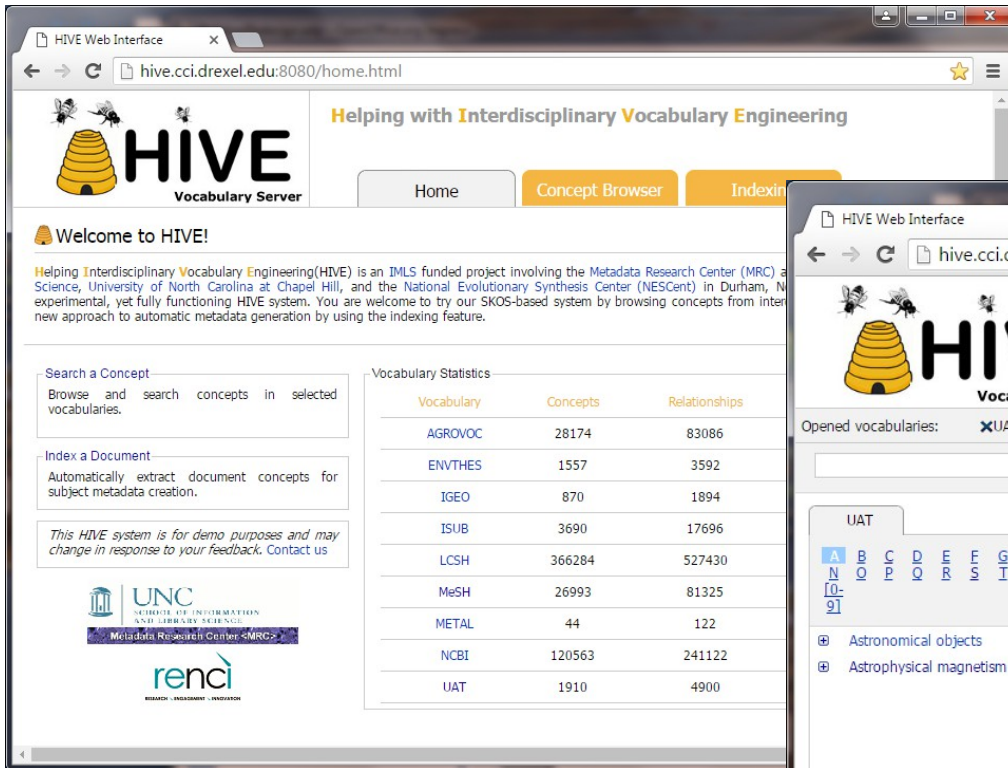


HIVE Update

Joan Boone
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HIVE 1.0

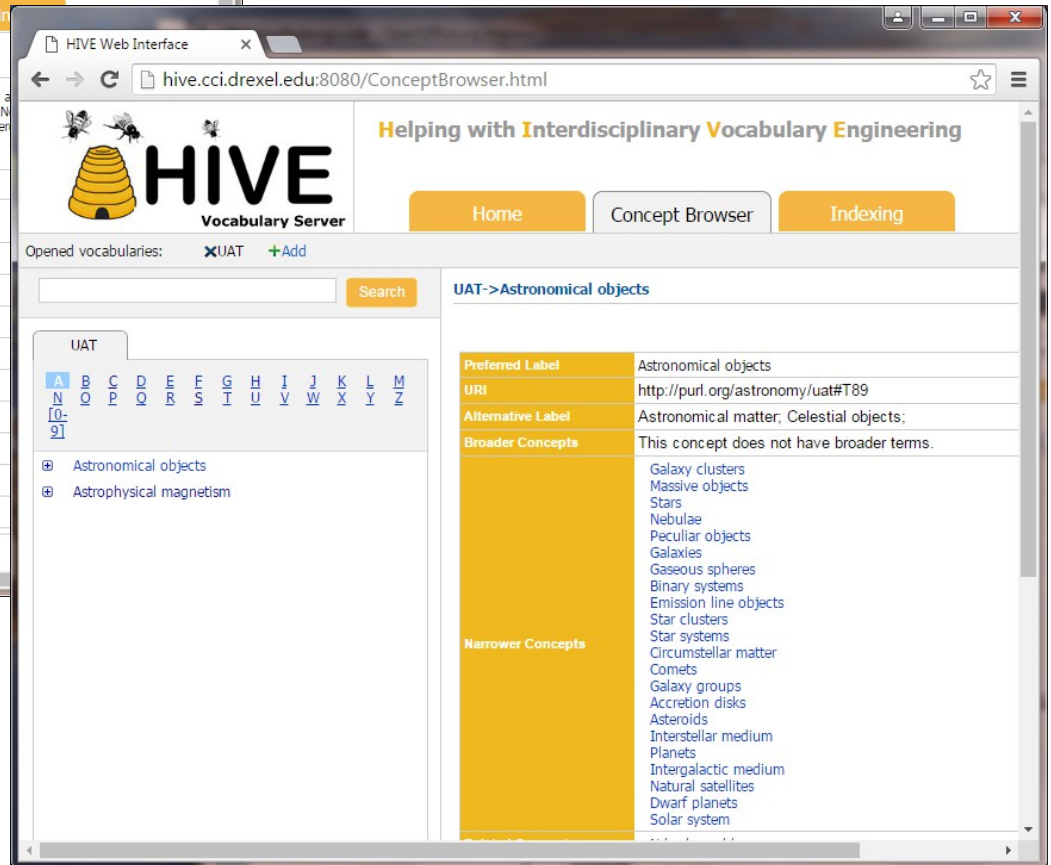
Available Vocabularies



The screenshot shows the HIVE Web Interface home page. The browser address bar displays `hive.cci.drexel.edu:8080/home.html`. The page features the HIVE logo (a beehive) and the text "Helping with Interdisciplinary Vocabulary Engineering". Navigation buttons for "Home", "Concept Browser", and "Indexing" are visible. A "Welcome to HIVE!" message is followed by a paragraph describing the project as an IMLS-funded effort involving the Metadata Research Center (MRC) at UNC and the National Evolutionary Synthesis Center (NESCent) at Durham. Below this, there are sections for "Search a Concept" and "Index a Document". On the right, a "Vocabulary Statistics" table lists various vocabularies and their associated concept counts and relationships.

Vocabulary	Concepts	Relationships
AGROVOC	28174	83086
ENVTHES	1557	3592
IGEO	870	1894
ISUB	3690	17696
LCSH	366284	527430
MeSH	26993	81325
METAL	44	122
NCBI	120563	241122
UAT	1910	4900

Vocabulary Browse and Search




The screenshot shows the HIVE Web Interface Concept Browser. The browser address bar displays `hive.cci.drexel.edu:8080/ConceptBrowser.html`. The page features the HIVE logo and the text "Helping with Interdisciplinary Vocabulary Engineering". Navigation buttons for "Home", "Concept Browser", and "Indexing" are visible. Below the navigation buttons, there is a section for "Opened vocabularies" with a search bar and a "Search" button. The main content area is titled "UAT->Astronomical objects" and displays a list of concepts under the "UAT" tab. The concepts are listed in a table with columns for "Preferred Label", "URI", "Alternative Label", "Broader Concepts", and "Narrower Concepts".

Preferred Label	URI	Alternative Label	Broader Concepts	Narrower Concepts
Astronomical objects	http://purl.org/astronomy/uat#T89	Astronomical matter; Celestial objects;	This concept does not have broader terms.	Galaxy clusters Massive objects Stars Nebulae Peculiar objects Galaxies Gaseous spheres Binary systems Emission line objects Star clusters Star systems Circumstellar matter Comets Galaxy groups Accretion disks Asteroids Interstellar medium Planets Intergalactic medium Natural satellites Dwarf planets Solar system

HIVE 1.0 Indexing

HIVE Web Interface x News | Astronomy.com x

hive.cci.drexel.edu:8080/indexing.html#LCSH

 **HIVE**
Vocabulary Server

Helping with Interdisciplinary Vocabulary Engineering

Home Concept Browser Indexing

HIVE automatically extracts concepts from a document or URL based on selected vocabularies.


- Step 1: Select a vocabulary
- Step 2: Upload a document OR provide the URL for a document
- Step 3: Click Start Processing button

HIVE Automatic Concepts Extractor

1 Select vocabulary source ☒ AGROVOC ☒ UAT ☒ LCSH

2 Upload a document No file chosen

OR Enter the URL

Powered by 

Vocabulary Engineering

ser Indexing

KOS N triples, Dublin Core, MARC/XML, and MODS/XML.

