

Open UNiverse

Space science data: open, transparent, for everyone

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In cooperation with
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University of Sheffield

Open UNiverse, an Italian initiative

“Open Universe” is an initiative under the auspices of COPUOS with the objective of stimulating a large increase of the utilization of space science data (e.g. astrophysics, planetary science, cosmic rays), extending the potential of scientific discovery to new participants in all parts of the world.

Open Universe was proposed by Italy at the 2016 COPUOS session where it was included among the activities in preparation of UNISPACE+50, in line with the thematic priority “Capacity Building”, with focus on Science, Technology, Engineering and Mathematics.

A very wide range of communities will benefit from Open Universe: professional scientists, citizen scientists, teachers and students, potentially any citizen interested in space science.

Open UNiverse. Contribution to the SDGs



Open UNiverse. Main principles

Space science data is extremely valuable. It should be considered as a public good and preserved as such.

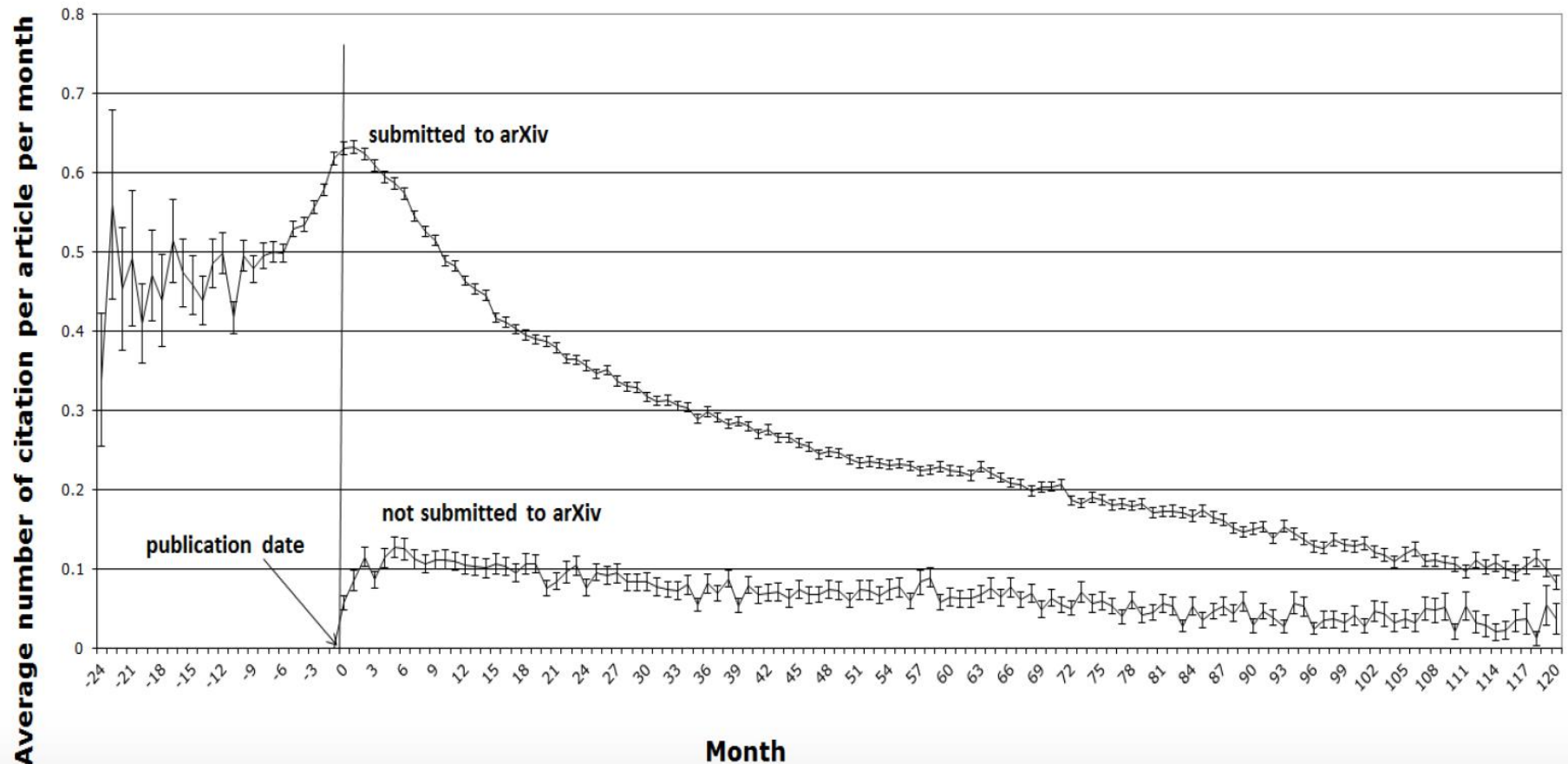
Space science data generated through public funding should eventually become openly available.

