

# Enjeux de la diffusion de données de simulations

Franck Le Petit - ASOV

Montpellier - 6 & 7 octobre 2022



# Le contexte de la Science Ouverte

- Science Ouverte
- FAIR
- EOSC (European Open Science Cloud)

## Science Ouverte

- 2016: Loi pour la République Numérique
- 2018: Plan National pour la Science Ouverte
- 2019: Feuille de route du CNRS pour la Science Ouverte

**Rendre disponible les données issues de la recherche publique**

- meilleur retour scientifique des données
- valider les résultats
- une recherche plus efficace



# Le contexte de la Science Ouverte

MINISTÈRE  
DE L'ENSEIGNEMENT  
SUPÉRIEUR,  
DE LA RECHERCHE  
ET DE L'INNOVATION

Liberté  
Égalité  
Fraternité

## Deuxième Plan national pour la science ouverte

GÉNÉRALISER  
LA SCIENCE OUVERTE  
EN FRANCE 2021-2024

The screenshot shows the homepage of the `recherche.data.gouv.fr` website. The browser address bar displays the URL. The page features a navigation menu with items like 'À propos', 'Membres de l'écosystème', 'Données', 'Aide en ligne', and 'Actualités'. A prominent banner at the top reads 'Un écosystème au service du partage et de l'ouverture des données de recherche' with the tagline 'FÉDÉRER, ACCOMPAGNER, PARTAGER, OUVRIR, RÉUTILISER'. Below the banner are two buttons: 'Rechercher un jeu de données' and 'Trouver des données'. A secondary button 'Déposer / Publier un jeu de données' is located further down. The 'Actualités' section contains several news items, each with an icon and a title.

recherche.data.gouv.fr

REpublique FRANÇAISE

Déposer / Publier un jeu de données

FR

À propos Membres de l'écosystème Données Aide en ligne Actualités

Un écosystème au service du partage et de l'ouverture des données de recherche

FÉDÉRER, ACCOMPAGNER, PARTAGER, OUVRIR, RÉUTILISER

Rechercher un jeu de données

Trouver des données

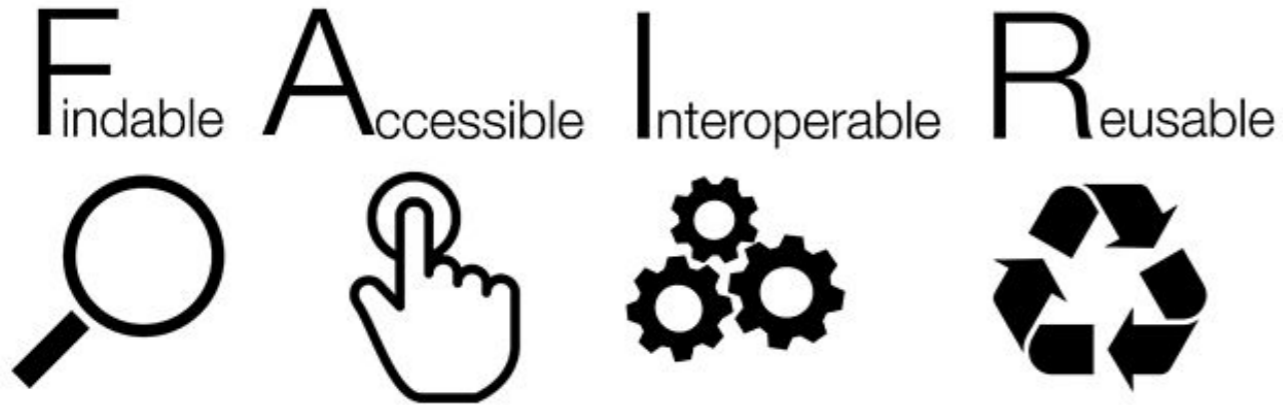
Déposer / Publier un jeu de données

### Actualités

- Comité de rédaction**  
**Le comité de rédaction de Recherche Data Gouv est lancé !**  
Une nouvelle marche vient d'être gravie : un comité de rédaction Recherche Data Gouv s'est réuni en cette rentrée 2022 en vue de faire vivre le portail...  
Publiée le mardi 04 octobre 2022
- Capsule vidéo**  
**[Vidéo] Recherche Data Gouv, un projet collectif au service de la science ouverte**  
Nicolas Fressengeas, chargé de mission Science ouverte, Université de Lorraine et Violaine Louvet, directrice de l'UAR GRICAD et administratrice...  
Publiée le lundi 12 septembre 2022
- Clôture de l'AMI Ateliers de la donnée**  
**Derniers jours pour rejoindre l'écosystème en tant qu'Atelier de la donnée**  
Clôture du 2ème appel à manifestation d'intérêt « Atelier de la donnée » de Recherche Data Gouv : nous attendons vos propositions. La...  
Publiée le lundi 12 septembre 2022
- Rencontre de l'écosystème**  
**14 septembre 2022 : Première rencontre des ateliers de la donnée « labellisés » et « sur la trajectoire de labellisation ».**  
Les ateliers de la donnée se construisent progressivement en région pour
- Du 04 octobre 2022**  
**Au 28 octobre 2022**  
**L'université Paris-Saclay engagée pour la science ouverte !**  
Open science month 2022 : webinaires thématiques, stands d'information et rendez-vous individuels vous sont proposés. Découvrez le programme !

# Le contexte de la Science Ouverte

## Données FAIR



- 2018: Commission Européenne: “Turning Fair into Reality”
- 2018 : Plan National pour la Science Ouverte (MESRI): “Notre ambition est de faire en sorte que les données produites par la recherche publique française soient progressivement structurées en conformité avec les principes FAIR.”

### Impacts:

- ESFRI doivent respecter les principes FAIR
- ERC et ANR demandent des plans de gestion des données et de plus en plus à ce que les données produites soient rendues publiques



Plan d'action de la commission européenne

# Le contexte de la Science Ouverte

## EOSC - European Open Science Cloud

Infrastructure européenne pour le partage et la découverte des données



**EUROPEAN OPEN  
SCIENCE CLOUD**

- Partage et découverte de données
- Stockage des données
- Ressources de calcul
- Analyse de données
- etc ...

Respecte les principes FAIR

Actuellement: des programmes pilotes pour définir EOSC

Plusieurs projets européens de diffusion des données font le lien avec EOSC  
Ex: ESCAPE (participation du CDS & Observatoire de Paris)

**EUROPEAN OPEN SCIENCE CLOUD**

About Services & Resources Policy Use Cases Media For providers Subscribe

## The European Open Science Cloud (EOSC)

Offers 1.7 million European researchers and 70 million professionals in science and technology a virtual environment with open and seamless services for storage, management, analysis and re-use of research data, across borders and scientific disciplines.

