

A VOEvent Vocabulary in a Semantic World

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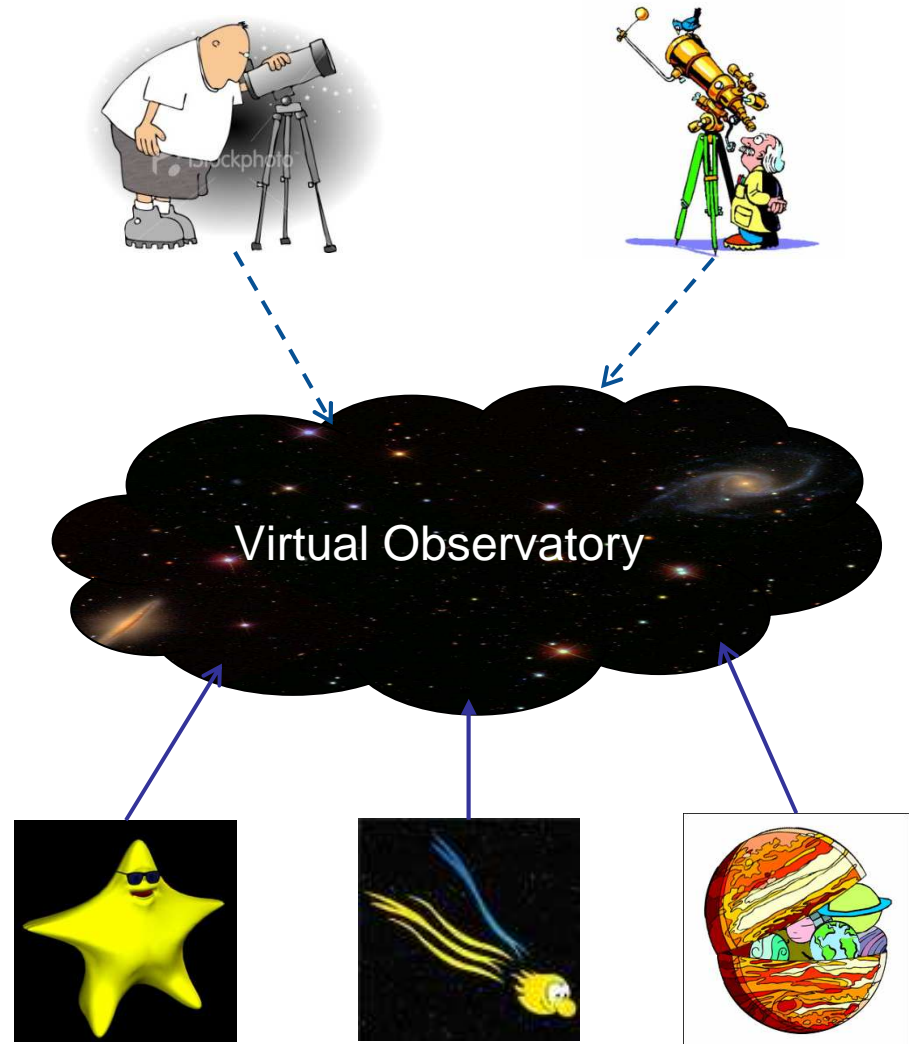
[Explicator Project](#)

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Explicator Project: <http://explicator.dcs.gla.ac.uk>