Extracted Concepts Cloud

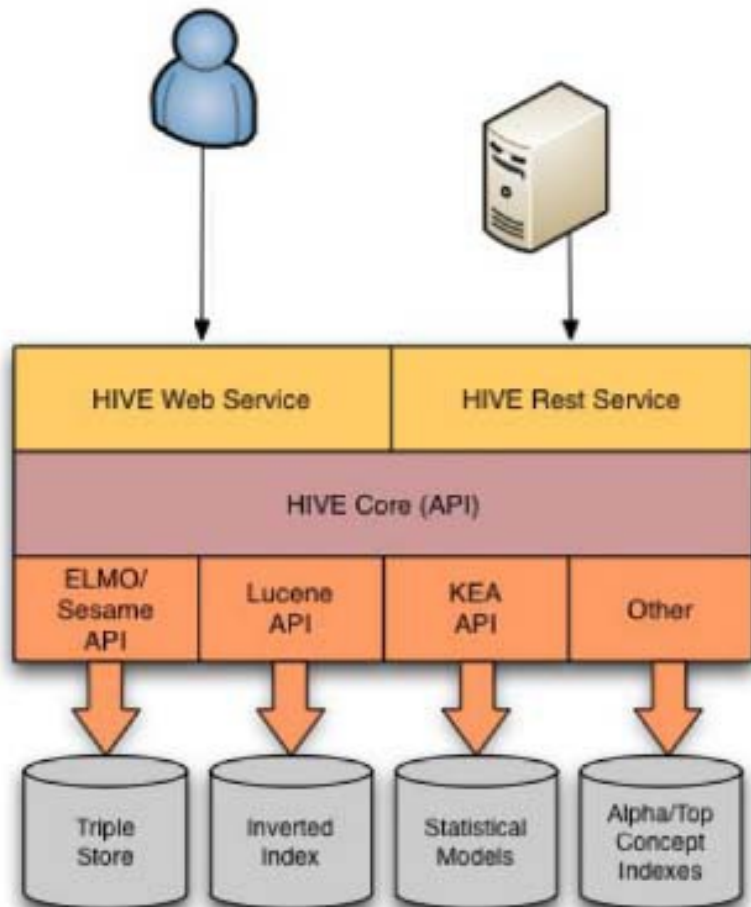
☒ AGROVOC
☒ UAT
☒ LCSH

Moon phases Hilling Venus Mercury Climatic change Shops
Clouds Universities Spacing Mankind

Globular star clusters Galactic Center Massive stars Heavy metal stars
Pluto Brown dwarfs Supermassive black holes Galactic evolution
Gas clouds Hot Jupiters

Venus (Planet)--Transit Uranus (Greek deity) Sky
Jupiter (Roman deity) in literature Jupiter (Planet)--
Atmosphere Jupiter (Planet)--Magnetosphere
Jupiter (Planet)--Radiation Jupiter (Planet)--Mass
Jupiter (Planet)--Juvenile literature Space vehicles--
Atmospheric entry--Jupiter (Planet)

HIVE 1.0 Architecture



What's in the Dockerized HIVE

- Tomcat Server
- HIVE Web Services
- HIVE Core API
- Data stores and indexes
- Two vocabularies (AGROVOC, UAT)

Link to [HIVE Docker files on GitHub](#)

HIVE 1.0 Services

Vocabulary info

- List of available vocabularies
- Number of concepts and relationships for a vocabulary
- Alphabetic and top concept indexes for a vocabulary

Browsing and search

- Browse the vocabulary
- Browse the details for a specific concept (preflabel, altlabel, broaders, narrowers, relateds, SKOS format)
- Search concepts by keyword across multiple vocabularies

Indexing

- Index a URL or text document using multiple vocabularies

[List of available HIVE Services and examples](#) at Drexel

Redesign of Web Interface using HIVE 1.0 Services

The image displays two screenshots of the HIVE web interface. The left screenshot shows the 'Welcome to HIVE!' page, which includes a navigation bar with 'HIVE', 'Home', 'Concept Browser', and 'Indexing'. Below the navigation bar, there is a 'Welcome to HIVE!' message and a 'Vocabulary Statistics' table. The right screenshot shows the 'Concept Browser' page, which displays a list of concepts and a detailed view for 'UAT > Planetary science'.

Welcome to HIVE!

Helping Interdisciplinary Vocabulary Engineering (HIVE) is an Information Research Center (MRC) at the School of Information and Library Studies, Hill, and the National Evolutionary Synthesis Center (NESCent) in Drexel University. You are welcome to explore concepts from interdisciplinary vocabularies or experience a new way of using the indexing feature.

Vocabulary Statistics

Vocabulary	Concepts	Relationships
AGROVOC	28174	83086
METAL	44	122
NCBI	120563	241122
UAT	1910	4900

Concept Browser

Concepts

- Astronomical objects
- Astrophysical magnetism
- Celestial mechanics
- Cosmology
- Equipment and apparatus
- Galactic physics
- Interdisciplinary astronomy
- Lunar physics
- Methods and techniques
- Nuclear astrophysics
- Observational astronomy
- Planetary science
- Positional astronomy
- Space exploration
- Stellar physics

UAT > Planetary science

Preferred Label	Planetary science
URI	http://purl.org/astronomy/uat#T1292
Alternative Label	Planetology
Broader Concepts	This concept does not have broader terms.
Narrower Concepts	<ul style="list-style-type: none">Atmospheric scienceExtrasolar planet detectionImpact phenomenaInterplanetary physicsPlanetary alignmentPlanetary atmospheresPlanetary structurePlanetary system formationPlanetary theorySatellite formationSolar-planetary interactions
Related Concepts	This concept does not have related concepts.
Scope Notes	This concept does not have scope notes.

