



Abstract ID : 1

## TFCat – Time-Frequency Catalogue

### Content

TFCat (Time-Frequency Catalogue) is an information model and a transport format designed for features varying in the temporal and spectral domains. It allows to describe spectro-temporal feature geometries, as points, sets of points, lines, sets of lines, polygons or sets of polygons. The catalogue and as well as each geometrical feature is associated with properties. TFCat has been drafted for low frequency radio emission (within the frame of the MASER project), for which the spectro-temporal shape of the emission is key for scientific interpretation (e.g., for solar radio bursts, planetary auroral radio emissions). We present how we reuse IVOA building blocks, and where we need to use external elements. The proposed implementation is adapted from GeoJSON, a geo-spatial feature catalogue format.

### Preferred talk time

day time in Europe

**Primary authors:** CECCONI, Baptiste (Observatoire de Paris); Mr LOH, Alan (Observatoire de Paris); Mr BONNIN, Xavier (CNRS-Observatoire de Paris); Mr LION, Sonny (CNRS-Observatoire de Paris)

**Presenter:** CECCONI, Baptiste (Observatoire de Paris)

**Track Classification:** Data Access Layer; Radio Astronomy; Time Domain

Submitted by **CECCONI, Baptiste** on **Monday 12 April 2021**



Abstract ID : 2

## Product Type Vocabulary Review

### Content

SimpleDALRegExt contains the vocabulary <https://www.ivoa.net/rdf/product-type>, which is mainly derived from what `obscore` has for its `dataprodukt_type` column.

However, the definitions of this vocabulary needs to be reviewed, as the concepts so far are not (obviously) either disjunct or strict subsets. In this talk, I will review the problems and propose improvements.

### Preferred talk time

daytime CEST

**Primary author:** DEMLEITNER, Markus (GAVO)

**Presenter:** DEMLEITNER, Markus (GAVO)

**Track Classification:** Data Access Layer; Registry; Semantics

Submitted by **DEMLEITNER, Markus** on **Wednesday 21 April 2021**



Abstract ID : 3

## Vocabularies in Action

### Content

The Vocabularies in the VO 2 spec is now in RFC. In this talk, I will discuss the various implementations mentioned on the RFC page and, if first reviews are in, items requiring additional consideration.

### Preferred talk time

daytime CET

**Primary author:** DEMLEITNER, Markus (GAVO)

**Presenter:** DEMLEITNER, Markus (GAVO)

**Track Classification:** Semantics

Submitted by **DEMLEITNER, Markus** on **Wednesday 21 April 2021**



Abstract ID : 4

## Advanced Column Metadata

### Content

In the continuing project of enabling blind discovery (i.e. data discovery based on physical constraints), in this talk I will present a roadmap to adding information on the distribution of the values in a column to VODataService table metadata.

### Preferred talk time

daytime CET

**Primary author:** DEMLEITNER, Markus (GAVO)

**Presenter:** DEMLEITNER, Markus (GAVO)

**Track Classification:** Registry

Submitted by **DEMLEITNER, Markus** on **Wednesday 21 April 2021**



Abstract ID : 5

## Datalink XSLT

### Content

(feel free to chuck this if there are too many talks)

Datalink results come in VOTables, which need to be processed in non-trivial ways to be human-consumable. While in general this is done on the client side, making datalink results properly show in web browsers is a nice and useful service, in particular as long as many important clients do not (fully) support datalink.

In this talk, I will discuss a combination of XSLT and (ideally) Javascript that enables this; it is available from <https://github.com/msdemlei/datalink-xslt>.

### Preferred talk time

daytime CET

**Primary author:** DEMLEITNER, Markus (GAVO)

**Presenter:** DEMLEITNER, Markus (GAVO)

**Track Classification:** Data Access Layer

Submitted by **DEMLEITNER, Markus** on **Wednesday 21 April 2021**



Abstract ID : 6

## VODataService 1.2 in RegTAP

### Content

With VODataService 1.2 in RFC, the question of how to map it into RegTAP to actually make the additional metadata useful for discovery becomes urgent. In this talk, I will present the `rr.stc_X` tables that have been used on `reg.g-vo.org` during the development of VODataService 1.2, together with ADQL extensions required to enable powerful queries on this data.

### Preferred talk time

daytime CET

**Primary author:** DEMLEITNER, Markus (GAVO)

**Presenter:** DEMLEITNER, Markus (GAVO)

**Track Classification:** Registry

Submitted by **DEMLEITNER, Markus** on **Wednesday 21 April 2021**



Abstract ID : 7

## Education, Virtual Observatory and Astronomical Data

### Content

We present two projects that have been working on Astronomy Education using Archival Data and Virtual Observatory tools. Both these projects and possible extensions of these can be done in collaboration with iAU-OAD and the IVOA. In terms of data analysis and VO Tools, we covered Python, Astropy, TopCat, Aladin, EsaSky, R, Machine Learning and Big Data. The data used was Gaia, SDSS, HST, Kepler, etc. We introduced students to high-quality archival astronomy data from various facilities, ground and space-based. It involved a variety of speakers from India and abroad on Virtual Observatory Tools, Data Archives and Science cases. All the sessions were recorded and posted online. We propose a coordination between various worldwide attempts in this domain that will be of immense benefit to students and teachers.

### Preferred talk time

9:00 hrs UTC - 2:00 hrs UTC

**Primary author:** Dr HASAN, Priya (Maulana Azad National Urdu University, Hyderabad, India)

**Presenter:** Dr HASAN, Priya (Maulana Azad National Urdu University, Hyderabad, India)

**Track Classification:** Education

Submitted by **Dr HASAN, Priya** on **Friday 23 April 2021**



Abstract ID : 8

## The Theoretical Astrophysical Observatory

### Content

In this talk, I will share my experiences building and running the Theoretical Astrophysical Observatory (TAO), an online platform that hosts and delivers galaxy evolution models and cosmological N-body simulations to the astronomical community.

