UN/Italy Workshop on the Open Universe Initiative

Plan of Action

Vienna, Austria 20-22 November

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UNITED NATIONS
Office for Outer Space Affairs

GMT+01	Mon 20/11	Tue 21/11	Wed 22/11
9am	9 – 10 High Level Opening Remarks and Keynote	9:10 – 11 SESSION3	9:30 – 10:50 SESSION 5
10am	10:10 – 12:30p SESSION 1		
11am		11:25 – 12:45p SESSION 4	11:20 – 12:30p DISCUSSION: PLAN OF ACTION
12pm			
1pm			
1:30p – 3:35p SESSION 2	1:45p – 2:50p SPLINTER DISCUSSIONS	1:30p – 3:30p ROUNDTABLE	
2pm			
3pm	2:50p – 3:50p POSTER LIGHTNING ROUND / SESSION	3:30p - Closing Remarks	
4pm	4p – 6p SOFTWARE DEMOS	3:50p – 4:50p DISCUSSION OUTCOMES	
5pm		4:50p – 5:40p OPEN FLOOR	
6pm	6p – 7:45p Reception		
7pm			
8pm		8:10p – 9:10p Planetarium show	
9pm			

Splinter discussion groups

INCREASE TRANSPARENCY of already accessible resources: including promoting FAIR (Findable, Accessible, Interoperable, Reusable) guiding principles, promoting the adoption of widely-used standards, processing from raw data to web-ready products, developing enhanced data-mining and integration solutions, 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, including legacy data, developing enhanced data-mining and integration solutions, 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, planetariums, amateur scientists or other potential end-users; and by promoting STEM education, particularly among women and youth in developing countries.

Series of actions and roadmap

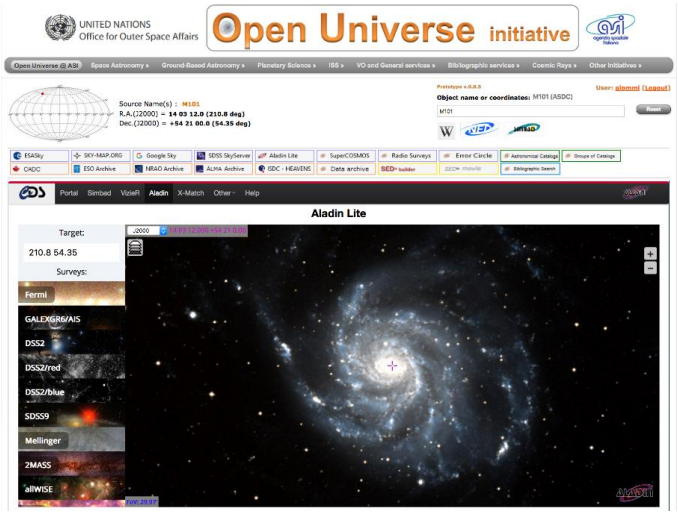
- Identify partners
- Propose projects
- Request support