[More about EOSC](#)

### ACCESS EOSC SERVICES & RESOURCES

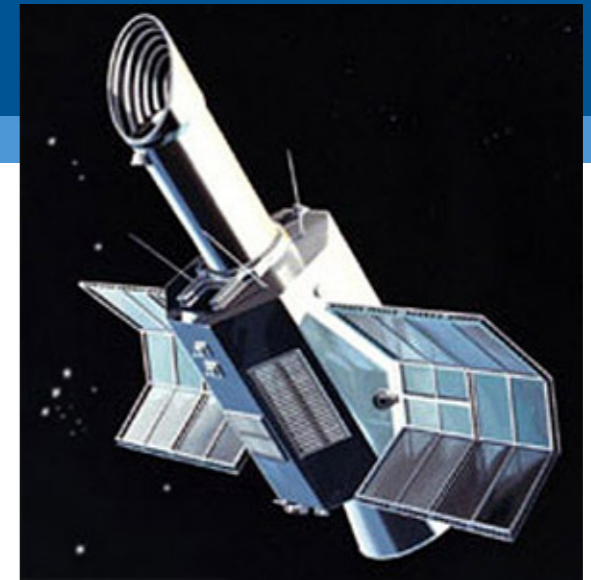
- NETWORKING
- COMPUTE
- STORAGE
- SHARING & DISCOVERY
- DATA MANAGEMENT
- PROCESSING & ANALYSIS
- SECURITY & OPERATIONS
- TRAINING & SUPPORT

# Le contexte de la Science Ouverte

Astronomy & Astrophysics is a pioneer in data dissemination

IUE : FITS format in 1978

CDS : 1972



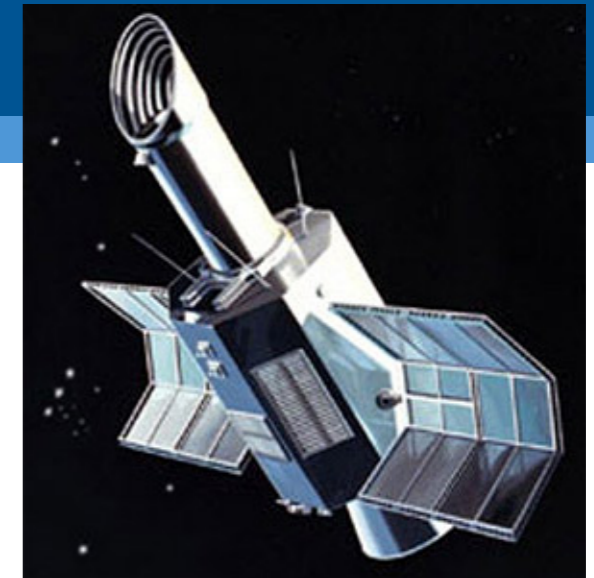
IUE - Launched 1978

# Le contexte de la Science Ouverte

Astronomy & Astrophysics is a pioneer in data dissemination

IUE : FITS format in 1978

CDS : 1972



IUE - Launched 1978

## IVOA

International Virtual Observatory Alliance

Created in **2002**

Defines standards for the diffusion of data in astronomy

Gathers the national projects

Organisation

- Executive board
- Technical coordination board
- Working groups & Interest groups

Two meetings per year (InterOps)





## One view of the VO from an application:

**Built from VO Registry**

**1000s All-Sky data sets**

**Largest catalogues: PanSTARRS, Gaia etc.**

**Complex ADQL queries**

**Multi-resolution techniques for Big Data**

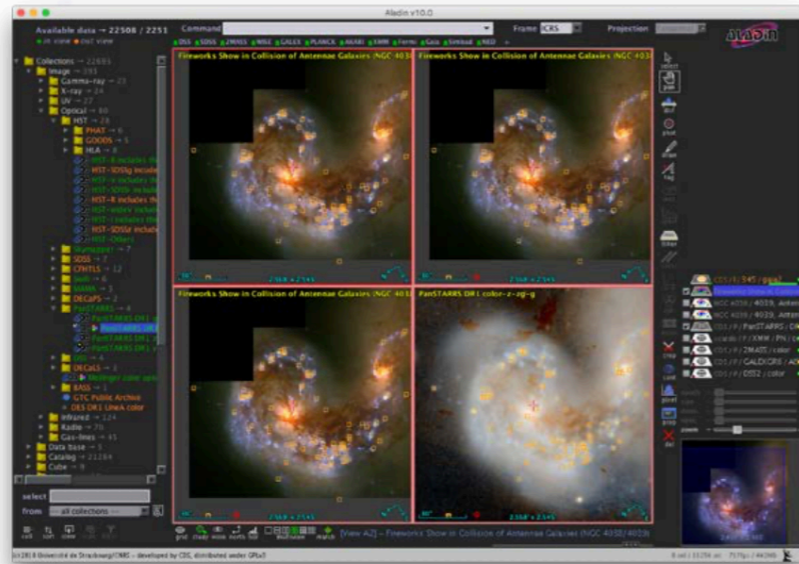
**Interoperability of data**

**Interoperability between applications**

**Data from many observatories and missions**

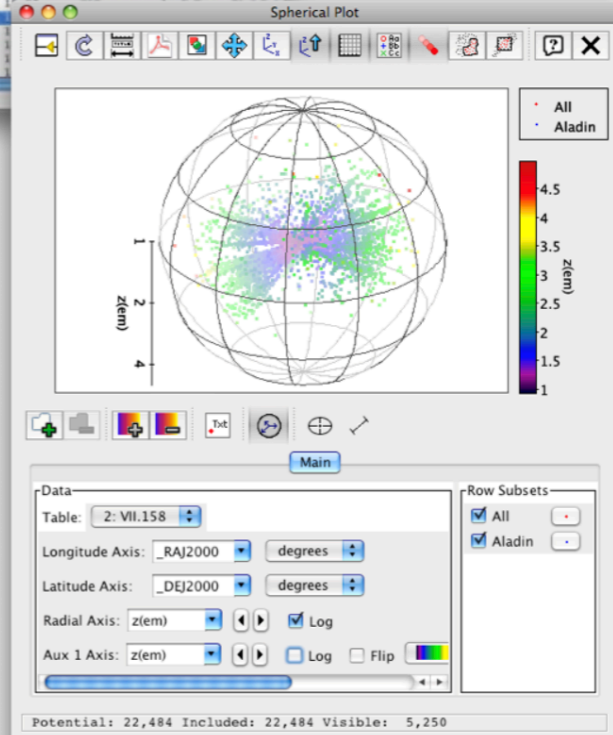
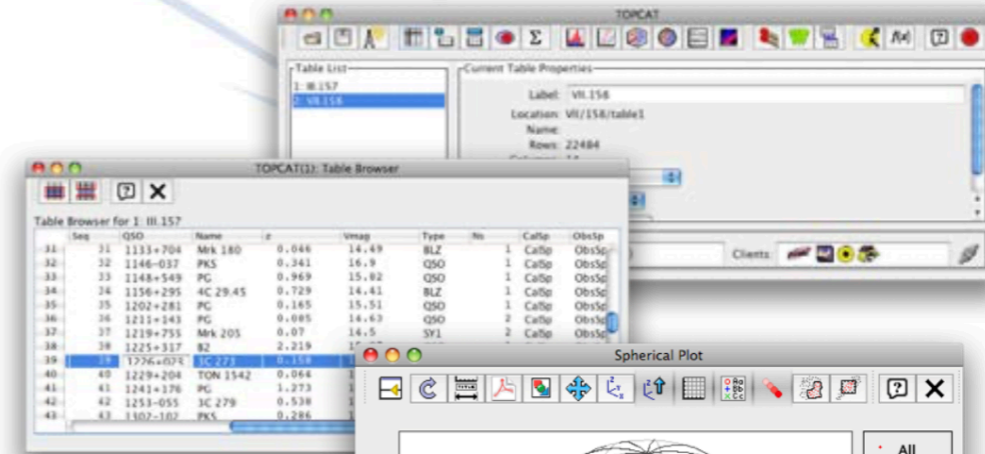