### Preferred talk time

Any time for UTC+10:00 when the sun is up

**Primary author:** CROTON, Darren (Swinburne University of Technology)

**Presenter:** CROTON, Darren (Swinburne University of Technology)

**Track Classification:** Data Curation and Preservation; Knowledge Discovery in Databases; Theory

Submitted by **CROTON, Darren** on **Friday 30 April 2021**





Abstract ID : 9

## A VOSpace implementation with tape support

### Content

Some INAF developers, supported by the Italian Center for Astronomical Archives (IA2), are working on a VOSpace implementation where part of the files are stored inside a tape library. Tape data is not immediately available and has to be retrieved using an asynchronous recall command that is performed inside a pullToVoSpace operation. The talk will discuss some limits that have been encountered in implementing this use case following the VOSpace specification.

Other notable features of this implementation are a support both for XML and JSON payloads and the usage of an OAuth2 token for authorization.

### Preferred talk time

morning or afternoon slot (UTC+2)

**Primary authors:** ZORBA, Sonia (Istituto Nazionale di Astrofisica (INAF)); URBAN, Cristiano (Istituto Nazionale di Astrofisica (INAF)); BERTOCCO, Sara (Istituto Nazionale di Astrofisica (INAF)); CALABRIA, Nicola Fulvio (Istituto Nazionale di Astrofisica (INAF))

**Presenter:** ZORBA, Sonia (Istituto Nazionale di Astrofisica (INAF))

**Track Classification:** Applications; Grid and Web Services

Submitted by **ZORBA, Sonia** on **Friday 30 April 2021**



Abstract ID : 10

## A web portal for hydrodynamical, cosmological simulations

### Content

I will describes a new data center hosting a web portal for accessing and sharing the output of large, cosmological, hydro-dynamical simulations with a broad scientific community hosted at LRZ. It also allows users to receive related scientific data products by directly processing the raw simulation data on a remote computing cluster.

The data center has a multi-layer structure: a web portal, a job control layer, a computing cluster and a HPC storage system. The outer layer enables users to choose an object from the simulations. Objects can be selected by visually inspecting 2D maps of the simulation data, by performing highly compounded and elaborated queries or graphically by plotting arbitrary combinations of properties. The user can run analysis tools on a chosen object. These services allow users to run analysis tools on the raw simulation data. The job control layer is responsible for handling and performing the analysis jobs, which are executed on a computing cluster. The innermost layer is formed by a HPC storage system which hosts the large, raw simulation data.

### Preferred talk time

9:00-11:00 (CET)

**Primary author:** Dr DOLAG, Klaus

**Co-author:** Dr DOLAG, Klaus

**Presenters:** Dr DOLAG, Klaus; Dr DOLAG, Klaus

**Track Classification:** Applications; Data Curation and Preservation; Knowledge Discovery in Databases; Theory

Submitted by **DOLAG, Klaus** on **Monday 03 May 2021**



Abstract ID : 11

## The IllustrisTNG Simulation Data Platform

### Content

I will describe our efforts over the past several years to comprehensively release the Illustris and IllustrisTNG simulations ([www.tng-project.org](http://www.tng-project.org)). These are cosmological magnetohydrodynamical simulations: “virtual Universes in a box”. I will discuss the current capabilities, usage, and future directions of the TNG public data release platform. This includes direct data access, API-based interactions, on-demand visualization and analysis tasks, and a Lab-based analysis interface.

### Preferred talk time

EU daytime

**Primary author:** NELSON, Dylan (ITA, Heidelberg University)

**Presenter:** NELSON, Dylan (ITA, Heidelberg University)

**Track Classification:** Applications; Grid and Web Services; Data Curation and Preservation; Knowledge Discovery in Databases; Theory

Submitted by **NELSON, Dylan** on **Monday 03 May 2021**



Abstract ID : 12

## Disseminating Galacticus data through online platforms

### Content

I will briefly describe our experiences in disseminating data from the “Galacticus” galaxy formation model through online platforms, with a focus on some of the challenges and limitations that we have found.

### Preferred talk time

8-4pm UTC+7:00

**Primary author:** BENSON, Andrew (Carnegie Institution for Science)

**Presenter:** BENSON, Andrew (Carnegie Institution for Science)

**Track Classification:** Grid and Web Services

Submitted by **BENSON, Andrew** on **Wednesday 05 May 2021**



Abstract ID : 13

## Can I do this?

### Content

The first step towards interoperable cloud compute and science platforms - a simple metadata schema and web service API to check if a computing activity can be performed on a platform.

### Preferred talk time

No preference

**Primary author:** MORRIS, Dave (University of Edinburgh)

**Presenter:** MORRIS, Dave (University of Edinburgh)

**Track Classification:** Grid and Web Services; Knowledge Discovery in Databases; Science Platform workshop

Submitted by **MORRIS, Dave** on **Thursday 06 May 2021**



Abstract ID : 14

## Registering IVOA software in ESCAPE

### Content

The European ESCAPE project is creating a registry of software linked to the project. Our work package in ESCAPE is tasked with promoting IVOA standards and software within ESCAPE. We have started a discussion in ESCAPE about how to promote IVOA software in the context of ESCAPE. This session is to raise the same discussion at the IVOA, collecting thoughts ideas and suggestions about how to promote IVOA software to other communities.

### Preferred talk time

Given the topic, European time zone would be best.

**Primary author:** MORRIS, Dave (University of Edinburgh)

**Presenter:** MORRIS, Dave (University of Edinburgh)

**Track Classification:** Applications

### Comments:

Not sure which track this fits under. Probably the main one is Applications, but I expect some of the people involved in Registry and Semantics may want to contribute to this.