Other Supporting/Background Activities

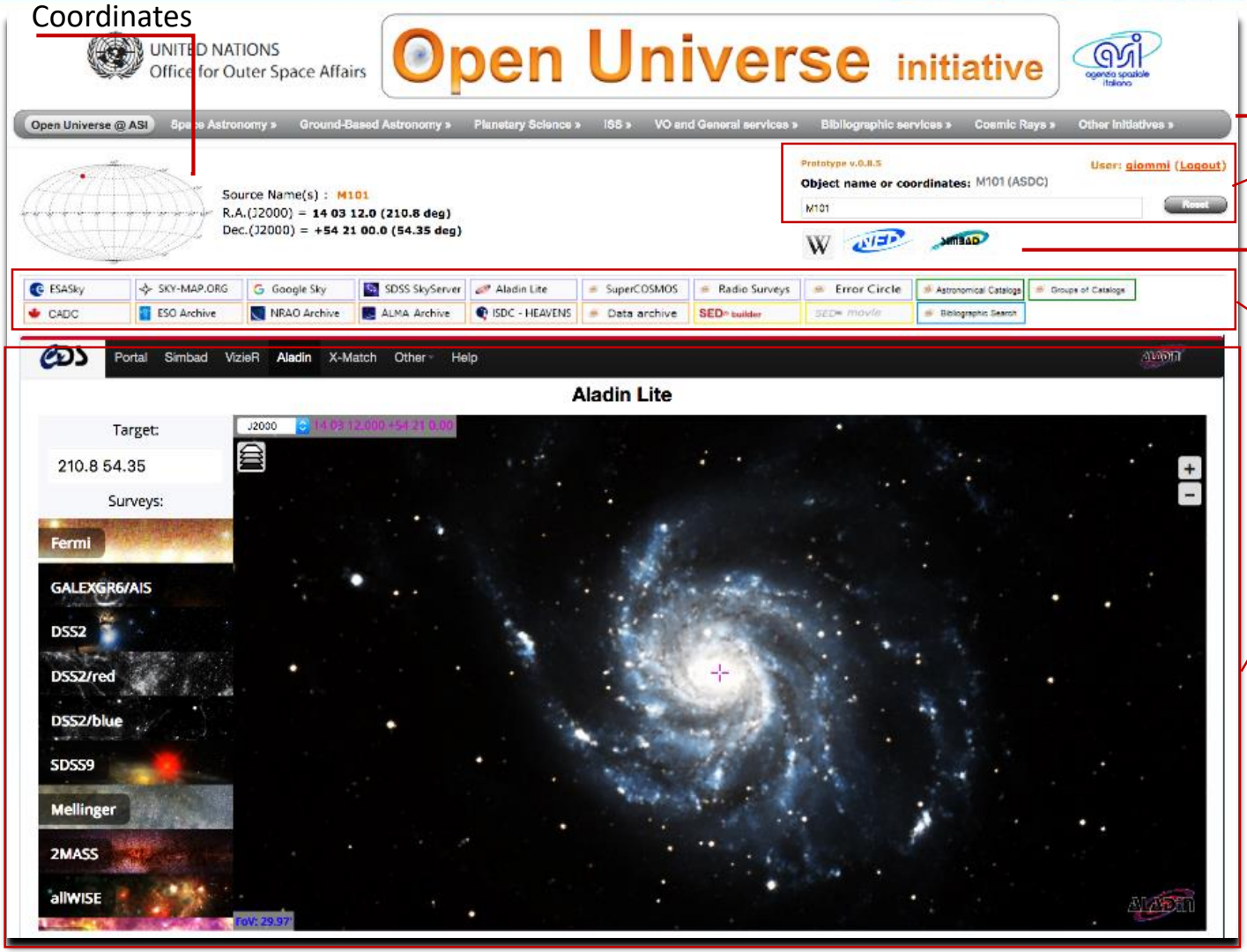
- Former work of the office under Basic Space Science Initiative
- UNOOSA's space weather activities, IHY2007, ISWI, including work of the Expert group on Space Weather of STSC
- Regional Centres for Space Science and Technology Education, with curricula and courses among other on atmospheric and space science
- Organizations that have developed a set of standards widely used in space science, (e.g., IVOA, IPDA, IAU FITS Working Group, NASA's PDS or VSO, among others, or the more recent Research Data Alliance efforts for inter-disciplinary standards).
- External partners such as the IAU Office of Astronomy for Development, with a regional nodes network distributed across the world
- UNOOSA and other organization efforts in the promotion of STEM, particularly among the youth, among women, and in developing countries

1. One-stop-shop to the Universe

- Links the major on-line space science open data services and providers
- Allows for a cross-platform and cross-service search for astronomy objects or coordinates
- Interfaces (or links) to third-party platforms providing imagery, interactive services, processed products and data, raw data and eventually legacy data



Data providers, data centres, and other service providers can submit requests to appear, be excluded, or their type of access be modified from the portal. They are also encouraged to submit a one-pager primer on how to access their services, or a link to the tutorial page if it already exists. Links to the various organizations developing and maintaining standards are also included.