Aladin

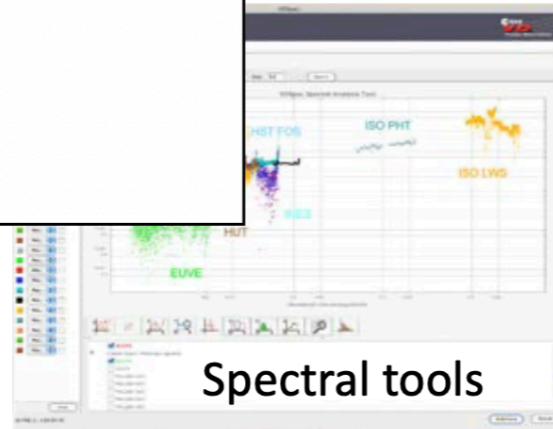
## Interoperable applications and services



TOPCAT



Notebooks



Spectral tools



Your apps  
& programs



Theory I.G. : 2004

Many evolutions of the goals for Theory standards:

- particle simulations
- cosmological simulations
- all kind of simulations

## Whitepaper Euro-VO DCA

Editors: G. Lemson, H. Wozniak, J. Zuther

Date: 2008



RI031675

EuroVO-DCA

The European Virtual Observatory Data Centre Alliance

COORDINATION ACTION

RESEARCH INFRASTRUCTURE

COMMUNICATION NETWORK DEVELOPMENT

### **D11 – TEG REPORT: FRAMEWORK FOR THE INCLUSION OF THEORY DATA AND SERVICES IN THE VOBS**

Due date of deliverable: 31/10/2008

Actual submission date: 16/12/2008

Start date of project: 01/09/2006

Duration: 28 month

MPG

Final version

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)		
Dissemination Level		
<b>PU</b>	Public	X
<b>PP</b>	Restricted to other programme participants (including the Commission Services)	
<b>RE</b>	Restricted to a group specified by the consortium (including the Commission Services)	
<b>CO</b>	Confidential, only for members of the consortium (including the Commission Services)	

## Why to *publish theoretical data* ?

- Access to the data described in your publications, so readers can extend the work  
→ **increase the impact of papers**
- readers can verify the results → **increase the quality of papers**
- allows to benchmark other works with your results / **reproductibility of results**
- increasingly **mandated by funding agencies**
- **showcases** for future proposals
- ...

## Why to *publish theoretical data in the Virtual Observatory* ?

- makes results available in a **standard way**
- forces you to think carefully about your results and **improves re-usability for you**
- *maybe not give obvious benefit to you but you may agree that if others do it, you would have an easier job using their data*
- facilitates **comparison models - observations**

# Diffusion of simulations in the VO in France

Important role of France for the definition of IVOA standards

## **Euro-VO**

- HORIZON-CRAL
- GALMER (projet HORIZON)
- Modèles PDR

**Astronet Projet** : STARFORMAT (P. Hennebelle)

- STARFORMAT (simulations RAMSES et autres) -> **Galactica**
- PDRDB -> **ISMDB**
  
- DEUVO (J.M. Alimi et collaborateurs)

## ① Simulation Data Model (SimDM)

IVOA Recommendation

International Virtual  
Observatory Alliance

IVOA Documents



Simulation Data Model  
Version 1.0

IVOA Recommendation 03 May 2012

Interest/Working Group:  
<http://www.ivoa.net/wiki/bin/view/IVOA/IvoaTheory>

Author(s):

Gerard Lemson, Laurent Bourges, Miguel Cervino, Claudio Gheller, Norman Gray, Franck LePetit, Mireille Louys, Benjamin Ooghe, Rick Wagner, Herve Wozniak

Editor(s):

Gerard Lemson, Herve Wozniak

### Abstract

In this document and the accompanying documents we describe a data model (Simulation Data Model) describing numerical computer simulations of astrophysical systems. The primary goal of this standard is to support discovery of simulations by describing those aspects of them that scientists might wish to query on, i.e. it is a model for meta-data describing simulations. This document does not propose a protocol for using this model. IVOA protocols are being developed and are supposed to use the model, either in its original form or in a form derived from the model proposed here, but more suited to the particular protocol. The SimDM has been developed in the IVOA Theory Interest Group with assistance of representatives of relevant working groups, in particular DM and Semantics.

