

# Open Universe

**Space science data: open, transparent, for everyone**

A progress report

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# 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.

# SDGs: the relevance of space technology



SUSTAINABLE DEVELOPMENT GOALS

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SUSTAINABLE DEVELOPMENT GOALS

# Open Universe

## Space science data: open, transparent, for everyone

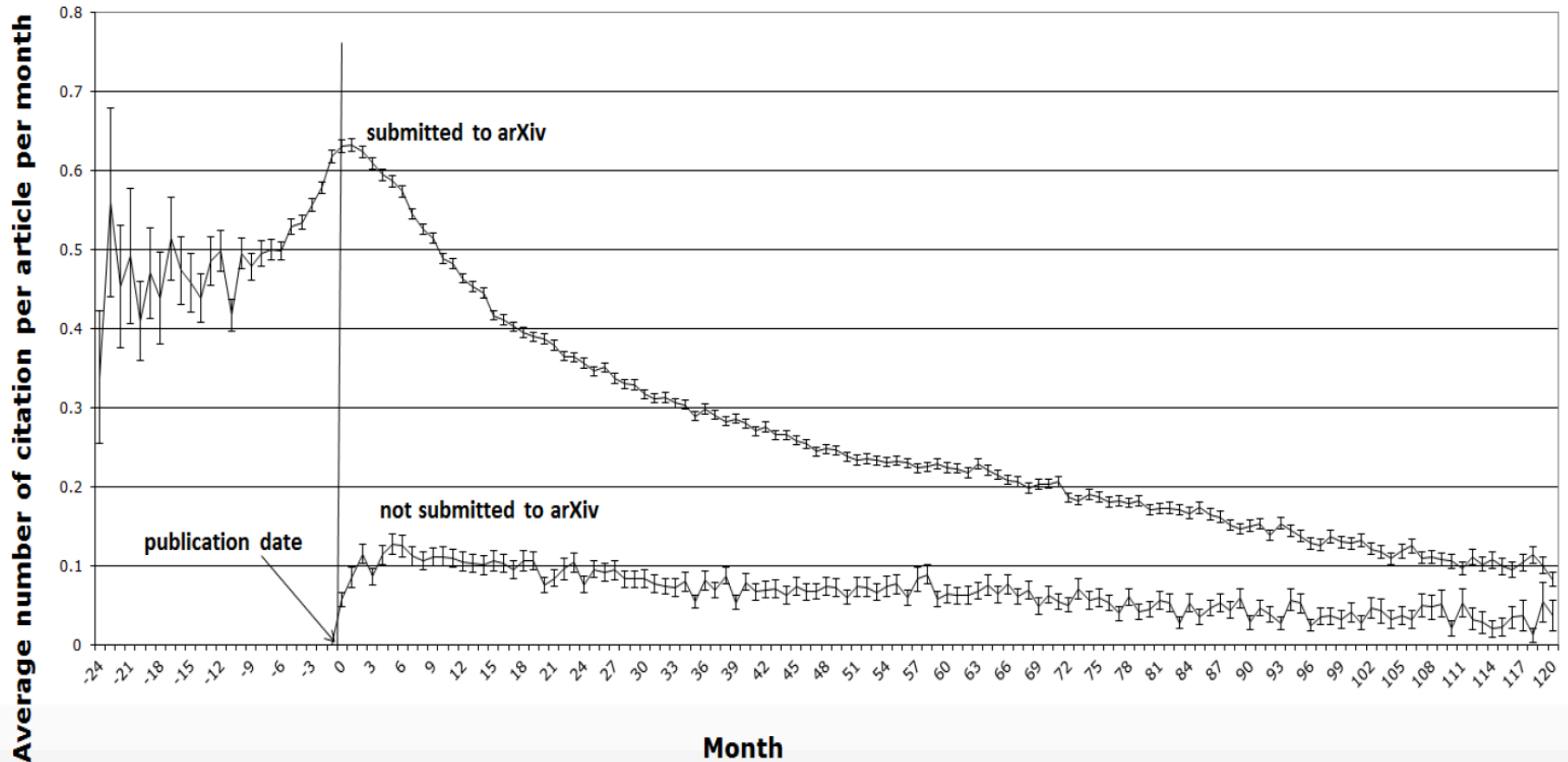
**Space science data produced with public money is valuable. It should be considered as a public good and preserved as such.**

**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 and for democratising access to scientific information.**

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



# Space science data: open, transparent, for everyone

## Components of transparency of space science data

\*preliminary and under discussion\*

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

# 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.



# Open Universe Initiative: legal aspects

Vienna 30 March 2017

Chaired by S. di Pippo, director of (UNOOSA).

