Status of the Open UNiverse initiative

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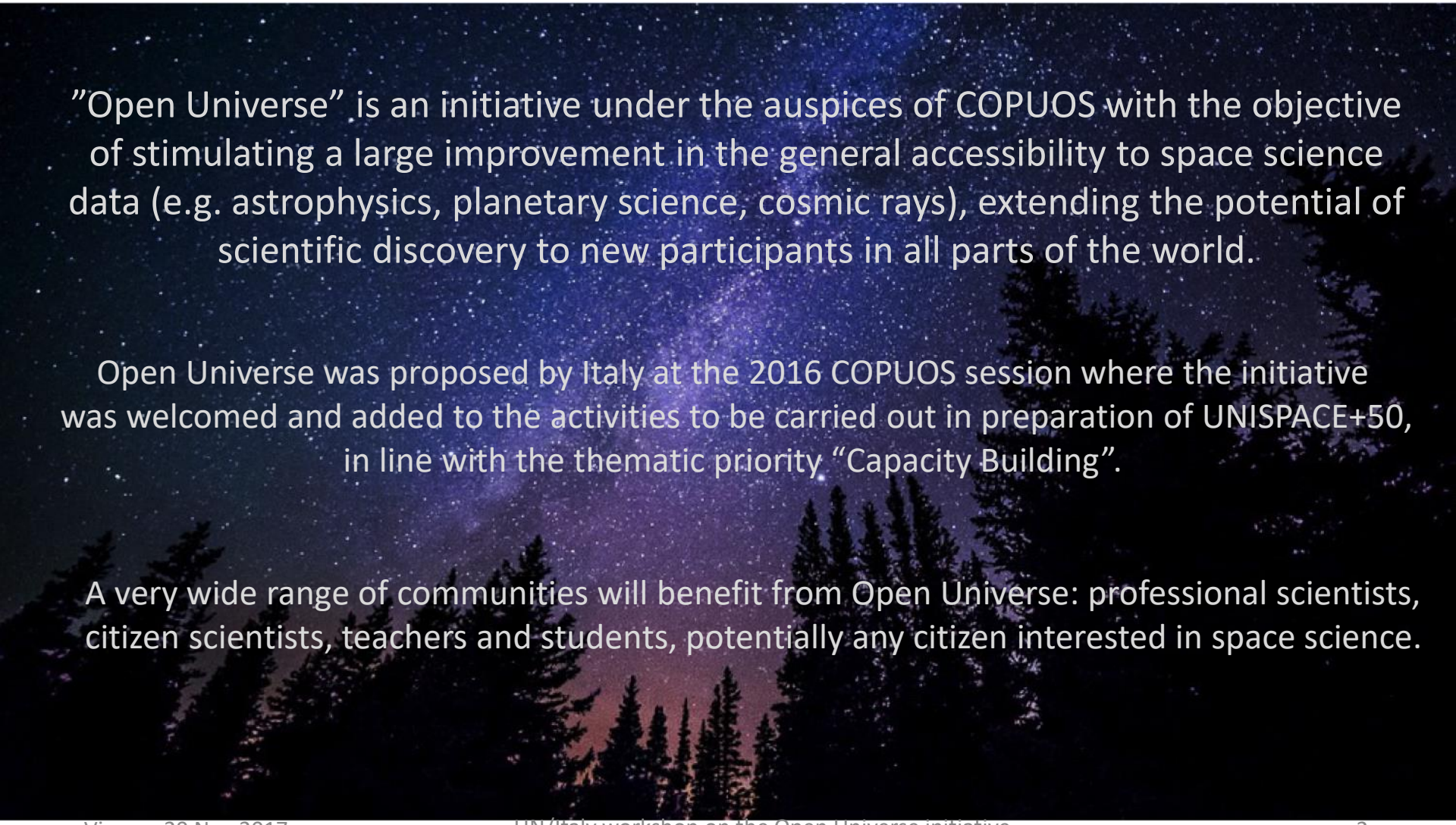
Open UNiverse, an Italian initiative



”Open Universe” is an initiative under the auspices of COPUOS with the objective of stimulating a large improvement in the general accessibility to 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 the initiative was welcomed and added to 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 is expensive (~15 Billion €/year) and extremely valuable

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**
- **Democratising access to scientific information.**

Open UNiverse. Main principles - 2

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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.