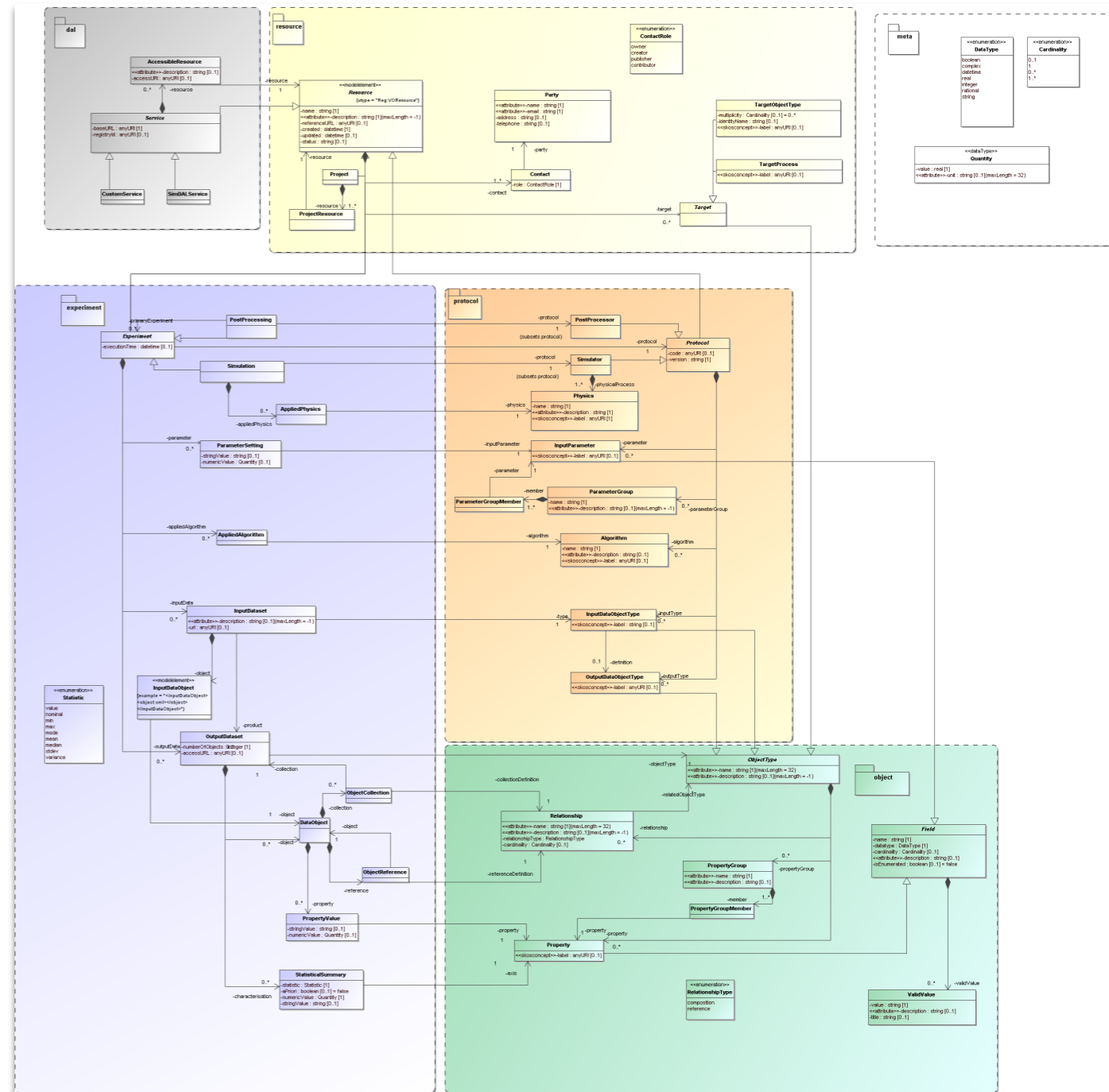
### Status of this document

This document has been produced by the Theory Interest Group. It has been reviewed by IVOA Members and other interested parties, and has been endorsed by the IVOA Executive Committee as an IVOA Recommendation. It is a stable document and may be used as reference material or cited as a normative reference from another document. IVOA's role in making the Recommendation is to draw attention to the specification and to promote its widespread deployment. This enhances the functionality and interoperability inside the Astronomical Community.

Implemented on:

- cosmological simulations
- MHD simulations
- interstellar medium micro-physics models (PDRs)
- ...

→ proof of the versatility



## ② Simulation Data Access protocol (SimDAL)

- SimDAL Repository
- SimDAL Search
- SimDAL Cutout

allow to discover & retrieve simulations

## ③ Semantics / SKOS vocabularies

<http://votheory.obspm.fr/>

- Algorithms
- AstronomicalObjects
- DataObjectTypes ~ 700 concepts
- PhysicalProcesses
- PhysicalQuantities

## ⊗ But no common raw data format

No standard raw data format because of the **heterogeneity** (no FITS for example)

→ a limitation to use the VO

Recommendation to use VO-Table / FITS whenever possible



### Simulation Data Access Layer Version 1.0

IVOA Recommendation 20 March 2017

#### Interest/Working Group:

<http://www.ivoa.net/twiki/bin/view/IVOA/IvoaDAL>

#### Author(s):

David Languignon, Franck Le Petit, Carlos Rodrigo, Gerard Lemson, Marco Molinaro, Hervé Wozniak

#### Editor(s):

David Languignon, Franck Le Petit

#### Abstract

The Simulation Data Access Layer protocol (SimDAL) defines a set of resources and associated actions to discover and retrieve simulations and numerical models in the Virtual Observatory. SimDAL and the Simulation Data Model are dedicated to cover the needs for the publication and retrieval of any kind of simulations: N-body or MHD simulations, numerical models of astrophysical objects and processes, theoretical synthetic spectra, etc... SimDAL is divided in three parts. First, SimDAL Repositories store the descriptions of theoretical projects and numerical codes. They can be used by clients to discover theoretical services associated with projects of interest. Second, SimDAL Search services are dedicated to the discovery of precise datasets. Finally, SimDAL Data Access services are dedicated to retrieve the original simulation output data, as plain raw data or formatted datasets cut-outs. To manage any kind of data, eventually large or at high-dimensionality, the SimDAL standard lets publishers choose any underlying implementation technology.

#### Status of this document

This document has been produced by the Data Access Layer Working Group. It has been reviewed by IVOA Members and other interested parties, and has been endorsed by the IVOA Executive Committee as an IVOA Recommendation. It is a stable document and may be used as reference material or cited as a normative reference from another document. IVOA's role in making the Recommendation is to draw attention to the specification and to promote its widespread deployment. This enhances the functionality and interoperability inside the Astronomical Community.

This service is dedicated to scientists and VO developers who wish to publish theoretical services described by the [Simulation Data Model](#).

As described in the [IVOA](#) standard, Simulation Data Model, registrations of theoretical services, require to provide several URIs corresponding to semantics keywords describing services and simulations. VO-Theory concepts are based on SKOS description as recommended by the [IVOA Semantic Working Group](#).

Example of a VO-Theory URIs : <http://purl.obspm.fr/vocab/Algorithms/GaussSeidel>

This website is dedicated to the discovery of these URIs. Navigate through the broader, narrower, related terms to discover the most precise concept you wish.

To suggest new concepts or corrections, contact : [support.votheory@obspm.fr](mailto:support.votheory@obspm.fr).



Search concepts

- 3+1 Formalism
- 8-Wave Scheme
- Accelerated Lambda Iteration
- Adaptive Mesh Refinement
- Advection Upstream Splitting Method
- Algorithm
- Alternating Direction Implicit
- BiConjugate Gradient
- BiConjugate Gradient Stabilized
- Block Based AMR
- Bulirsch-Stoer
- Cell Based AMR
- Cell Centred
- Central Difference Scheme
- Chebyshev Iteration
- Conjugate Gradient Method
- Conjugate Gradient Squared Method
- Constrained Transport
- Coupled Escaped Probability
- Crank-Nicolson
- Discontinuous Galerkin
- Discontinuous Galerkin methods
- Escape Probability
- Euler

# Example: Millenium

## Millenium simulation

Virgo - Millennium Database

Documentation

CREDITS/Acknowledgments

Registration

News

FAQ

Databases

millimil (context)

Streaming queries return unlimited number of rows in CSV format and are cancelled after 30 seconds. Browser queries return maximum of 1000 rows in HTML format and are cancelled after 30 seconds.

There is a partial mirror of this database in Durham at <http://galaxy-catalogue.dur.ac.uk:8080/Millennium/>. The Durham database does not contain all the latest L-Galaxies models but does contain more recent GALFORM models.

Query (stream)

Query (browser)

Help

Maximum number of rows to return to the query form: 10

Demo queries: click a button and the query will show in the query window. Holding the mouse over the button will give a short explanation of the goal of the query. These queries are described in some more detail on [this page](#).

