BRICS Astronomy Workshop 2016 — 5 to 7 September — Ekaterinburg, Russia
Ural Federal University

Ulisses Barres de Almeida & Paolo Giommi
for the BSDC collaborators

Brazilian Science Data Center

Presentation of the concept and proposal for a “science-ready” Astronomical database in Brazil.

Contents

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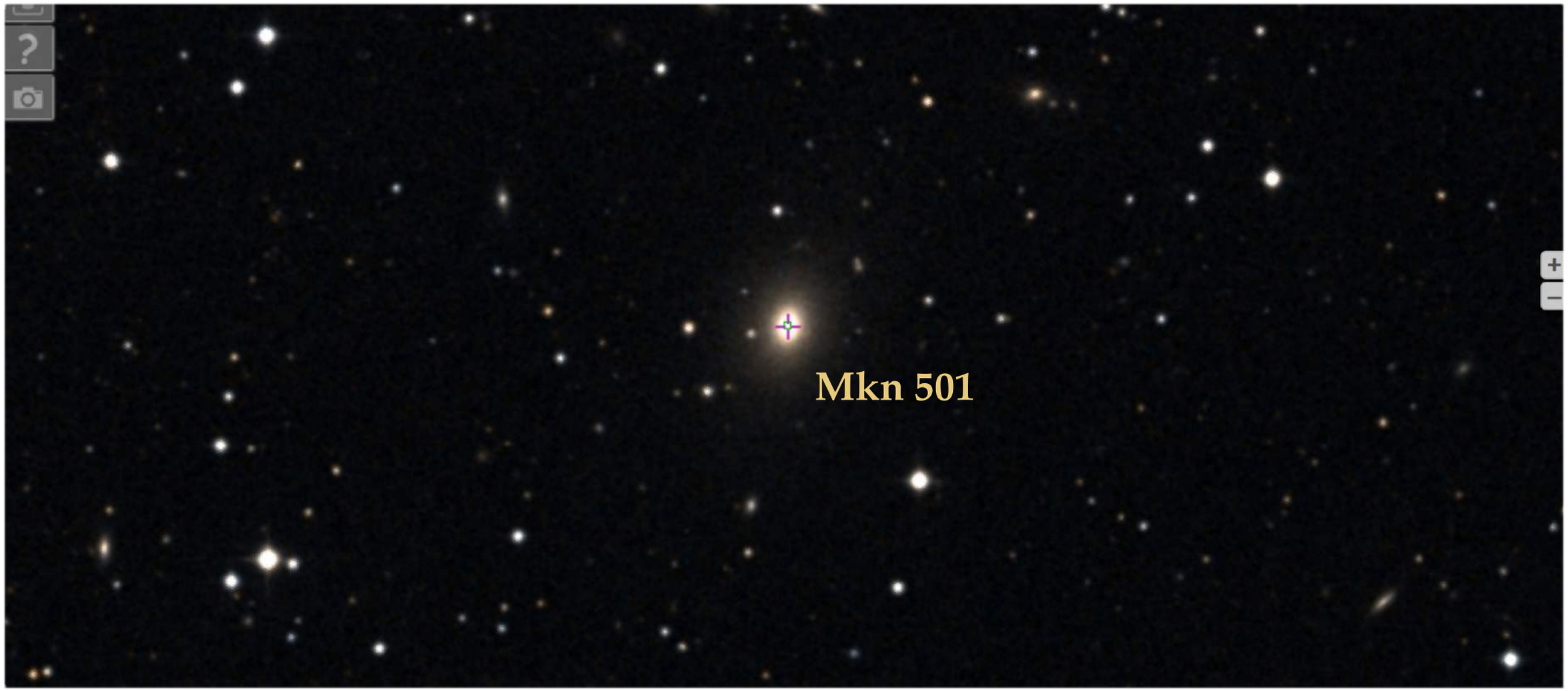
CBPF
Centro Brasileiro de Pesquisas Físicas

ICRANet



To study a well-know AGN such as Mkn501 or Mkn 421

- Timing variability
- Spectral Energy Distribution
- Cross-matching maps with multi messengers

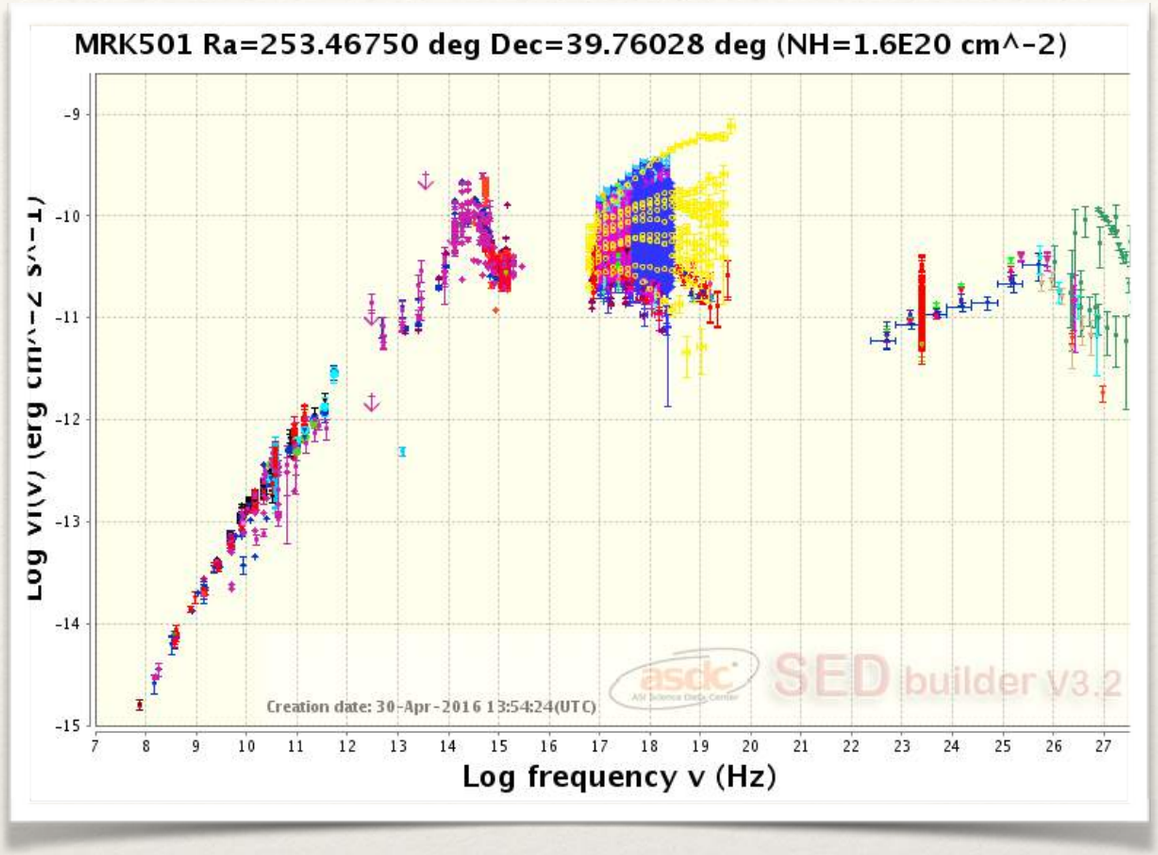
$\triangle t_{var}$: 4 orders mag.

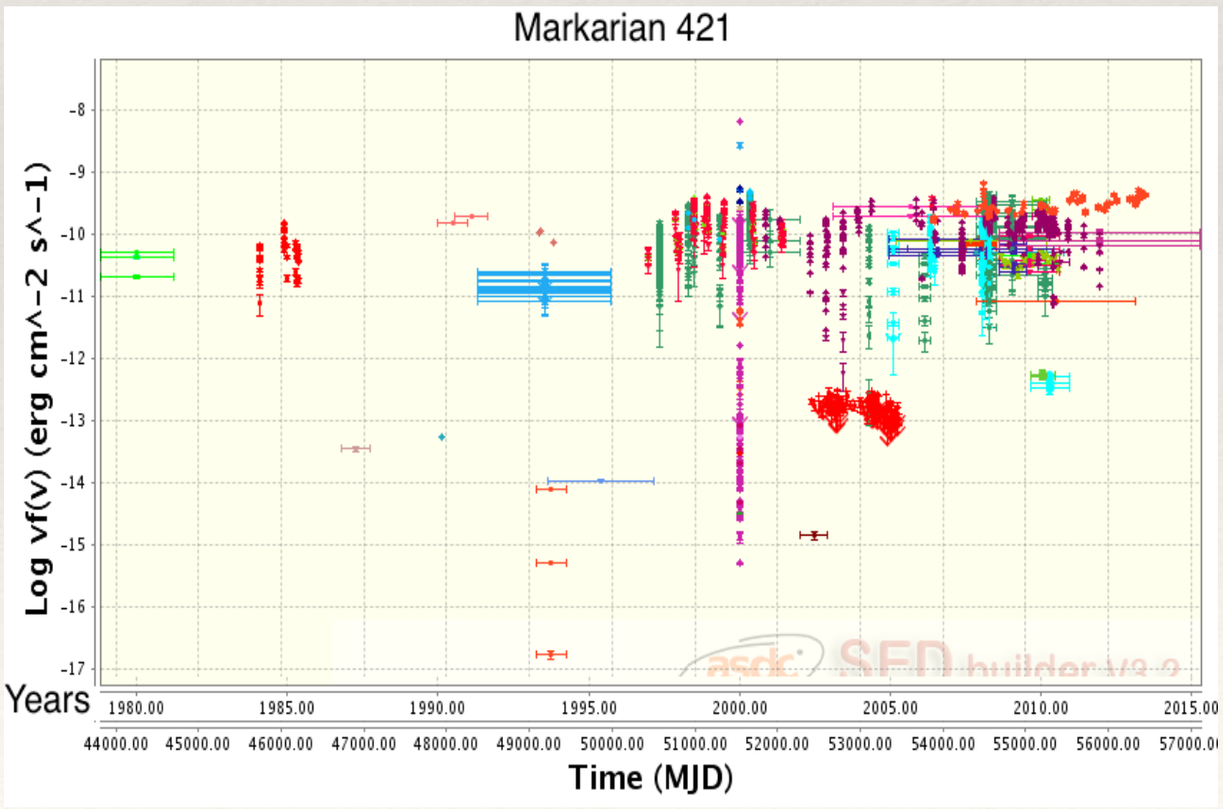
SED : 20 orders mag.