Submitted by **MORRIS, Dave** on **Thursday 06 May 2021**



Abstract ID : 15

## Data Central's Simple Spectral Access Service

### Content

Australian spectroscopic surveys have produced millions of spectra with the help of innovative multi-object spectroscopy instrumentation. Since February 2021, spectra from several surveys are now available via Data Central's new Simple Spectral Access service. In this talk we will give an overview of the service and its Python Django implementation. Particular attention will be given to how the highly heterogeneous formats of the original spectra were regularised with the help of `astropy specutils`. We provide several client Python scripts that show how the service can be used, e.g. plotting time series spectra, generating preview PDFs of spectra with image cutouts and creating interactive applications to visualise spectra. Lastly, we discuss future plans for the service within the broader set of Data Central services. This may include exploiting the Python implementation of the service as a test bed for new features, e.g. multi-order coverage (MOC) map based spatial and/or temporal queries using `MOCpy`.

### Preferred talk time

Any of the DAL sessions are fine. Timezone: UTC+10 (Sydney)

**Primary author:** MISZALSKI, Brent (Macquarie University)

**Presenter:** MISZALSKI, Brent (Macquarie University)

**Track Classification:** Data Access Layer

Submitted by **MISZALSKI, Brent** on **Sunday 09 May 2021**



Abstract ID : 16

## Data Central's Data Aggregation Service

### Content

Observational data are now accessible in a wide variety of online interfaces that may be queried programmatically (e.g. from Python). These include IVOA DAL services (e.g. TAP, SIA, SSA and SCS), HiPS sky maps, cubes and catalogues (e.g. using MOCs), and API endpoints (e.g. VizieR ASU; MAST PANSTARRS/HSC catalogues; Gemini archive). Even with a list of known services, it can be laborious for the average astronomer to check whether a favourite target has any data available, especially since each service also has its own idiosyncrasies to learn. In this talk we will introduce a Data Aggregation Service (DAS) developed for the Commensal Real-time ASKAP Fast Transients (CRAFT) survey team to quickly inspect Fast Radio Burst (FRB) candidates. The DAS is a Django Python web application that uses Aladin Lite to aggregate catalogue and imaging data from multiple services for a given sky position of interest. An overlay in Aladin Lite shows the FRB position and its uncertainty, while several catalogues from multiple services are loaded into Aladin Lite. The latter may be downloaded or sent directly to TOPCAT via Web SAMP. Apart from HiPS images, Aladin Lite can display FITS data sourced directly from SIA and other services (e.g. Gemini archive), allowing for versatile data visualisation and discovery. We plan to extend DAS by adding user management, allowing for a wide range of astronomers to customise and benefit from its unique aggregation capabilities.

### Preferred talk time

Any of the Apps or DAL sessions are fine. Timezone: UTC+10 (Sydney)

**Primary author:** MISZALSKI, Brent (Macquarie University)

**Presenter:** MISZALSKI, Brent (Macquarie University)

**Track Classification:** Applications; Data Access Layer

Submitted by **MISZALSKI, Brent** on **Sunday 09 May 2021**





Abstract ID : 17

## MASER EPN-TAP services

### Content

We present EPN-TAP services proposed by the MASER project (dedicated to solar-system low frequency radio-astronomy).

### Preferred talk time

14:00 UTC+2

**Primary authors:** CECCONI, Baptiste (Observatoire de Paris); LOH, Alan (Observatoire de Pairs); LOUIS, Corentin (DIAS, Dublin, Ireland); LAMY, Laurent (Observatoire de Paris & LAM, Marseille)

**Presenter:** CECCONI, Baptiste (Observatoire de Paris)

**Track Classification:** Solar System

Submitted by **CECCONI, Baptiste** on **Monday 10 May 2021**



Abstract ID : 18

## Observatorio Astrofísico de Javalambre (OAJ) publishing registry and VO services validation

### Content

The Centro de Estudios de Física del Cosmos de Aragón (CEFCA) is carrying out from the Observatorio Astrofísico de Javalambre (OAJ, Teruel, Spain) two large area multiband photometric sky surveys, J-PLUS and J-PAS, covering the entire optical spectrum using narrow and broad band filters.

As an effort to make public the data, we offer Virtual Observatory (VO) compliant services to make more versatile the access to the data through the multiple VO compliant existent tools. To publish all of these services a Publishing Registry has just been implemented and registered in the RoF. Moreover, all our VO services (SCS, SIAP, TAP, MOC and HIPS) have been validated using different external validators and improved to fulfill the protocols.

This contribution presents CEFCA catalogues publishing registry, how has been implemented and all the issues and problems found during this VO services validation process.

### Preferred talk time

If possible between 06:30 and 20:00 UTC . I live in Spain UTC +2.

**Primary author:** CIVERA LORENZO, Tamara (Centro de Estudios de Física del Cosmos de Aragón (CEFCA))

**Presenter:** CIVERA LORENZO, Tamara (Centro de Estudios de Física del Cosmos de Aragón (CEFCA))

**Track Classification:** Registry; Operations

Submitted by **CIVERA LORENZO, Tamara** on **Monday 10 May 2021**



Abstract ID : 19

## Data-sharing at the CCA: Binder and FlatHUB

### Content

I will describe and discuss the two main platforms for providing public access to astrophysical simulation data that is hosted at the Flatiron Institute. The Binder service, built upon the open-source tool BinderHub, allows any Flatiron researcher to customize a computing environment for external users, providing them with basic tools such as a terminal and a Jupyter notebook for interfacing with selected data stored on the Flatiron cluster. FlatHUB is a science platform developed in-house that allows users to explore and compare data from different simulations and datasets with one another, browse and filter the data collections, make simple preview plots, and download sub-samples of the data.

### Preferred talk time

any of the sessions starting 13:30 UTC are ok (I am located in EDT), except for Friday 5/28 on which I will not be available

**Primary author:** Dr GENEL, Shy (Flatiron Institute)

**Presenter:** Dr GENEL, Shy (Flatiron Institute)

**Track Classification:** Data Curation and Preservation; Knowledge Discovery in Databases; Theory; Science Platform workshop

Submitted by **Dr GENEL, Shy** on **Monday 10 May 2021**



Abstract ID : 20

## pyvo, registry search and data discovery

### Content

The evolution of data discovery and search patterns in the registry require the expansion of pyvo search functionality to cover some use cases. Bringing together registry, pyvo experts, and invested users can clarify the path forward.