Mainly Halos: H1 H2 H3 H4 H5 HF1 HF2 HF3

Mainly Galaxies: G1 G2 G3 G4 G5 G6 HG1 HG2 GF2

Galformod Project Portal

Web Services for Galaxy Formation Model

Max Planck Institute for Astrophysics

login/registration  
legal notice  
about  
publications  
team  
contact

About +

The Galformod Project  
Millennium Simulations  
Publications & Papers  
Credits & Acknowledgment  
Project Team

Web Services +

Portal  
Dashboard

Millennium Data Bases +

Public  
MyMillennium  
MyMillenniumTAP  
Millennium XXL Resources

Meetings & Workshops  
Millennium Workshop 2012  
L-Galaxies Workshop 2016

Millennium Run Observatory +

Imaging Surveys  
Image Browser  
Interactive Image Browser

- Access to Millenium simulations
- **Many services developed above the data**
  - access to simulations
  - halo catalogs / Lightcones
  - synthetic images
  - ...
- **Prototype for SimDM**
- **VO compatibility for some data (TAP / Images)**

UDF Viz Image w/ real UDF noise #1:  
blablabla

Images:

- UDF Viz Image w/ real UDF noi...
- UDF Viz Image w/ real UDF noi...
- SDSS gri Image
- CFHTLS-Wide gri Image
- CFHTLS-Deep gri Image
- CFHTLS-Deep riz Image
- HSC/Wide riz Image
- HSC/Deep riz Image
- HSC/Ultradeep riz Image
- GOODS v2.0 BVz Image
- GOODS v2.0 Viz Image
- HUDF BVz Image
- HUDF Viz Image
- GOODS/ERS 9 filters Image
- GOODS/ERS LUIS Image
- GOODS/ERS SExtractor Segme...
- CANDELS/GSD YJH Image (test...
- CANDELS/GSD BVz Image (test...
- CANDELS/COSMOS F125W ima...
- CANDELS/COSMOS F160W Im...
- CANDELS/UDS J,J+H,H RGB Im...
- CANDELS/UDS F125W Image w...
- CANDELS/UDS F160W Image ...
- CANDELS/UDS J,J+H,H RGB Im...

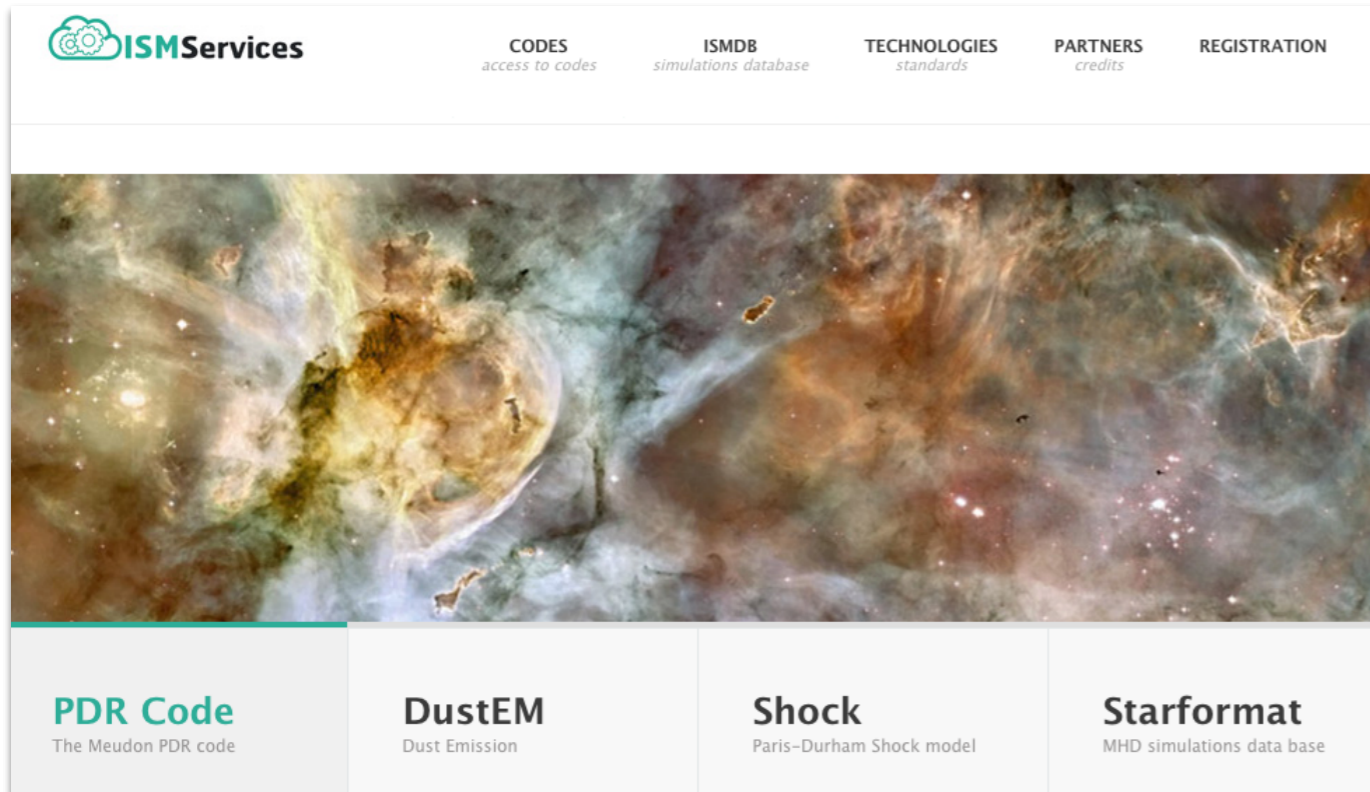
Highlights:

- Blue Galaxy
- Red nuggets
- Big Galaxy
- Face-on bulge+disk
- Cluster (z=0.14)
- Low-mass Group (z=0.36)
- High-mass Group (z=0.37)
- Y-dropout 1 (z=7.4)
- Y-dropout 2 (z=8.1)
- Y-dropout 3 (z=8.4)
- Y-dropout 4 (z=7.5)
- J-dropout 1 (z=8.5)
- J-dropout 2 (z=9.5)
- J-dropout 3 (z=10.3)
- J-dropout 4 (z=10.8)
- Merger\_Type 2 Example 1 (z=1.7)
- Merger\_Type 2 Example 2 (z=1.4)

