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

Susana Sánchez Expósito, Lourdes Verdes-Montenegro, Julian Garrido, Sebastian Luna, Michael G. Jones
Instituto de Astrofísica de Andalucía - CSIC

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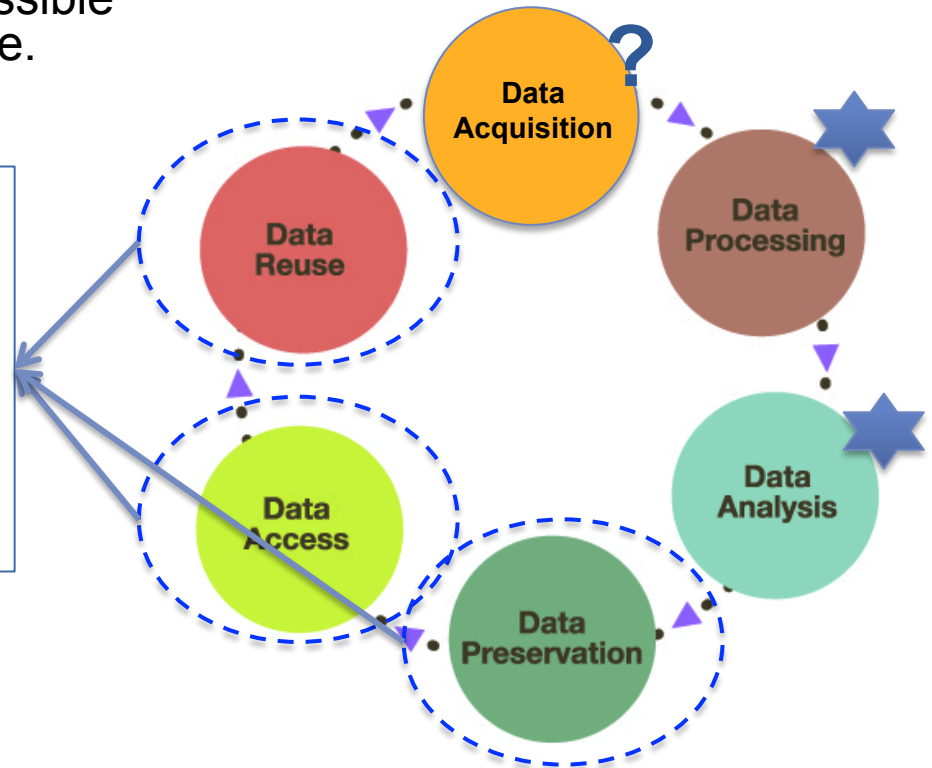
Source: https://blogs.ntu.edu.sg/lib-datamanagement/data-lifecycle/

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.

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An example: A HI datacube archive and VO services

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
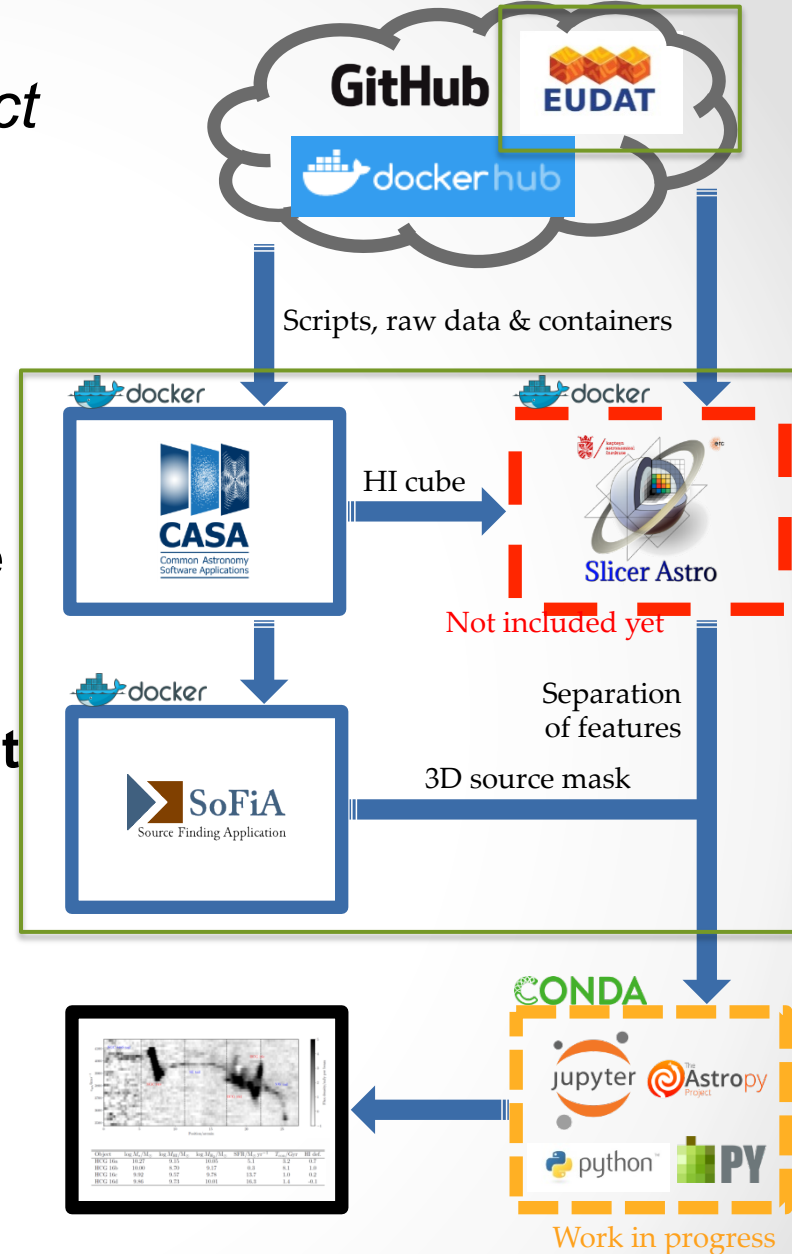
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Data Analysis

