GFZ POTSDAM

INFORMATION SYSTEMS AND DATA CENTER

Global Earth Science Data

IUGONET

SCOSTEP-WDS Workshop

Global Data Activities for the Study of Solar-Terrestrial Variability

28-30 September 2015

National Institute of Information and Communications Technology (NICT), Tokyo, Japan

espas

Open Data, Open Publication and Open Science Approach for Geo and Space Science Domain

B. Ritschel (GFZ/京都大学), Ch. Seelus (GFZ), G. Neher (FHP),
T. Iyemori (Kyoto University), Y. Koyama (NII)
A. Yatagai (Nagoya University), Y. Murayama (NICT),
T. King (University of California), J. Hughes (JPL),
S. Fung (NASA GSFC), I. Galkin (University of Massachusetts),
M. Hapgood (STFC), A. Belehaki (National Observatory of Athens)

GFZ Helmholtz Centre Potsdam

WDC Kyoto for Geomagnetism

Nagoya University

Science & Technology Facilities Council

UMLCAR

Institute of Geophysics and Planetary Physics, University of California, Los Angeles

NICT

NII

GCMD

SPASE

Kyoto University

Poem „The Sorcerer's Apprentice“
Johann Wolfgang von Goethe, Weimar, 1797

Good! The sorcerer, my old master

left me here alone today!

Now his spirits, for a change,

my own wishes shall obey!

…

with my powers of will I can

do some witching, too!

…

Come on now, old broom, get dressed!

…

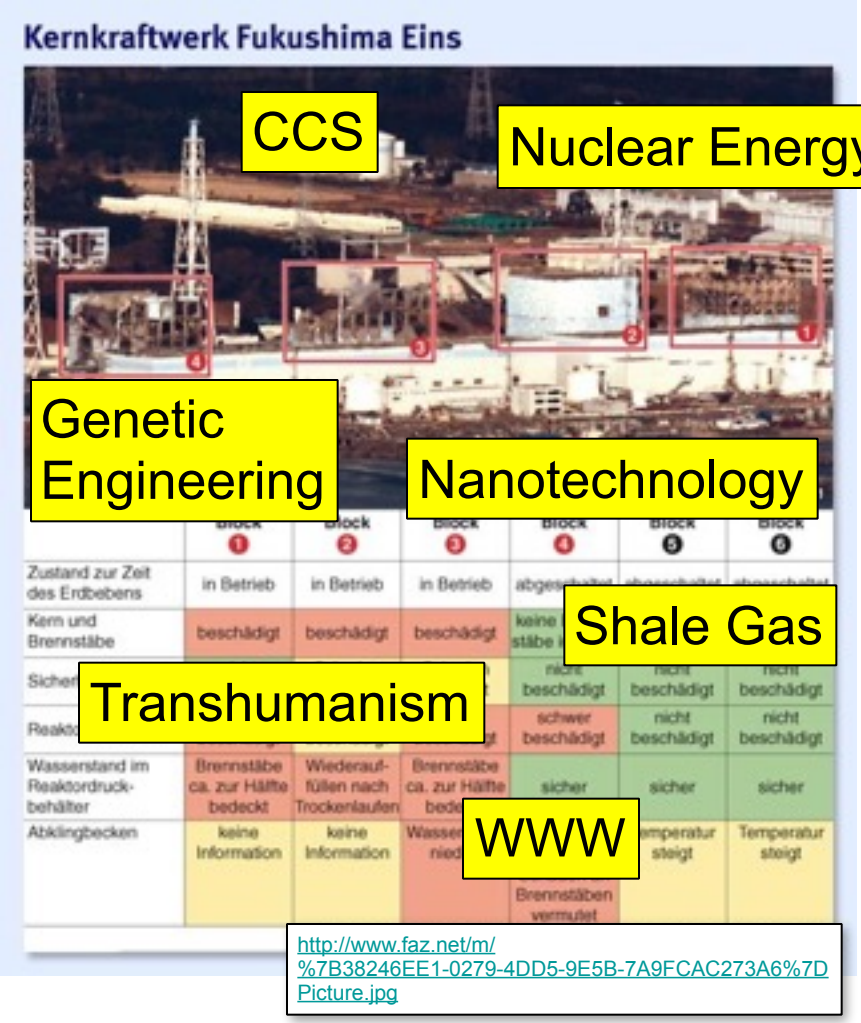
and today you will be mine!

