

The Open UNiverse initiative

Paolo Giommi
Italian Space Agency

Open UNiverse, an Italian initiative

“Open Universe” is an initiative under the auspices of COPUOS and coordinated by UNOOSA with the objective of stimulating a great increase in the visibility, free accessibility and ease of utilization of space science data, and in particular astronomical data, 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 59th session where the initiative was welcomed and included among the activities to be carried out in preparation of UNISPACE+50, in line with the thematic priority “Capacity Building”.

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. Main principles - 1



Space science data generated through public funding should be considered a public good and eventually should 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**
- Achieve equal opportunity in the access to scientific information.**

Open UNiverse. Main principles - 2



As the availability of scientific data grows exponentially research activities are increasingly becoming data intensive, multi-frequency and multi-messenger

The production of knowledge from the available data depends on the simple accessibility and integration of widely different datasets.

Open UNiverse. Main principles - 2



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Lowering the barriers to the use of space science and astronomy data is a way to achieve more transparency in what is produced with public money and a great opportunity to accomplish equal opportunity in the scientific sector and share the benefits with the developing Countries:

Open UNiverse. Main principles - 2

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Lowering the barriers to the use of space science and astronomy data is a way to achieve more transparency in what is produced with public money and a great opportunity to accomplish equal opportunity in the scientific sector and share the benefits with the developing Countries:

A significant contribution to the achievement of the UN Sustainable Development Goals.



Open UNiverse

Main events :

- 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](http://www.unoosa.org/oosa/oosadoc/data/documents/2018/aac.105/aac.1051175_0.html)
- 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
 - ✓ www.unoosa.org/oosa/oosadoc/data/documents/2018/aac.105/aac.1051175_0.html

