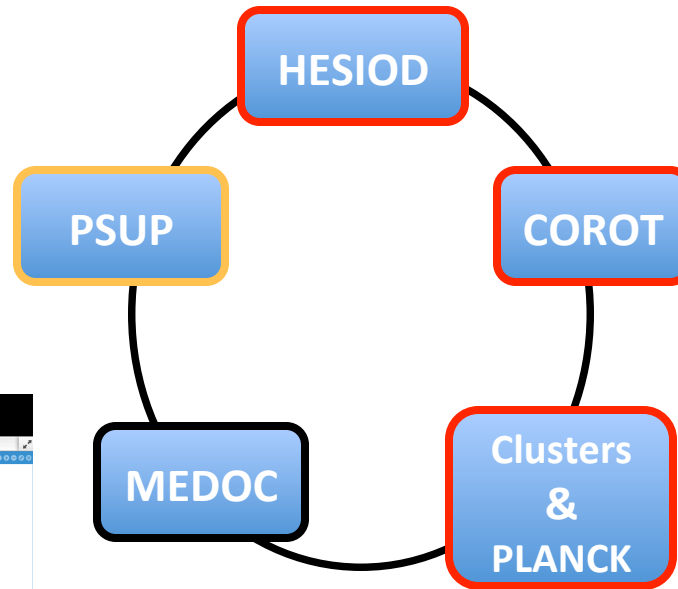
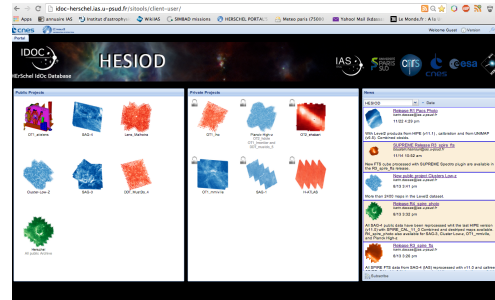
Stellar System Data (D2S)

<https://idoc.ias.u-psud.fr/D2S>

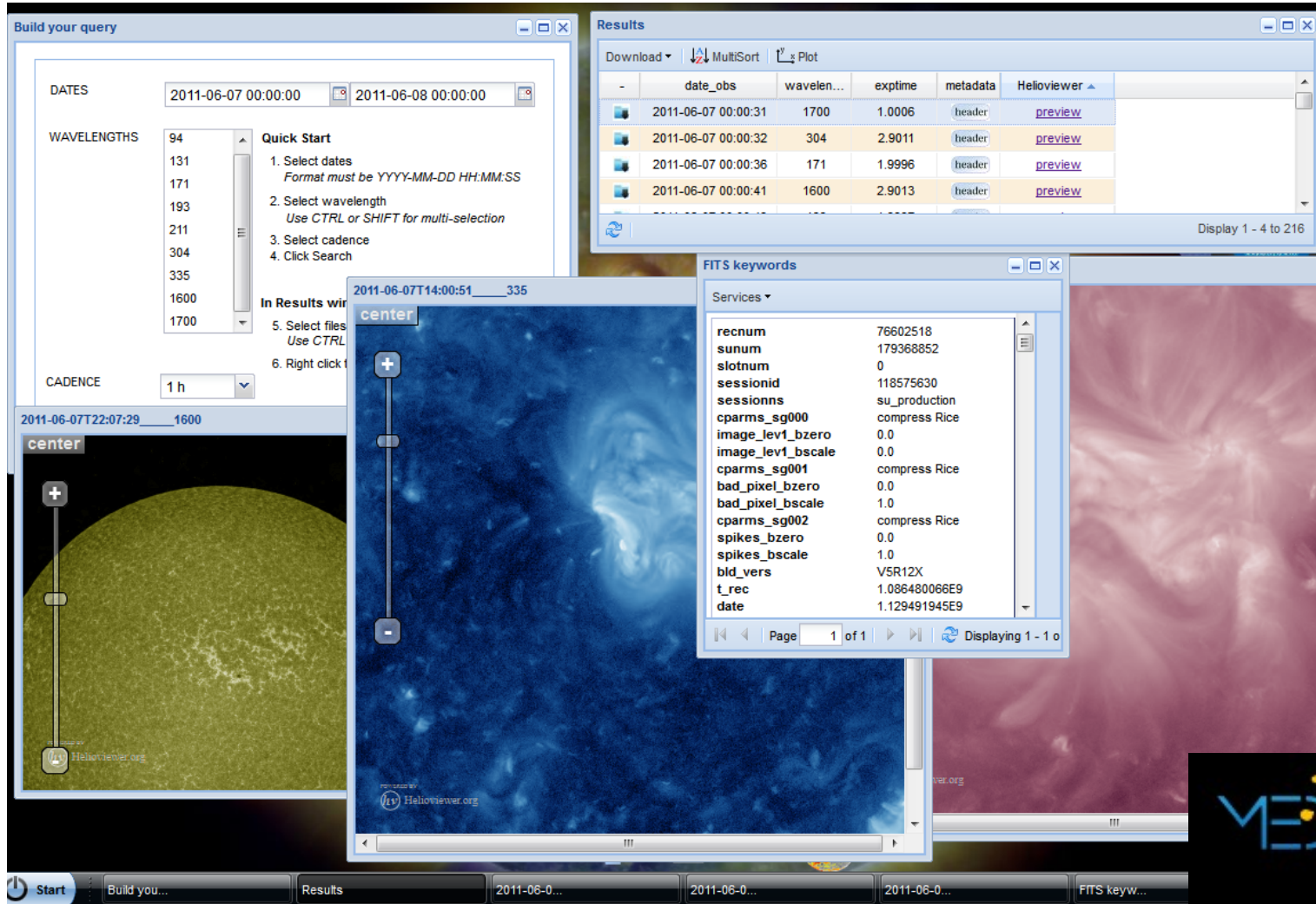
IDOC Data Interfaces

Data Access and Visualization

<https://github.com/SITools2/SITools2-core/projects>



Data Access and Vizualisation : <http://medoc-sdo.ias.u-psud.fr>



Build your query

DATES: 2011-06-07 00:00:00 to 2011-06-08 00:00:00

WAVELENGTHS: 94, 131, 171, 193, 211, 304, 335, 1600, 1700

Quick Start

1. Select dates
Format must be YYYY-MM-DD HH:MM:SS
2. Select wavelength
Use CTRL or SHIFT for multi-selection
3. Select cadence
4. Click Search