…

http://de.wikipedia.org/w/index.php?title=Datei:Tovenaarsleerling_S_Barth.png&filetimestamp=20100506151118

Poem „The Sorcerer's Apprentice“
Johann Wolfgang von Goethe, Weimar, 1797

I've forgotten - woe is me!
what the magic word may be.
Oh, the word to change him back
into what he was before!
...
O, you ugly child of Hades!
...
Please, I'm begging you!
...
I have need of Thee!
from the spirits that I called
Sir, deliver me!
...



http://www.faz.net/m/%7B38246EE1-0279-4DD5-9E5B-7A9FCAC273A6%7DPicture.jpg

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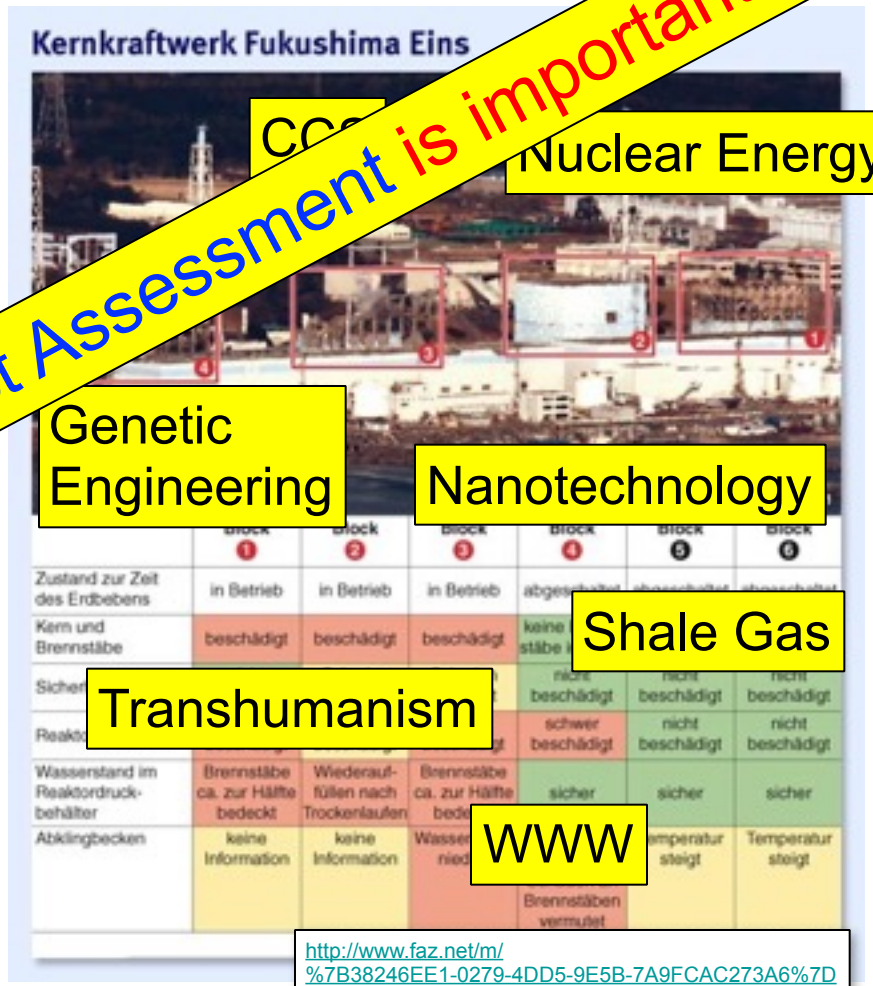