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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 increase the level of democracy and equal opportunity in the scientific sector and share the benefits with the developing Countries:

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

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.

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

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

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 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.

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V1.0 of the portal is available at

http://openuniverse.asi.it

A demo of the software will be given this afternoon

Open UNiverse for astronomy

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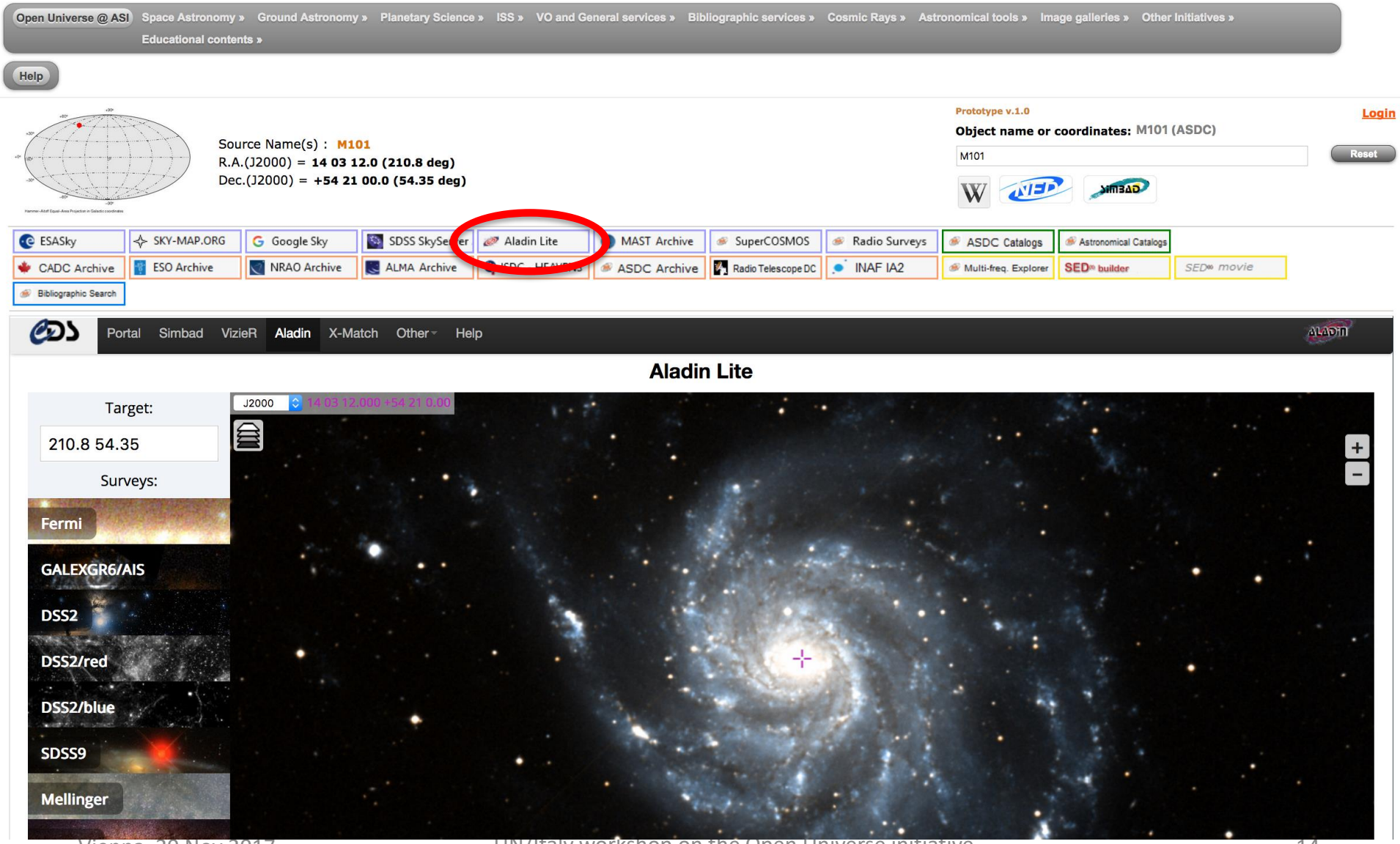