In Results window

5. Select files
Use CTRL
6. Right click

CADENCE: 1 h

2011-06-07T22:07:29 1600

center

2011-06-07T14:00:51 335

center

Results

Download | MultiSort | Plot

	date_obs	wavelen...	exptime	metadata	Helioviewer
	2011-06-07 00:00:31	1700	1.0006	header	preview
	2011-06-07 00:00:32	304	2.9011	header	preview
	2011-06-07 00:00:36	171	1.9996	header	preview
	2011-06-07 00:00:41	1600	2.9013	header	preview

Display 1 - 4 to 216

FITS keywords

Services

```

recnum          76602518
sunum           179368852
slotnum         0
sessionid       118575630
sessionns      su_production
cparams_sg000  compress Rice
image_lev1_bzero 0.0
image_lev1_bscalescale 0.0
cparams_sg001  compress Rice
bad_pixel_bzero 0.0
bad_pixel_bscale 1.0
cparams_sg002  compress Rice
spikes_bzero   0.0
spikes_bscale  1.0
bld_vers       V5R12X
t_rec          1.086480066E9
date           1.129491945E9
    
```

Page 1 of 1 | Displaying 1 - 1 of 1

Start | Build you... | Results | 2011-06-0... | 2011-06-0... | 2011-06-0... | FITS keyw...



PSUP 1/3

Planetary Surface Portal

Home | News | Project Description | MarsSi | Mars Visu

Welcome to the Planetary Surface Portal (PSUP)

This facility involves a data processing center coupled with planetary surface data dissemination center (mineralogical maps, geomorphologic maps, DTM...). Planetary Surface Portal is an initiative from OSUPS and OSUL. You can:

- o Browse the catalog in the right window "datasets"
- o Visualize in 2D or 3D the datasets with the module "Mars Visu"
- o Process DTM and other planetary datasets from the module "MarsSi"
- o Download the data and additional information from any modules (Downloads).

The database will be updated regularly to include new observations, new redshift estimates and new relevant information. You are encouraged to Register to the RSS to be kept up to date on new releases.

datasets

- OMEGA data Cubes
- OMEGA mineral maps
- Catalogs

Omega Cube Query Form

Omega Cube Query Form

Date Between: 2001-01-01 00:00 | 2015-01-01 00:00

Date request : for a given time T0, define time between T0 - 10 min and T0 + 10 min

Solar Longitude: [] []

Longitude (0° to 360° East): [] []

Latitude (-90° to 90°): [] []

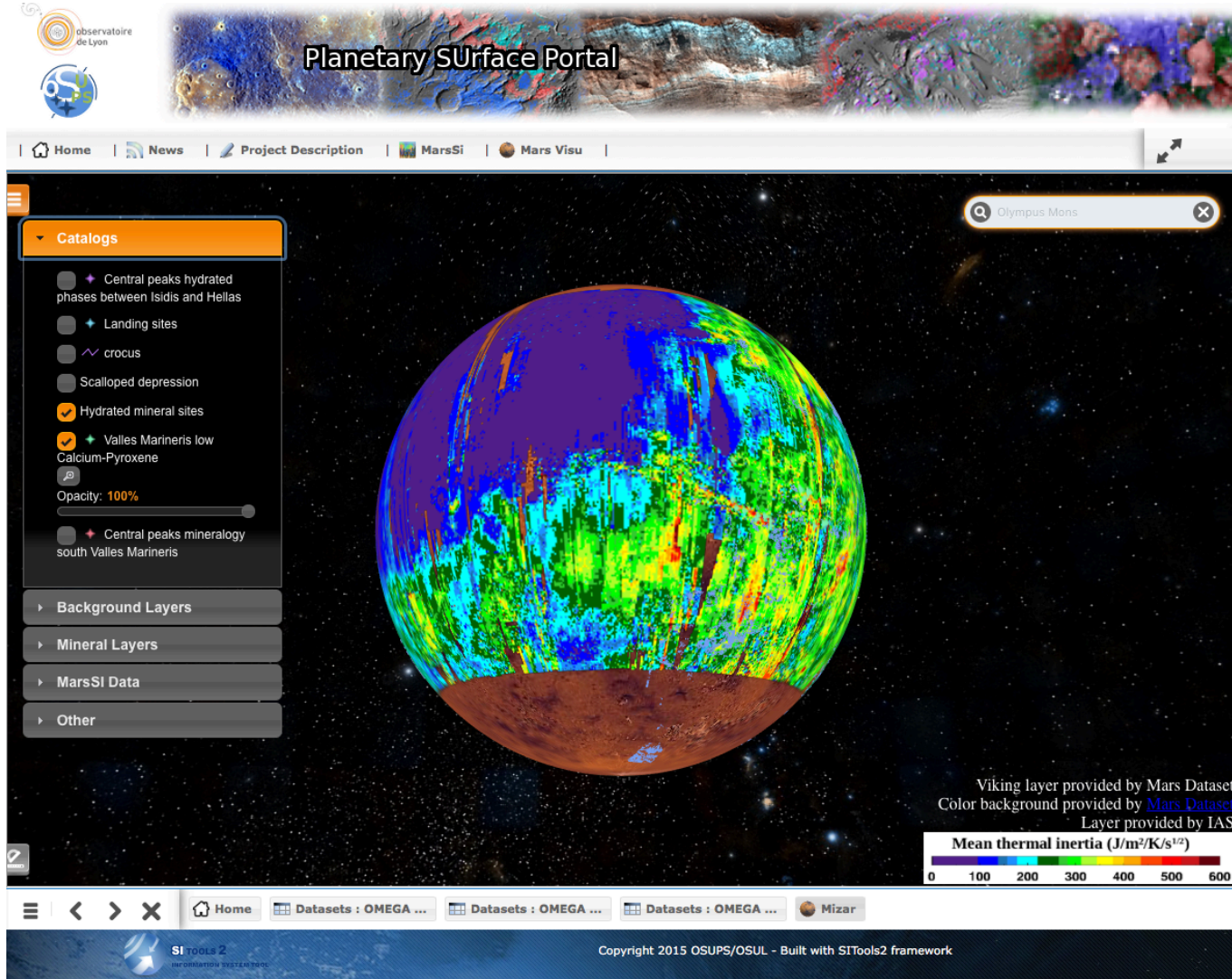
Orbit #: []