Focussed on the legal aspects of freedom of access to scientific data.

It was recognized that the principle of free access to space data is already rooted in the Outer Space Treaty and that various legal instruments and guidelines, including national and international legislations, recognize access to space data.



## 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](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, CADAC, 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

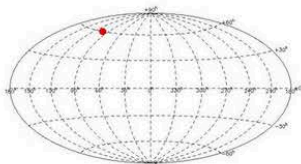
# An ASI Open Universe web portal prototype

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](http://openuniverse.asi.it) and will be presented at the November 2017 workshop on Open Universe



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

Surveys:

Fermi

GALEXGR6/AIS

DSS2

DSS2/red

DSS2/blue

SDSS9

Mellinger

2MASS

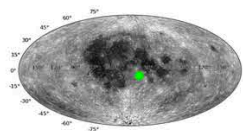
allWISE

J2000



FoV: 29.97'





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

Prototype v.0.8.6

[Login](#)

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

[Reset](#)



[Google Moon](#) [DARTS KAGUYA 3D GIS](#) [Moon Trek](#)



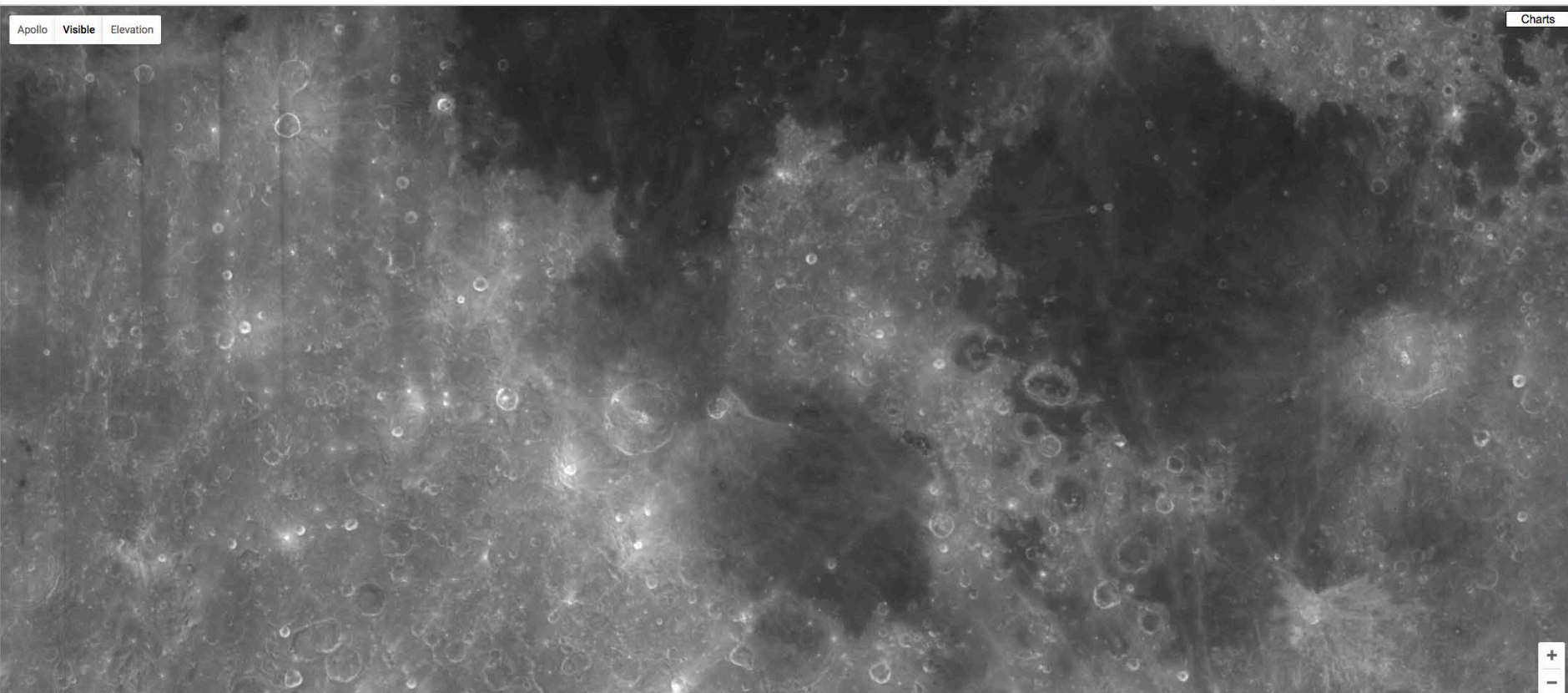
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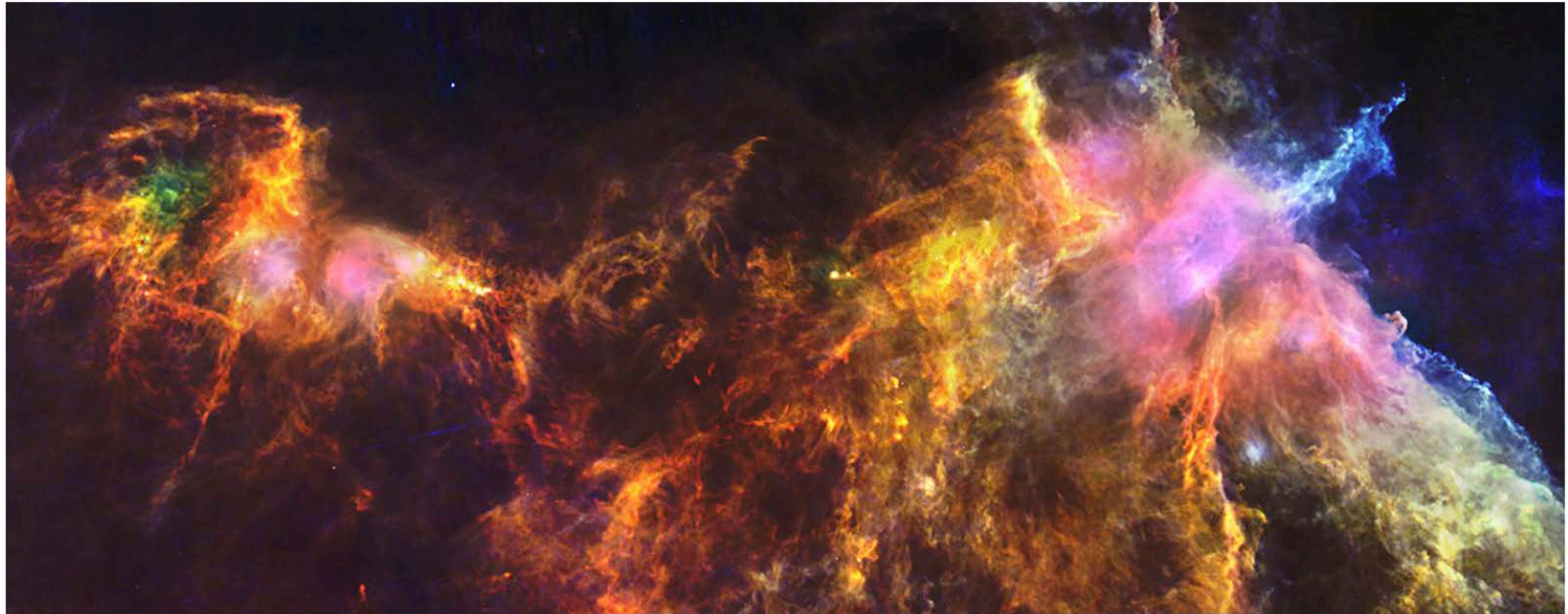
[Link this view](#)

[View Moon with Google Earth](#) [About](#)

[Apollo](#) [Visible](#) [Elevation](#)

[Charts](#)





## 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

An Invitation Circular has been distributed in the pigeonholes of all delegation with the invitation to participate to the

Briefing that the Director of the Office for Outer Space Affairs will hold on the Open Universe Initiative

**13 June 2017 at 13:00 in room C0713/15 on the margins of this Session of the Committee.**