Many specialised fields.

AGN SED and light curves

- Data from over 10 satellites and 12 catalogues
- Over 500 pointed observations
- About 20 years of data collection and archival





AGN SED and light curves

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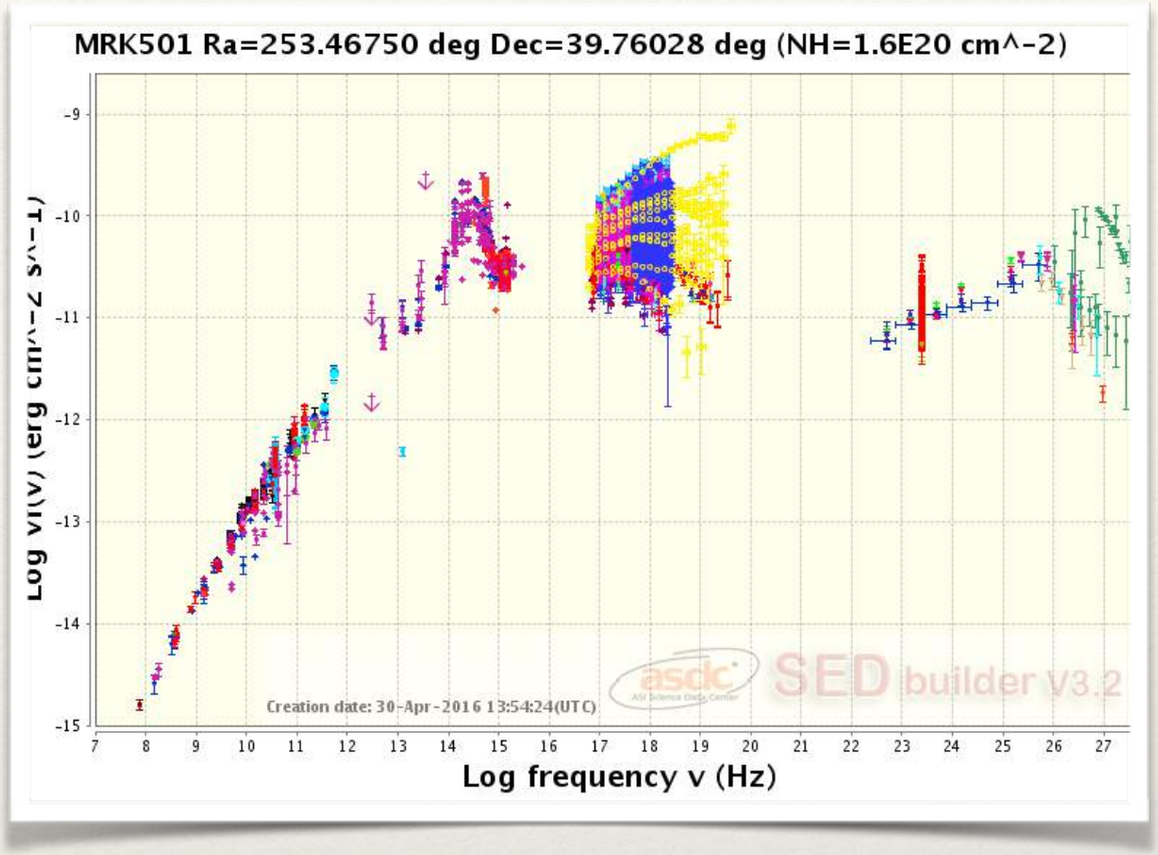
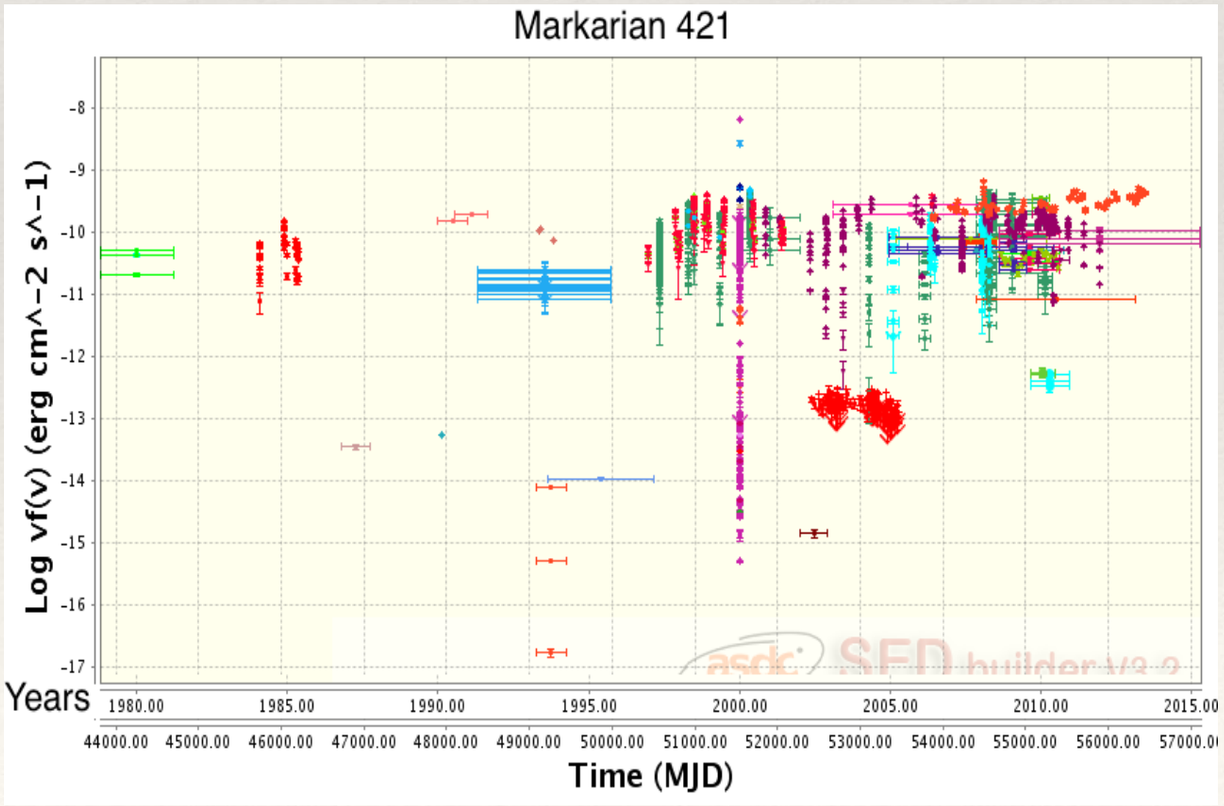


Traditionally, such data collection and analysis would require coordination and the specialist knowledge from every field of observational astrophysics.

A single well-sampled campaign of ~ week length would require direct collaboration of 10+ scientists worldwide.