Cube #: []

Data quality: []

Search | Reset

PSUP 2/3



Planetary SURface Portal

Home | News | Project Description | MarsSI | Mars Visu

Catalogs

- Central peaks hydrated phases between Isidis and Hellas
- Landing sites
- crocus
- Scalloped depression
- Hydrated mineral sites
- Valles Marineris low Calcium-Pyroxene
- Central peaks mineralogy south Valles Marineris

Opacity: 100%

Background Layers

Mineral Layers

MarsSI Data

Other

Olympus Mons

Viking layer provided by Mars Dataset
Color background provided by Mars Dataset
Layer provided by IAS

Mean thermal inertia ($J/m^2/K/s^{1/2}$)

0 100 200 300 400 500 600

SI TOOLS 2 INFORMATION SYSTEMS 2000

Copyright 2015 OSUPS/OSUL - Built with SITools2 framework

PSUP 2/3 WMS, WCS, and WFS

Getting georeferenced Images :
WMS requests to the IDOC Mapserver



Background Viking

<http://idoc-wmsmars.ias.u-psud.fr/wmsmap?WIDTH=1500&HEIGHT=750&STYLES=&FORMAT=image/png&TRANSPARENT=false&SERVICE=WMS&REQUEST=GetMap&VERSION=1.1.1&SRS=EPSG:4326&BBOX=0,-90,180,90&LAYERS=Viking>



ALBEDO Layer

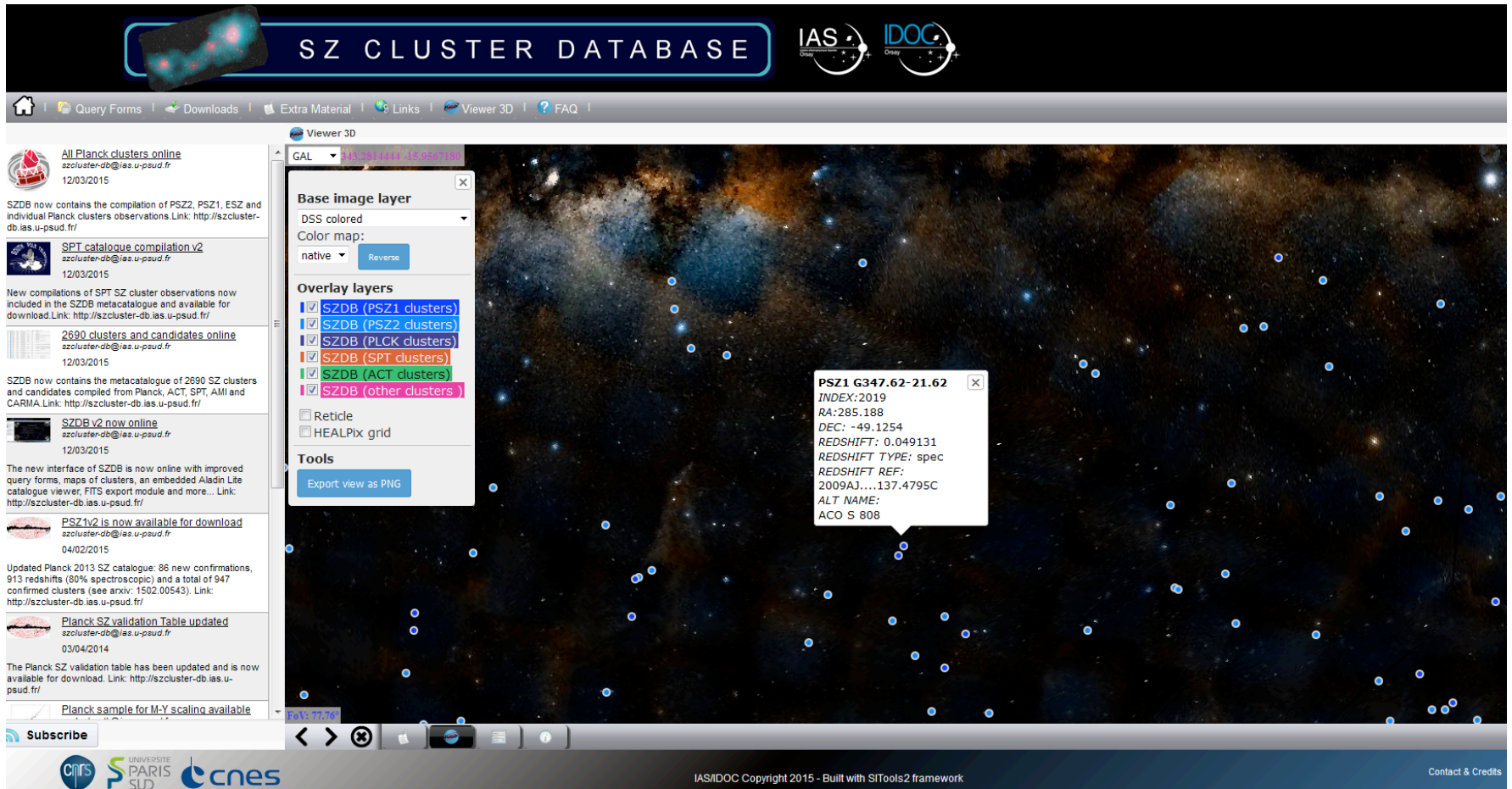
http://idoc-wmsmars.ias.u-psud.fr/wmsmap?WIDTH=1500&HEIGHT=750&STYLES=&FORMAT=image/png&TRANSPARENT=false&SERVICE=WMS&REQUEST=GetMap&VERSION=1.1.1&SRS=EPSG:4326&BBOX=0,-45,180,45&LAYERS=OMEGA_solar_albedo