http://www.faz.net/m/%7B38246EE1-0279-4DD5-9E5B-7A9FCAC273A6%7DPicture.jpg

Between the Poles of an Open Approach

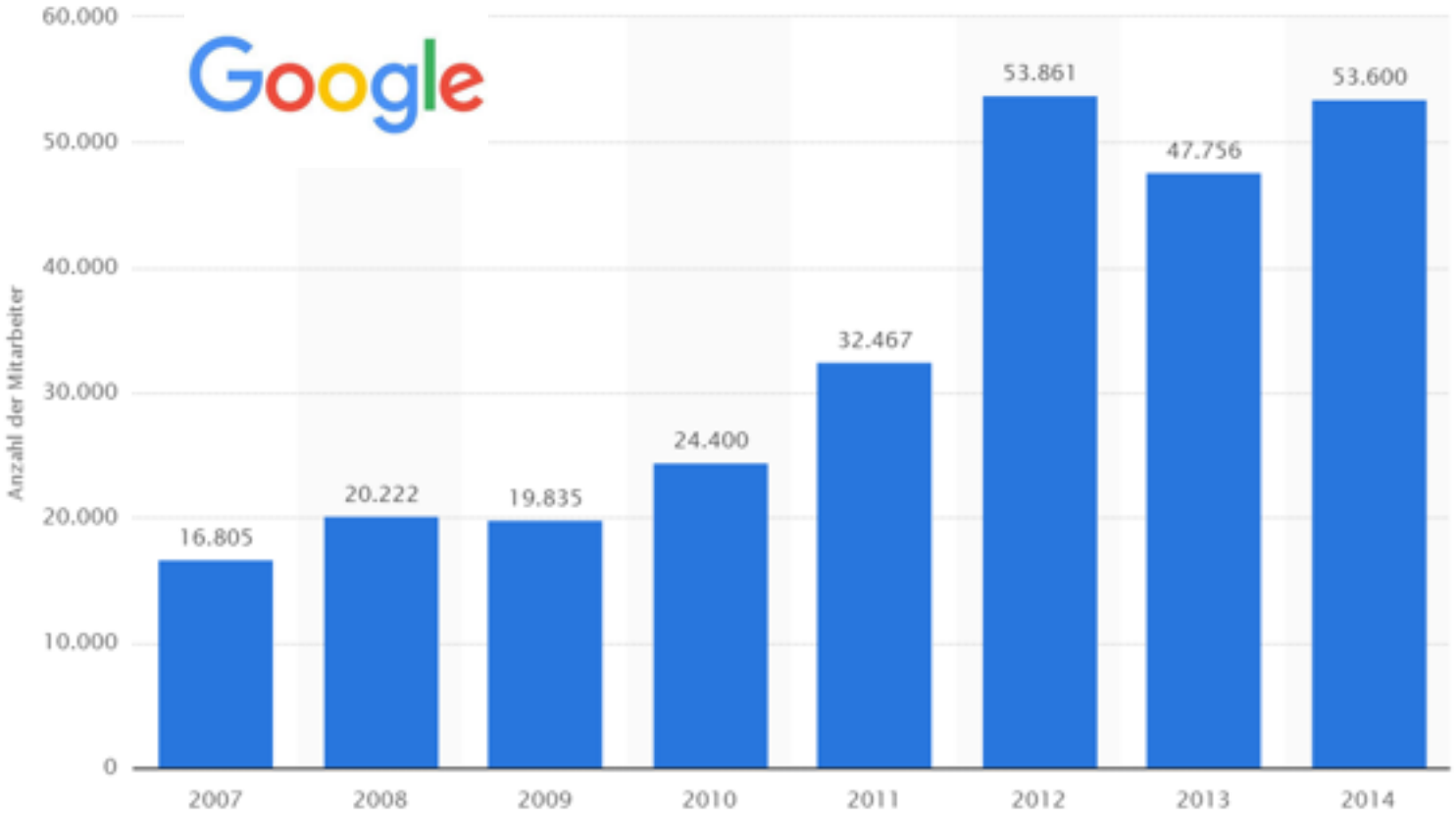
Sustainable science	<=>	short-term success
Independent science	<=>	interest controlled funding
Verifiable science	<=>	closed data archives
Open publications	<=>	SCI and publishers' power
Ethical driven science	<=>	military induced research
Open data science	<=>	ubiquity spying and abuse
WDS science services	<=>	Google* power & services

Science and research are embedded in the society and are controlled by many and partly contrary interests.

*stands for the big private players, such as Microsoft, Apple, …

Number of full-time Google employees from 2007 to 2014

Most of them are data scientists and software engineers.



Machine Learning -> Deep Learning

(from Google Maps/Earth to AI based services)

Deep Learning (DL) takes the Artificial Intelligence (AI) a step further

- DL trains machines
  - to recognize patterns in the data, then classify and categorize them, all on their very own (so with less engineering labor)
  - enables the process to unfold huge reams of previously unmanageable data.
- Google
  - Brain team => 100 different teams use that technology

Google

http://recode.net/2015/07/15/deep-learning-ai-is-taking-over-tech-what-is-it/

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How to compete with Google, Microsoft or Apple services?

Google

Google: **Drain for the brain**

- Money is at play. An engineer proficient in deep learning can earn upward of $250,000 a year at places like Google and Facebook, according to several sources; exceptional or more experienced ones can net seven-figure salaries.
- "There's been a huge brain drain from academia," said Naveen Rao, the CEO of Nervana Systems, a heavily funded deep learning startup. (Bengio is an adviser.) Valley firms are taking up the mantle. That tends to push research in their preferred direction, advancing models that, for instance, work best for smartphones or search, Rao argued. DeepMind is working directly with Google's search or Knowledge unit. "It's always a little bit biased," Rao said. "It always has a slant."