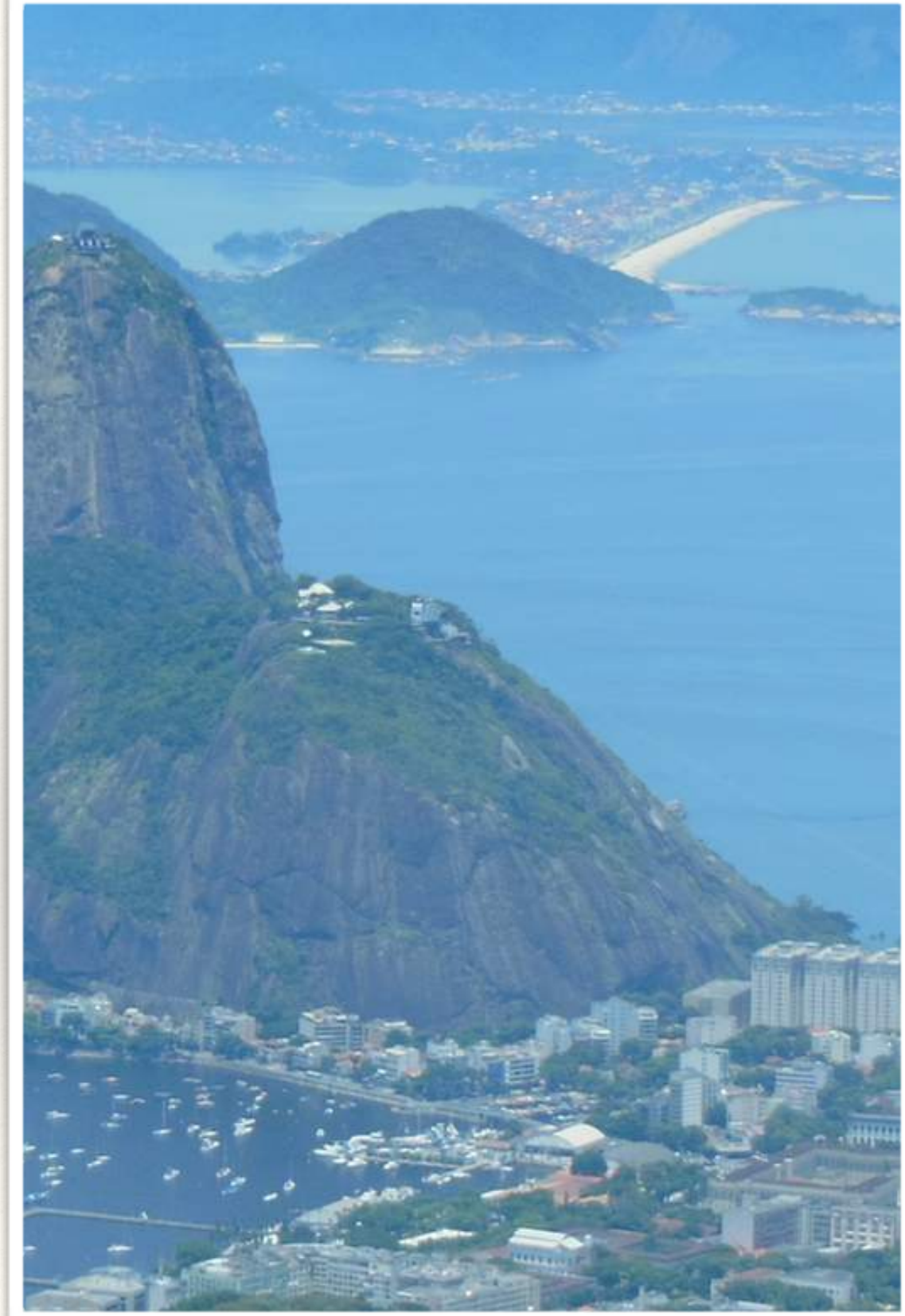
Do we take the most of this data?
How much of if is never converted into real scientific information?

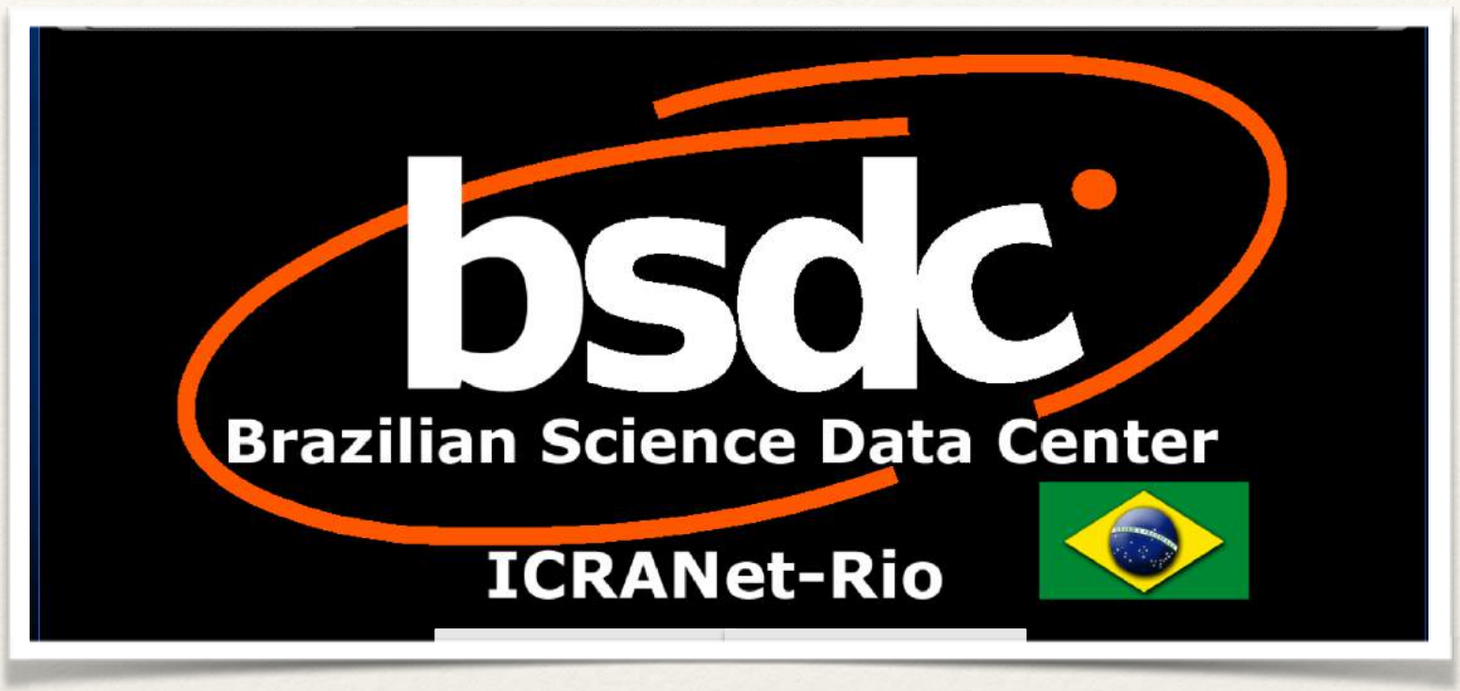


The concept

BSDC : *A "science-ready" astronomical data center in Brazil*

- Hosting a multi-instrument, multi-messenger archive open to community
- Containing final ready-products and, when possible, online data reduction tools
- Web-based data interaction tools
- Participation to virtual observatory and other worldwide repositories
- Science and Data Center Research





