

VO Services for the SAEU Cloud and a Use Case based on FAIR HI studies of Isolated Galaxies and Compact Groups

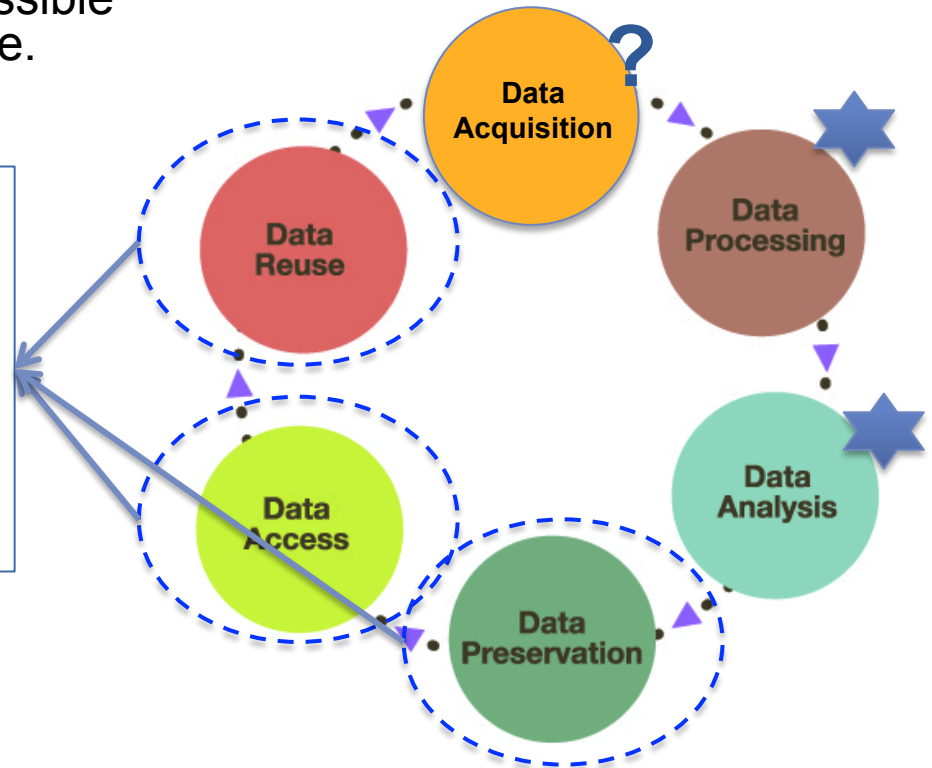
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Identifying Functionalities

- Identify functionalities in every step of the the Research Data Lifecycle
- Decide which functionalities are in the scope of this pilot
 - * Ensure they cover as much as possible the whole Research Data Lifecycle.

Data Archive and VO compliant services for data discovery, access and retrieval.



Source:

<https://blogs.ntu.edu.sg/lib-datamanagement/data-lifecycle/>

An example: A HI datacube archive and VO services

- AMIGA development used as a Prototype for the IVOA SIAv2 protocol. J.E. Ruiz 2014
- Two Catalogues:
 - B0dega. 30 datacubes – submm - SMA
 - WHISP sample. 33 datacubes – HI 21 cm – WSRT
- Based on SIAv2, DataLink, AccessData (currently SODA)
 - Datacube metadata
 - On the fly generated moment maps
 - Cut-outs
 - Spectral/radial profiles.

An example: A HI datacube archive and VO services

QuickTime Player Archivo Edición Visualización Compartir Ventana Ayuda

/ SIaV2 Archive / SIaV2 Archive

amiga.iaa.es:9000/search/ Buscar

SIaV2 Archive Prototype

Home | BODEGA | WHISP | Search | About | Admin

Search criteria

Spatial Axis
Coordinates ("ra,dec" in degrees): Width (deg):

Energy Axis

Frequency
Central value (Hz): Width (Hz):
Frequency search criteria prevail over Velocity.