Google

http://recode.net/2015/07/15/ai-conspiracy-the-scientists-behind-deep-learning/

Research with temporary contracts?

Forschen mit Zeitvertrag: "Aus Hire-and-fire entsteht keine gute Wissenschaft" How we can expect a sustainable usage of data?

DPA

Proteste gegen Finanznot in Baden-Württemberg: Es fehlen Dauerstellen für Daueraufgaben, sagt die GEW

Sie sind die klügsten des Landes, arbeiten aber teils jahrelang unter prekären Bedingungen: Ein Großteil der wissenschaftlichen Mitarbeiter an deutschen Hochschulen ist auf Zeitvertragsbasis beschäftigt.

Spiegel Online (16.03.2015): http://www.spiegel.de/unispiegel/jobundberuf/wissenschaftliche-mitarbeiter-hochqualifiziert-und-prekaer-beschaeftigt-a-1019255.html

Most of scientists at German universities and research institutes are working under precarious conditions.

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How to convince funders to support sustainable science?

Most of scientists at German universities and research institutes are working under precarious conditions.

Five companies control more than half of academic publishing

Citation: Larivière V, Haustein S, Mongeon P (2015) The Oligopoly of Academic Publishers in the Digital Era. PLoS ONE 10(6): e0127502. doi:10.1371/ journal.pone.0127502

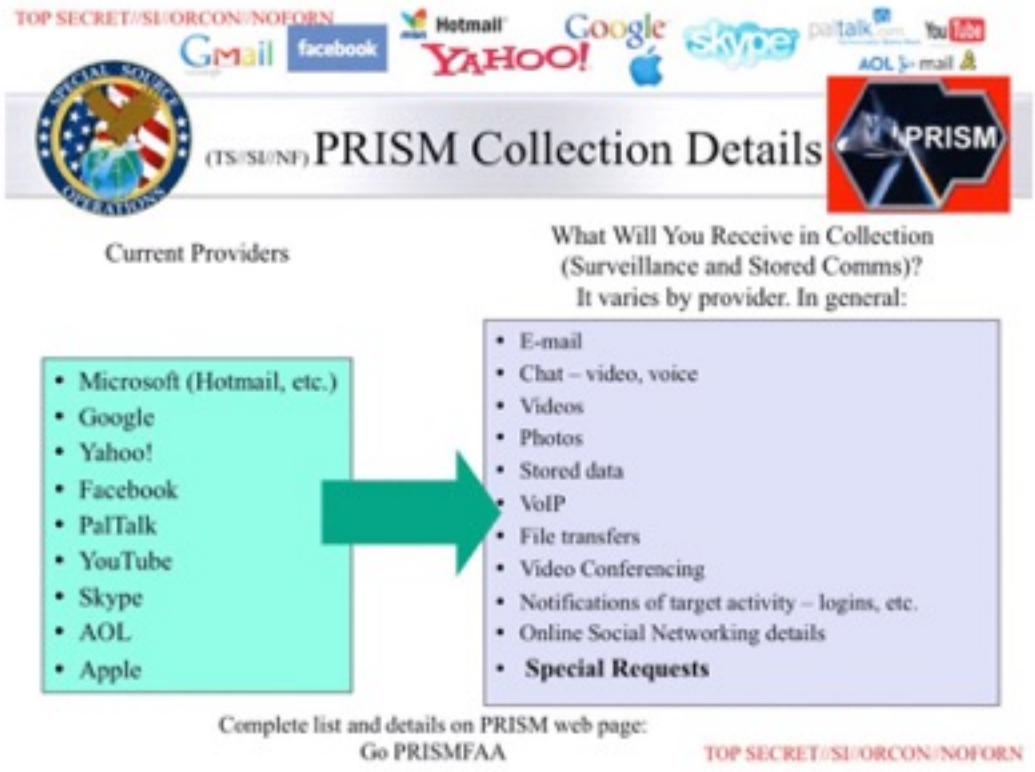
A study at the University of Montreal shows that the market share of the five largest research publishing houses reached 50% in 2006, rising, thanks to mergers and acquisitions, from 30% in 1996 and only 20% in 1973. "Overall, the major publishers control more than half of the market of scientific papers both in the natural and medical sciences and in the social sciences and humanities," said Professor Vincent Larivière of the School of Library and Information Science, who led the study. "Furthermore, these large commercial publishers have huge sales, with profit margins of nearly 40%. While it is true that publishers have historically played a vital role in the dissemination of scientific knowledge in the print era, it is questionable whether they are still necessary in today's digital era.

