# AGN-DB:
the ultimate AGN database

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Abstract The AGN database (AGN-DB) is the repository of all the discovered AGN. It contains all the publicly available AGN catalogs along with their properties, spanning from the radio to the X-ray wavelengths. All the objects are securely classified as AGN (spectroscopically or with reliable photometric methods) and matched together with LYRA, a robust algorithm that includes Bayesian statistics and photometric priors. The primary goal of AGN-DB is to collect AGN across the entire Universe in the most comprehensive way possible. Whenever a new AGN catalog (or even single objects) becomes available, AGN-DB can ingest it, regardless of its format, and convert all the physical units to the standard cgs system. AGN-DB will be published as a single, complete catalog that will be available through a web querying interface and other tools (e.g., jupyter notebooks).

The database: more than 7 million AGN

- AGN classified either through spectra or reliable photometric methods, sub-classes (type 1, type 2, blazars, etc.) are available when possible
- Redshift completeness at ~90% (61% photo-z, 39% spec-z); z up to ~7
- 66 magnitude/flux wavebands (Figure: radio-IR/yellow, Optic-UV/purple, and X-rays/green; height is the normalized number of values/band)
- Semi-automated pipeline to ingest and match new catalogs (or single objects)
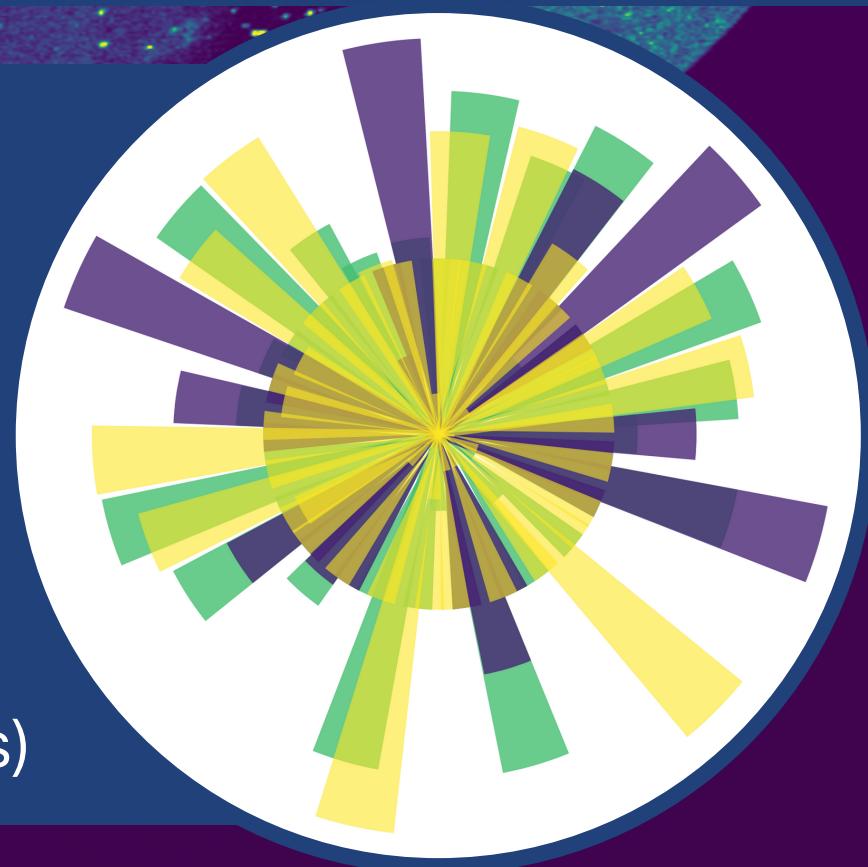
LYRA: counterparts matching

LYRA is a pythonic algorithm powered by machine learning and capable of matching every kind of catalog using Bayesian statistics:

- Match simultaneously as many catalogs as you want
- Match partially overlapping catalogs
- Include magnitude priors through a maximum likelihood approach
- Include as many additional priors as you wish
- Turn on/off each of the above, even Bayesian statistics
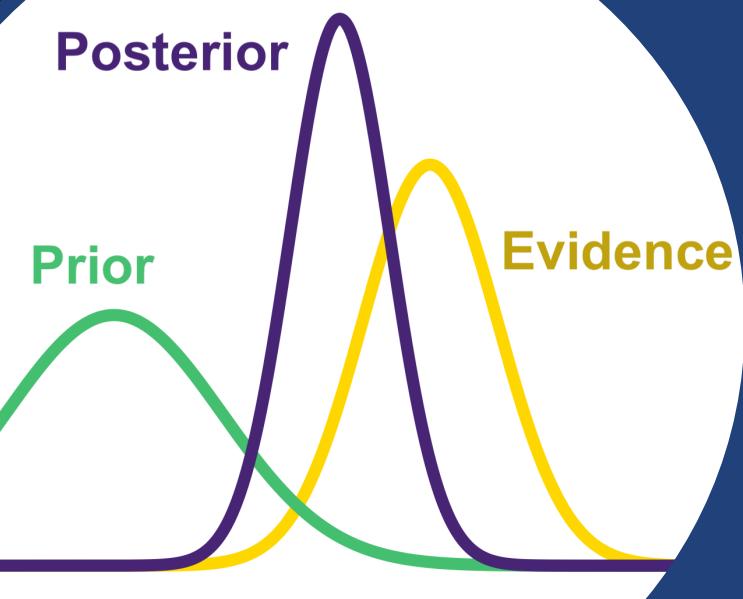
Current projects