Open Universe space science data for everyone

Open UNiverse for astronomy

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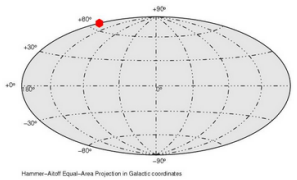

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R.A.(J2000) = **11 04 27.34 (166.11392 deg)**
Dec.(J2000) = **+38 12 32.4 (38.209 deg)**

Prototype v.1.0 Login

Object name or coordinates: MKN421 (ASDC)

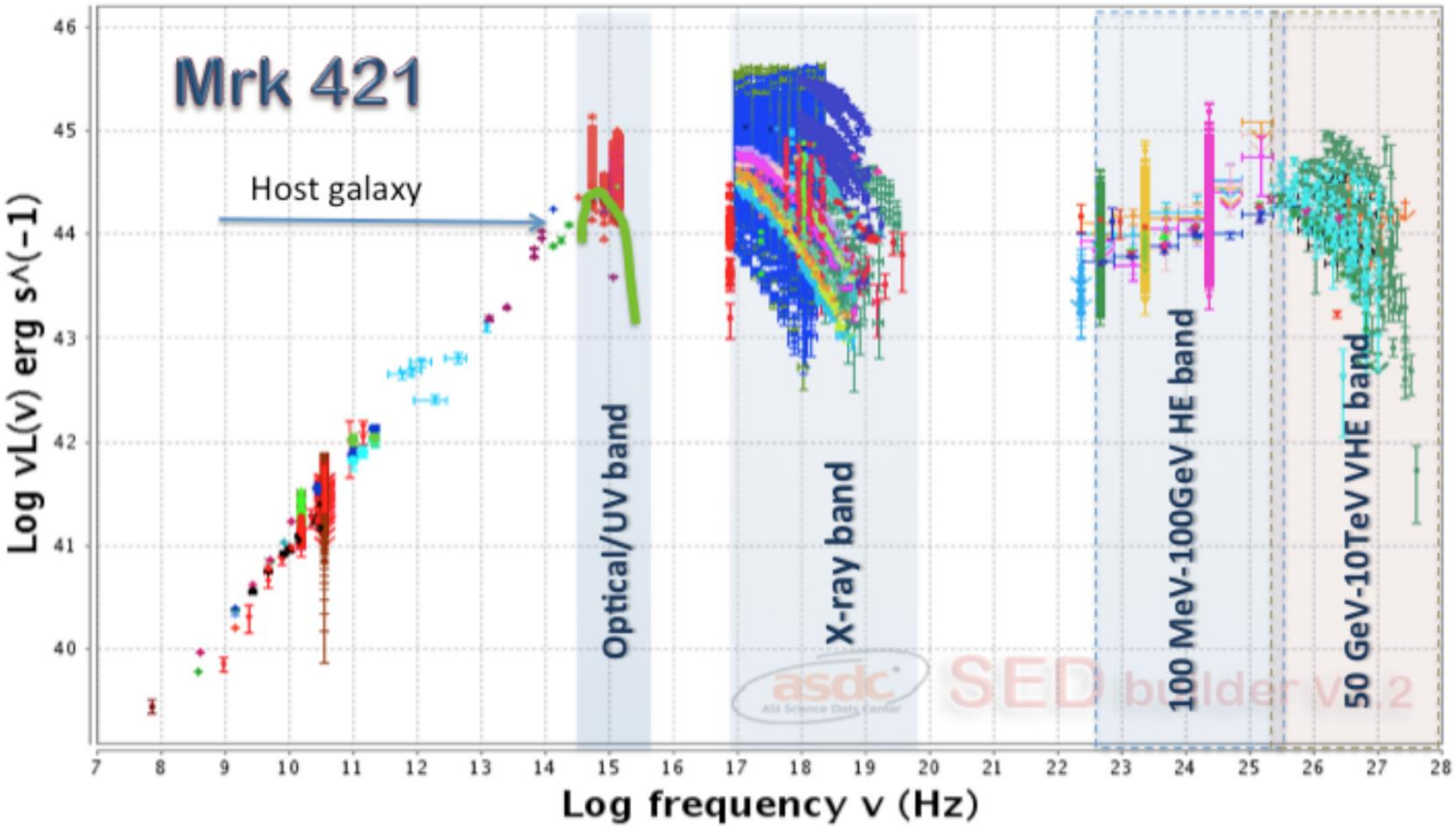
MKN421 Reset

Data intensive tools

ESASky | SKY-MAP.ORG | Google Sky | SDSS SkyServer | Aladin Lite | MAST Archive | SuperCOSMOS | Radio Surveys | ASDC Catalogs | Astronomical Catalogs