Links to various providers

(name or coordinates)

Search Box

(name or coordinates)

Other results

(Wikipedia…)

Results

(click buttons, colour coded)

Selected result

(embedded, original portal presented AS IS, internal menus and options clickable, no processing of data or any way of making it uniform)

Possible tutorials?

Location not fixed yet
(link to tutorial page, or video tutorial, or downloadable PDF…)

1. One-stop-shop to the Universe

Target audience

- the **research community** as providers but as well as users, fostering cooperation and data sharing among various entities.
- **potential data providers** that want to make their data or products available and share with the community
- **scientists from other disciplines** that want to access astronomy and space science data for the first time, for curiosity or for potential research in the hinges of two disciplines
- the **wider user-base** including citizen scientists and developers of citizen science applications, educators and students, providing an easier access to data for use or to include in their applications or courses

One-stop-shop to the universe

Main Partner(s)	ASI + …
UNOOSA role	Host and maintenance of the platform, requirements definition
Schedule	Additional development: 6 months. Maintenance: initially 2 years
UNOOSA Staff	One dedicated consultant / JPO / NRL for 2 years initially
Additional UN costs	Server and IT costs TBD

All figures are preliminary

2. Data Utilisation Hands-on Workshops

- Some of the data archives and services available require a dedicated training, even for experienced researchers.
- COSPAR and UNOOSA propose the organization of trainings on space science data archives accessibility and exploitation
- Yearly frequency and ideally associated to or organized on the margins of existing conferences and meetings, such as the COSPAR General Assemblies
- Possibly recorded as video-tutorial and offered online through Project 1

PILOT PROPOSAL: two-day hands-on workshop on Cassini or Rosetta data utilization associated with the fifty-second COSPAR General Assembly to be held in Pasadena, United States of America, on 14-22 July, 2018

A number of applicants from both developed and developing countries would be invited to attend.

2. Data Utilisation Hands-on Workshops

Target audience

- the **research community**, both from developed and developing countries by providing specialized training
- **university level educators and students** that may want to incorporate it in their courses, or that want to specialize in these domains

Data Utilization Hands-On Workshops	
Main Partner(s)	COSPAR + 1 data centre/agency per year
UNOOSA role	Co-organization of meeting, sponsoring participants
Schedule	Yearly event. Tentatively 2-day workshop
UNOOSA Staff	One to two person-months of work of a UNOOSA staff
Additional UN costs	$30-50k for sponsoring participants

Part of UNOOSA's regular activities?

3. UNISON Telescopes

The project would contribute to UNOOSA activities by:

- Donating small telescopes and other necessary hardware to appropriate academic and research institutions in developing countries and assisting with establishing telescope facilities there;
- Providing necessary training for specialists from developing countries;

ISON would fund the projects and possibly provide manpower and assistance

Target audience

- the **research community**, both from developed and developing countries by providing access to hardware and specialized training
- **Experts, university researchers in the fields covered,** and users of ISON by expanding the network and increasing the amount of data

UNISON Telescopes	
Main Partner(s)	ISON network (KIAM RAS)
UNOOSA role	Administrative tasks, calls for proposals
Schedule	To be discussed
UNOOSA Staff	One man month per year of UNOOSA staff
Additional UN costs	In principle assumed by ISON

4. Observation Campaigns in Unison

- Coordinate these joint observation campaigns with focus on asteroids and Near-Earth Objects (NEO), Gamma Ray Burst (GRB) afterglows, and space debris
- Project tied to UNISON Telescope donation and network
- Related to other UNOOSA topics of interest such as LTS, SMAPG and IAWN, and BSSI
- Data tentatively shared through project 1

Target audience

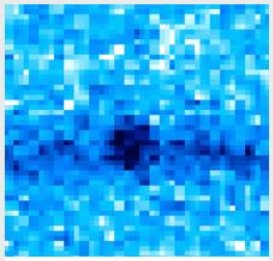
- the **research community**, both from developed and developing countries by performing coordinated campaigns and data sharing
- **Experts, university researchers in the fields covered,** and users of ISON