Problem

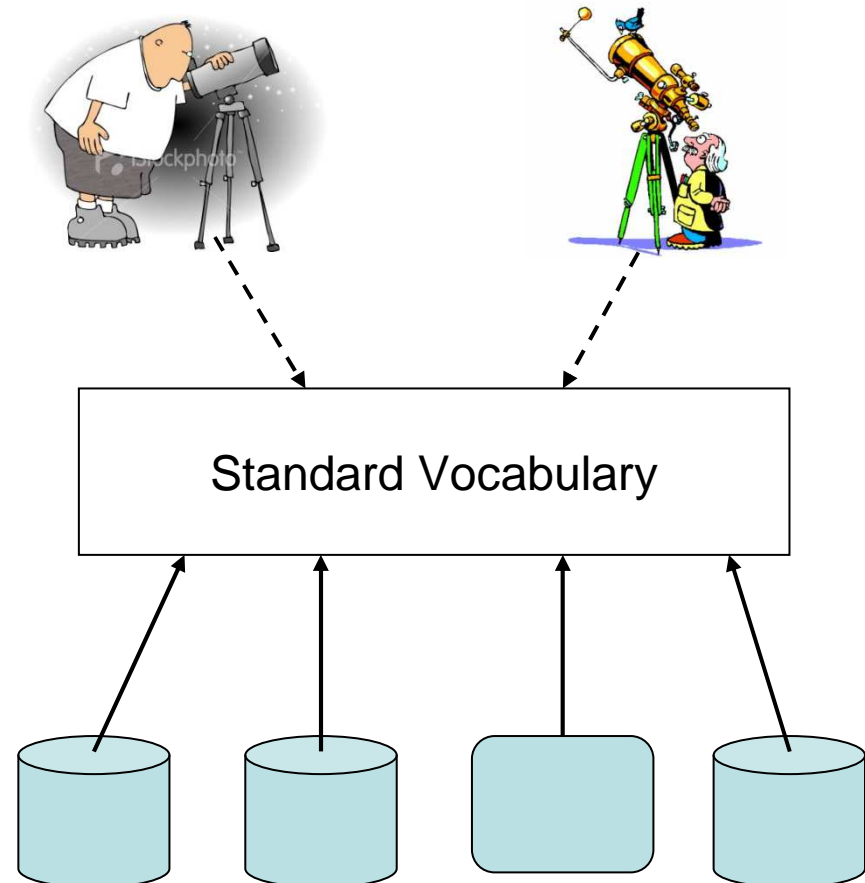
- Astronomers need to locate relevant data
- Data published
 - By multiple sources
 - Using different vocabularies
- Applications use own vocabularies



Standard Vocabulary

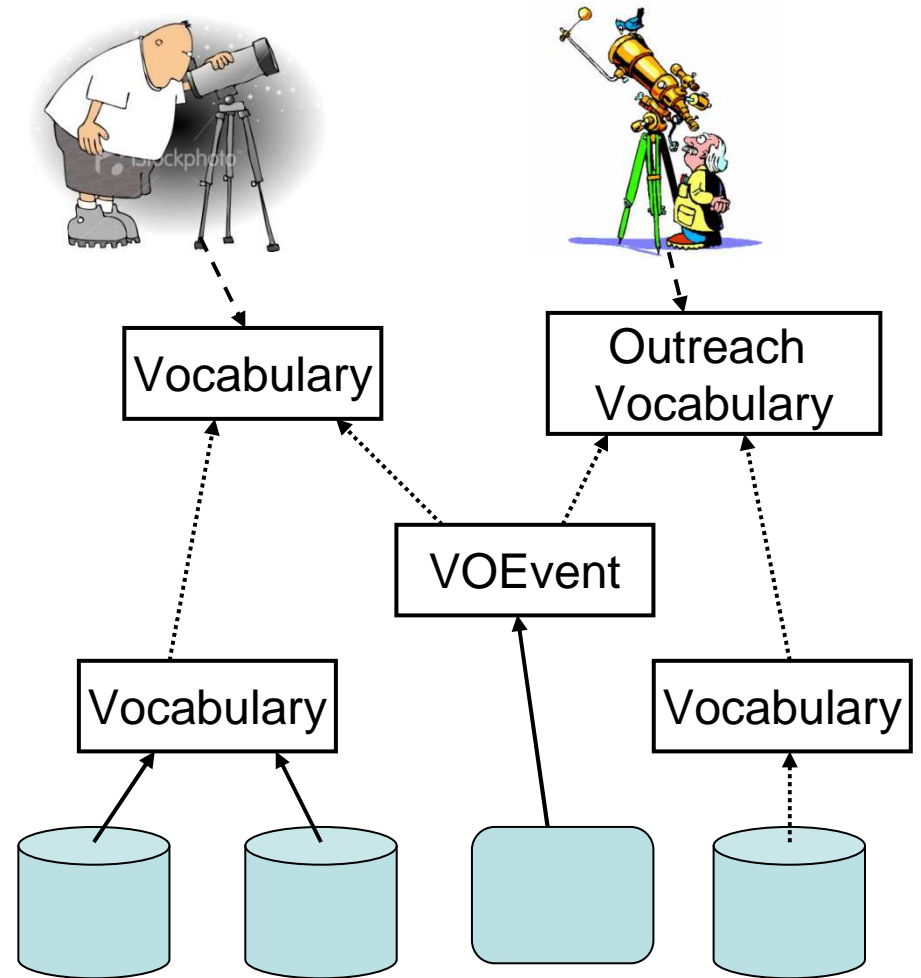
- Data published using standard vocabulary
- Applications receive data in standard vocabulary
- Everyone can work together