Jupyter Notebook for reproducing figures

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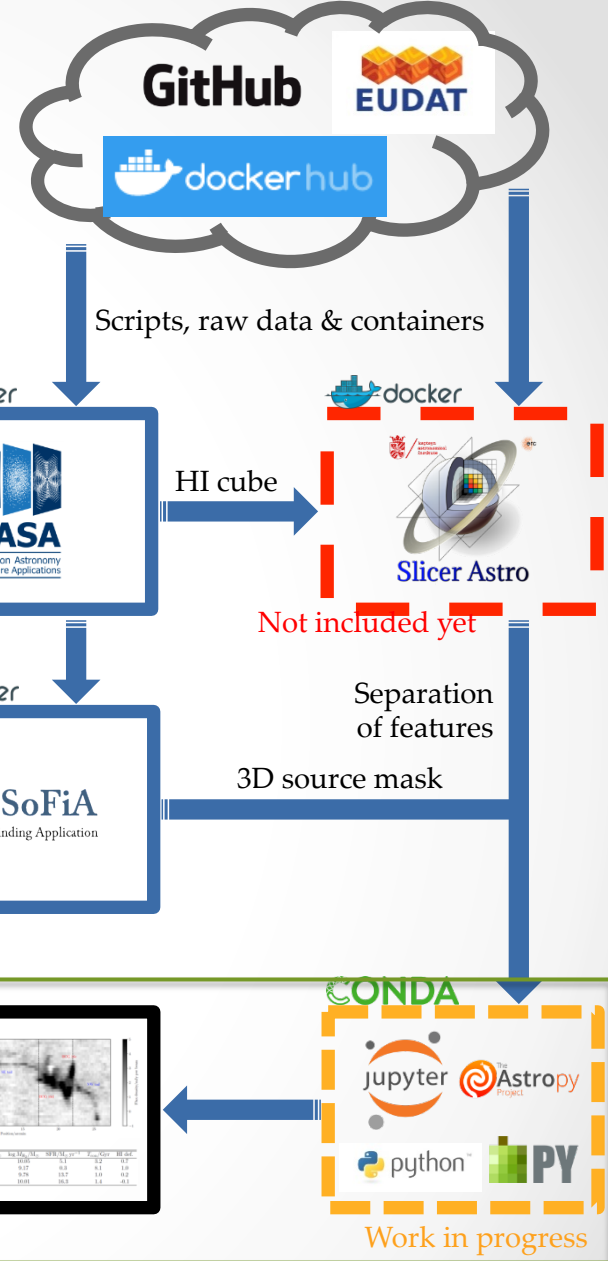
- Facilitate paper revision / error correction

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

GitHub **EUDAT**
docker hub

Scripts, raw data & containers

docker **docker**

CASA
Common Astronomy Software Applications

HI cube

Slicer Astro

Not included yet

Separation of features

docker

SoFiA
Source Finding Application

3D source mask

CONDA
jupyter **Astropy** The Project
python **IPY**

Work in progress

Thanks!