CADC Archive | NRAO Archive | ALMA Archive | ISDC - HEAVENS | ASDC Archive | Radio Telescope DC | INAF IA2

Multi-freq. Explorer | SED builder | SED movie | Bibliographic Search



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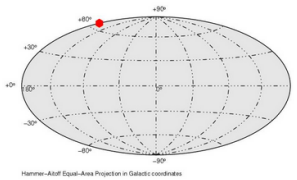

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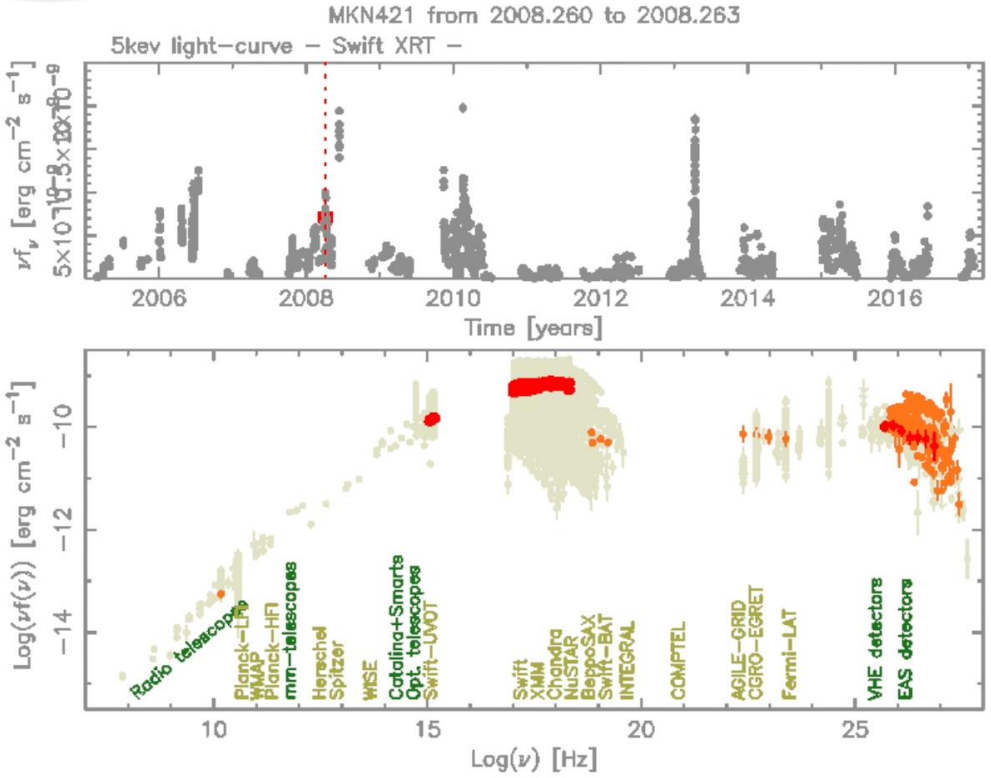
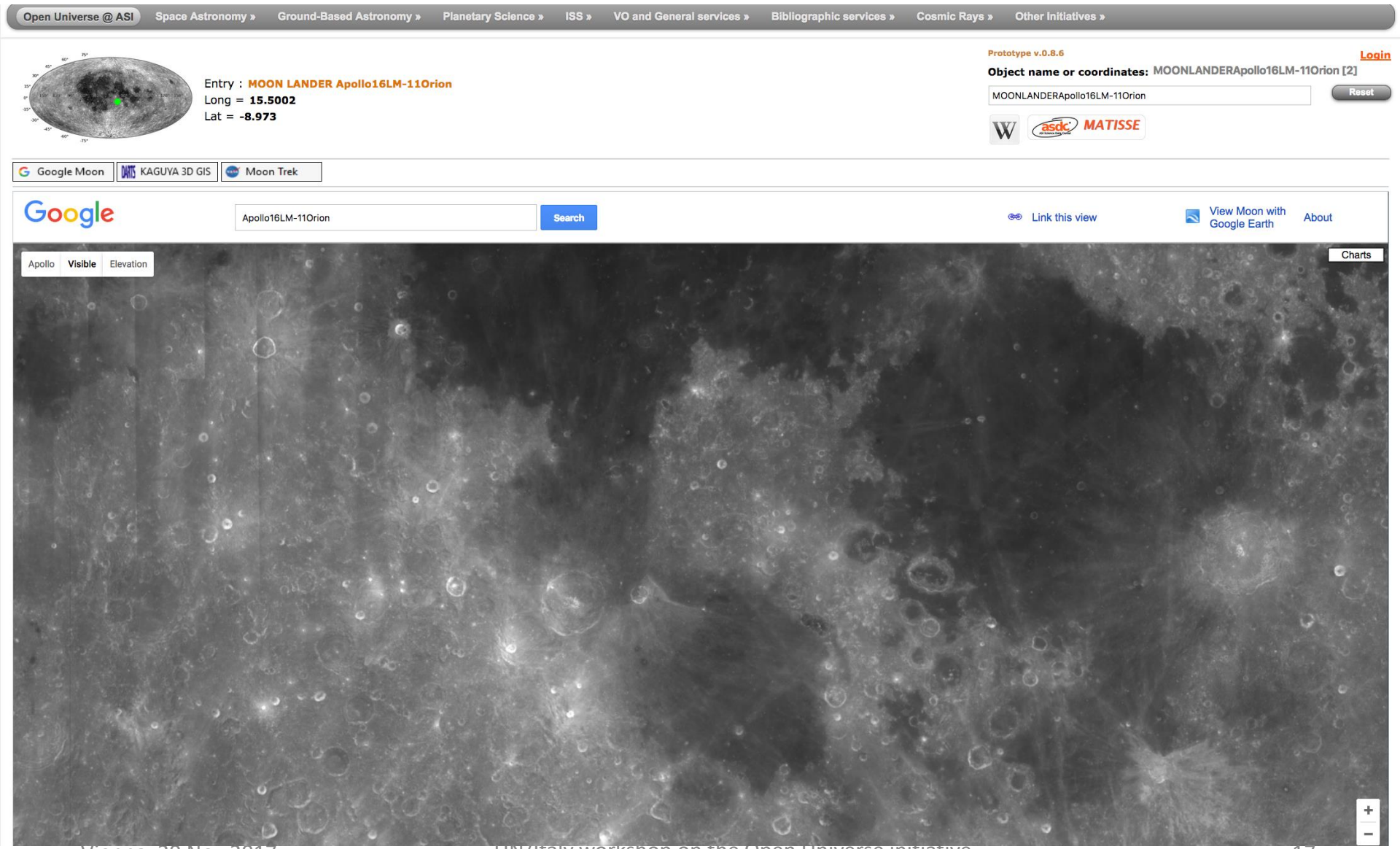