### Preferred talk time

NOT Tuesday morning EDT.

**Primary author:** DOWER, Theresa (STScI)

**Presenter:** DOWER, Theresa (STScI)

**Track Classification:** Registry

Submitted by **DOWER, Theresa** on **Monday 10 May 2021**



Abstract ID : 21

## SIIV2-next and Simple dataset discovery

### Content

A couple of issues have been opened after a long feedback on SIIV2 implementations. Furthermore, the question of extending SIIV2 to all types of datasets (spectra, Timeseries, etc...) has to be raised. The talk will expose possible evolutions of parameter based discovery services

### Preferred talk time

15'

**Primary author:** BONNAREL, François (CDS observatoire astronomique de Strasbourg)

**Presenter:** BONNAREL, François (CDS observatoire astronomique de Strasbourg)

**Track Classification:** Data Access Layer

Submitted by **BONNAREL, François** on **Tuesday 11 May 2021**



Abstract ID : 22

## TimeSeries discovery and Access DAL possible solutions

### Content

Various possible DAL solutions for TimeSeries discovery and access will be discussed

### Preferred talk time

15'

**Primary authors:** BONNAREL, François (CDS observatoire astromique de Strasbourg); LOUYS, mireille (CDS, ICUBE, Université de Strasbourg); MICHEL, Laurent (Observatoire de Strasbourg); MOLINARO, Marco (Istituto Nazionale di Astrofisica (INAF)); NEBOT GOMEZ, Ada (CDS, ObAS, Université de Strasbourg)

**Presenter:** BONNAREL, François (CDS observatoire astromique de Strasbourg)

**Track Classification:** Data Access Layer; Data Model; Time Domain

### Comments:

Could be either in DAL or in DAL/DM according to time left

Submitted by **BONNAREL, François** on **Tuesday 11 May 2021**



Abstract ID : 23

## Radio data and interferometry ObsCore extension proposal

### Content

Fine grain description of radio visibility data would benefit from the standardisation of specific metadata to be added to the basic ObsCore attributes

### Preferred talk time

15'

**Primary authors:** BONNAREL, François (CDS observatoire astronomique de Strasbourg); LOUYS, mireille (CDS, ICUBE, Université de Strasbourg)

**Presenter:** BONNAREL, François (CDS observatoire astronomique de Strasbourg)

**Track Classification:** Data Model; Radio Astronomy

### Comments:

better in DM

Submitted by **BONNAREL, François** on **Tuesday 11 May 2021**



Abstract ID : 24

## Radioastronomy data services integration in the VO implementation note

### Content

This talk will present the status of this implementation note

### Preferred talk time

10'

**Primary authors:** BONNAREL, François (CDS observatoire astronomique de Strasbourg); LACY, Mark (NRAO)

**Presenters:** BONNAREL, François (CDS observatoire astronomique de Strasbourg); LACY, Mark (NRAO)

**Track Classification:** Radio Astronomy

### Comments:

Presentation by Mark or François

Submitted by **BONNAREL, François** on **Tuesday 11 May 2021**





Abstract ID : 25

## CDS registry migration

### Content

The CDS registry publishes a significant fraction of the VO resources with 20K of Vizier catalogues. A revisited version of the CDS registry has been developed in accordance with the recent recommendation of the IVOA registry. The upgrade includes a description of the mirrors, the catalogues DOI, a better management of related resources and finally a keyword mapping using the Unified Astronomical Thesaurus (UAT). To prevent any client compatibility issues –in particular with the registries of registries– a beta version containing all registered CDS resources is available. We will list the updates and the schema used in this version in order to plan a migration of the CDS registry .

### Preferred talk time

Europe timezone

**Primary author:** LANDAIS, Gilles (CDS - Observatoire Astronomique de Strasbourg)

**Co-author:** Dr DERRIERE, Sebastien (CDS)

**Presenter:** Dr DERRIERE, Sebastien (CDS)

**Track Classification:** Registry

Submitted by **LANDAIS, Gilles** on **Tuesday 11 May 2021**



Abstract ID : 26

## Handling Cosmological Simulations at the Port d'Informació Científica (PIC)

### Content

Our group at the Port d'Informació Científica (PIC) collaborates with different cosmology projects such as the Dark Energy Survey (DES), Euclid, the Physics of the Accelerating Universe Survey (PAUS) and the Marenstrum Institut de Ciències de l'Espai simulations (MICE). For these projects, simulations are a key ingredient in the whole data flow, from feeding the software pipelines to finally enabling to achieve precise estimations of cosmological parameters.

Cosmological simulations are usually rather large (> 100 GiB) and most users only require specific subsets related to their own field of work. At PIC, we have developed CosmoHub (<https://cosmohub.pic.es>), a web platform based on Hadoop to perform interactive exploration, customization and distribution of massive astronomical datasets without any Structured Query Language (SQL) knowledge required. It currently manages over 60 TB of catalogued information and over 50 billion objects, and provides support to an ever-growing worldwide community of more than 1000 scientists.

During the talk I will describe CosmoHub and some of the lessons learned during the last years handling cosmological simulations.

### Preferred talk time

May 25 at 13:30 UTC

**Primary author:** CARRETERO PALACIOS, Jorge (Institut de Física d'Altes Energies (IFAE) - Port d'Informació Científica (PIC))

**Presenter:** CARRETERO PALACIOS, Jorge (Institut de Física d'Altes Energies (IFAE) - Port d'Informació Científica (PIC))

**Track Classification:** Applications; Data Access Layer; Grid and Web Services; Science Platform workshop

Submitted by **CARRETERO PALACIOS, Jorge** on **Tuesday 11 May 2021**



Abstract ID : 27

## A&A Updates: GMS, SSO and tokens

### Content

I will present updates to the Group Membership Service WD based on our two reference implementations. I will also present recent additions to the CADC authentication libraries to support command line use of tokens for authentication. The intent is to stimulate discussion around these two areas of development.