Open Universe Expert Meeting

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

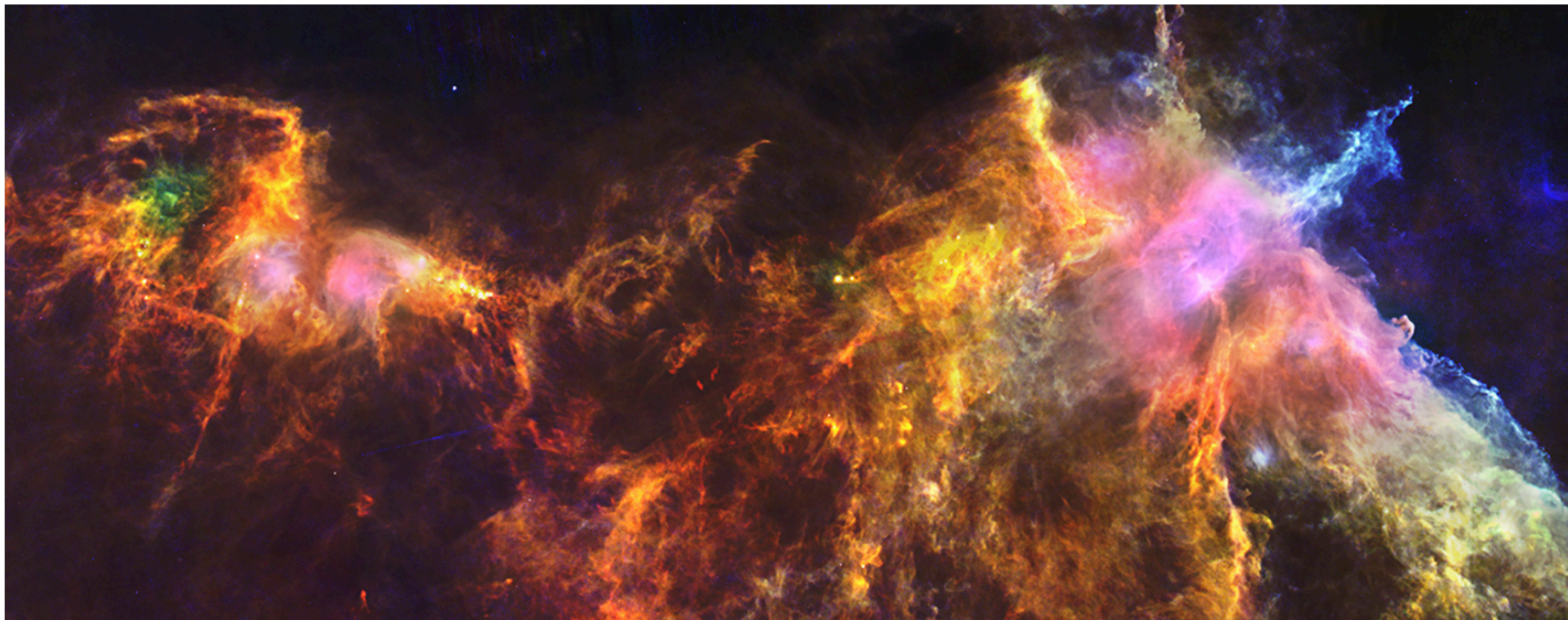
Expert Meeting Programme PDF



[reset video]

Meeting presentations

The Open Universe Initiative	P. Giommi - ASI	PDF	
Inexorable Logic of the Open Universe	A. Pollock - University of Sheffield	PDF	
Welcome to the Open Universe			



United Nations / Italy Workshop on the Open Universe Initiative

VIENNA, AUSTRIA, 20-22 NOVEMBER 2017



General Assembly

Distr.: General
7 December 2017

Original: English

Committee on the Peaceful Uses of Outer Space

Report on the United Nations/Italy Workshop on the Open Universe initiative

(Vienna, 20–22 November 2017)

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

Open UNiverse

An ASI Web portal prototype

A prototype of a Open Universe web portal has been 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 and facilitates access to data and information.

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

V1.1 of the portal is available at
<http://openuniverse.asi.it>



Astronomy



Planetary Science



Cosmic rays



Atmospheric Physics

Version 1.1

Enter object name or coordinates:

e.g. 3C279 or 194.04625, -5.789167 or 12 56 11.1, -05 47 21.0

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Reset



Open Universe

is an initiative under the auspices of COPUOS/UNOOSA for expanding availability of and accessibility to

open space science data in the fields of

Astronomy-Cosmology
Planetary Science
Cosmic Rays
Atmospheric physics - TGF

Links to Open Universe documents

- [Technical Presentation, 12 June 2017, COPUOS 60th session, Vienna, Austria](#)
- [Report on the Open Universe Expert Meeting](#)
- [Open Universe Expert Meeting, 11-12 April 2017, ASI-HQ, Rome, Italy](#)
- [Technical Presentation, 10 June 2016, COPUOS 59th session, Vienna, Austria](#)
- [A/AC.105/2016/CRP.6, COPUOS 59th session, 8-17 June 2016, Vienna, Austria](#)
- [Report on the United Nations/Italy Workshop on the Open Universe initiative](#)



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Open UNiverse for astronomy

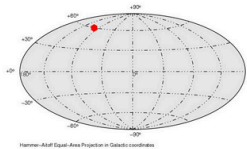


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Open Universe @ ASI Space Astronomy » Ground Astronomy » Planetary Science » ISS » VO and General services » Bibliographic services » Cosmic Rays » Astronomical tools » Image galleries » Other Initiatives »
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Help



Source Name(s) : **M101**
R.A.(J2000) = **14 03 12.0 (210.8 deg)**
Dec.(J2000) = **+54 21 00.0 (54.35 deg)**

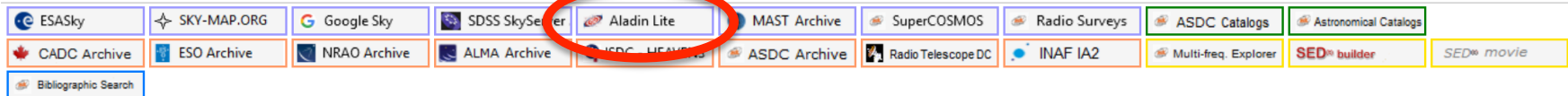
Prototype v.1.0

Object name or coordinates: M101 (ASDC)

M101

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Portal Simbad VizieR **Aladin** X-Match Other ▾ Help



Aladin Lite

Target:

210.8 54.35

Surveys:

Fermi

GALEXGR6/AIS

DSS2

DSS2/red

DSS2/blue

SDSS9

Mellinger

J2000 14 03 12.000 +54 21 00.0



Pisa, 15 Mar 2018

Fermi-LAT collaboration meeting

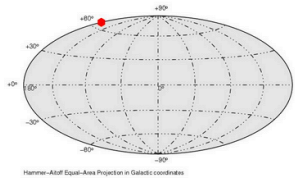
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Open Universe space science data for everyone