Getting coverage :
WCS requests to the IDOC Mapserver

Getting Footprints and metadata (geojson):
WFS requests to the MArSI Geoserver



Planck – SZ cluster database



SZ CLUSTER DATABASE

IAS | IDOC

Home | Query Forms | Downloads | Extra Material | Links | Viewer 3D | FAQ

Viewer 3D

GAL: **Planck - PSZ1**

Base image layer

DSS colored
Color map: native

Overlay layers

- SZDB (PSZ1 clusters)
- SZDB (PSZ2 clusters)
- SZDB (PLCK clusters)
- SZDB (SPT clusters)
- SZDB (ACT clusters)
- SZDB (other clusters)

Reticle
 HEALPix grid

Tools

PSZ1 G347.62-21.62

INDEX: 2019
RA: 285.188
DEC: -49.1254
REDSHIFT: 0.049131
REDSHIFT TYPE: spec
REDSHIFT REF: 2009AJ....137..4795C
ALT NAME:
ACO S 808

Subscribe

UNIVERSITE PARIS SUD | CNRS | CNES

IAS/IDOC Copyright 2015 - Built with SITools2 framework

Contact & Credits

Planck – SZ cluster database

[Home](#) | [Query Forms](#) | [Downloads](#) | [Extra Material](#) | [Links](#) | [Viewer 3D](#) | [FAQ](#)

All Planck clusters online
szcluster-db@ias.u-psud.fr
12/03/2015

SZDB now contains the compilation of PSZ2, PSZ1, ESZ and individual Planck clusters observations. Link: <http://szcluster-db.ias.u-psud.fr/>

SPT catalogue compilation v2
szcluster-db@ias.u-psud.fr
12/03/2015

New compilations of SPT SZ cluster observations now included in the SZDB metacatalogue and available for download. Link: <http://szcluster-db.ias.u-psud.fr/>

2690 clusters and candidates online
szcluster-db@ias.u-psud.fr
12/03/2015

SZDB now contains the metacatalogue of 2690 SZ clusters and candidates compiled from Planck, ACT, SPT, AMI and CARMA. Link: <http://szcluster-db.ias.u-psud.fr/>

SZDB v2 now online
szcluster-db@ias.u-psud.fr
12/03/2015

The new interface of SZDB is now online with improved query forms, maps of clusters, an embedded Aladin Lite catalogue viewer, FITS export module and more... Link: <http://szcluster-db.ias.u-psud.fr/>

PSZ1v2 is now available for download
szcluster-db@ias.u-psud.fr
04/02/2015

Updated Planck 2013 SZ catalogue: 86 new confirmations, 913 redshifts (80% spectroscopic) and a total of 947 confirmed clusters (see arxiv: 1502.00543). Link: <http://szcluster-db.ias.u-psud.fr/>

Planck SZ validation Table updated
szcluster-db@ias.u-psud.fr
03/04/2014

The Planck SZ validation table has been updated and is now available for download. Link: <http://szcluster-db.ias.u-psud.fr/>

Planck sample for M-Y scaling available

ACT-CL J0301.1-0110

Index	487
RA	45.2925
DEC	-1.1716
Redshift	0.53
Redshift type	phot
Redshift ref.	2013JCAP...07..008H
Alt. Name	
VO Link	

Subscribe

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[Contact & Credits](#)

Herschel – HESIOD <http://idoc-herschel.ias.u-psud.fr/>

cnes
Welcome Guest [Version](#) [Login](#)

HESIOD

Public Projects

Main Public Project

Herschel
All public
Archive

Other Public Projects

OT1_atielsens

Cluster-Low-Z

Lens_Maihotra

SAG-3

SAG-4

DDT_MustDo_

Private Projects

OT2_ehabart

OT1_lho

OT1_mmmville

SAG-1

H-ATLAS

Planck-High-z
OT2_hdale

News

HESIOD

Release R6 PACS SPECTRO
christophe.cossou@ias.u-psud.fr
6/24 3:21 pm

pac_s_cal_72_0_hipe_v14.0.1 Level 2 products available. For each type of data file, here are the products it represents and a short description: Cube [HPS3DRR_HPS3DBI_Spectroscopy 3d cube context RebinnedCube [HPS3DRR_HPS3DBI_Spectroscopy rebinned 3d cube context ProjectedCube [HPS3DRR, H...

Release R3 PACS Photo
christophe.cossou@ias.u-psud.fr
5/3 9:24 am

With Level 2 products from HIPE (v14.0), calibration PACS_CAL_72_ and UNIMAP (now directly included in HIPE).

Release R7 spire photo
christophe.cossou@ias.u-psud.fr
5/3 9:20 am

All SAG-4 public data have been reprocessed with the last HIPE version (v14.0) with SPIRE_CAL_14_2 Combined and extended map available. R7 spire_photo also available for SAG-3_clusters_lowz, DDT_mustdo_3, KEG1_cwis001, OT1_mmmville, OT2_hdale, DDT_mustdo_4, GT1_baltieri, lens_maihotra, OT1_lm...

Release FTS R6 spire fts
karin.dassas@ias.u-psud.fr
4/25 3:34 pm

All SPIRE FTS data from SAG-4 (IAS and LAM) and OT1_atielsens reprocessed with hipe v14 and calfree SPIRE_CAL_14_2 Naive nearest and gridding cube projections available. Supreme Data are also available for all ineses products.