BSDC : A "science-ready" Astronomical Data Center in Brazil

DEMOCRATIC ACCESS

IMPROVED SCIENTIFIC OUTPUT OF DATA

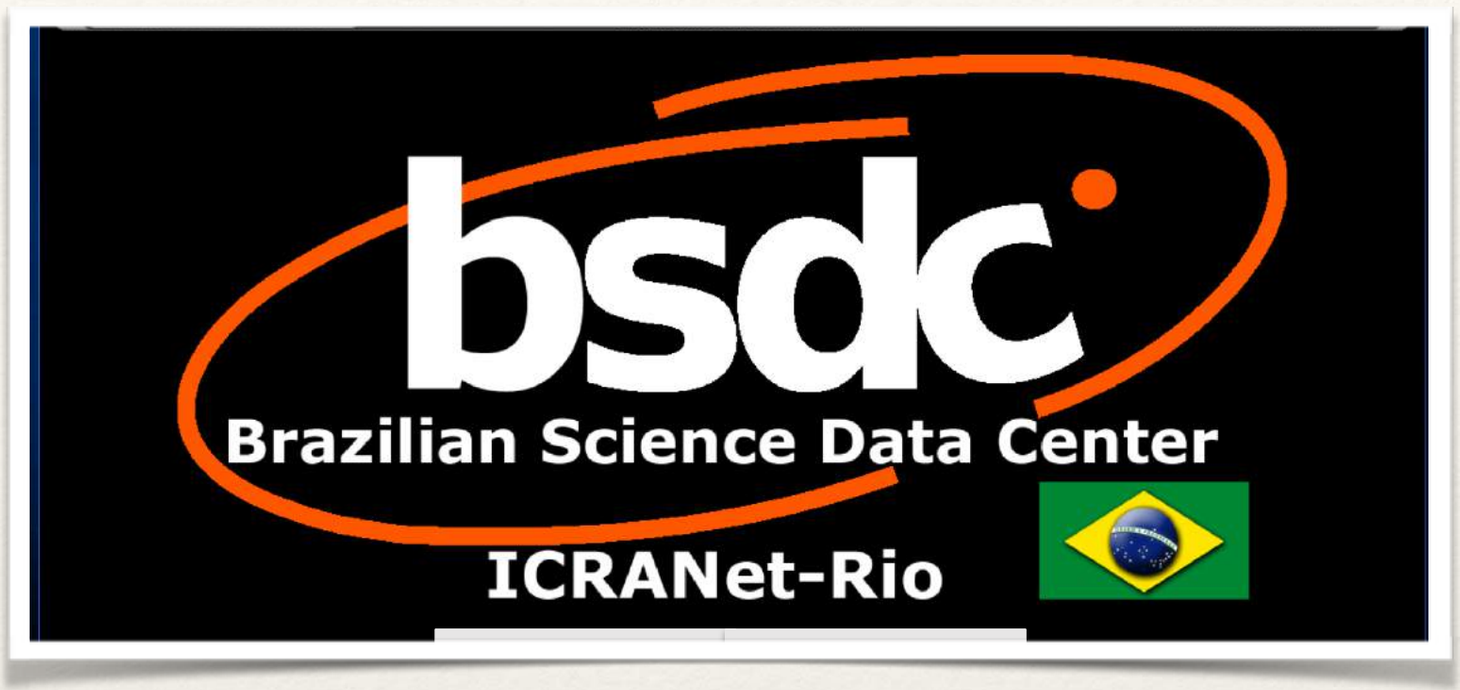
INCREASE VISIBILITY BY INTEGRATION

ASTROPHYSICS

ASTROPARTICLES

COSMOLOGY

PLANETOLOGY …



BSDC : A "science-ready" Astronomical Data Center in Brazil

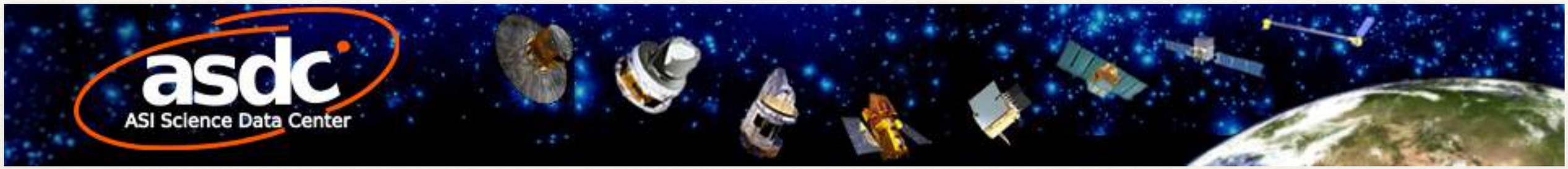
DEMOCRATIC ACCESS

IMPROVED SCIENTIFIC OUTPUT OF DATA

INCREASE VISIBILITY BY INTEGRATION

THESE ARE SPECIALLY STRATEGIC ACTIONS FOR SCIENCE IN DEVELOPING COUNTRIES

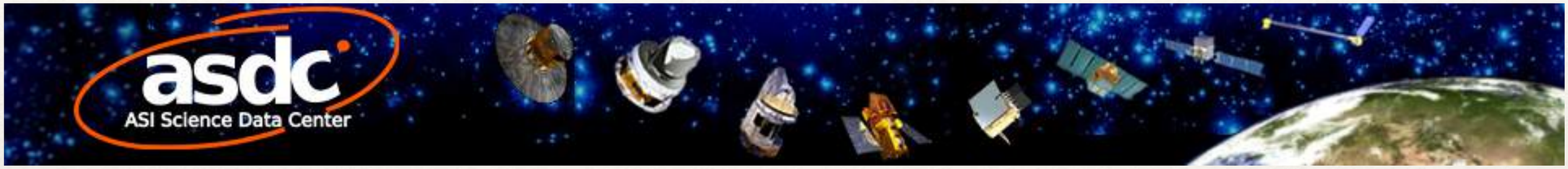
The example of ASI



The ASI Science Data Center (ASDC)

- Data-distribution, multi-mission archive maintained by ASI for 23 space missions, 13 being currently operational
- Web based interactive data analysis and data fusion: timing and spatial domain, multi-messenger, imaging.
- On-the-fly data reduction software for some missions: Swift, NuSTAR, etc.
- Participation to virtual observatory and other web-based archives

The cooperation with ASI

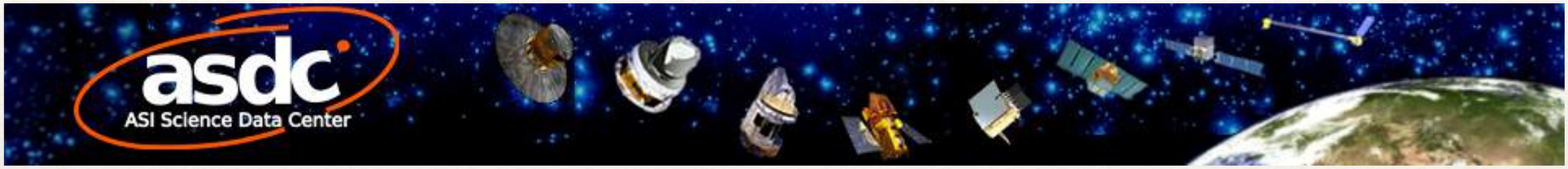


The BSDC is to be partner

\+

BR-focused branch for the work of ASDC

The cooperation with ASI



The BSDC is to be partner

function as a collaborator / sister institute

+

BR-focused branch for the work of ASDC

special interest on serving BR community and integrating BR-produced /owned data

ASI Science Data Center

asdc — ASI Science Data Center

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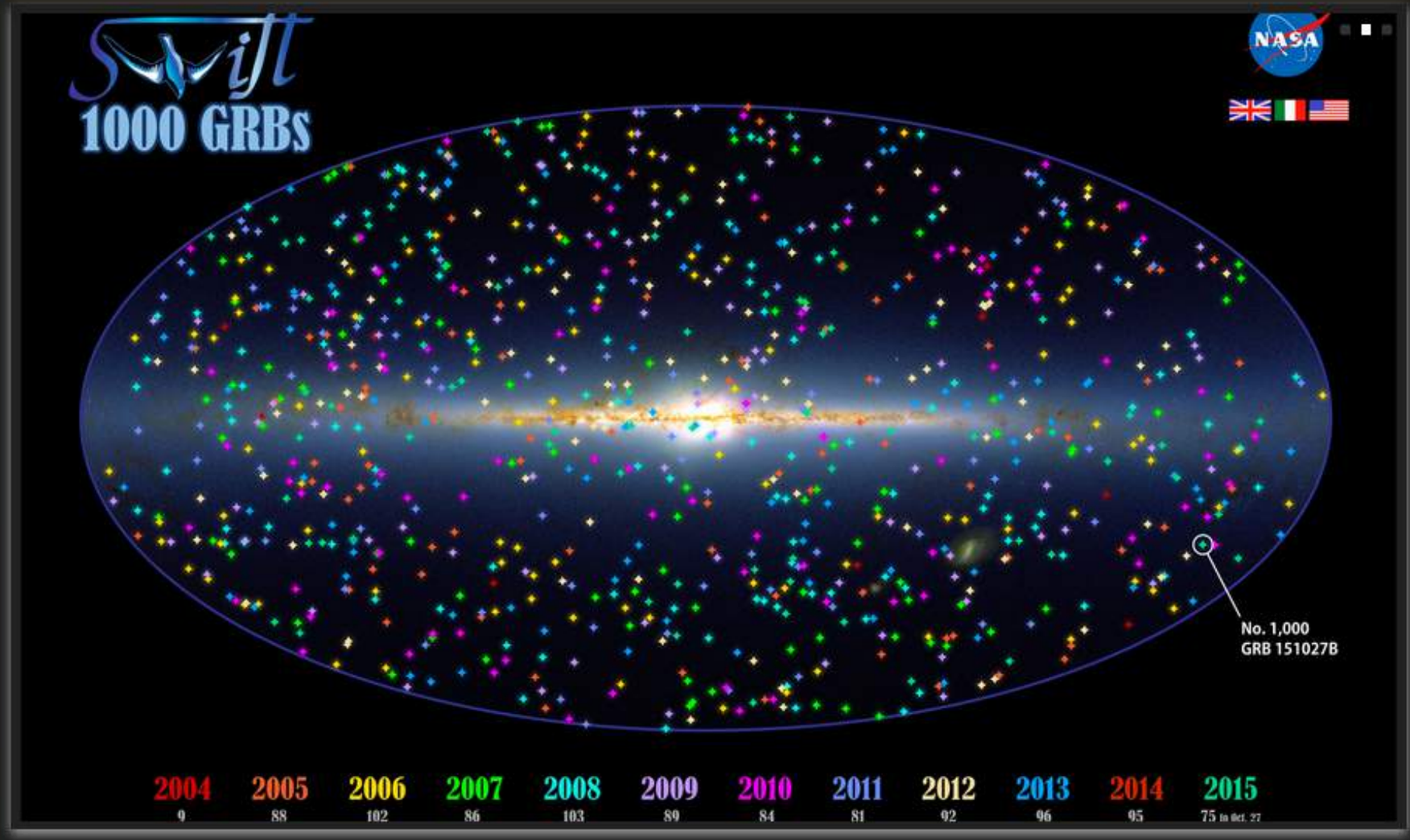
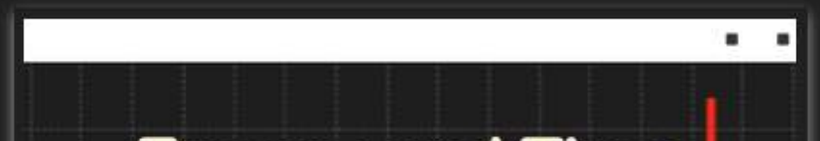
Home | About ASDC | Public Outreach | Quick Look | Missions | Multimission Archive | Catalogs | Tools | Links | Bibliographic services | Helpdesk | Privacy