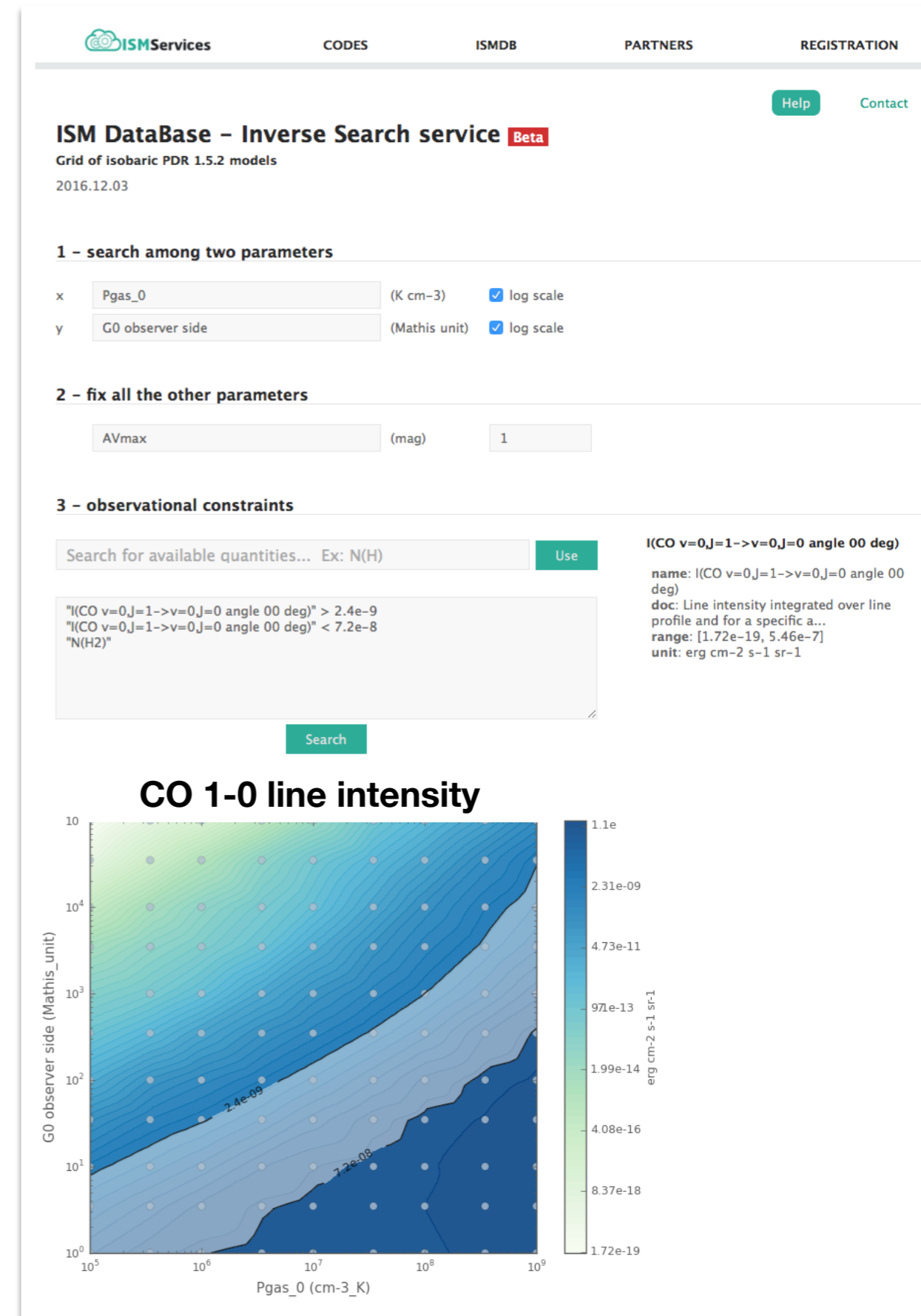
# Example: Interstellar medium

## ISM Services: models in interstellar clouds

<http://ism.obspm.fr>



- Access to simulations of the Interstellar Medium
- Prediction of line intensities
- Fully VO-Theory compatible
  - ISMDB: **SimDM + SimDAL + Semantics**
  - Online codes: **PDL**



ISM Services CODES ISMDB PARTNERS REGISTRATION

Help Contact

### ISM DataBase - Inverse Search service Beta

Grid of isobaric PDR 1.5.2 models  
2016.12.03

**1 - search among two parameters**

x Pgases\_0 (K cm<sup>-3</sup>)  log scale

y G0 observer side (Mathis unit)  log scale

**2 - fix all the other parameters**

AVmax (mag) 1

**3 - observational constraints**

Search for available quantities... Ex: N(H)

"I(CO v=0,J=1->v=0,J=0 angle 00 deg)" > 2.4e-9  
"I(CO v=0,J=1->v=0,J=0 angle 00 deg)" < 7.2e-8  
"N(H2)"

I(CO v=0,J=1->v=0,J=0 angle 00 deg)  
name: I(CO v=0,J=1->v=0,J=0 angle 00 deg)  
doc: Line intensity integrated over line profile and for a specific a...  
range: [1.72e-19, 5.46e-7]  
unit: erg cm<sup>-2</sup> s<sup>-1</sup> sr<sup>-1</sup>

### CO 1-0 line intensity

Y-axis: G0 observer side (Mathis\_unit) [10<sup>0</sup> to 10<sup>5</sup>]

X-axis: Pgases\_0 (cm<sup>-3</sup>\_K) [10<sup>5</sup> to 10<sup>9</sup>]

Color scale: 1.1e, 2.31e-09, 4.73e-11, 9.71e-13, 1.99e-14, 4.08e-16, 8.37e-18, 1.72e-19

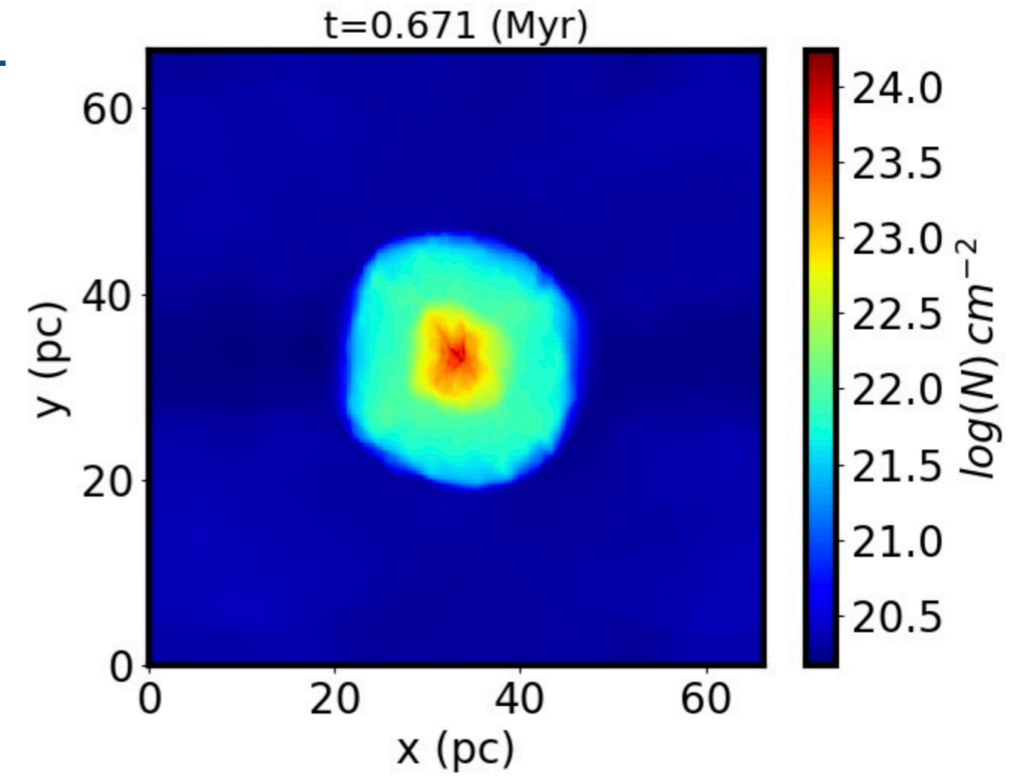
Unit: erg cm<sup>-2</sup> s<sup>-1</sup> sr<sup>-1</sup>



# Example: Galactica

## 3D Simulations :

<http://www.galactica-simulations.eu/db/>



Set custom search filters to get your own protoplanetary disk subset.