Problem: Need to agree on standard vocabulary content



Network of Vocabularies

- Data published in native vocabulary(ies)
- Astronomers search in native vocabulary
- Automatic translation between vocabularies



One (Potential) VOEvent Use

- Event described in VOEvent
- Sent to interested astronomer with:
 - Related publications (requires link to journal vocabulary)
 - Processing applications (requires link to resources vocabulary)
 - Related data (requires links to data vocabularies)

Semantic Tools

- **Ontologies:** Representation of knowledge
- **Thesaurus:** Synonyms, antonyms, etc
- **Taxonomy:** Broader/narrower, super-class/sub-class
- **Vocabulary:** Controlled list of words, broader/narrower/related
- **Folksonomy:** Free keywords/tagging

Representing Vocabularies

- Been worked on in Library science for 20 years
- Allows retrieval of information exploiting relationships
- SKOS (Simple Knowledge Organisation System)
W3C Working Draft

```
ACTIVE GALACTIC NUCLEI
UF agn
BT GALACTIC NUCLEI
    VARIABLE SOURCES
    X RAY SOURCES
NT BLAZARS
    SEYFERT NUCLEI
RT ACTIVE GALAXIES
    BL LACERTAE OBJECTS
    COMPACT NUCLEI
    EMISSION LINE GALAXIES
    GALAXIES
    QUASARS
    RADIO GALAXIES
```

IAU Thesaurus

Existing Vocabularies

- Many existing vocabularies, e.g.
 - Astronomy and Astrophysics Journal keywords
 - IAU Thesaurus
 - AOIM (Outreach vocabulary)
- SKOS representations can be generated automatically
- Mappings stored separately

Example Query

```
prefix skos: <http://www.w3.org/2004/02/skos/core#>
prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#>
prefix AAk: <ivo://ivoa/Vocabulary/AAkeys#>
prefix AOIM: <ivo://Vocabulary/AOIM#>
```

```
select ?r ?b
where {
  AOIM:startypevariablenova rdfs:subClassOf ?r.
  ?r skos:broader ?b.
}
```

<uri>ivo://Vocabulary/AOIM#startypevariablenova</uri>

<uri>ivo://Vocabulary/AOIM#star</uri>

<uri>ivo://ivoa/Vocabulary/AAkeys#starsnovaecataclysmicvariables</uri>

<uri>ivo://ivoa/Vocabulary/AAkeys#stars</uri>

Conclusions

- Multiple vocabularies are in use
- Developing standard vocabulary will take time and not meet all needs
- Vocabularies can be machine understandable
- Allows linking of information across applications

- Similar approach for data models