Open UNiverse for astronomy



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Source Name(s) : **MKN421**

R.A.(J2000) = **11 04 27.34 (166.11392 deg)**

Dec.(J2000) = **+38 12 32.4 (38.209 deg)**

Prototype v.1.0

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MKN421

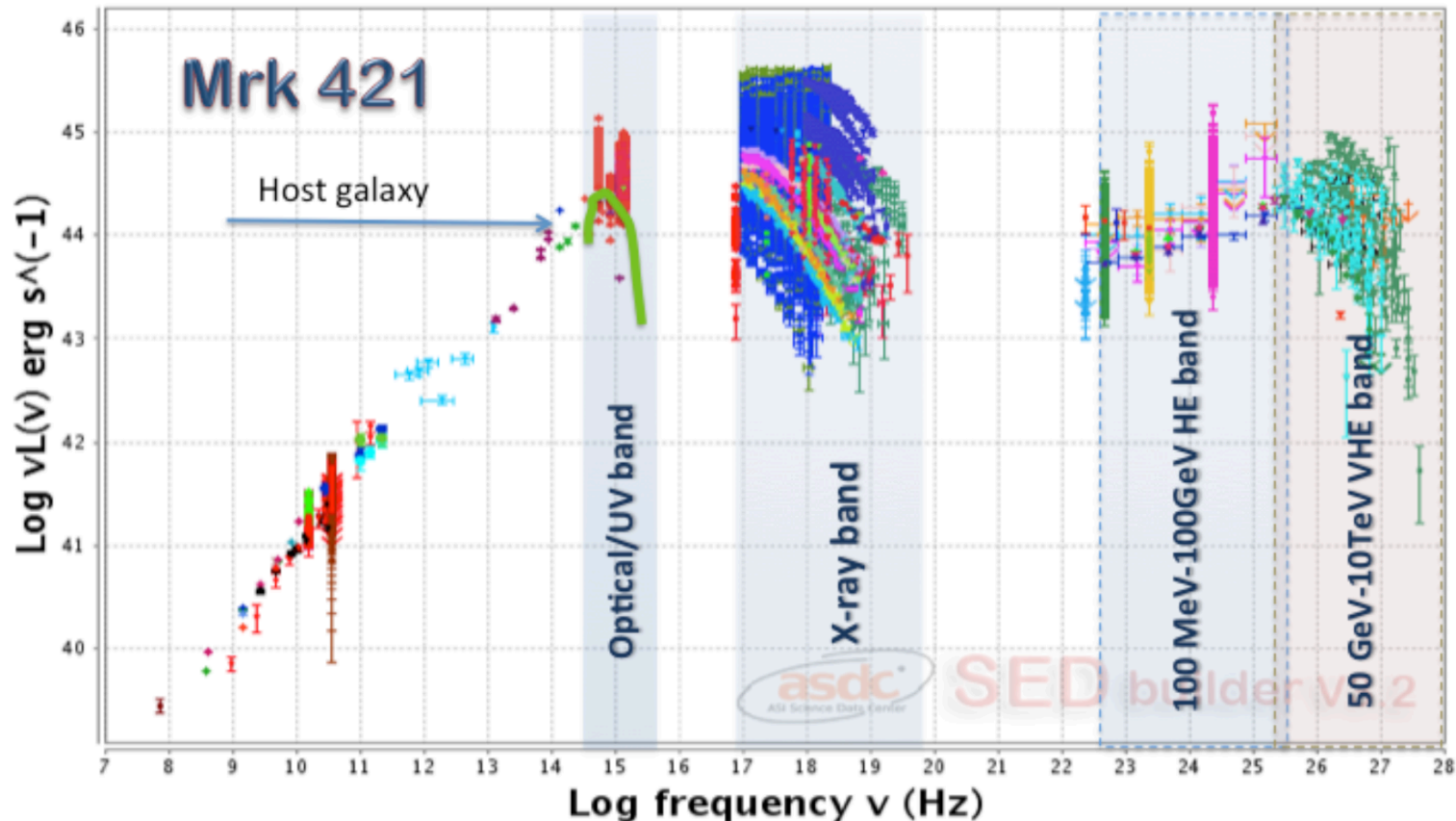
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Data intensive tools