### Preferred talk time

I'm in Victoria BC, UTC-9

**Primary author:** MAJOR, Brian (CADC)

**Presenter:** MAJOR, Brian (CADC)

**Track Classification:** Grid and Web Services

Submitted by **MAJOR, Brian** on **Tuesday 11 May 2021**



Abstract ID : 28

## CANFAR Science Platform 2.0

### Content

The Canadian Advanced Network for Astronomical Research (CANFAR) recently launched an interactive, container-based platform for astronomy research. Users and projects manage much of their own experience on this platform via an integrated software image registry and self-managed Group Membership Service. This talk will highlight the unique offerings of this platform, the difficult problems faced during development, and thoughts on how we can collaborate with other platforms through standardization and open-source development.

### Preferred talk time

I'm in Victoria BC, UTC-9

**Primary author:** MAJOR, Brian (CADDC)

**Presenter:** MAJOR, Brian (CADDC)

**Track Classification:** Science Platform workshop

### Comments:

Giuliano, Gerard: If you do not think this talk will be relevant to the workshop I do not need to present. I don't believe we have any simulations being run on this platform yet. We are currently integrating a GPU node into k8s to be made available to the different sessions (Jupyter, CARTA, etc...)

Submitted by **MAJOR, Brian** on **Tuesday 11 May 2021**



Abstract ID : 29

## Workflow interoperability for telescope operations and time domain astronomy

### Content

I will present our work on improving interoperability of scientific workflows, supporting operations of astronomical data centers, started with INTEGRAL observatory ground segment activities, and extended to several other missions. We are adapting traditional data analysis processes into cloud-native environment and incorporating RDF Knowledge Graphs to annotate, publish, and discover data and live workflows. The Knowledge Graphs also consume diverse human-written and automated publications and drive automated data and workflow transformation and composition for the needs of time domain astronomy and telescope operations. Our platform implements end-to-end (publication-experiment-publication) scientific process, while maintaining semantically rich data knowledge-driven data model, facilitating data and workflow interoperability in linked data paradigm. Our development is fully open source, available for deployment on premises or in public cloud by any interested party.

### Preferred talk time

no preference at this time

**Primary authors:** SAVCHENKO, Volodymyr (University of Geneva); Dr FERRIGNO, Carlo; Prof. NERONOV, Andrii

**Presenter:** SAVCHENKO, Volodymyr (University of Geneva)

**Track Classification:** Applications; Data Model; Grid and Web Services; Registry; Semantics; Knowledge Discovery in Databases; Operations; Time Domain

Submitted by SAVCHENKO, Volodymyr on Wednesday 12 May 2021



Abstract ID : 30

## Astro Colibri

### Content

Flares of known stable astronomical sources and transient sources can occur on different timescales, from only a few seconds to several days. The discovery potential of both serendipitous observations and multi-messenger and multi-wavelength follow-up observations could be maximized with a tool which allows for quickly acquiring an overview over both stable sources and transient events in the relevant phase space. We here present COincidence LIBrary for Real-time Inquiry (Astro-COLIBRI), a comprehensive tool for this task. Astro-COLIBRI's architecture comprises a RESTful API, a real-time database, a cloud-based alert system and a website. Users will also have the opportunities to use it on an apps for both iOS and Android. The structure of Astro-COLIBRI is optimized in terms of performance and exploits concepts such as multi-index database queries, a global content delivery network (CDN), direct data streams from the database to the clients and caching.

Astro-COLIBRI evaluates incoming VOEvent messages of astronomical observations in real time, stores them in the database and filters them by user specified criteria in the context of known sources from various catalogs. The clients provide a graphical representation with a summary of the relevant data to allow for the fast identification of changes in observed sky regions, and for analyses of those. In this contribution, the key features of Astro-COLIBRI are presented including the architecture and the resources providing data to the Back-End. The current implementation of Astro-COLIBRI will be illustrated with use cases in multi-messenger astrophysics

### Preferred talk time

morning of UTC+2

**Primary authors:** Dr LEFRANC, Valentin (CEA IRFU); SCHUSSLER, Fabian (IRFU / CEA Paris-Saclay); Mr REICHHERZER, Patrick

**Presenter:** Dr LEFRANC, Valentin (CEA IRFU)

**Track Classification:** Applications; Data Access Layer; Grid and Web Services; Data Curation and Preservation; Knowledge Discovery in Databases

Submitted by **LEFRANC, Valentin** on **Wednesday 12 May 2021**



Abstract ID : 31

## Simulations for Large-scale surveys

### Content

In this talk, I will briefly introduce the LSST DESC DC2 Simulated Sky Survey, a simulation effort carried out in preparation for analysis of the Vera C. Rubin Observatory Legacy Survey of Space and Time (LSST) by the LSST Dark Energy Science Collaboration (DESC). The DC2 effort provides LSST-like data from a major end-to-end simulation effort, that starts from large cosmological simulations, involves image simulations and processing of the images with the LSST Science Pipelines. The data has been made publicly available via a web-portal hosted at NERSC.

