Exploring and Mapping Vocabularies

IVOA InterOp Semantics Session

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Outline

- Vocabulary Exploration
- Vocabulary Mappings
  - Why do we need them?
  - How should we express them?
  - A GUI Editor
- Open Issues

Vocabulary Explorer

- Web application

  http://explicator.dcs.gla.ac.uk/WebVocabularyExplorer

- Uses official vocabularies

- Allows text search for vocabulary concepts

  – Displays available concept information

  – Exploration of Broader, Narrower and Related links

- Demonstrate why we need

  – Multiple vocabularies (screenshots)

  – Mappings

Exploring a Vocabulary

Exploring a Vocabulary

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Exploring a Vocabulary

- Small number of results
  - Could be none
  - Can lead to frustration

- What if we explore all the vocabularies? ([Screenshots](#))

Exploring Vocabularies

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Exploring Vocabularies

- Get more search results
  - Results from different vocabularies
- Exploration "locks" you into a vocabulary
  - No additional links to concepts in other vocabularies

- What if we have mappings?
  - What is a mapping?
  - How can they be expressed?

What is a Mapping?

"A relationship from a concept in one vocabulary to a concept in another vocabulary."

- Types of mapping:
  - The same concept
  - A more general/broader concept
  - A more specific/narrower concept
  - A related concept
  - Others? Similar, synonym, …

Using broader/narrower/related

- Conceptual mismatch
  - Leads to inconsistencies
- No "*these things are the same*" relationship

```
aaKeys:sunspot
  a skos:concept ;
…
  skos:narrower aaKeys:sun ;
  skos:narrower aoim:starspot ;
…
```

```
aoim:starspot
  a skos:concept ;
…
  skos:narrower aoim:star ;
  ex:sameAs aaKeys:sunspot ;
…
```

Separate Mapping Terms

- Currently four mapping relationships:
  - `skos:exactMatch`
  - `skos:broader`
  - `skos:narrower`
  - `skos:related`
- Inverse mappings
- Declared in separate file
  - Good practice
  - Use vocabulary independently of mappings
  - Declare in one direction

Generating Mappings
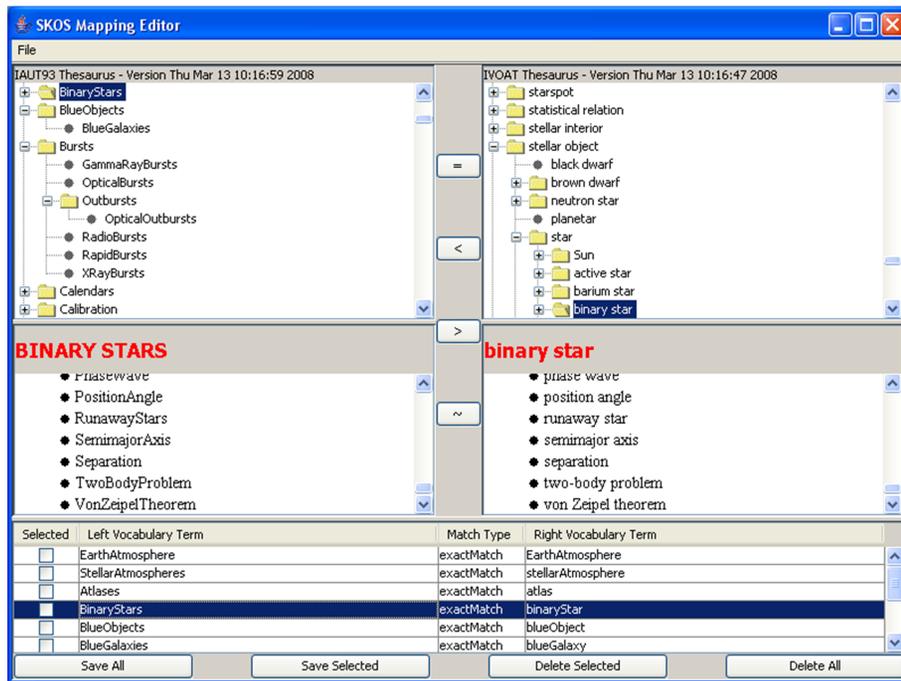
- Choose 2 vocabularies

- Choose concepts

- Click type of mapping

- Save mappings to file

Mapping File

```
[Appropriate prefix declarations]

<>
    dc:creator "Alasdair J G Gray"@en;
    dc:created "2008-02-07";
    dc:title "Mappings from Astronomy &
    Astrophysics Journal keywords to the AOIM
    taxonomy"@en .

aaKeys:AccretionAccretionDisks skos:exactMatch
    aoim:StarCircumstellarMaterialDiskAccretion .


aaKeys:BlackHolePhysics skos:relatedMatch
    aoim:StarEvolutionaryStageBlackHole ,
    aoim:GalaxyComponentCentralBlackHole .

aaKeys:GravitationalLensing skos:exactMatch
    aoim:GalaxyTypeGravitationallyLensed ;
    skos:relatedMatch
    aoim:CosmologyPhenomenonLensing .
```

- Require metadata
  - dc terms
  - Our own
- What do we require?
  - Creator
  - Vocabularies
  - Versions
  - Date
  - ?

Exploring Using Mappings

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Exploring Using Mappings

(Screenshots)

- Many search results
  - Require better ranking (try star)
- Discover inter vocabulary relationships
  - Jump to concepts in other vocabularies
- Require more mapping files
  - Need to be generated using domain knowledge
  - Laborious process
  - Done once used often

Conclusions

- Mappings are useful
- Mappings are different from relationships
  - Are current mappings sufficient for our needs?
  - What metadata do we require?
- Need tools to help us
  - [Basic mapping editor](#)
  - [Vocabulary Explorer](#)
- Need improved search ranking