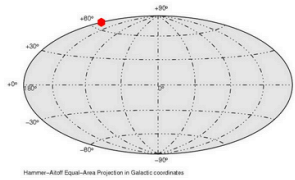
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CADC Archive	ESO Archive	NRAO Archive	ALMA Archive	ISDC - HEAVENS	ASDC Archive	Radio Telescope DC	INAF IA2		
Multi-freq. Explorer	SED[®] builder	SED[®] movie	Bibliographic Search						



Open UNiverse for astronomy



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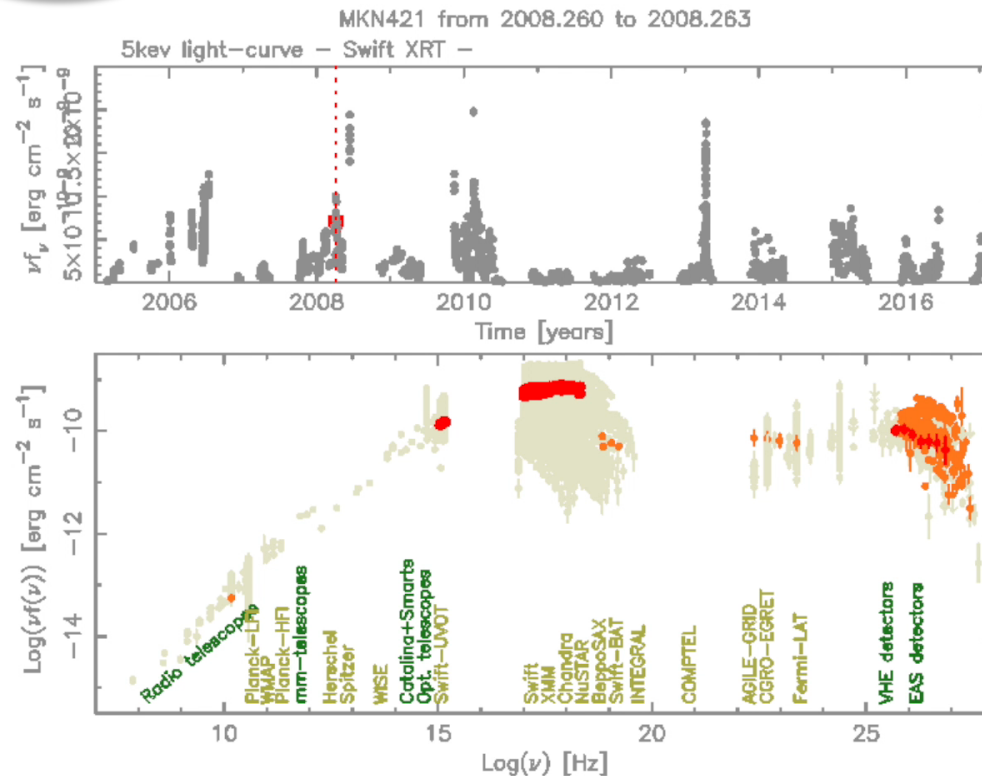
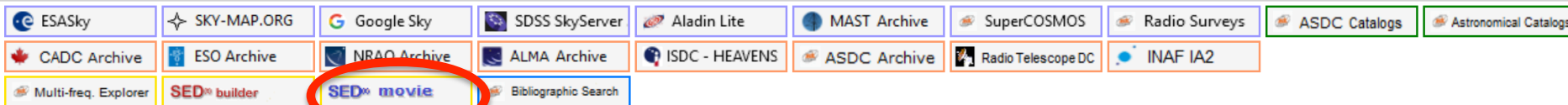
MKN421