PACS Photometer PSF available
karin.dassas@ias.u-psud.fr
3/29 8:21 pm

[Subscribe](#)

Herschel - HESIOD

The screenshot displays the HESIOD web interface. On the left, a table lists data products:

	Rec	Desc	Data	Cut Fits
Pacs Photometer				
• Level 1	72			
• Level 2	82			
Pacs Spectrometer				
• Level 1	599			
• Level 2	28			
Spire Photometer				
• Level 1	86			
• Level 2	426			
• Level 2.5	264			
Spire FTS				
• Level 1	2466			
• Level 2	666			
Previous Releases				

The main preview window shows a large grayscale astronomical image with a red overlay. Below the preview is a table of data rows:

8.84	Header	S3	SAG-3	HIPE	500.0	11.0.2934	R4_spire_r
46.6	Header	S3	SAG-3	HIPE	250.0	11.0.2934	R4_spire_r

At the bottom of the interface, it says "Display 26 - 38 to 264".

Herschel – HESIOD – Cube Explorer

← | Home | Project Description | Projects Feeds | SAG-4 Related Publications | Mizar | User | Info | Help | Share

Refresh

View cube : pacs_spectro_i2

Cube Explorer | Header(s)

Rec	Desc	Data	Cut Fits
Pacs ...			
• Leve...	80		
• PAC...	12		
Pacs ...			
• Leve...	599		
• Leve...	36		
Spire ...			
• Leve...	625		
• Leve...	297		
• Leve...	1755		

Coordinates: RA 333°22'21.33" DEC 70°14'36.05"

Selection Type: Pixe Line Clear

Cube Depth Index: 39 - 157.73 (um)

Slice color scale:

Flux (Jy/pixel) for each selected pixel(s)
Click on pixel(s) to display spectra - Select plot area to zoom on - Click to unzoom

Wavelength (um)

SI TOOLS 2 INFORMATION SYSTEM TOOL

IAS/IDOC Copyright 2013 - Build by SITools2 framework

Contacts Help Acknowledgements

To be improved : data size management, genericity, robustness...

Herschel - HESIOD

Background layer

- HIPS Herschel
- HESIOD VO
- Dataset Herschel**
 - Spire_photo_I25
 - Opacity: 100%
 - Spire Catalog
- Other
- Coordinate systems

Search: Orion

Images:

- Spire_photo_I25
- Orion_B-S-1_ExtEmGainsApplied_destri...

Overlapped observations:

- OrionB-S-1 PLW map
- OrionB-S-1 PMW map
- OrionB-S-1 PSW map**
- OrionB-S-1 PLW map
- OrionB-S-1 PMW map
- OrionB-S-1 PSW map
- OrionB-S-1 PLW map

<i>description:</i>	PSW map
<i>buildversion:</i>	12.0.2603
<i>program:</i>	SAG-3
<i>identifier:</i>	Orion_B-S-1_E...
<i>ra:</i>	86.05235
<i>object:</i>	OrionB-S-1
<i>filesize:</i>	2.019312E8
<i>dec:</i>	-1.7549866

Metadata:

<i>description:</i>	PSW map
<i>buildversion:</i>	12.0.2603
<i>program:</i>	SAG-3
<i>identifier:</i>	Orion_B-S-1_ExtE...
<i>ra:</i>	86.05235
<i>object:</i>	OrionB-S-1
<i>filesize:</i>	2.019312E8
<i>dec:</i>	-1.7549866

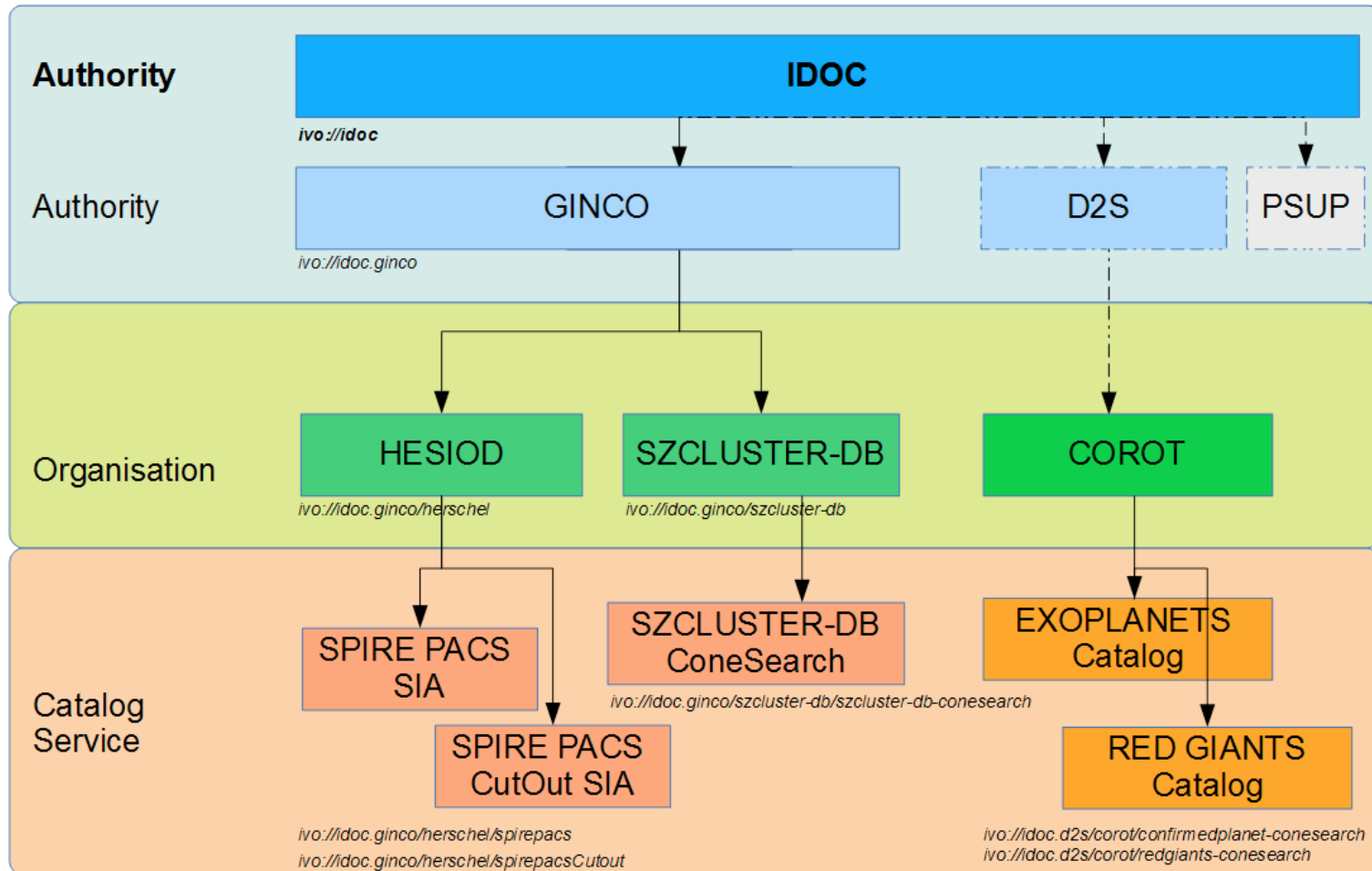
5h 37m 15.34s x +1° 42' 54.12"