### Preferred talk time

Any of the sessions for this track is fine. My time zone is US Central

**Primary authors:** HEITMANN, Katrin (Argonne National Laboratory); LSST DESC

**Presenter:** HEITMANN, Katrin (Argonne National Laboratory)

**Track Classification:** Grid and Web Services; Theory

Submitted by **HEITMANN, Katrin** on **Wednesday 12 May 2021**



Abstract ID : 32

## VESPA-Cloud

### Content

EOSC experiment for automated deployment of TAP service

### Preferred talk time

UTC+2

**Primary authors:** CECCONI, Baptiste (Observatoire de Paris); HAMY, Philippe (Obs Paris); LE SIDANER, Pierre (pierre.lesidaner@obspm.fr)

**Presenters:** CECCONI, Baptiste (Observatoire de Paris); HAMY, Philippe (Obs Paris); LE SIDANER, Pierre (pierre.lesidaner@obspm.fr)

**Track Classification:** Applications; Grid and Web Services

Submitted by **CECCONI, Baptiste** on **Wednesday 12 May 2021**





Abstract ID : 33

## IVOA Spectral Models and Access in the Era of Big Data

### Content

We discuss the suitability of the IVOA Spectral Data Model for supporting common science use cases involving 1-D spectra and Spectral Energy Distributions (SEDs). We will describe our experiences in using this data model for spectra from Spitzer, SOFIA, and Herschel; and for SEDs from NED. We recommend some updates to the model based on this experience. We also present some science use cases that may strain the capabilities of the Simple Spectral Access protocol, including usage of “Big Spectra” data sets from e.g. Euclid and SPHEREx. Finally, we strongly advocate for the prioritization of work on the Spectral Data Model and spectral access in light of upcoming missions.

### Preferred talk time

9am-5pm PDT

**Primary author:** Dr DESAI, Vandana (Caltech/IPAC-IRSA)

**Co-authors:** DUBOIS-FELSMANN, Gregory; MAZZARELLA, Joe; WU, Xiuqin

**Presenter:** Dr DESAI, Vandana (Caltech/IPAC-IRSA)

**Track Classification:** Data Access Layer; Data Model

Submitted by **Dr DESAI, Vandana** on **Wednesday 12 May 2021**



Abstract ID : 34

## **EPN-TAP and the Registry: the Good, the Bad and the Ugly**

### **Content**

We report the current status of EPN-TAP resources declared in the registry, and evaluate the practices.

### **Preferred talk time**

UTC+2

**Primary authors:** CECCONI, Baptiste (Observatoire de Paris); LE SIDANER, Pierre (Obs paris); ERARD, Stéphane (LESIA / Observatoire de Paris); CHAUVIN, Cyril (Obs paris)

**Presenter:** CECCONI, Baptiste (Observatoire de Paris)

**Track Classification:** Registry; Solar System

Submitted by **CECCONI, Baptiste** on **Thursday 13 May 2021**



Abstract ID : 35

## ObsLocTAP status

### Content

We would present the status of ObsLocTAP, currently in RFC from TCG and already fulfilling the requests from the different TCG members so the standard is ready for the next recommendation phase

### Preferred talk time

EU

**Primary author:** Mr SALGADO, Jesus (Quasar for ESA)

**Presenter:** Mr SALGADO, Jesus (Quasar for ESA)

**Track Classification:** Applications; Data Access Layer

Submitted by **Mr SALGADO, Jesus** on **Thursday 13 May 2021**



Abstract ID : 36

## Wrapping up ADQL-2.1

### Content

A brief overview of what have changed between the version 2.0 and 2.1 of the ADQL while starting the RFC period.

### Preferred talk time

27th 06:00 UTC, but the 2 other slots would be fine

**Primary author:** MANTELET, Grégory (CDS - Observatoire astronomique de Strasbourg)

**Presenter:** MANTELET, Grégory (CDS - Observatoire astronomique de Strasbourg)

**Track Classification:** Data Access Layer

### Comments:

If no time for this talk, I can still prepare the slides and publish them on the Interop's program page. Considering it is just to present a summary of changes, slides should be rather self-explanatory. And anyway, I don't really expect discussions on this.

Submitted by **MANTELET, Grégory** on **Thursday 13 May 2021**



Abstract ID : 37

## The EPN-TAP access protocol

### Content

The EPN-TAP protocol to access Solar System data has been submitted as a Working Draft and presented at the last Interop meeting.

EPN-TAP is the association of TAP with a specific vocabulary, EPNCORE, describing data in a field encompassing Solar System studies, heliophysics, extrasolar planets, and laboratory experiments such as spectroscopy in solid phase. The standard also includes a set of rules to design EPN-TAP services and tables.

EPNCORE results from design of 50+ data services published in the recent years within the Europlanet H2020 EU programme, and accessible via the VESPA portal (<http://vespa.obspm.fr>). Version 2.0 has been in use since 2015, and is the first version submitted to IVOA.

The current Working Draft integrates feedback received from various sources, and is presented here.

### Preferred talk time

CET

**Primary authors:** ERARD, Stéphane (LESIA / Observatoire de Paris); CECCONI; LE SIDANER; DEMLEITNER

**Presenter:** ERARD, Stéphane (LESIA / Observatoire de Paris)

**Track Classification:** Solar System

Submitted by **ERARD, Stéphane** on **Friday 14 May 2021**



Abstract ID : 38

## HDF5 and the VO

### Content

An emerging practice in machine learning is to combine data from different domains, such as spectra and images, to gain additional knowledge. Combining such data brings its own challenges which we solved by using HDF5 for creating a specialized data model. It is used to store and process combined spectra and images efficiently.

In this talk, I will discuss the possibility to connect HDF5 via VO protocols to existing tools, such as Topcat or Aladin to explore the combined data.

### Preferred talk time

UTC+2

**Primary author:** NADVORNIK, Jiri (Czech Technical University in Prague)

**Presenter:** NADVORNIK, Jiri (Czech Technical University in Prague)

**Track Classification:** Applications

Submitted by **NADVORNIK, Jiri** on **Friday 14 May 2021**



Abstract ID : 39

## **NADC Metadata Management for Astronomical Data: Standards and System**

### **Content**

We present and discuss the metadata management in National Astronomical Data Center of China in terms of standards and system. Practices are shared on aspects of data taxonomy, metadata granularity in relation to IVOA resource metadata standards, design of metadata management and data submission system serving the process from metadata submission to data Release. Also, we want to discuss the best practices for data quality assessment.