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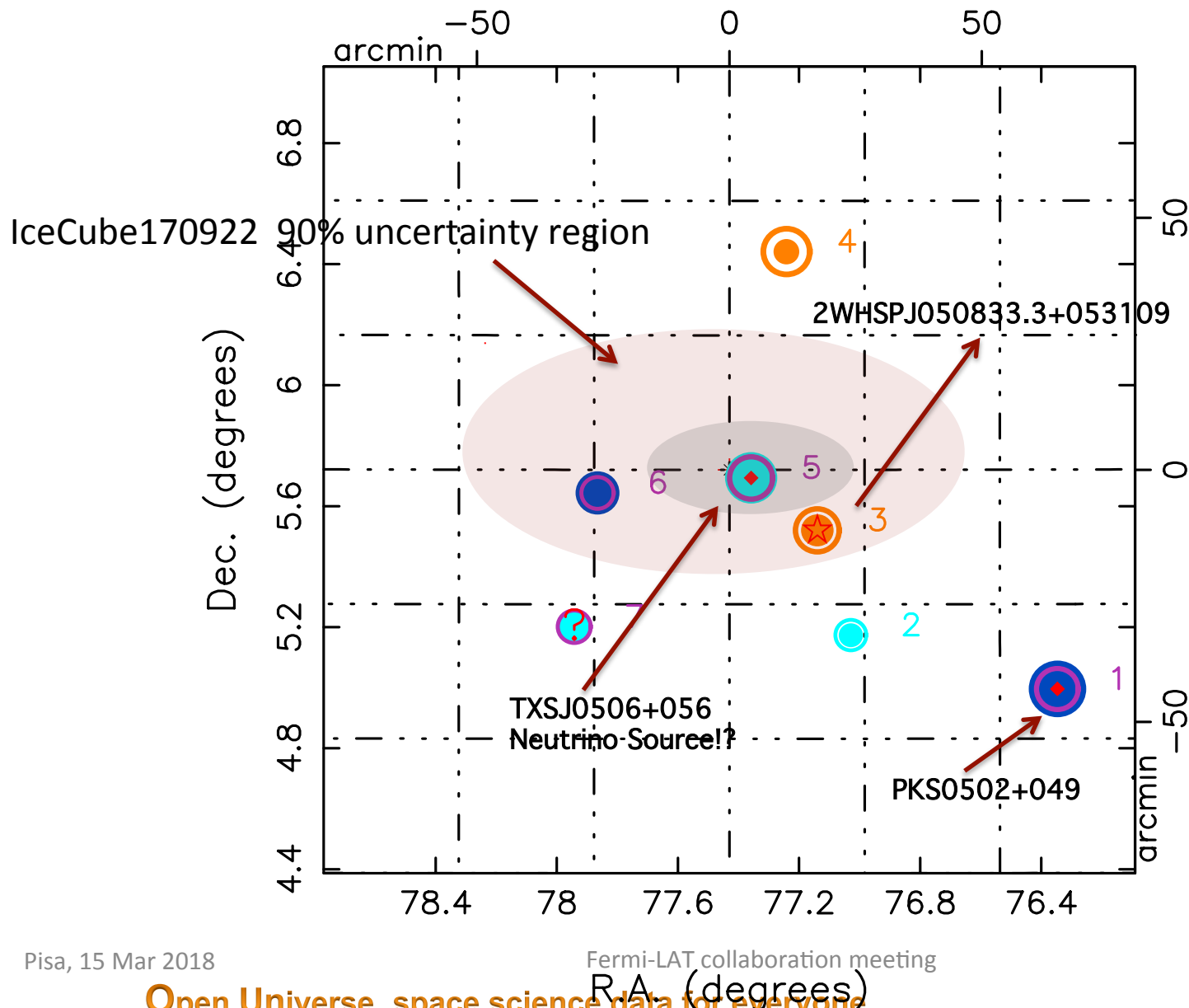
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Data intensive tools