DSS background from IAS
The most brightest stars coming from CDS VizieR catalogue
HIPS Herschel from IAS
Hips Spire Planck Fields background from IAS

IDOC VO registered services summary

IDOC Virtual Observatory (euro-vo)

IVOA identifier



MAGYC : Multi wAvelength GalaxY Clusters

Job Manager Results

Job launcher

Search a given region of the sky for Galaxy Clusters in optical galaxy surveys.
Coordinate system is decimal Equatorial (J2000 ICRS).

Supported surveys :
SDSS DR12

Right Ascension
RA (degrees)

Declination
DEC (degrees)

Search radius
RADIUS (arcminutes)

OR

Upload a list of coordinates
Choose File no file selected

OCA

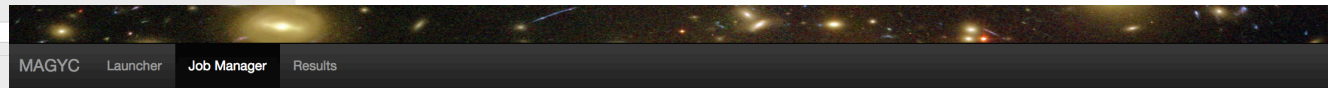
C.Benoist, C.Ordenovic, E.Slezak

IAS

M.Douspis, A.Beelen, H. Balans, F. Lefebvre

CDS

T.Boch, P.Fernique, A.Schaaff



Jobs Manager

Refresh Do not refresh

Search:

RA	DEC	RADIUS	Survey	Type	Created	Started	Elapsed	Remove	Phase	Action
197.87	-1.33	5	SDSS	wazp	20/10/2016 18:36:24	20/10/2016 18:36:24	4m 23s	Remove	Download	Results
197.87	-1.33	5	SDSS	dummy	20/10/2016 18:36:11	20/10/2016 18:36:11	15s	Remove	Download	N/A
197.87	-1.33	5	SDSS	hproj	20/10/2016 18:36:11	20/10/2016 18:36:12	31s	Remove	Download	Preview
197.87	-1.33	5	SDSS	catalogs	20/10/2016 18:36:08	20/10/2016 18:36:08	16s	Remove	Download	Properties
197.87	-1.33	5	SDSS	images	20/10/2016 18:36:08	20/10/2016 18:36:08	1m 28s	Remove	Download	Preview
247.15	39.5602	5	SDSS	wazp	20/10/2016 15:25:05	20/10/2016 15:25:06	4m 27s	Remove	Download	Results
247.15	39.5602	5	SDSS	hproj	20/10/2016 15:25:56	20/10/2016 15:25:56	36s	Remove	Download	Preview
247.15	39.5602	5	SDSS	dummy	20/10/2016 15:25:54	n/a	n/a	Remove	PENDING	

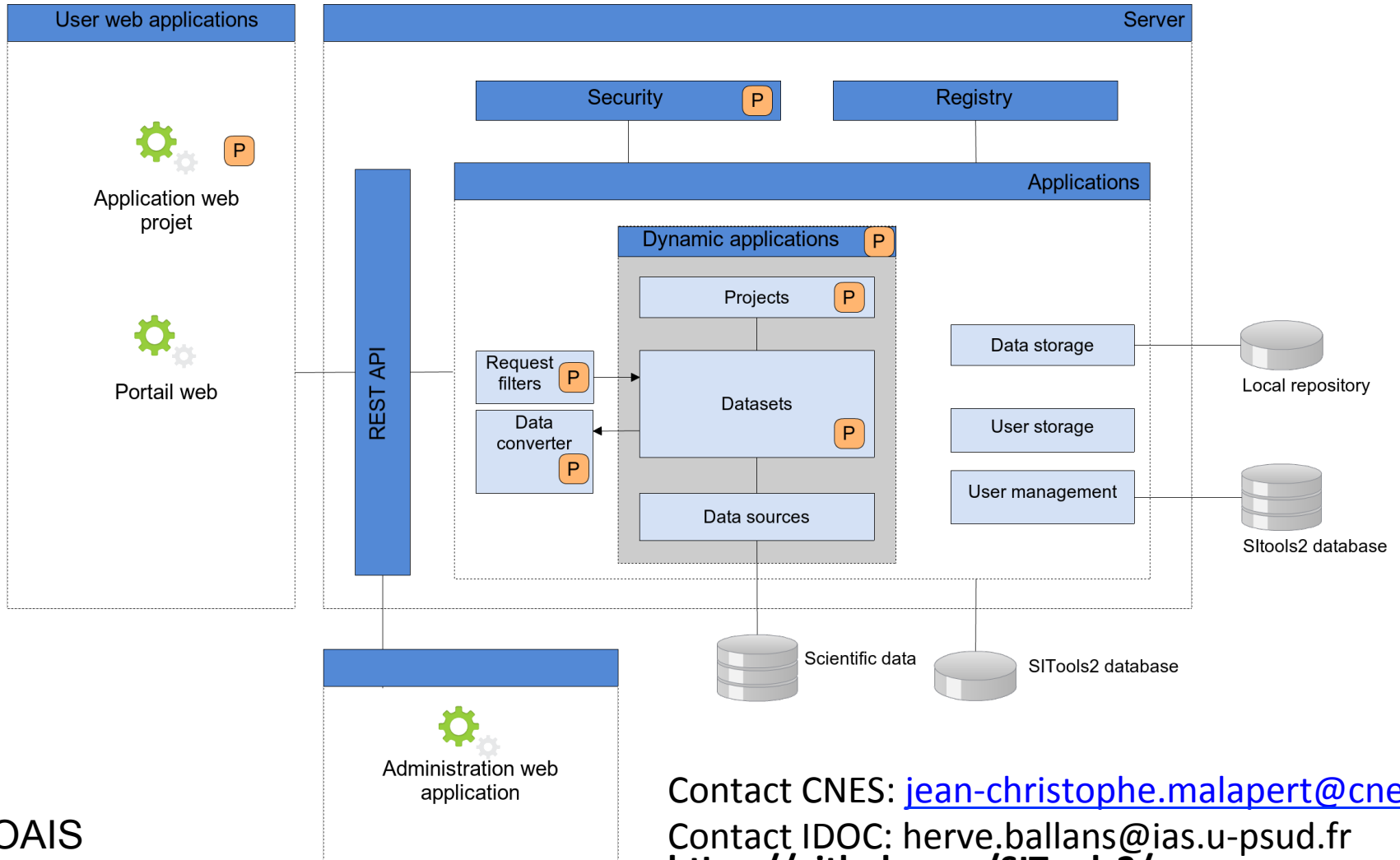
2 UWS servers
(Library Gregory Mantelet CDS
UWS 1.0)