Reed Elsevier · WILEY-BLACKWELL · Springer · Taylor & Francis · SAGE Publications

GFZ Helmholtz Centre Potsdam

http://www.nouvelles.umontreal.ca/udem-news/news/20150610-five-companies-control-more-than-half-of-academic-publishing.html

The „Whistleblower“ Age



New Snowden Docs Reveal British Spy Agency Tactic To Manipulate Social Media

Manipulating the results of online polls, artificially inflating pageview counts, spoofing email accounts -- the U.K.'s secretive GCHQ can do it all, and maybe more.

By Frederick Reese @FrederickReese | July 16, 2014

An aerial image of the Government Communications Headquarters (GCHQ) in Cheltenham, Gloucestershire in the United Kingdom. (Photo/UK Ministry of Defense via Flickr)

http://www.mintpressnews.com/new-snowden-docs-reveal-british-spy-tactic-to-social-media/194034/

Edward Snowden was rewarded the renowned Carl-von-Ossietzky medal by the International League for Human Rights in Berlin in December 2014.

The „Whistleblower“ Age

http://www.mintpressnews.com/new-snowden-docs-reveal-british-spy-tactic-to-social-media/194034/

How to protect Open Data and Science against abuse?

Edward Snowden was rewarded the renowned Carl-von-Ossietzky medal by the International League for Human Rights in Berlin in December 2014.

Open Data/Open Science

G8 Open Data Charta* (Northern Ireland, June 2013)

...

8. We therefore agree to follow a set of **principles** that will be the foundation for access to, and the release and re-use of, data made available byG8 governments.
   They are:

   § Open Data by Default
   § Quality and Quantity
   § Useable by All
   § Releasing Data for Improved Governance
   § Releasing Data for Innovation

...

*https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/207772/Open_Data_Charter.pdf

Open Data/Open Science

***Action 2: Release of high value data**

- We recognise the following as areas of high value, both for improving our democracies and encouraging innovative re-use of data.

Data Category	Example datasets
…	…
Earth observation	Meteorological/weather, agriculture, forestry, fishing, and hunting
Education	List of schools; performance of schools, digital skills
Geospatial	Topography, postcodes, national maps, local maps

..

*https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/207772/Open_Data_Charter.pdf

Open Data/Open Science

EU implementation of the G8 Open Data Charter*

…

The challenges for making further progress towards the openness of information resources are mainly practical and technical:

- making data available in an open format;
- enabling semantic interoperability;
- ensuring quality, documentation and where appropriate reconciliation across different data sources;
- implementing software solutions allowing easy management, publication or visualisation of datasets;
- simplifying clearance of intellectual property rights.

*http://ec.europa.eu/digital-agenda/en/news/eu-implementation-g8-open-data-charter

Open Data/Open Science

A Review of Progress on the Open Data Charter* (March 2015)

Country	Total Score	Number of	Open
United Kingdom	*90*	*20,505*	*Yes*
Canada	*80*	*214,033*	*Yes*
United States	*80*	*137,601*	*Yes*
France	*65*	*13,976*	*Yes*
Italy	*35*	*9,031*	*Yes*
Japan	*30*	*12,800*	*No*
Germany	*25*	*9,799*	*No*
Russia	*5*	*2,424*	*No*

...

*http://www2.datainnovation.org/2015-open-data-g8.pdf

Open Data/Open Science

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Germa	*25*	*9,799*	*No*
	5	*2,424*	*No*

...