High-level "final" data products (e.g. calibrated images, spectra), should be transparent and usable by all:

Transparency and accessibility are key factors for

- The efficient conversion of data into knowledge**
- Democratising access to scientific information.**

Analysis based on articles published in the Journal of High energy Physics and Physical Review D



Indicators of transparency of space science data

preliminary and under discussion

Discoverable	Data must be easily found on the web
Open	Free of any legal restriction
Accessible	Simple and intuitive data access, no bureaucratic barriers
Understandable	No specialized knowledge required for high-level final data products. Effective documentation
Web ready	No further processing necessary, ideally downloadable with one click
Timely	Data available in a timely fashion

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Costs: minor modification of agencies cost-to-completion models

Open UNiverse

and the International Virtual Observatory Alliance (IVOA)

- The IVOA, in more than 15 years of collaboration among the major astronomical data providers, has established data standards and exchange protocols for diverse large data sets.
- Several "Virtual Observatories" have been built according to IVOA standards (CDS, CADC, ASI/ASDC, NASA, ESA, etc).
- The primary users have been researchers with reasonable astronomical backgrounds, although some interfaces for the general public do exist.
- The Open Universe initiative, among others goals, aims at giving access to existing facilities in a uniform, friendly manner, making them accessible and usable in a transparent way to the widest possible community.

Preparatory Activities

- Open Universe Legal Aspects panel, 30 March 2017, on the margins of LSC, VIC, Vienna, Austria
- Expert Meeting on Open Universe, 11-12 April 2017, ASI HQ, Rome, Italy
 - ✓ Agencies, research community, major space data providers, data archive experts
 - ✓ http://openuniverse.asi.it/documents/ou_documents.php
 - ✓ Report and preliminary recommendations: [A/AC.105/2017/CRP.22](#)
- Briefing on the margins of COPUOS, 13 June 2017, VIC, Vienna, Austria
- UN / Italy Workshop on the Open Universe Initiative, 20-22 November 2017, VIC, Vienna, Austria
 - ✓ http://www.unoosa.org/oosa/en/ourwork/psa/schedule/2017/workshop_italy_openuniverse.html



Open Universe Expert Meeting















11-12 April 2017
ASI-HQ, Rome, Italy

Expert Meeting Programme  PDF



http://www.openuniverse.asi.it/documents/ou_documents.php

Meeting presentations

The Open Universe Initiative	P. Giommi - ASI		PDF	
Inexorable Logic of the Open Universe	A. Pollock - University of Sheffield		PDF	
Welcome ASI President			N/A	
Open Science at NASA Implementation and lessons learned	G. Allen - NASA		PDF	
Space Science Data at ESA	C. Arviset - ESA		PDF	
Space Science Data at JAXA	K. Masuda - JAXA/ISAS		PDF	
Space Science Data at ASI	E. Russo - ASI		PDF	N/A
Challenges of open data provision	J. Osborne - University of Leicester		PDF	

Open UNiverse Expert Meeting

Rome 11-12 April 2017

The meeting was attended by 54 experts and professionals from 15 countries, representing

- Major space agencies (NASA, ESA, JAXA, ASI)
- International organizations/alliances (UNOOSA, ESO, COSPAR, IAU, ICRANet, IVOA, OECD)
- Archive facilities (ASDC, CDS, CADC, ISDC, U. Leicester, etc.)
- Research centres/Universities (U. Sheffield, CNR, U. Sapienza, CBPF, CNRS, CfA Russian Academy of Sciences)
- Private companies