SkyView, SkyServer
Aladin Lite

Wazp at OCA
Hproj at IAS

Tools behind

SItools 2

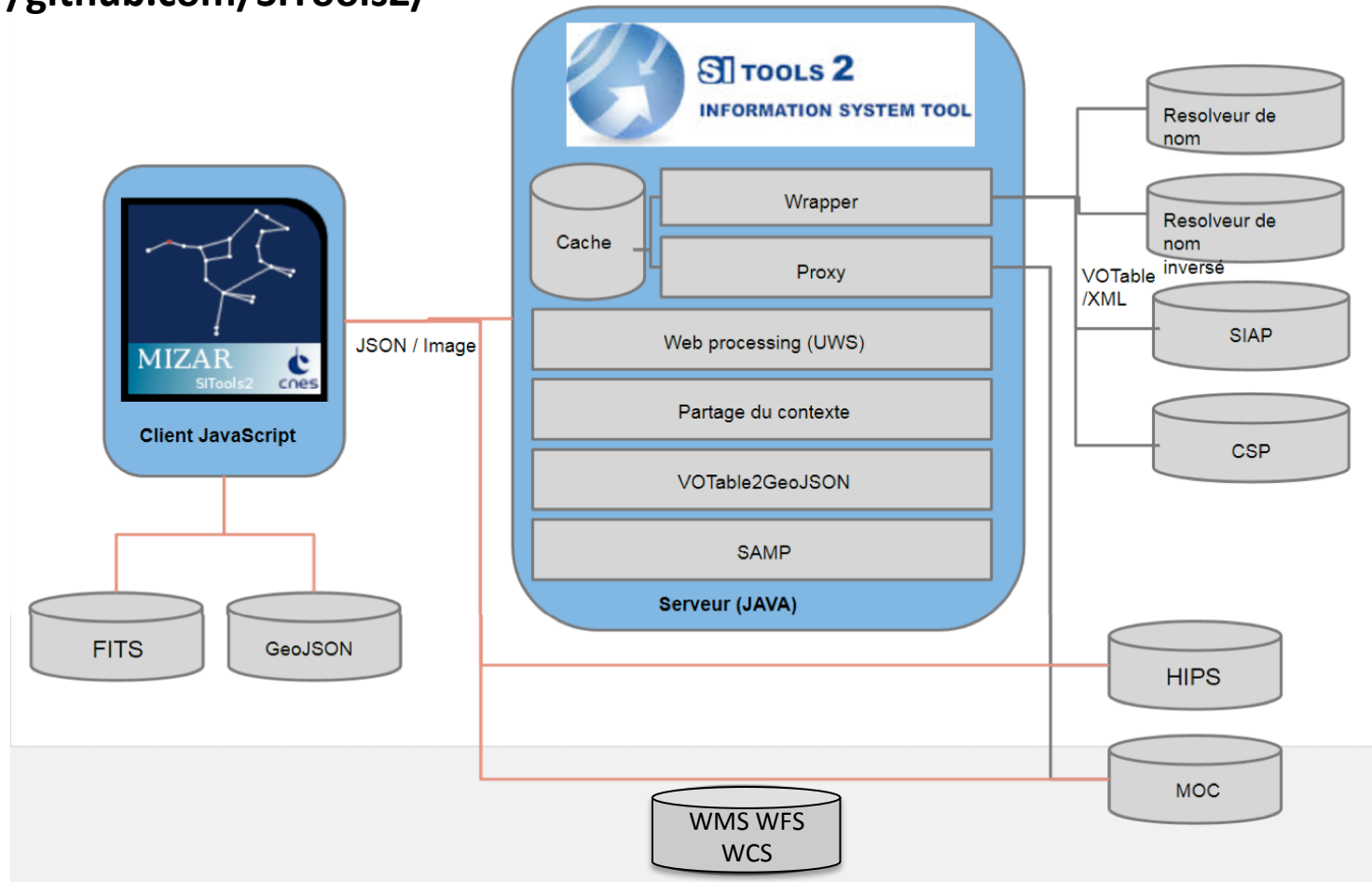


OAIS

Contact CNES: jean-christophe.malapert@cnes.fr
 Contact IDOC: herve.ballans@ias.u-psud.fr
<https://github.com/SITools2/>