Open UNiverse



VOU-BLAZAR
Open UNiverse

Open UNiverse

Image centre R.A.=14 20 22.9 Dec.=+06 12 9.7

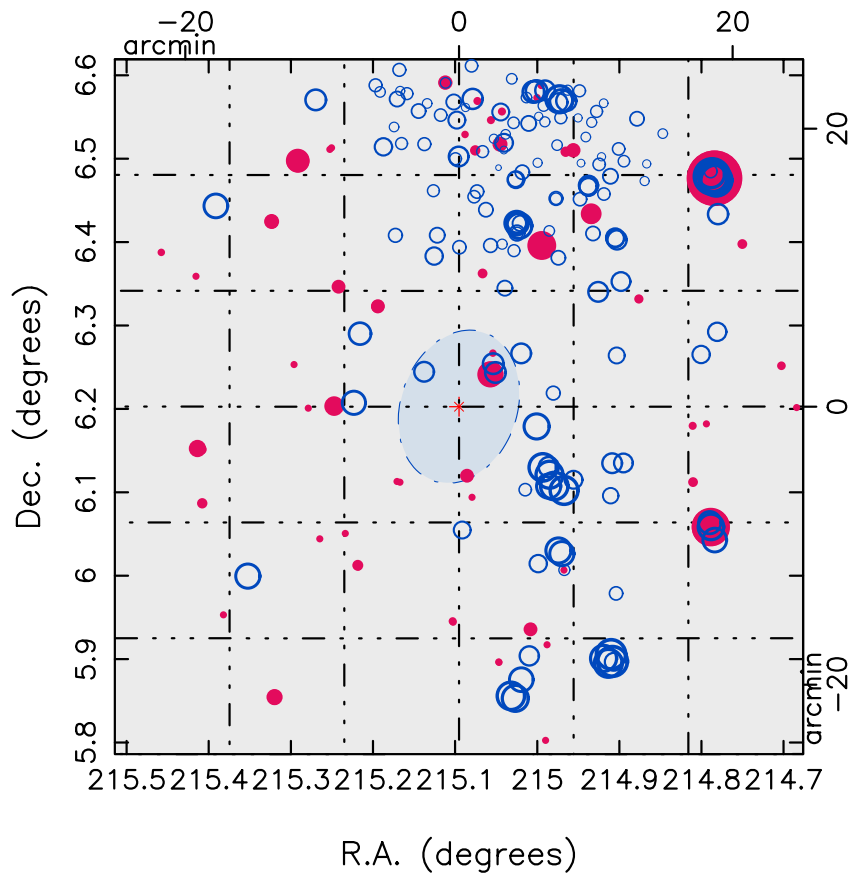
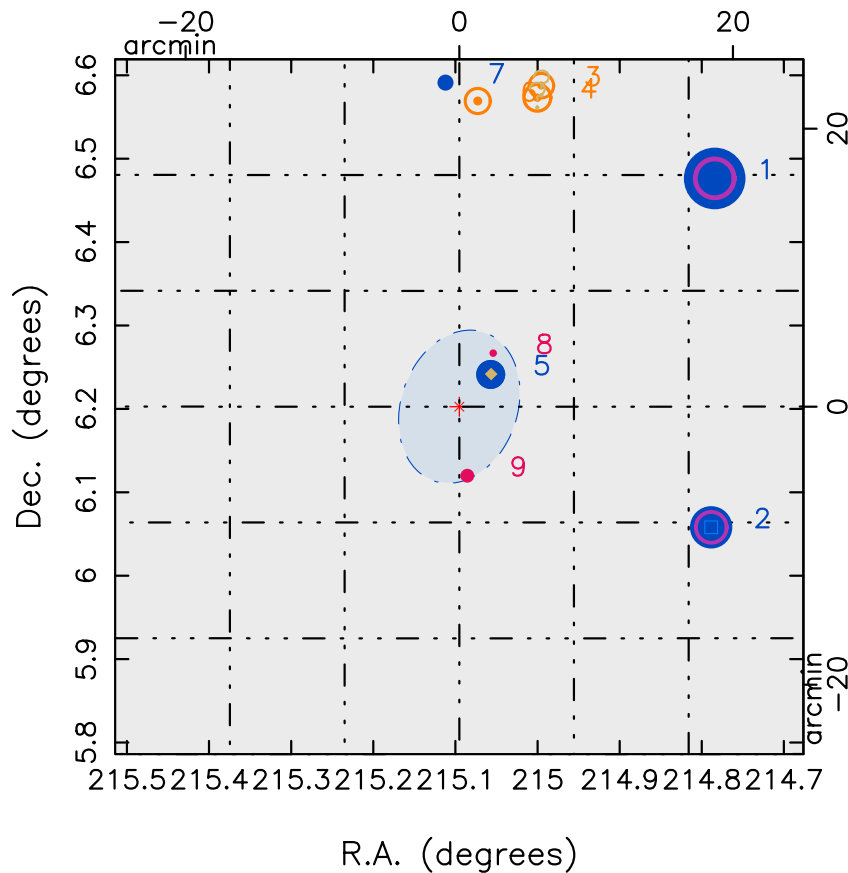