### **Preferred talk time**

10:00-12:00,14:00-17:00,19:00-23:00(UTC+8)

**Primary author:** TAO, Yihan (National Astronomical Observatories, Chinese Academy of Sciences)

**Co-authors:** HUO, Zhiying; HE, Boliang; MI, Linying; CUI, Chenzhou

**Presenter:** TAO, Yihan (National Astronomical Observatories, Chinese Academy of Sciences)

**Track Classification:** Data Curation and Preservation

Submitted by **TAO, Yihan** on **Friday 14 May 2021**



Abstract ID : 40

## LIFE Target Database

### Content

The LIFE initiative (LIFE = Large Interferometer For Exoplanets) has the goal to develop the science and technology for a future space mission designed to characterize terrestrial exoplanet atmospheres and search for life outside the solar system. After an official kick-off in late 2018 and community building efforts in 2020, LIFE is currently in a first study phase.

One of the working groups of the LIFE Science Team is defining and designing the stellar target database. The goal of the LIFE database is to collect relevant data about the stellar systems to optimize target prioritization and, ultimately, target selection for the mission. Aside from offering scientists easy ways to access the data, the database should be able to output a list of selected stellar targets together with defined key parameters. This list will depend on the available data in the database as well as the observation scenario that is chosen as input. Currently the database is at the end of the design phase and will soon go over to the implementation phase. The database will primarily encompass stars within 20 parsec of the Sun together a large set of stellar parameters and measurements, as well as important information about planets and circumstellar disks orbiting the stars. The set of stellar parameters is currently being finalized. A key feature of the database is that it should automatically update its content via VO compatible sources (e.g. SIMBAD, VizieR,...) and be VO compatible itself. In this talk I will summarize the content and logical structure of the database.

### Preferred talk time

Any of the following UTC timeslots work for me: 25.05.21 13:30-16:00 26.05.21 06:00-07:00 27.05.21 06:00-07:00 and 13:30-16:00 28.05.21 06:00-07:00 and 13:30-16:00 Preferred timeslot would be 27. or 28. in the morning.

**Primary author:** MENTI, Franziska (ETH Zurich)

**Presenter:** MENTI, Franziska (ETH Zurich)

**Track Classification:** Applications; Data Access Layer; Data Model; Semantics; Knowledge Discovery in Databases; Solar System

### Comments:

I was encouraged by the IVOA member Eleonora Alei to offer you a contribution for the meeting. I would like to introduce the LIFE mission and its target database working group, tell you what the current status of the database is and ask for help in applying the IVOA standards to it. Since IVOA has much more experience in databases than I have I hope to get in contact with people willing to help me finish the database design phase and take on the implementation phase. For the IVOA I assume it is helpful to get insight into a new project working with (or at least trying to) their standards and getting feedback on the challenges in doing so. I am not sure if I selected the right Tracks.

Submitted by **MENTI, Franziska** on **Saturday 15 May 2021**





Abstract ID : 41

## Accessibility to astronomical data and services for all

### Content

Fransesca Primas, a colleague from ESO, contacted me in November 2020 to know if accessibility and technology issues for people with disabilities were discussed at IVOA. A first workshop around Astronomy Research Accessibility, <https://www.cosmos.esa.int/web/sara2020>, was held in late 2020, organised by major actors of our domain.

It sounded great to me to introduce a noble human concern in addition to the usual scientific and technological concerns. And to start looking for solutions to make it happen.

Always interested in R&D around new ways of interactions, and motivated by the human side of this work, a six month study will start in September 2021 with a student. The aim is to draw up an initial inventory of the accessibility of CDS data and services for people with disabilities, to find solutions to improve the existing but also to set up upstream new ways of presenting data, developing interfaces and tools. It is an interesting and rich work involving a large variety of new technologies as well as a human experience.

Sharing this experience and federating around it would be even better.

It concerns potentially a large panel of IGs/WGs but the most important is to initiate a discussion and the Education IG could be a good place even if accessibility is also for professionals and not only for Education.

### Preferred talk time

flexible

**Primary author:** SCHAAFF, André (CDS CNRS Observatoire astronomique de Strasbourg)

**Presenter:** SCHAAFF, André (CDS CNRS Observatoire astronomique de Strasbourg)

**Track Classification:** Education

Submitted by **SCHAAFF, André** on **Sunday 16 May 2021**



Abstract ID : 42

## ESASKY SSOSS: A NEW WINDOW FOR SOLAR SYSTEM DATA EXPLORATION

### Content

Solar System Objects (SSOs) are often difficult, or even impossible, to query for in astronomy archives if they were not the target of the observation, owing to their ever-changing coordinates. We aim to provide the scientific community with a service to search for all the potential detections of any SSOs (asteroids, Kuiper-belt objects and comets) within the ESA astronomy archival imaging data, called the Solar System Object Search Service (SSOSS). This service performs a geometrical cross-match of the orbital path of each SSO, as seen by the satellite reference frame, with respect to the public high-level imaging footprints stored in the ESA archives. About 800,000 asteroids and 2,000 comets are included in this work. This service is available through the ESASky application and it provides both targeted and serendipitous observations. For this first integration, three representative missions covering a wide range of frequencies, from X-Rays (XMM-Newton) to far infrared (Herschel) including the UV-Near Infrared band from the Hubble Space Telescope (HST), were chosen as a proof of concept.

### Preferred talk time

Day time UTC+2

**Primary author:** Ms RACERO, Elena (SERC0 for European Space Agency (ESA))

**Presenter:** Ms RACERO, Elena (SERC0 for European Space Agency (ESA))

**Track Classification:** Solar System

Submitted by **CECCONI, Baptiste** on **Monday 17 May 2021**



Abstract ID : 43

## Radio Astronomy projects in the Spanish VO

### Content

Spanish Virtual Observatory is starting a new set of activities and collaborations in radio astronomy, being our final aim the integration of large data cubes (both observed and modeled) into the VO project.