This picture also reflects the open data situation in science

*http://www2.datainnovation.org/2015-open-data-g8.pdf

Open Data/Open Science

The Open Science Project: OpenScience.org*

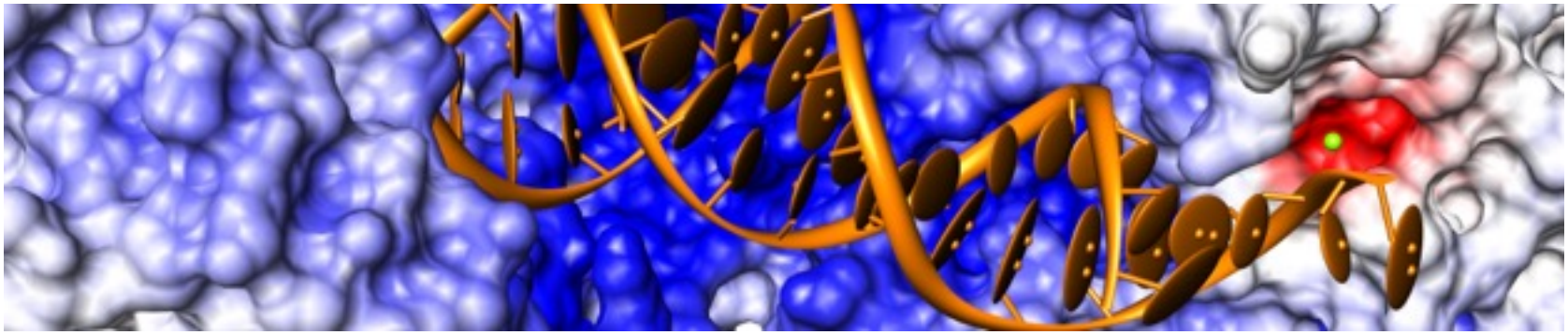
What is Open Science?

- Transparency in methodology and collection of data.
- Availability and re-use of scientific data.
- Public accessibility to scientific communication.
- Using social media to facilitate scientific collaboration.

Open Science is the idea that scientific knowledge of all kinds should be openly shared as early as is practical in the discovery process.

*http://www.openscience.org/blog/wp-content/uploads/2013/06/OpenSciencePoster.pdf

Open Data/Open Science



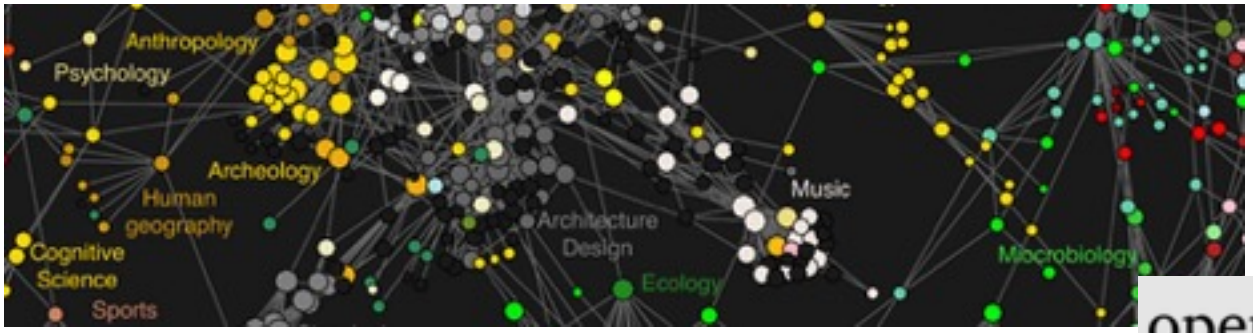
About OpenScience*

The OpenScience project[1] is dedicated to writing and releasing free and Open Source scientific software. We are a group of scientists, mathematicians and engineers who want to encourage a collaborative environment in which science can be pursued by *anyone* who is inspired to discover something new about the natural world.

[1]Initiated by a group led by Dan Gezelter (Theoretical & Computational Chemistry)

*http://www.openscience.org/blog/?page_id=44

Open Data/Open Science



UNI GRAZ

openscienceASAP

6 Open Science Principles*

- Open Methodology (documentation of used methods)
- Open Source (software and hardware)
- Open Data (free access to data)
- Open Access (publishing in open access journals)
- Open Peer Review (transparent and open review process)
- Open Educational Resource (use of free and open materials)

GFZ Helmholtz Centre Potsdam

*http://openscienceasap.org/open-science/

Kyoto University Founded 1897

New EGU ESSI subprogram: Informatics for Science 2.0

- ESA innitative:* Earth Observation (EO) Open Science 2.0
  http://congrexprojects.com/15c12/objectives
- Community consultation meeting in ESRIN, 12-14 Oct 2015
  http://www.eoscience20.org/
  - Open tools and software
  - Data-intensive science
  - Virtual research environment
  - E-infrastructure
  - Citizen science
  - Crowdsourcing
  - Advanced visualization
  - E-learning and education of the new generation of **Data scientists**

*Yves-Louis Desnos and Pierre-Philippe Mathieu from ESA

MoU between ESPAS and IOGONET

Mike Hapgood
RAL, STFC
Oxford, England

Toshihiko Iyemori
京都大学, WDC

Kyoto, Japan

Major Objectives and Scope

The aim of the cooperation is to promote and establish a research community to build the infrastructures to solve the global data issues.