SED BUILDER | SKY EXPLORER | MATISSE | COSMIC RAY DATABASE | ASDC MULTIMISSION ARCHIVE FOR SPACE SCIENCE | ASDC CATALOGS (NEW!) | ASDC BIBLIOGRAPHY TOOL | NEWSLETTER

Media

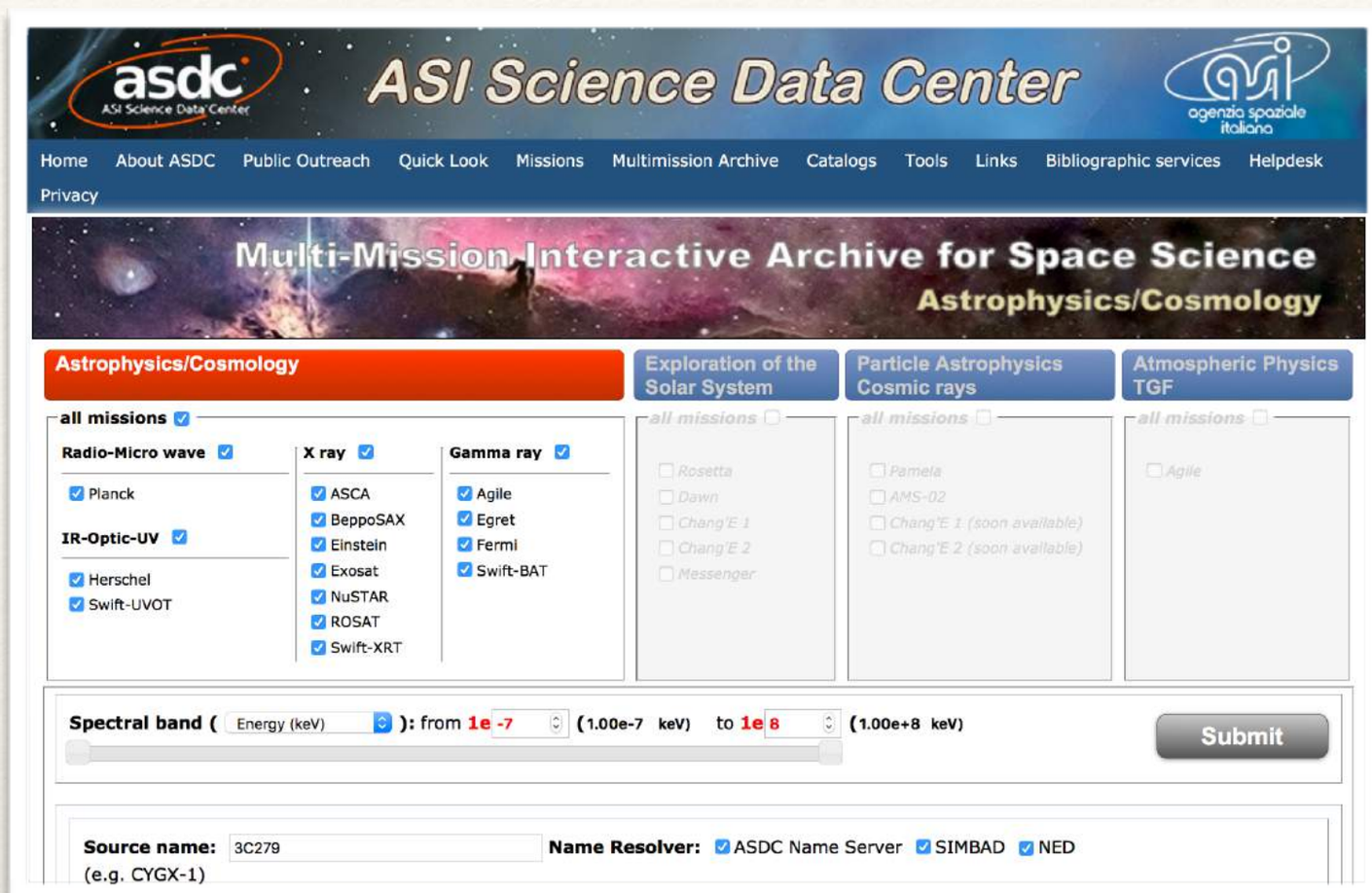


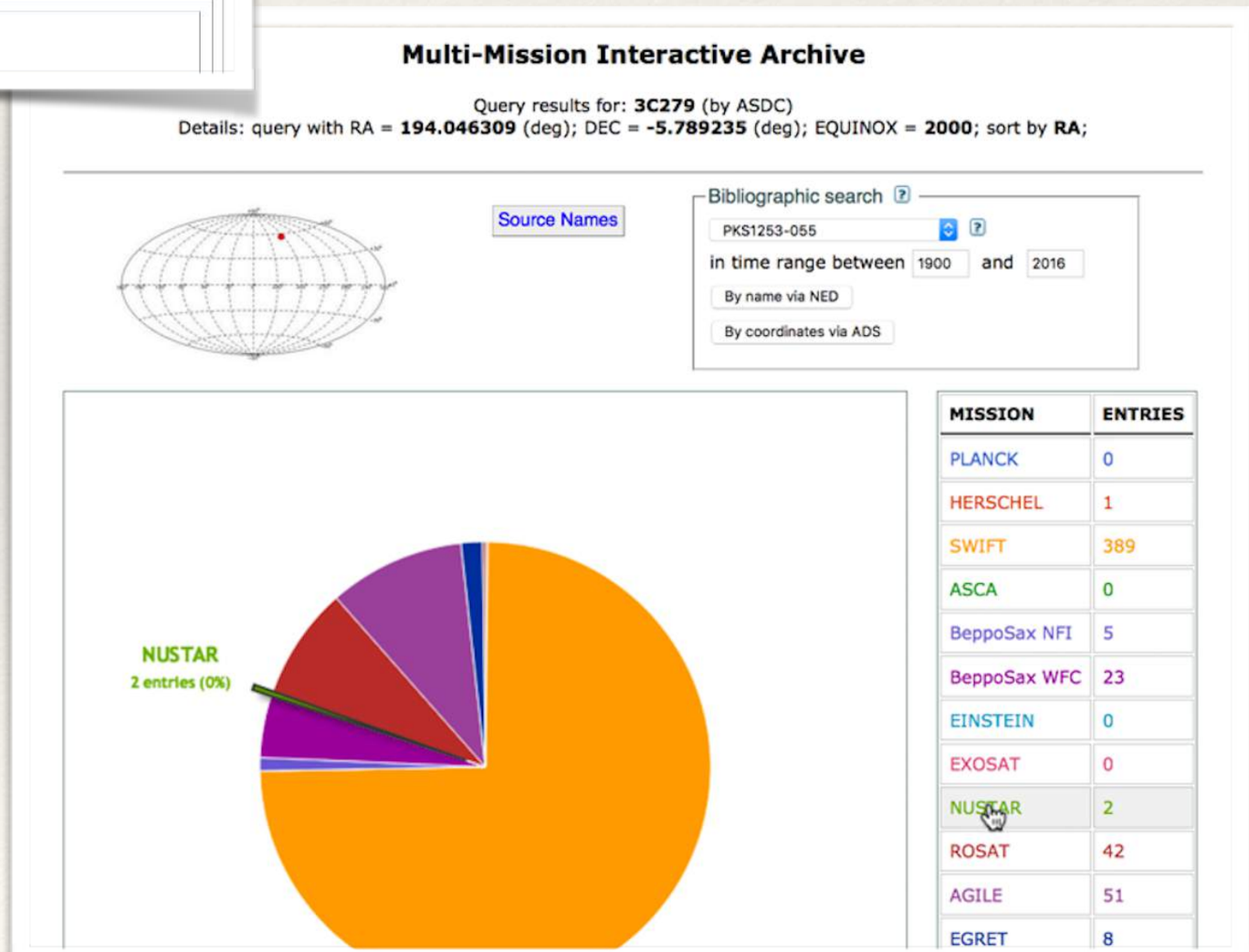
Top News

Events

Multi-mission interactive archive, separated per field of knowledge: Astrophysics, Solar system, Astroparticles, ….

Here, an example of an object-specific query into the multi-mission archive.