Developed with basic front-end web technologies (HTML, CSS, JavaScript) using HIVE 1.0 services.

[Link to HIVE 1.0 Web interface redesign at Drexel](#)

HIVE 2.0 Redesign Objectives

- Implement with Python to address skills availability for developing and supporting HIVE
- Simplify vocabulary import and data model
- Improve web services interface for indexing and search functions
- Leverage existing Python tools and libraries
 - [CherryPy](#) for web framework
 - [Natural Language Toolkit \(NLTK 3.0\)](#) for text analysis: parsing, stemming, filtering, classification
 - [RDFLib](#) to read, parse, and transform RDF vocabularies
 - [SQLite](#) for relational database access

HIVE 2.0 Work in progress

- Import of RDF vocabularies using RDFLib, with conversion to a SQLite database
- Text processing using NLTK to tokenize, stem, and filter document content
- Installed CherryPy web server at Drexel
- Deployed test app that generates top concept hierarchy from UAT database

Converting RDF vocabularies to SQL database

RDF file snippet

```
<rdf:Description rdf:about="http://www.altbibl.io/astronomy/uat/xl_en_15xytrsw">
  <rdf:type rdf:resource="http://www.w3.org/2004/02/skos/core#Concept"/>
  <hasStatus xmlns="http://art.uniroma2.it/ontologies/vocbench#">Published</hasStatus>
  < dct:created   rdf:datatype="xsd:http://www.w3.org/2001/XMLSchema#dateTime">2014-09-10T19:51:06Z</dct:created>
  < dct:modified  rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2014-09-10T19:54:46Z</dct:modified>
  <skos:broader  rdf:resource="http://www.altbibl.io/astronomy/uat/xl_en_zk4ftwhn"/>
  <skos:inScheme rdf:resource="http://www.altbibl.io/astronomy/uat"/>
  <skosxl:altLabel rdf:resource="http://www.altbibl.io/astronomy/uat/xl_en_3527dfde"/>
  <skosxl:prefLabel rdf:resource="http://www.altbibl.io/astronomy/uat/xl_en_10ba7619"/>
</rdf:Description>
```

- Used **RDFLib** to parse the vocabulary in RDF format, and create a graph database of triples
- Graph database is large (~90MB)
 - Slow to access and search
 - Contains 30K+ triples (for a vocabulary with ~1800 terms)
- SQLite (relational) version is fast and small (~1.1MB)
 - Removed triples not used by HIVE
 - 4K+ 'triples' are defined as relations

HIVE 2.0 Test App:

Top Concept Hierarchy for UAT

The image displays two browser windows side-by-side, illustrating the 'Top Concept Hierarchy for UAT' (Unified Astronomy Thesaurus) application.

Left Window (astrothesaurus.org/hierarchical-browse/):

- Browser tabs: HIVE Web Inter..., News | Astron..., Hierarchical Bro..., localhost:8088
- Address bar: astrothesaurus.org/hierarchical-browse/
- Page Title: **UNIFIED ASTRONOMY THESAURUS**
- Navigation: Thesaurus | Contribute | Updates | About | Contact
- Section: **Unified Astronom Thesaurus**
[expand all](#) | [collapse all](#)
- Text: Please click on a term in the hi...
- Hierarchy (expanded):
 - ▼ Astrophysical processes
 - ▼ Astrophysical magnetism
 - Cosmic magnetic fields theory
 - Emerging flux tubes
 - ▼ Magnetic fields
 - Geomagnetic fields
 - Magnetic anomalies
 - Primordial magnetic fields
 - ▼ Gravitation
 - ▼ Celestial mechanics
 - Apparent superluminal motion
 - Astrodynamics
 - ▼ Close encounters
 - Opik theory
 - ▼ Lunar theory
 - Annual equation
 - Anomalistic month
 - Lunar node regression

Right Window (localhost:8088):

- Browser tabs: localhost:8088
- Address bar: localhost:8088
- Search, Star, and Menu icons in the top right.
- Content (Expanded Hierarchy):
 - Astrophysical processes
 - Astrophysical magnetism
 - Cosmic magnetic fields theory
 - Emerging flux tubes
 - Magnetic fields
 - Geomagnetic fields
 - Magnetic anomalies
 - Primordial magnetic fields
 - Gravitation
 - Celestial mechanics
 - Apparent superluminal motion
 - Astrodynamics
 - Close encounters
 - Opik theory
 - Lunar theory
 - Annual equation
 - Anomalistic month
 - Lunar node regression
 - N-body problem
 - Few-body systems
 - Orbits
 - Orbit determination
 - Orbital elements
 - Apsis
 - Apastron
 - Aphelion
 - Apocenter
 - Anagee