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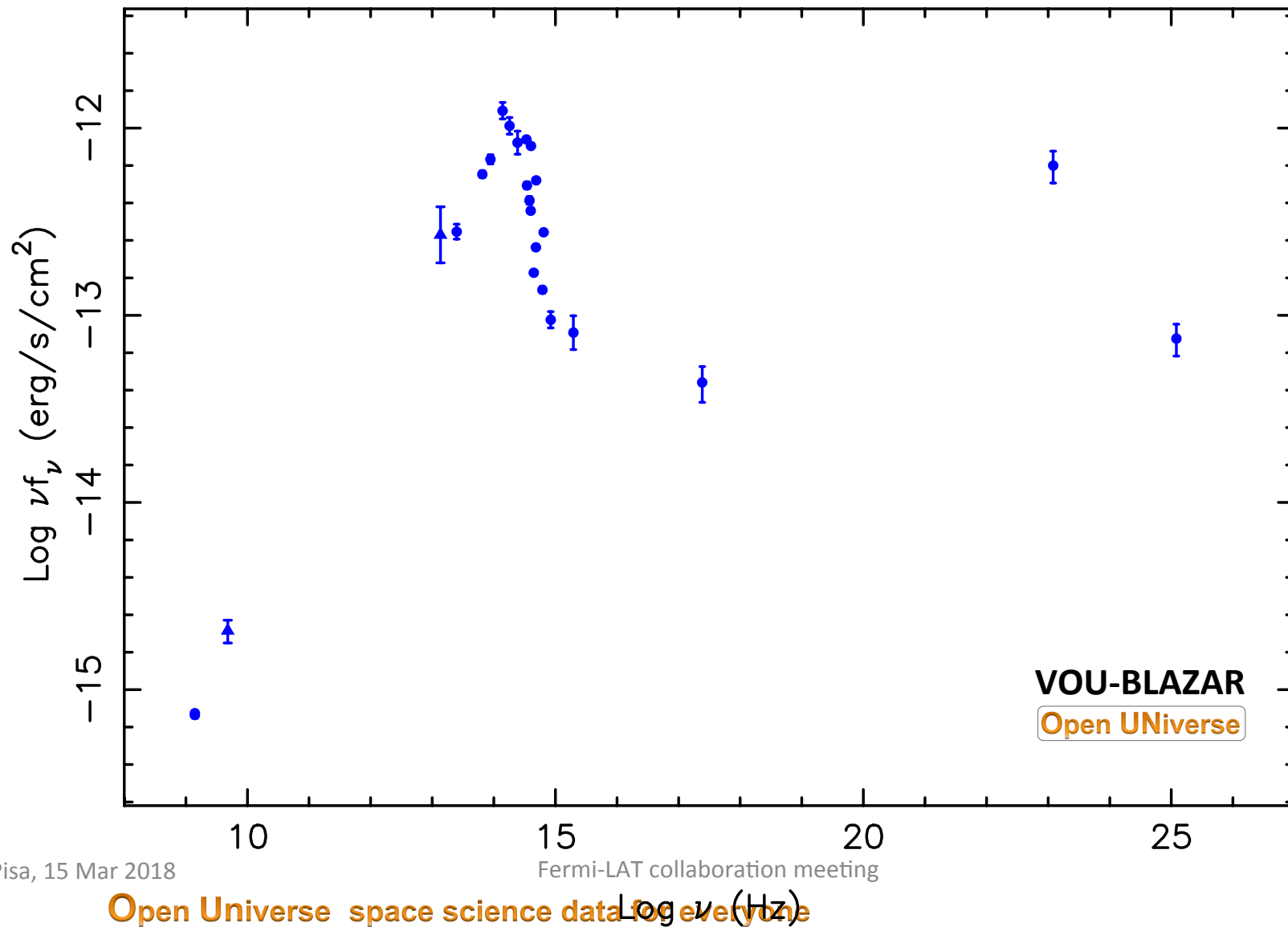