Objectives:

- Review recent developments in archive services
- Serve as a forum to discuss space science in capacity building
- Discuss the social and economic benefits of open space science data access
- Lay the ground for the follow up UN/Italy workshop of November 2017

Full details can be found in the Conference Room Paper A/AC.105/2017/CRP.22



HIGH LEVEL FORUM on Space as a driver for Socioeconomic Sustainable Development

“Recognize the need for broadening
access to space”

“Stress the importance of full and
open access to space-derived data”

DUBAI
DECLARATION
2016

Preliminary Objectives

The various recommendations stemming from the celebrated meetings so far can be summarized into three broad priorities:



INCREASE TRANSPARENCY of already accessible resources: including promoting FAIR (Findable, Accessible, Interoperable, Reusable) guiding principles, promoting adoption of widely-used standards, processing from raw data to web-ready products, interfacing and facilitating cooperation between data providers and data centres and archives...



RESURFACE DATA and other hidden or otherwise hardly accessible resources: by identifying inaccessible data and working with national and regional entities to solve the challenges to make them public, as well as bringing new main players and actors in the international space science arena into the Initiative and in contact with other public data access solutions.



BROADEN THE USER-BASE of astronomy and space science data: to include as well the rapidly growing community of citizen scientists, by providing the necessary tools to use astronomy and space science data for a range of target groups, including educators and students in universities, schools, planetariums or any amateur scientists or other potential end-user

An ASI Web portal prototype

A prototype of a Open Universe web portal is being developed at the Italian Space Agency (ASI) as an example of a multi-discipline facility aimed at increasing the level of transparency of open space science data.

The portal concentrates access to many data services (thus increasing **discoverability**) and facilitates access to data and information (thus increasing **accessibility** and **understandibility**).

The portal is built on top of existing facilities and uses IVOA protocols, where possible.

The first public version of the portal will be available at openuniverse.asi.it and will be presented in Vienna at the November 2017 workshop on Open Universe

Open UNiverse for astronomy

Open Universe @ ASI

Space Astronomy »

Ground-Based Astronomy »

Planetary Science »

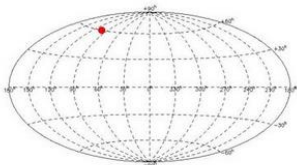
ISS »

VO and General services »

Bibliographic services »

Cosmic Rays »

Other Initiatives »



Source Name(s) : **M101**

R.A.(J2000) = **14 03 12.0 (210.8 deg)**

Dec.(J2000) = **+54 21 00.0 (54.35 deg)**

Prototype v.0.8.5

User: **giommi** (Logout)

Object name or coordinates: **M101 (ASDC)**

M101

Reset



ESASky

SKY-MAP.ORG

Google Sky

SDSS SkyServer

Aladin Lite

SuperCOSMOS

Radio Surveys

Error Circle

Astronomical Catalogs

Groups of Catalogs



CADC

ESO Archive

NRAO Archive

ALMA Archive

ISDC - HEAVENS

Data archive

SED[®] builder

SED[®] movie

Bibliographic Search



Portal

Simbad

VizieR

Aladin

X-Match

Other

Help



Aladin Lite

Target:

M101

J2000

14 03 12.000 +54 21 00.0



Surveys:

Fermi

GALEXGR6/AIS

DSS2

DSS2/red

DSS2/blue

SDSS9

Mellinger

2MASS

allWISE

FoV: 29.97'

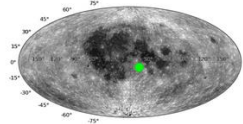


15



Open UNiverse for planetary science

Open Universe @ ASI Space Astronomy » Ground-Based Astronomy » Planetary Science » ISS » VO and General services » Bibliographic services » Cosmic Rays » Other Initiatives »



Entry : **MOON LANDER Apollo16LM-11Orion**
Long = **15.5002**
Lat = **-8.973**

Prototype v.0.8.6

Login

Object name or coordinates: MOONLANDERApollo16LM-11Orion [2]