Field	Unit	Range	Min.	Mean	Max.	Std dev.
<input checked="" type="checkbox"/> Disk mass	$M_{\odot}$	0.03 - 0.275	0.000	0.043	0.302	0.073
<input type="checkbox"/> Mass ratio		0.002 - 42.464	0.003	1.134	42.464	6.541
<input type="checkbox"/> Sink mass	$M_{\odot}$	0.002 - 2.816	0.002	0.693	2.816	0.736
<input type="checkbox"/> Radius	au	7.033 - 121.108	7.034	32.270	121.108	29.303
<input type="checkbox"/> B (norm)	G	0.009 - 0.563	0.009	0.177	0.562	0.148
<input type="checkbox"/> Angle B/momentum	$^{\circ}$	24.578 - 158.562	24.579	95.197	158.561	38.408
<input type="checkbox"/> Temperature	K	38.816 - 987.686	38.816	393.377	987.685	226.162
<input type="checkbox"/> Sink index		1 - 95	1	59.585	95	27.024
<input type="checkbox"/> Sink age	yr	2255.919 - 26866.966	2255.919	11340.379	26866.965	6106.710

Show 50 results. Sort by catalog item index in ascending order.

Search

Matching protoplanetary disk objects (from #1 to #10) total: 10

id	data	Disk mass ( $M_{\odot}$ )	Mass ratio	Sink mass ( $M_{\odot}$ )	Radius (au)	B (norm) (G)	Angle B/momentum ( $^{\circ}$ )	Temperature (K)	Sink index	Sink age (yr)
1		1.471129e-01	1.823150e-01	8.069159e-01	1.131328e+02	4.840554e-02	1.087986e+02	1.304396e+02	1.000000e+00	2.686697e+04
2		1.585625e-01	7.393907e-02	2.144502e+00	5.043804e+01	4.091911e-01	7.091499e+01	4.802829e+02	2.000000e+00	2.417412e+04
6		3.071646e-02	4.075917e-02	7.536085e-01	7.692168e+01	1.327899e-01	1.242738e+02	2.762805e+02	1.100000e+01	2.014154e+04
9		1.273925e-01	4.941301e-02	2.578116e+00	4.128613e+01	2.565217e-01	1.287993e+02	5.224334e+02	4.000000e+01	1.628401e+04
12		1.103075e-01	3.917803e-02	2.815545e+00	2.656212e+01	3.378769e-01	5.166664e+01	5.408418e+02	4.800000e+01	1.548379e+04
17		1.514141e-01	1.483825e-01	1.020431e+00	9.935441e+01	1.567855e-01	1.235986e+02	4.043518e+02	6.300000e+01	1.074929e+04
18		4.710493e-02	1.434211e-01	3.284380e-01	4.335976e+01	6.107736e-02	6.610590e+01	1.589515e+02	6.400000e+01	1.038618e+04
20		8.644119e-02	4.246364e+01	2.035652e-03	5.025286e+01	2.496938e-02	1.293782e+02	3.881635e+01	6.600000e+01	1.023237e+04
29		3.042593e-02	3.363893e-02	9.044857e-01	3.010081e+01	1.316068e-01	1.228191e+02	4.029398e+02	7.700000e+01	7.227803e+03
30		3.827882e-02	8.441479e-02	4.534611e-01	6.220716e+01	4.049315e-02	5.491156e+01	1.829524e+02	7.800000e+01	6.818535e+03

# Example: Stellar synthetic spectra

## POLLUX database: synthetic stellar spectra

<http://pollux.graal.univ-montp2.fr>

The screenshot displays the POLLUX database interface. On the left, a navigation pane shows a tree structure for 'Select Spectra' with categories like SSHR, MARCS, CMFGEN, CMFGEN-WR, ATLAS, and MARCS & CMFGEN & ATLAS. The main area is a 'Query Form' with sections for 'Spectrum Parameters' and 'Specific Abundances'. The 'Spectrum Parameters' section includes fields for effective temperature (3000 K), gravity (log10 cgs), mass (1.00000 solar mass), luminosity (1.18800 log10 solar luminosity), microturbulent velocity (1.00000 km/s), and metallicity (-5.00000 [Fe/H]). The 'Specific Abundances' section includes fields for alpha elements, Carbon, Oxygen, Nitrogen, r process elements, and s process elements. A 'Cart Status' section at the bottom indicates 'No spectra to be downloaded'. On the right, a spectral plot window titled 'C\_s30000g3.25z0.0t5.0\_a0.00c0.00n0.00o0.00\_Mdot-5.93Vinfy1580beta0.8finfy1vcl0\_VIS.spec' shows a plot of absolute flux (erg/cm^2/s/A) versus wavelength (A). The plot shows a red line representing the synthetic spectrum, with a y-axis ranging from 0.00e+0 to 1.30e-2 and an x-axis ranging from 3000 to 13000 A. The plot is zoomed in from 3000 to 12500 A. Below the plot, there are controls for 'From 3000.0 To 12500.0', 'update chart', 'full spectrum', and 'zoom out 2x'. At the bottom, instructions state: 'Instructions: Please select the appropriate icon information above for more detailed information about a tool or a feature ... or type in'.

- Access to synthetic stellar spectra
- Fully VO-Compatible
  - SSA used of theoretical spectra
  - VO-Tools: CASSIS, VO-Spec, ...

## Diffusion of simulation in **Science Platforms**

TWiki > [IVOA Web](#) > [IvoaTCG](#) > [ProgramPrepVirtualMay2021](#) > [InterOpMay2021](#) > [InterOpMay2021SPW \(2021-05-28, GiulianoTaffoni\)](#)

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## Theory GWS Science Platform Workshop Schedule - IVOA May 2021 Interoperability Meeting

[\[back to main programme page\]](#)

Schedule Summary						
Session	DateTime UTC	UTC-08:00	UTC-05:00	UTC+01:00	UTC+08:00	UTC+11:00
		Victoria BC/Pasadena	Washington DC	Strasbourg	Perth/Beijing	Canberra
SP1	<a href="#">May 25 13:30</a>	May 25 06:30	May 25 09:30	May 25 14:30	May 25 21:30	May 25 23:30
SP2	<a href="#">May 26 13:30</a>	May 26 23:30	May 26 09:30	May 26 14:30	May 26 21:30	May 26 23:30
SP3	<a href="#">May 27 13:30</a>	May 27 23:30	May 27 09:30	May 27 14:30	May 27 21:30	May 27 23:30

### Theory/GWS Workshop 1

Time: [Tuesday May 25 13:30 UTC](#)

Speaker	Title	Time	Material
Simon O'Toole	Introduction	10'+2'	
Gerard Lemson	Cosmological simulations on the <a href="#">SciServer</a> science platform	10'+2'	<a href="#">pdf</a>
Jorge Carretero	<a href="#">Handling Cosmological Simulations at the Port d'Informació Científica (PIC)</a>	10'+2'	<a href="#">pdf</a>
Darren Croton	<a href="#">The Theoretical Astrophysical Observatory</a>	10'+2'	<a href="#">pdf</a>
Shy Genel	<a href="#">Data-sharing at the CCA: Binder and FlatHUB</a>	10'+2'	<a href="#">pdf</a>