Velocity
Line:
Central value (km/s): Width (km/s):

Collection
Data collection:

Output options

Format Response:

Help

In the **Spatial Axis** you may define a spatial region to search for datasets which overlap this region. *Coordinates* are comma-separated values given in ICRS reference frame with degrees units. The value given in *Width* defines a square box centered for the spatial region of interest in the *Coordinates* value.

In the **Energy Axis** you may define both a **frequency or velocity** interval to search for datasets which overlap this interval. Emission frequency search criteria prevail over velocities criteria.

Frequency *central* and *width* values are given in Hz units to set an frequency interval related to the measured wavelength in the vacuum of a particular molecular or atomic transition.

Velocity *central* and *width* values are given in km/s units to set an velocity interval related to the measured velocity of the gas emitting in the selected *Line*.

Collection allows to perform a search inside a particular collection of datasets.

Output options allows to specify the response format of the response.

All search criteria are inclusive.



Use Case: HI studies of Galaxies and Compact Groups

- HI data of about 70 Galaxies / Compact Groups: **VLA, JVLA, GMRT**

Ensure the **FAIR**–ability in each phase of **the Research Data Lifecycle**

(F): Data/Codes have sufficient metadata and unique, persistent identifiers in a searchable database

(A): Data/Codes stored in standard repositories. Automatic data retrieval. Easy software deployment.

(I): Use a standard language for metadata (VO standards)

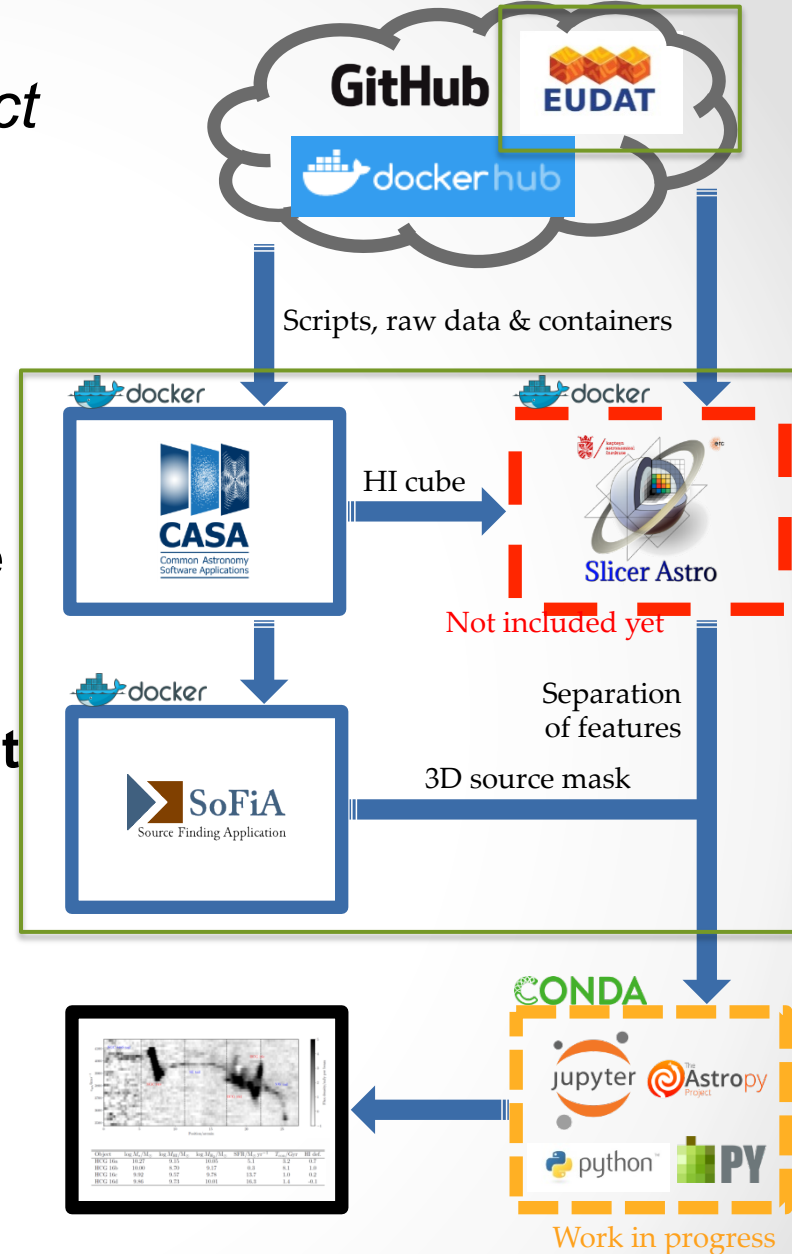
(R): Provide provenance information, annotations