Observation Campaigns in Unison

Main Partner(s)	ISON network
UNOOSA role	Coordinating Project 1 platform to include the "shop" of ISON
Schedule	Initially 2 years (as project 1)
UNOOSA Staff	Part of Project 1, support of ISON may be requested temporarily (a 2 month placement of an ISON representative)
Additional UN costs	ISON platform adaptation to be embedded in Project 1. Cost TBD

5. Space Citizen-Science Network Database

- Built potentially on the same platform as Project 1
- Database of existing citizen-science projects utilizing, processing or generating astronomy and space science data or products
- Provides visibility to the various initiatives, serving as entry point for people interested in science that want to get involved, and establishing a framework for various projects to interact with each other

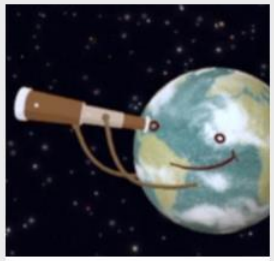


GALAXY NURSERIES

SUPERNOVA SIGHTING

EXOPLANET EXPLORERS

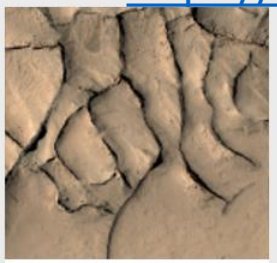
ASTRONOMY REWIND



BACKYARD WORLDS:
PLANET 9

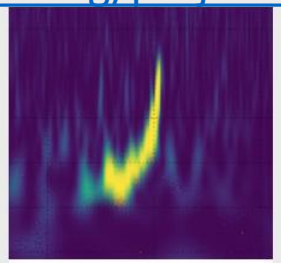
https://www.zooniverse.org/projects?discipline=astronomy

Zooniverse example

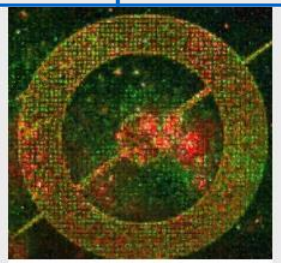


PLANET FOUR: RIDGES

HUBBLE'S HOT STARS



GRAVITY SPY

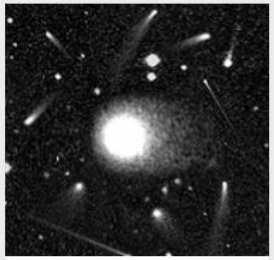


MILKY WAY PROJECT

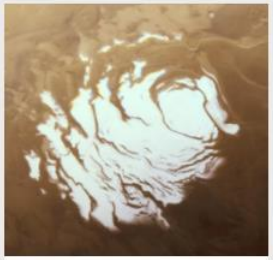
RADIO METEOR ZOO

SUPERNOVA HUNTERS

POPPIN' GALAXY

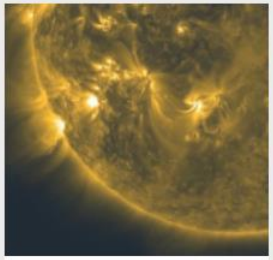


COMET HUNTERS



PLANET FOUR: TERRAINS

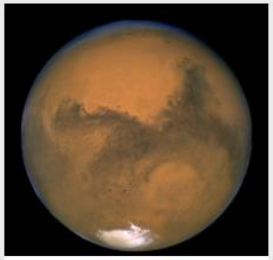
SCIENCE GOSSIP



SUNSPOTTER

DISK DETECTIVE

RADIO GALAXY ZOO



PLANET FOUR

GALAXY ZOO

3. Space Citizen-Science Network Database

Static database: not interactive

Name http://www.myproject.com

Short description. Lorem ipsum dolor sit amet, urna morbi non lorem quisque sapien metus, dictum mauris dui quis pellentesque ultricies dolor. Donec suspendisse vitae elit, tincidunt amet, sit elit.