Moderator: [Giuliano](#), Notetaker: [Simon](#), notes: [Etherpad link](#)

### Theory/GWS Workshop 2

Time: [Wednesday May 26 13:30 UTC](#)

Speaker	Title	Time	Material
Klaus Dolag	<a href="#">A web portal for hydrodynamical, cosmological simulations</a>	10'+2'	<a href="#">pdf</a>
Dylan Nelson	<a href="#">The IllustrisTNG Simulation Data Platform</a>	10'+2'	<a href="#">pdf</a>
Katrin Heitmann	<a href="#">Simulations for Large-scale surveys</a>	10'+2'	<a href="#">pdf</a>
Matt Turk	<a href="#">Infrastructure for Cosmological Simulations</a>	10'+2'	<a href="#">slides</a>
Andrew Benson	<a href="#">Disseminating Galacticus data through online platforms</a>	10'+2'	<a href="#">pdf</a>

Moderator: [Gerard](#), Notetaker: [Simon](#), notes: [Etherpad link](#)

## Are simulations more difficult to publish than observations ?

Simulations main specificities:

- more heterogeneous
- complex: anything that can be thought can be simulated
- no standard raw data format as FITS

Heterogeneity & complexity are solved with SimDM

**Now VO-Theory standards exist, simulations are less difficult to publish**

## Possible reasons

- VO-Theory standards come lately for some projects
- A question of culture
  - Data centers publishing observational data exist for a long time
  - Publishing of theoretical data is more recent and less organized

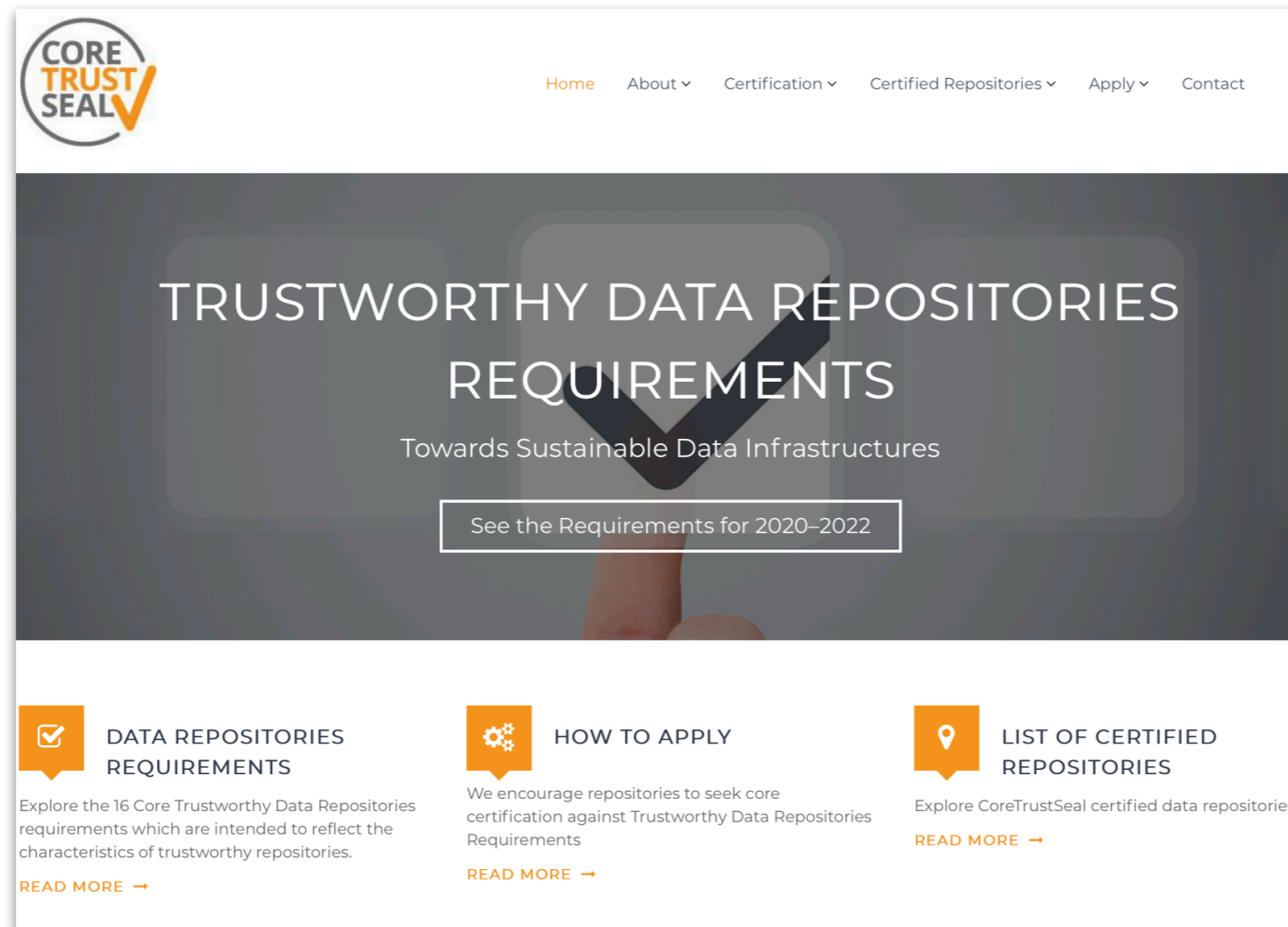
- Data centers are focused on observational data: **few help for theorists**
- Requires **time, procedures, experience & manpower** to publish data
- Needs evolution and maintenance of services

## Certification des entrepôts de données de confiance

De nombreux services de diffusion de données dans tous les OSUs

### Besoin de professionnaliser les méthodes et les procédures pour garantir la pérennité des données et des services sur le long terme

- Engager un processus de certification des entrepôts de données CoreTrustSeal
- Défi 14 de l'INSU : chercher à obtenir ce label pour des centres de données INSU



Actuellement : CDS & IFREMER-SISMER

# Conclusion

Contexte favorable à la Science Ouverte

- Incitations de l'Europe, du MEN pour une diffusion **FAIR** des données
- Financements : appels à projets

I/OA : une partie du travail est fait

- Standards SimDM, SimDAL, ...
- "Plateformes" VO compatibles existent pour diffuser ses simulations : GALACTICA, ISMDB, POLLUX
- Evolution des discussions vers les Science Platforms

→ Faut-il s'organiser pour mieux diffuser nos simulations en France ?

ASOV peut contribuer

- Soutien des missions pour collaborations / développement de l'interopérabilité
- Discussions INSU

# Inscription mailing lists ASOV

Deux listes

- OV France : liste générale (réunions, AO, annonces)
- OV France dev : liste plus orientée pour les développeurs (échanges d'expertises)

Pour s'inscrire :

Envoyer un mail à [sympa@services.cnrs.fr](mailto:sympa@services.cnrs.fr)

avec comme objet :

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Ou

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