Help

Show/hide columns

Advanced filtering

Print current view of table

Print complete table

Reset all filters

Query results for: **bllac(LOCAL)**

Details: query by **COORDINATE** with **RA** = 330.680417; **DEC** = 42.277500; **EQUINOX** = 2000; **RADIUS** = 5 arcmin; sort by **RA**; max lines retrieved: 1000 (on BROWSE catalog **numaster**)

Export Current view of Table in: Latex format | FITS format | Raw text format | CSV text format

Previous Page Next Page Page Size (# of lines) 50 Refresh page Reset all filters Show all entries

Entry number / Selection mode: Include / All		Archive	Interactive Analysis	Target Name	obsid	RA (J2000) hh mm ss.d	Dec (J2000) dd mm ss.d	time	public_date	exposure_a	exposure_b	Dist. from searched position arcmin
1 Select	ASDC Data Explorer	Data Access	Interactive Analysis	BL_LAC	60001001002	22 02 44.3	+42 14 33.7					
2 Select	ASDC Data Explorer	Data Access	Interactive Analysis	BL_LAC	60001001001	22 02 47.8	+42 14 43.0					

Previous Page Next Page Page Size (# of lines) 50 Refresh

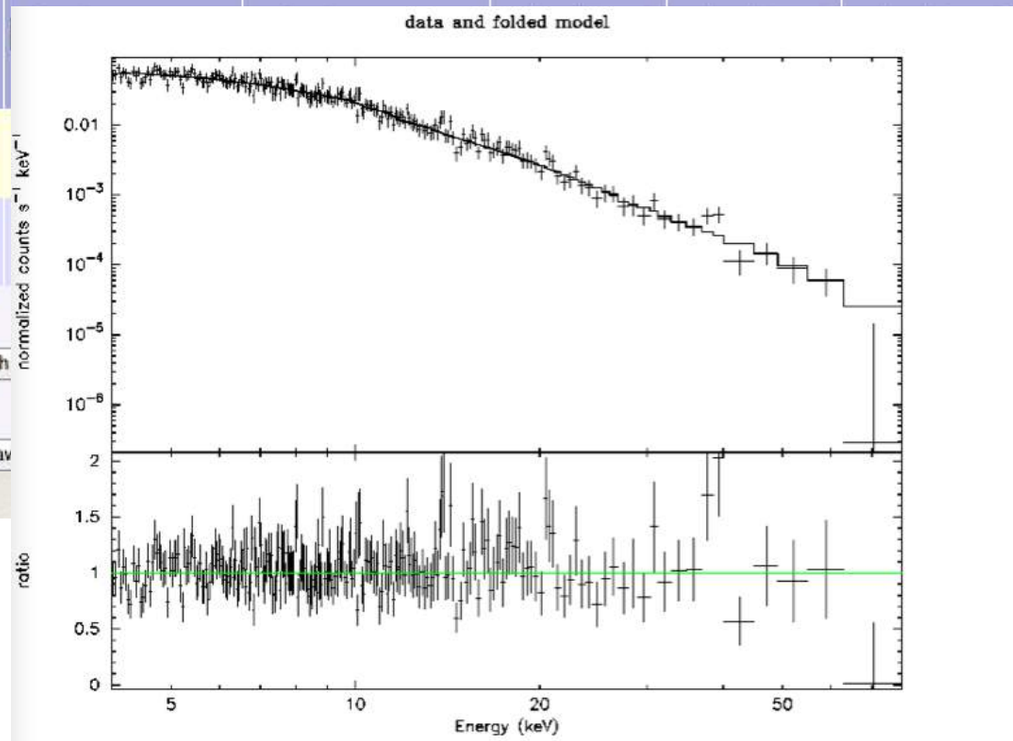
Export Current view of Table in: Latex format | FITS format | Rav

Spectral Energy Distribution (SED):

```
1.18237467E+18  2.10338756E+17  1.20990587E-11  2.74179496E-13
1.69408257E+18  3.01369128E+17  1.33162691E-11  2.91182334E-13
2.42724723E+18  4.31795568E+17  1.34440853E-11  3.46936428E-13
3.47771075E+18  6.1866798E+17   1.50269311E-11  5.30840671E-13
4.98279373E+18  8.86414936E+17  1.58526872E-11  7.74971396E-13
7.13924555E+18  1.27003736E+18  1.43058022E-11  1.33081415E-12
1.02289667E+19  1.81968391E+18  1.95793902E-11  2.53545514E-12
1.46558578E+19  2.60720623E+18  1.04843946E-11  4.25994309E-12
```

ASDC SED Builder access:
(click below to include SED data points)