SItools 2

<https://github.com/SITools2/>



Coming next : Regard

Needs

OAIS main
functions

OAIS data
preservation

Software
multitenancy

Interoperability :
OGC & IVOA

Modular OAIS
functions
& adaptable

Scalability

SSO

Development kit

Solutions

Microservice
architecture

Each microservice
Is adaptable :
plugins

REST API

ElasticSearch

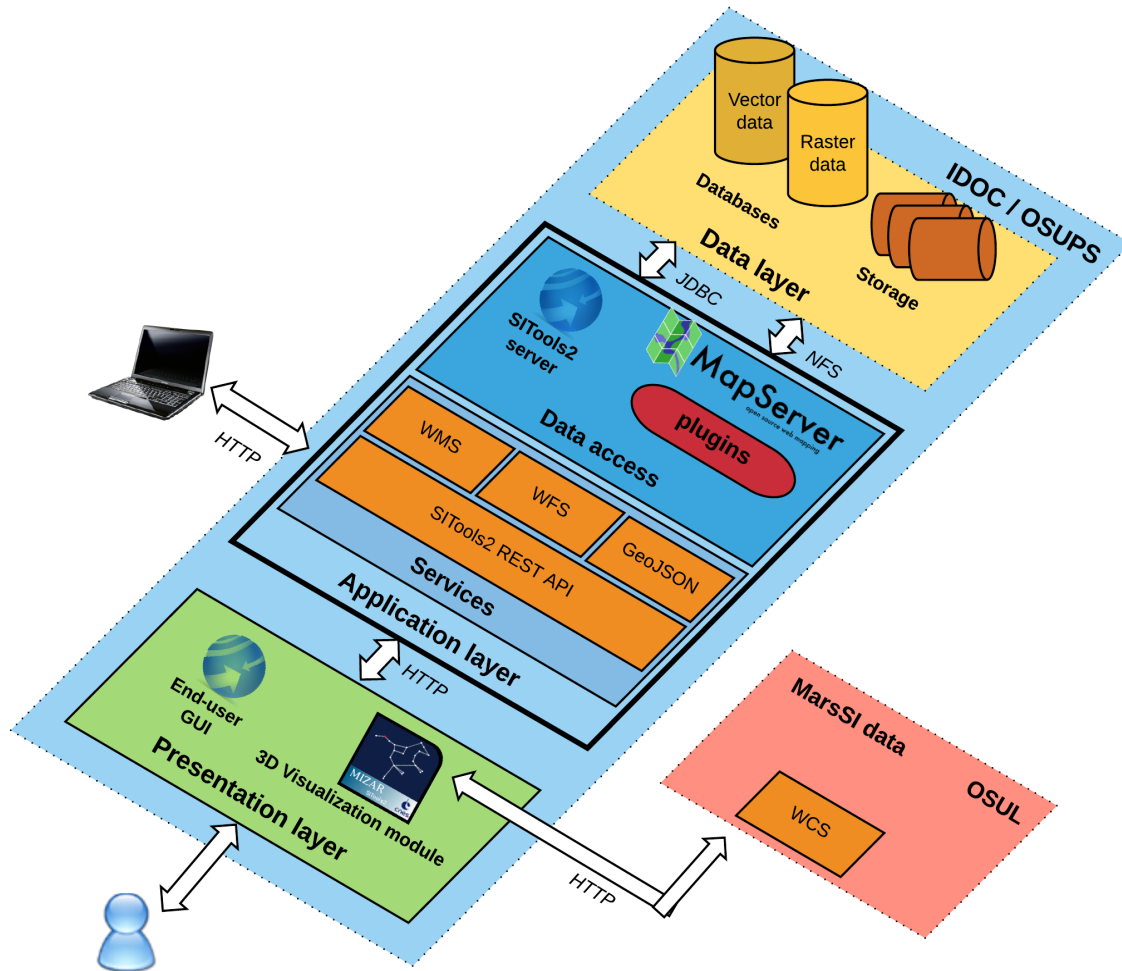
Targets

About 20 projects in different fields : astronomy, solar system, oceanography, ISS experiences, ...

Conclusion

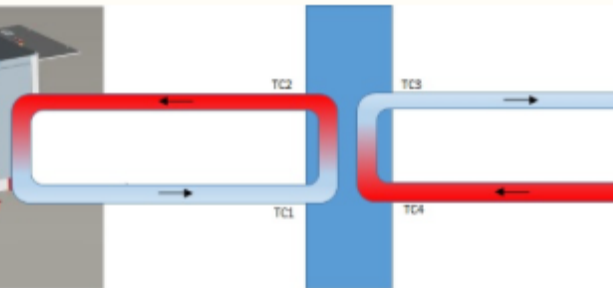
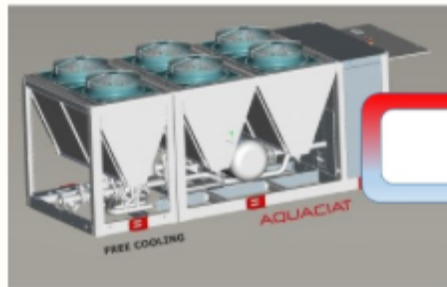
- Plan to publish new data into the VO (for current and next missions)
- TAP and EPN-TAP for the planetary portal
- UWS
- New interfaces with Regard (end 2017)

Thank you for your attention !



Labex P2IO « Vallée » computer room

- Shared by 8 laboratories (LAL, IPN, CSNSM...)
- Project realization : 2013
- Joint developments of competencies networks
- Governance documents
- Phase II (x2) already started : goal 2017
- 500 physical servers, 8000 cores, 5 PO of data.



Budget : 1st phase 1M€
2 more planned phases
ROI : 3 years

Computer room
sharing (green IT)

Formalization

- OAIS : Open Archival Information System
- ITIL : Information Technology Infrastructure Library (« best practices »)
- Label DSA : Data Seal of Approval



21/10/2016



IVOA meeting Trieste 2016



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