“Evolution of the HI content of compact groups: A case study of HCG16.”

M. G. Jones et al. subm. to A&A



- Raw data published in EUDAT (**sercheable repository**)
- **Workflow for reproducing cubes/moment maps:**
 - Orchestrated by CGAT
 - One container for each Wf step
 - Easy deployment and execution
 - Enable user to inspect the scripts involved
 - Tested in EGI Federated Cloud



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Data Analysis

Jupyter Notebook for reproducing figures

- Improve the re-usability of the method
- Facilitate paper revision / error correction

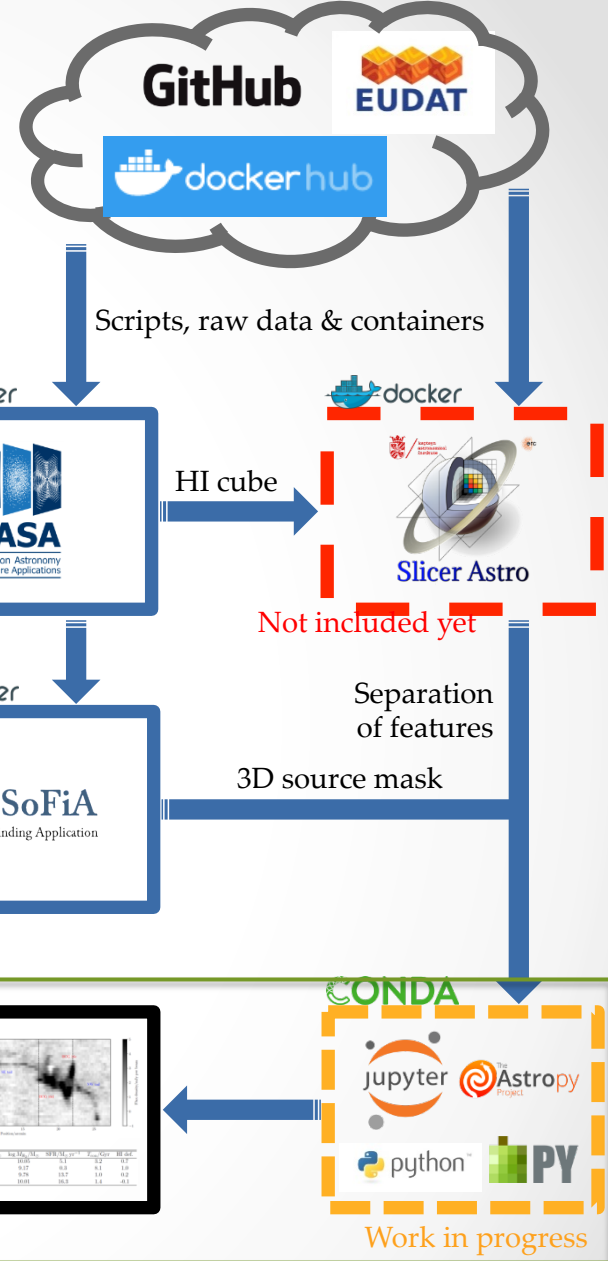
Data Reuse

Data Access

Data Preservation

VO Archive

- Final HI data products (cubes and moment maps) will be made VO-compliant and placed in a VO service



Thanks!