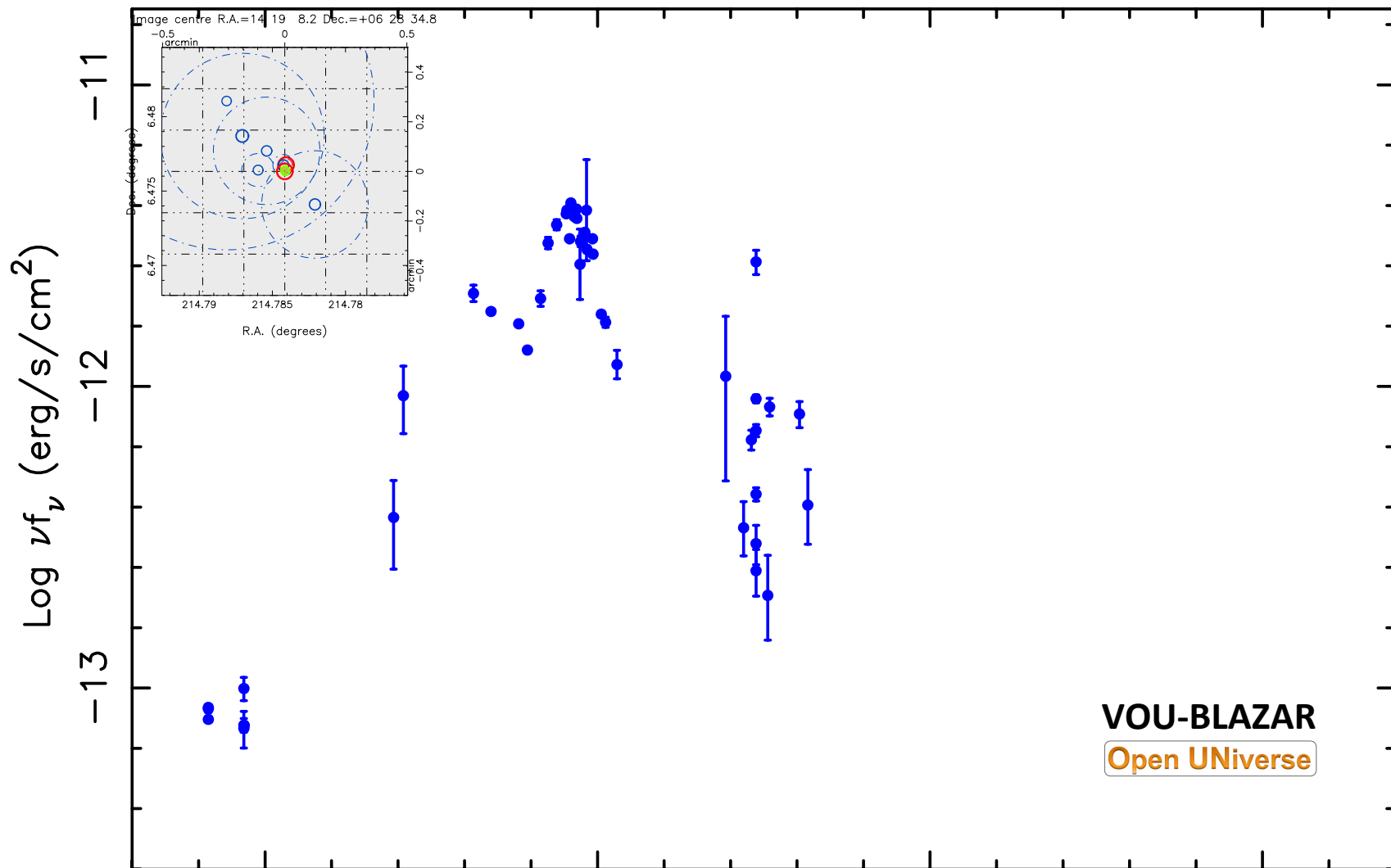
VOU-BLAZAR

Open UNiverse

Open UNiverse

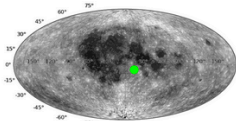
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Open UNiverse for planetary science

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

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MATISSE

Google Moon

KAGUYA 3D GIS

Moon Trek



Apollo16LM-11Orion

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Pisa, 15 Mar 2018

Fermi-LAT collaboration meeting

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Open Universe space science data for everyone



One video a month. Quality > Quantity

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Sustainable Costs

- Minor modification of agencies cost-to-completion models
- Avoid duplication of efforts
- Collaboration and coordination among data centres
- Full use of existing infrastructure and data services (e.g. IVOA standards)
- Innovative tools (e.g. openuniverse.asi.it)
- New paradigms (e.g. distributed analysis?)
- New technologies

2016 – proposal year.

2017 – discussions/meetings/workshop -> recommendations

2018 – towards implementation:

The list of activities to be carried out in the coming months based on the outcome and the recommendations of the November 2017 workshop, together with a detailed implementation plan, are being finalized.