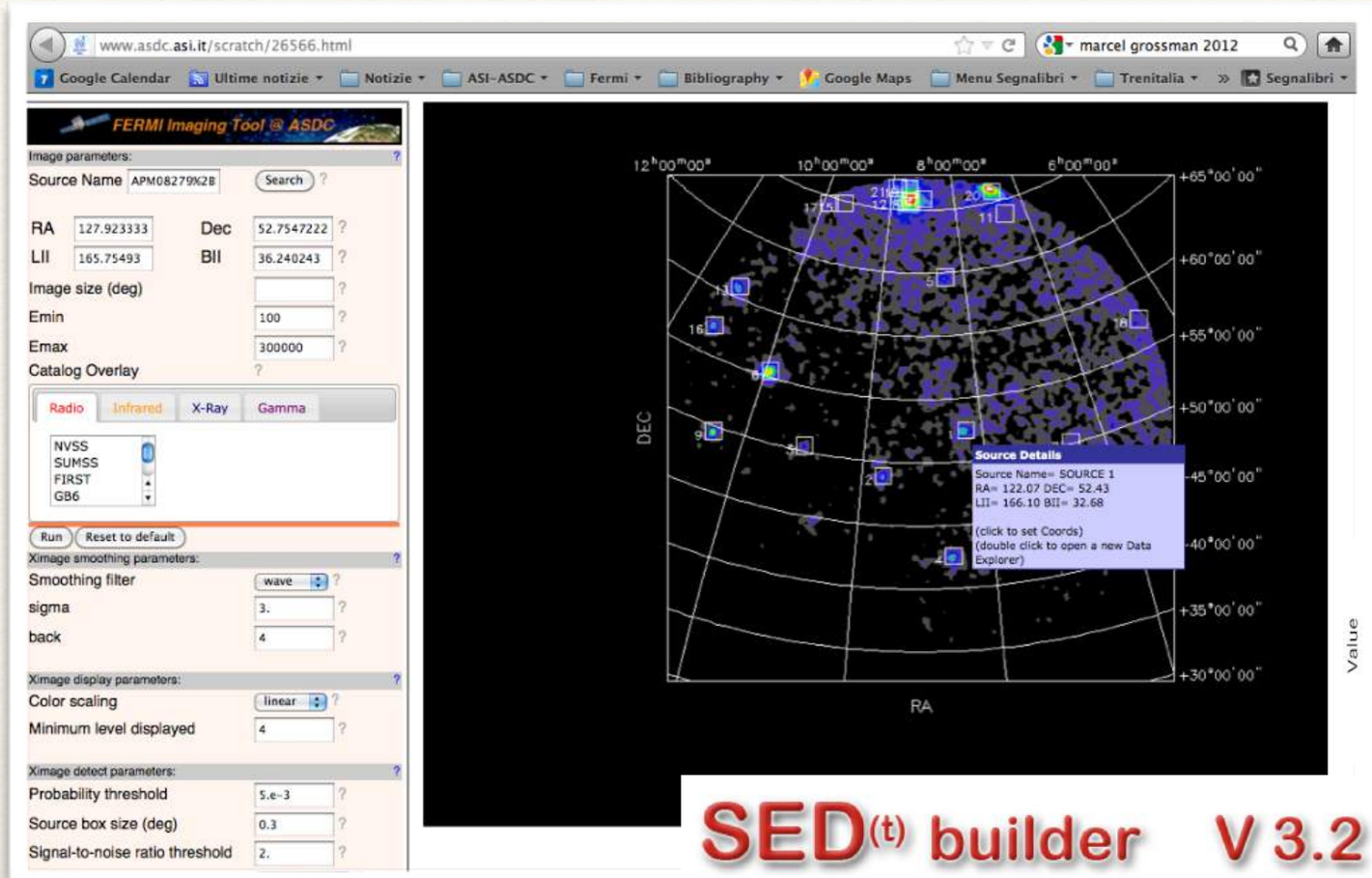
Add data to SED

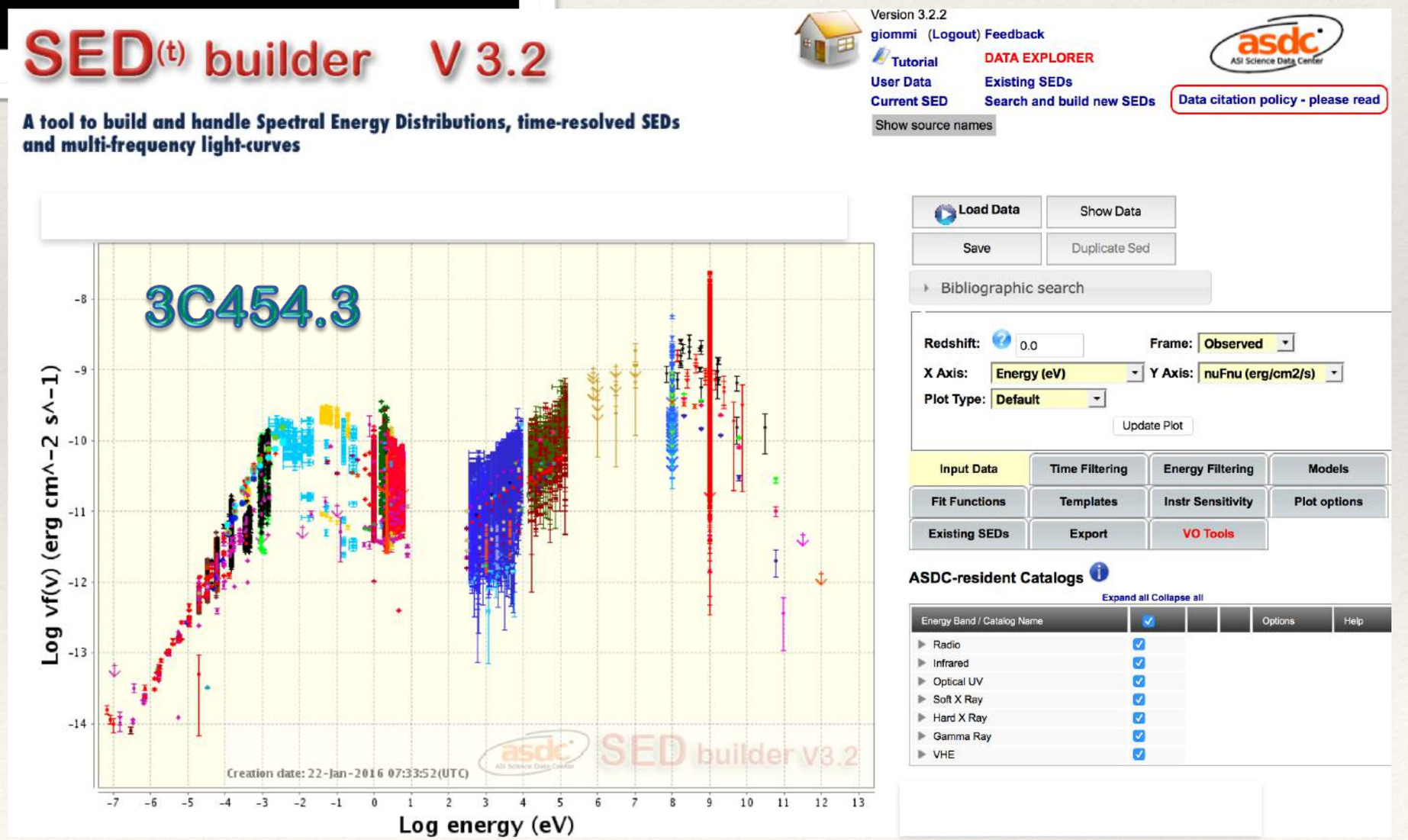



```
========================================================================
Model wabs<1>*powerlaw<2> Source No.: 1   Active/On
Model Model Component  Parameter  Unit     Value
 par  comp
   1    1   wabs       nH         10^22    0.173000      frozen
   2    2   powerlaw   PhoIndex             1.88443       +/-  2.45938E-02
   3    2   powerlaw   norm                 6.25717E-03   +/-  3.33419E-04
```

Skymaps query and visualisation, multimission and multi-messenger

The SED builder, for spectral + temporal visualisation and analysis of large AGN datasets.





UNITED NATIONS
Office for Outer Space Affairs

Open Universe

An initiative under the auspices of COPUOS announced by the ASI president and described in a conference room paper presented by Italy

for expanding availability of and accessibility to open source space science data

Approved by the general assembly of COPUOS at its 59th session (June 2016)

BY
PAOLO GIOMMI
ITALIAN SPACE AGENCY

A/AC.105/2016/CRP.6

14 June 2016

English only

Open Universe

Committee on the Peaceful Uses of Outer Space
Fifty-ninth session
Vienna, 8-17 June 2016

"Open Universe" proposal, an initiative under the auspices of the Committee on the Peaceful Uses of Outer Space for expanding availability of and accessibility to open source space science data.

Proposal by Italy

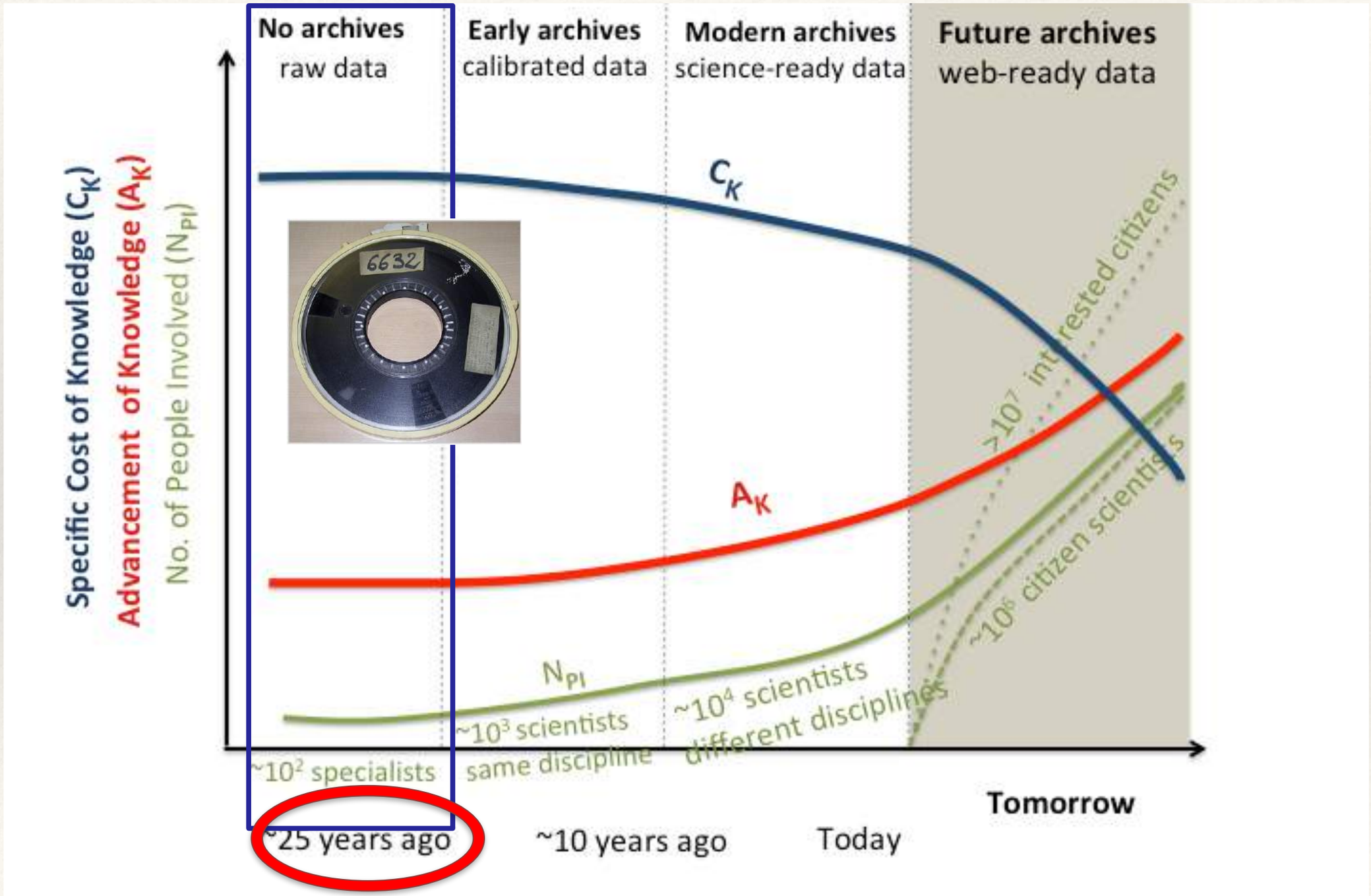
I. Background

1. The 2030 Agenda for Sustainable Development will require effective, enhanced and innovative tools to support its implementation. Among those tools are the ones offered by space science and technology, which could act as both an enabler and a catalyst for the efforts of countries with regard to progressing towards internationally agreed development goals and for sustainable development. Advancing international cooperation in the peaceful uses of space science and technology and increasing the use of space-derived data and information are at the core of international efforts for harnessing the benefits of outer space for development in the post-2015 framework.