MOONLANDERApollo16LM-11Orion

Reset



Google Moon

DAIS KAGUYA 3D GIS

Moon Trek



Apollo16LM-11Orion

Search

Link this view

View Moon with
Google Earth

About

Charts

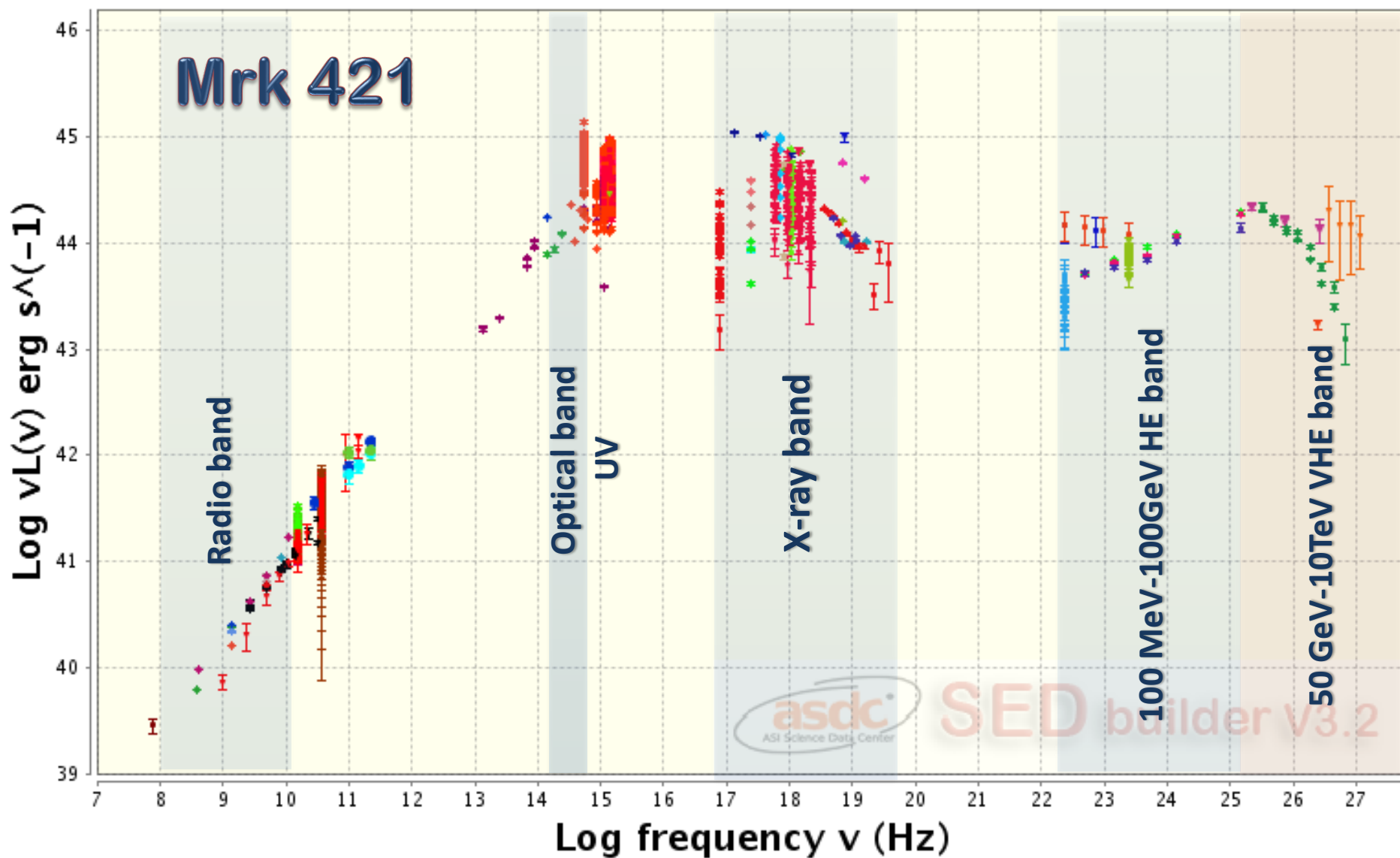
Apollo Visible Elevation

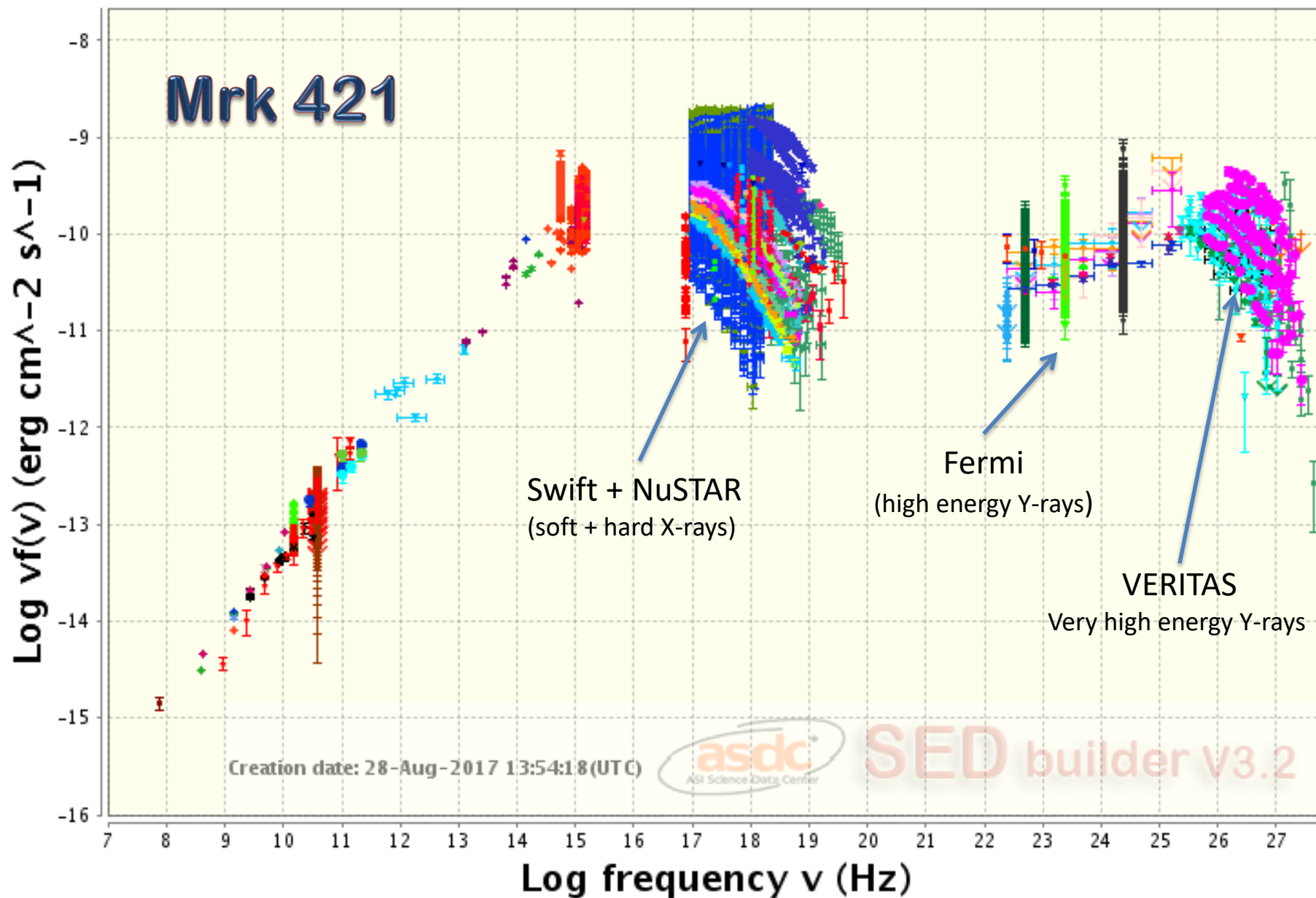


June 2017

16

Open UNiverse : space science data for everyone







United Nations / Italy Workshop on the Open Universe Initiative

VIENNA, AUSTRIA, 20-22 NOVEMBER 2017

Organized by the United Nations Office for Outer Space Affairs and
The Italian Space Agency, on behalf of the Government of Italy
Hosted by the United Nations Office for Outer Space Affairs and