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5. Space Citizen-Science Network Database

Target audience

- the **citizen-science community**, providing visibility to their activities
- **amateur scientists, students**, or the **general public** that have interest in astronomy and space science and use the database as an entry point

Space Citizen-Science Network Database	
Main Partner(s)	To be defined (desirable: citizen-science organizations)
UNOOSA role	Host and maintenance of the database
Schedule	Development: 1-2 additional months with respect to Project 1. Maintenance: initially 2 years
UNOOSA Staff	Two additional man-months per year wrt. Project 1
Additional UN costs	To be defined (smaller IT extra costs if done in conjunction with Project 1)

6. Universal Hackathon

- Increase visibility of citizen-science potential and encourage development of new tools and interactive services
- Biannual web-based coding competition, 48 hours, teams register 2 weeks prior event, problem released at midnight UTC
- Best 3 teams invited to present (at relevant UNOOSA activity)
- If applicable, resulting tool included in project 3 database

Target audience

- the **citizen-science community**
- **amateur scientists, students, software coders**, developers, geeks, and any person with an interest in astronomy and space science

Universal Hackathon

Main Partner(s)	To be defined
UNOOSA role	Co-organization of hackathon, sponsoring winners to attend event
Schedule	2-day online competition, possible presentation at a later event
UNOOSA Staff	Three person-months per year, planning, outreach, designing problem, running of competition, and evaluation of solutions.
Additional UN costs	IT costs TBD, ~$30k to sponsor participants

7. Observatories Explorer

- Resurface data and integrate it with existing solutions, and provide visibility to observatories linking them with research community, standard organizations, or potential archives
- Work with local organizations, national or regional Virtual Observatories or data centres, upon request of a Member State through advise of a local organization ~ Advisory Missions
- **Feasibility study to be performed**

Target audience

- the **research community**, from the observatories with the data to the wider community offering advice on archiving solutions, standards, and tools
- **governmental agencies** with a scientific focus that want to improve the data transparency in their country or region

Observatories Explorer

Main Partner(s)	Local entity/data centre/agency for each particular mission. Possible cooperation with IAU's Office of Astronomy for Development and their Regional Nodes
UNOOSA role	Expert advisory mission, facilitator
Schedule	2-3 missions per year
UNOOSA Staff	To be defined after feasibility study (min. one fully dedicated UNOOSA staff)
Additional UN costs	To be defined after feasibility study

8. Facilitator of Archiving Solutions

- Facilitator role
- Interface and link new players intending to make their data available with available data archives with existing solutions
- If needed, provide the framework to develop new hosting or archiving solutions for the particular data
- **Feasibility study to be performed**

Targets

- the **research community**, data providers, data centres and archives
- **new data providers** that want to make their data or products available and share with the community

Facilitator of Archiving Solutions	
Main Partner(s)	Data providers inputting data, existing data centres and archives offering hosting solutions
UNOOSA role	Interface or facilitator
Schedule	3 years initially
Staff	To be defined after feasibility study
Additional costs	To be defined after feasibility study

Credit: NASA

UNISPACE +50

THANK YOU

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Backup Slides

Recommendations Expert Meeting

- The Open Universe Initiative should engage with a wide user base, including the various target groups identified, ranging from the research community, higher and secondary education, citizen and amateur scientists and other potential end-users.

The Office for Outer Space Affairs should:

- promote among data providers the adoption of the FAIR (Findable, Accessible, Interoperable, Reusable) guiding principles for scientific data management, and of transparency on data production mechanisms and data access rules;
- recognize the existing standards defined by the organizations active in the field, and disseminate and promote their adoption by data providers and producers of data exploitation applications;
- foster partnerships among the research community in the development, extension and provision of visibility for the abovementioned data, services, applications and standards for a wider user base;
- facilitate collaboration and coordination among Data Centres for the provision, besides data, of an amount of computing power and server-side tools appropriate to fulfil the users requirements; and
- work with partners to promote education in astronomy, space science and other STEM subjects, particularly in the developing world and for women
  - ✓ More details in: A/AC.105/2017/CRP/22