Open Universe space science data for everyone

Open UNiverse for planetary science



Open Universe space science data for everyone

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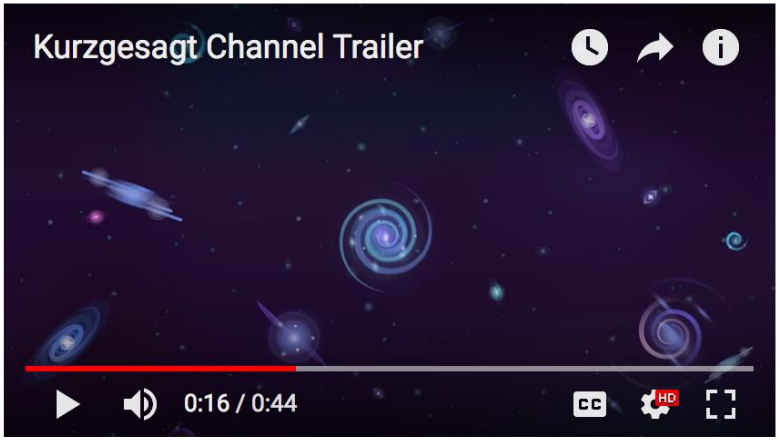

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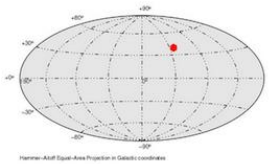

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Gravitational Wave Source in NGC 4993

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