In this talk we update the current status and prospects, with particular emphasis in a recently-published catalog of SiO maser emission toward oxygen-rich stars and also in the road to convert MADCUBA's output in VO-compliant.

The SiO catalog is complex and highly multidimensional, because it involves different isotopologs, rotational transitions, vibrational numbers, sources, telescopes, receivers, bands, observation modes and polarizations. MADCUBA, on the other hand, is a complete suite build to manage large data cubes. It is able to visualize and analyze spectroscopy data cubes, to identify molecular species, and to derive molecular parameters (LTE and non-LTE). This last feature -identified as SLIM and SLIM-multifit- has the potential to become particularly useful in the VO context.

Other short- and mid-term endeavors are also outlined.

### Preferred talk time

My time zone: GMT+2 - Preferred time slot: GMT 0900 to 1900

**Primary authors:** RIZZO, Ricardo (Centro de Astrobiologia); Mrs RODRIGO, Carlos (Centro de Astrobiologia)

**Presenter:** RIZZO, Ricardo (Centro de Astrobiologia)

**Track Classification:** Data Access Layer; Data Model; Radio Astronomy

Submitted by **RIZZO, Ricardo** on **Monday 17 May 2021**



Abstract ID : 44

## A NEO Physical Properties database at SSDC

### Content

Within the NEOROCKS EU project (“The NEO Rapid Observation, Characterization and Key Simulations” - SU-SPACE-23-SEC-2019 from the Horizon 2020) in WP5 (Data Management) we are developing a unique **NEO Physical Properties database** for all different data products resulting from NEO observations devoted to physical characterization in order to ensure an efficient online data products dissemination and their storage and availability.

To maximise its science exploitation, the NEOROCKS database will be designed by means of an **EPNCore derived data model ready for the EPN-TAP** service implementation, and thus able to store, maintain and regularly update all different levels of processing, from raw data to derived products beyond the duration of the project as an authoritative source of services and data on NEO physical properties hosted at the Space Science Data Center (SSDC) of the Italian Space Agency (ASI).

The NEO orbital elements will be imported and regularly updated with the ESA NEO Coordination Center (CC) data source, while the NEO physical properties will be initially imported from the ESA NEO CC, which collected since 2013 the legacy of the European Asteroid Research Node (EARN), and subsequently filled by observers using the NEOROCKS technical web portal.

### Preferred talk time

Session 17, before 21 UTC

**Primary author:** Mr GIARDINO, Marco (Agenzia Spaziale Italiana)

**Co-authors:** ZINZI, Angelo (SSSC - ASI); Dr GIUNTA, Alessio (INAF); POLENTA, Gianluca; PEROZZI, ettore (Agenzia Spaziale Italiana); Dr DOTTO, Elisabetta (Istituto Nazionale di Astrofisica (INAF))

**Presenter:** Mr GIARDINO, Marco (Agenzia Spaziale Italiana)

**Track Classification:** Solar System

Submitted by **Mr GIARDINO, Marco** on **Monday 17 May 2021**



Abstract ID : 45

## The Arecibo Observatory Archives: A 305m wide data management effort

### Content

The Arecibo Observatory is a clear example of resilience. After 57 years of endurance, economics, mother nature and finally gravity, the main instrument platform collapsed. Right after the collapse, working teams were formed to rescue the priceless data, over 3PB in 3 main sciences: Radio Astronomy, Planetary Radar and Atmospheric Sciences. Now that the data archive is being replicated in a safe computing center, the teams are looking into how to catalog, visualize and provide the most effective tools to the community to access our data. This talk is about opening our data to the community, learning from previous experiences, and establishing robust relationships with community members.

### Preferred talk time

Radio IG

**Primary author:** ALVARADO, Julio (Arecibo Observatory)

**Presenter:** ALVARADO, Julio (Arecibo Observatory)

**Track Classification:** Applications; Data Access Layer; Data Model; Data Curation and Preservation; Knowledge Discovery in Databases; Radio Astronomy

Submitted by **ALVARADO, Julio** on **Monday 17 May 2021**



Abstract ID : 46

## Infrastructure for Cosmological Simulations

### Content

In this talk, we will present work to make accessible large-scale (and small-scale) simulations through the usage of web technologies, APIs, access to python libraries, Jupyter, and webassembly. We'll describe our utilization of tools such as yt as well as implementations of tools on top of this, such as widgeys and ytree.

### Preferred talk time

None

**Primary author:** Prof. TURK, Matthew (University of Illinois at Urbana-Champaign)

**Co-author:** Dr KOWALIK, Kacper (University of Illinois at Urbana-Champaign)

**Presenter:** Prof. TURK, Matthew (University of Illinois at Urbana-Champaign)

**Track Classification:** Grid and Web Services; Theory; Science Platform workshop

Submitted by **Prof. TURK, Matthew** on **Monday 17 May 2021**



Abstract ID : 47

## Provenance information management

### Content

The Provenance Data Model recommendation released in 2020 is the base to manage provenance information. In practice, this information needs to be captured, stored and retrieved by end-users. The discussion with projects within ESCAPE and during ADASS revealed an interest in the concept of “last-step embedded provenance”, i.e. a flat list of keywords compliant with the data model defining the closest origin of a dataset (last activity). A more developed provenance management system would store the full provenance chain and allow for the exploration of previous steps, possibly from the last-step provenance, using e.g. ProvTAP and ProvSAP protocols that are now being tested in several prototype implementations.

### Preferred talk time

**Primary author:** SERVILLAT, Mathieu (LUTH - Observatoire de Paris)

**Presenter:** SERVILLAT, Mathieu (LUTH - Observatoire de Paris)

**Track Classification:** Data Access Layer; Data Model

Submitted by **MOLINARO, Marco** on **Wednesday 19 May 2021**