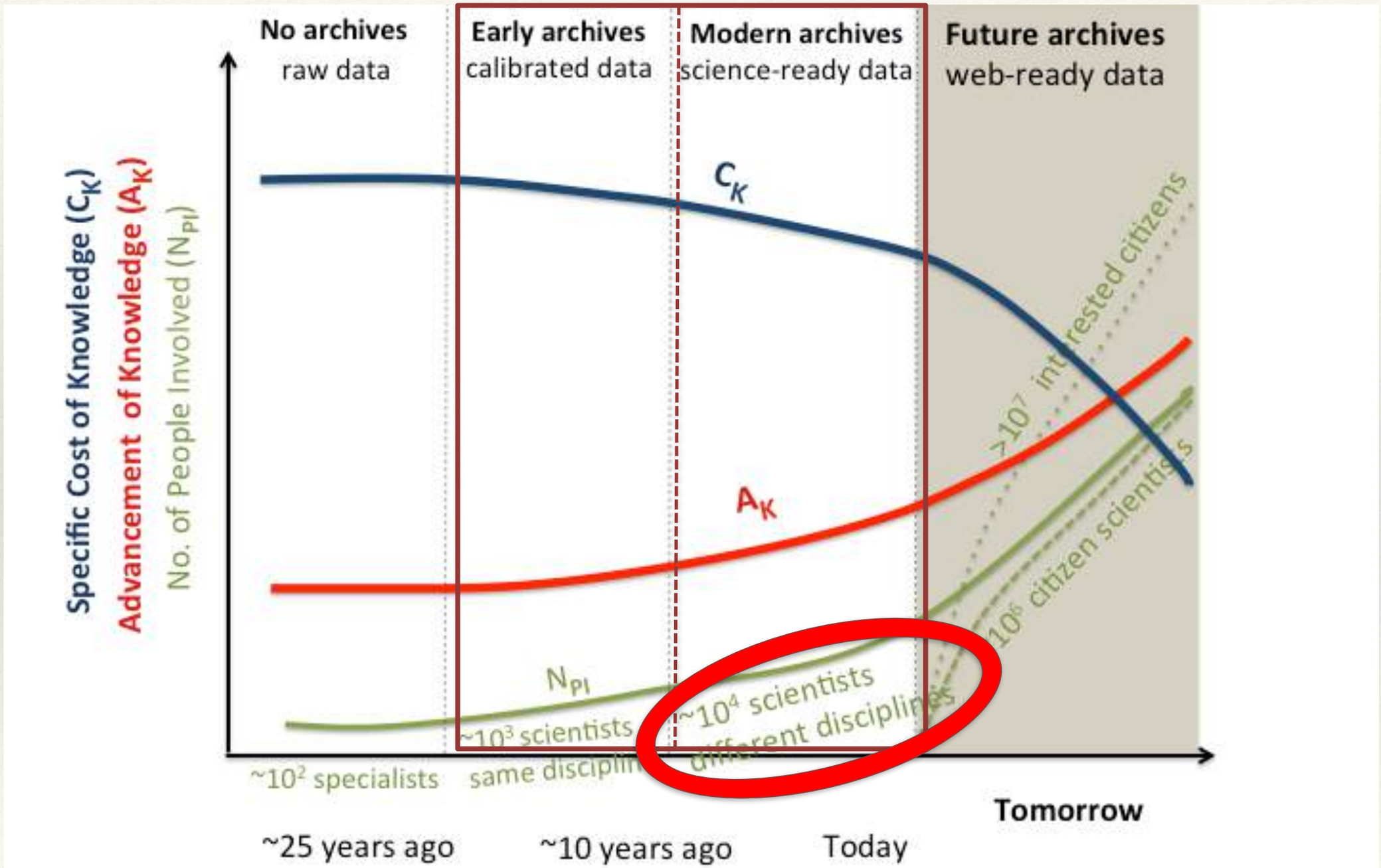
2. The General Assembly, in its resolution 66/71, emphasized the significant progress that has enabled humans to explore the universe, and the extraordinary achievements made over the past fifty years in space exploration efforts, including deepening the understanding of the planetary system and the Sun and the Earth itself, in the use of space science and technology for the benefit of all humankind. Also in that resolution, the General Assembly stressed the need to look more closely into how advanced space research and exploration systems and technologies could increase benefits, in particular for developing countries. Moreover, in that resolution, the General Assembly recognized that the Committee on the Peaceful

Approved by the general assembly of COPUOS at its 59th session (June 2016)

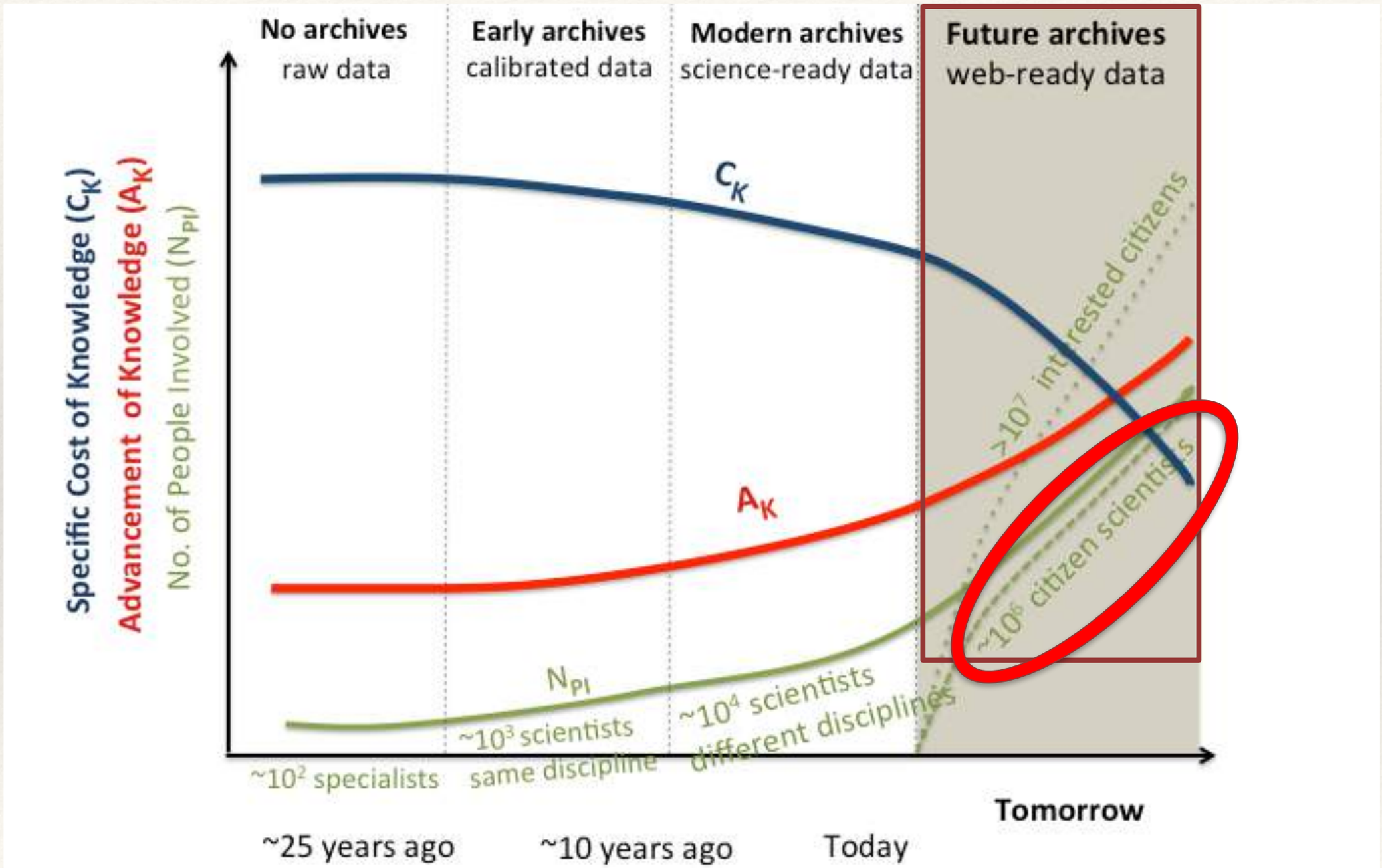
Open Universe



Open Universe



Open Universe



Specific Activities in Brazil

- Implementation of a complete VHE gamma-ray extragalactic database, integrated to SED builder, for the study of high-energy AGNs.

- Development of associated tools for temporal cross-correlation analysis, SED fits

- Implementation of a polarimetry database within ASDC/BSDC system, which is still inexistent.

- Development of software tools for visualisation and processing / analysis of polarimetry information (initially excluding imaging)

Specific Activities in Brazil

- Seek partnership with other institutions / observatories in Brazil, to provide a service of integration of Nationally-produced or owned astrophysical data of all kinds within BSDC/ASDC, thus seeking to enhance visibility of BR-owned data and cooperation in research world-wide for BR groups.

- All data present in ASDC / BSDC is properly referenced to give credit to the author / original owner.

- Create projects and tools for schools and outreach, with a special focus on BR astrophysical science and BR astronomical instruments.

- All this to be carried out in cooperation with interested partners, in a horizontal cooperation plan with CBPF.

What's in for the BRICS?

A reproducible model and a platform for effective collaboration

- The science-ready astrophysical ASDC / BSDC database initiative can be expanded to any partners in the BRICS.

- To create a horizontal, cooperative and integrated network seeking to increase data sharing and collaboration among BRIC countries.

- To be build under the auspices and developed under the guidance of UN "Open Universe" initiative, with the support of ASI/ASDC.

For interest in collaboration, write us:

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Paolo Giommi (ASI) - paolo.giommi@asi.it