- X-ray spectral analysis (NH focused) & SED fitting over the entire database
- Morphological classification of host galaxies (e.g., GAMORNET; Ghosh+22)
- Multi-wavelengths and bolometric luminosity functions
- Machine Learning methods for AGN misclassification (Figure: AGN/yellow, non-AGN/purple, and possible misclassified AGN in purple+yellow groups)
- Including spectroscopic properties available in the literature
- Matching secure AGN with unclassified objects to increase completeness

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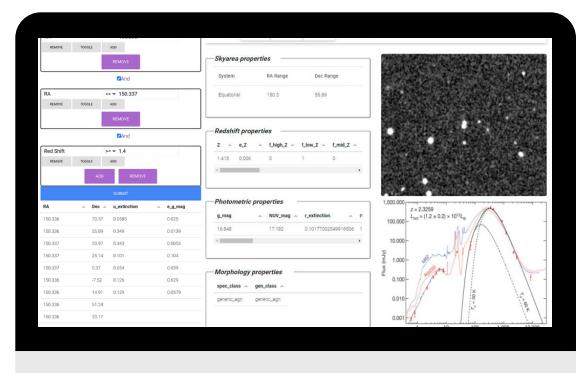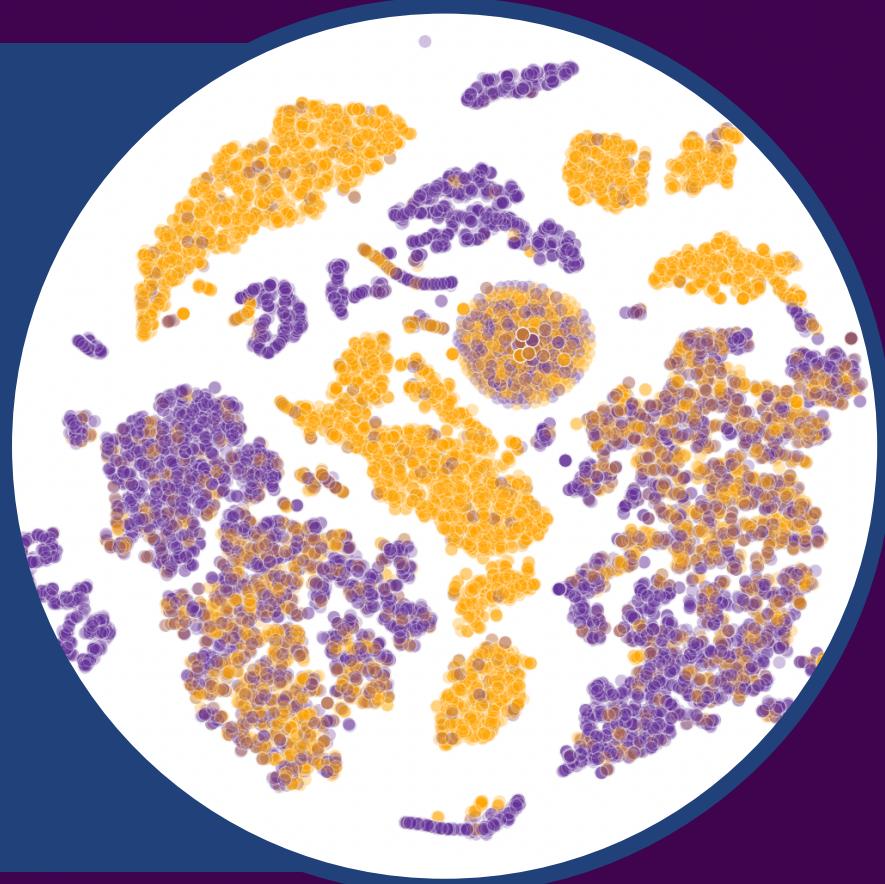
Web interface (query & SEDs) available soon!

Want to join?

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