1. Activities

The primary activities are agreed as follows:

- Exchange of information including data o×
- Exchange of researchers o
- Promotion of cooperative projects in a common field of interest o

2. Cooperation field

The cooperation will focus on the following studies, and personnel of the other field of interest by either institute may be invited to participate in the joint work independently from other institutions with mutual agreement.

- Make global geophysical data accessible for other science domains ×
- Make network of global observation data for integrated approach with the same metadata vocabulary o×
- Enhance usage of the common observational infrastructure o×
- Promote cooperation in the area of studies on solar, heliospherical, solar-terrestrial and geophysical activity o
- Use the e-infrastructures for education and for capacity building o

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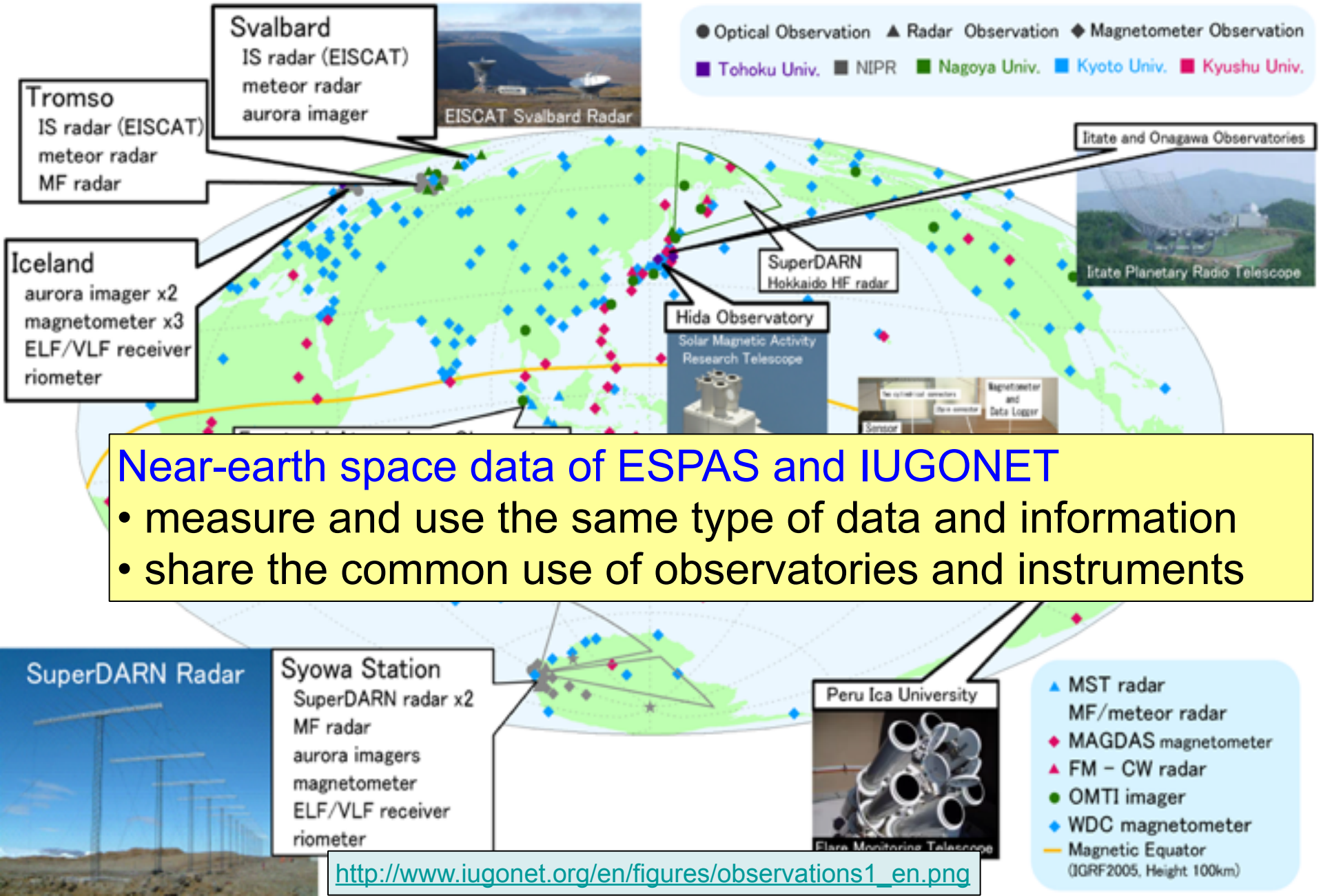
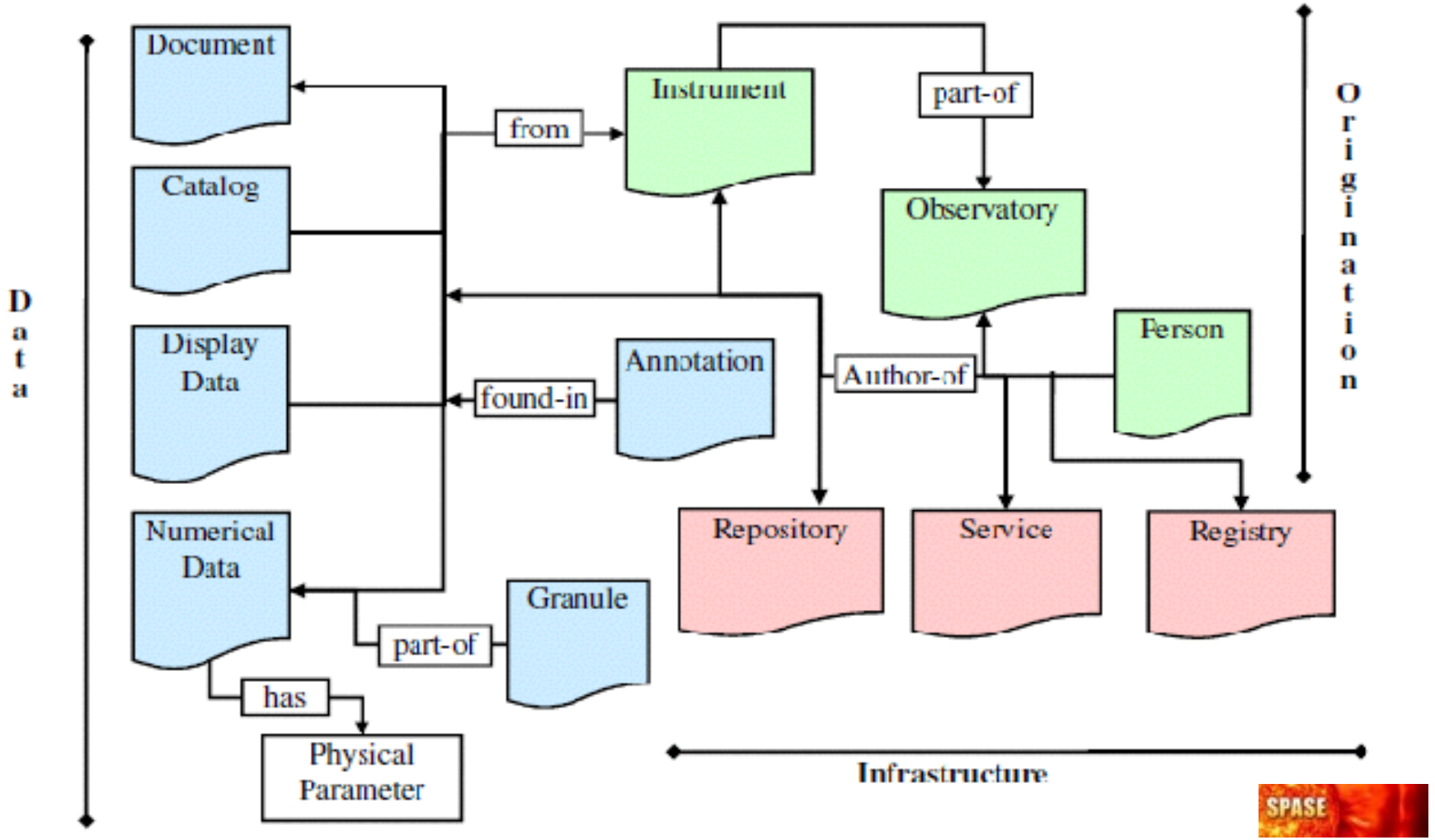
Major Objectives according to the Open Science Principles

Observations by IUGONET institutes/universities



http://www.iugonet.org/en/figures/observations1_en.png

IUGONET's data model is based on SPASE[1]



[1] **A Space and Solar Physics Data Model from the SPASE Consortium, Version: 2.2.2**
Release Date: 2011-02-27

[1] http://www.spase-group.org/docs/dictionary/spase-2_2_2.pdf

Near-Earth Space Data Infrastructure for e-Science

Home | News & Events | Documents | Design | Developer Wiki

Introduction

The ESPAS project will provide the e-Infrastructure necessary to support the access to observations and

Objectives:

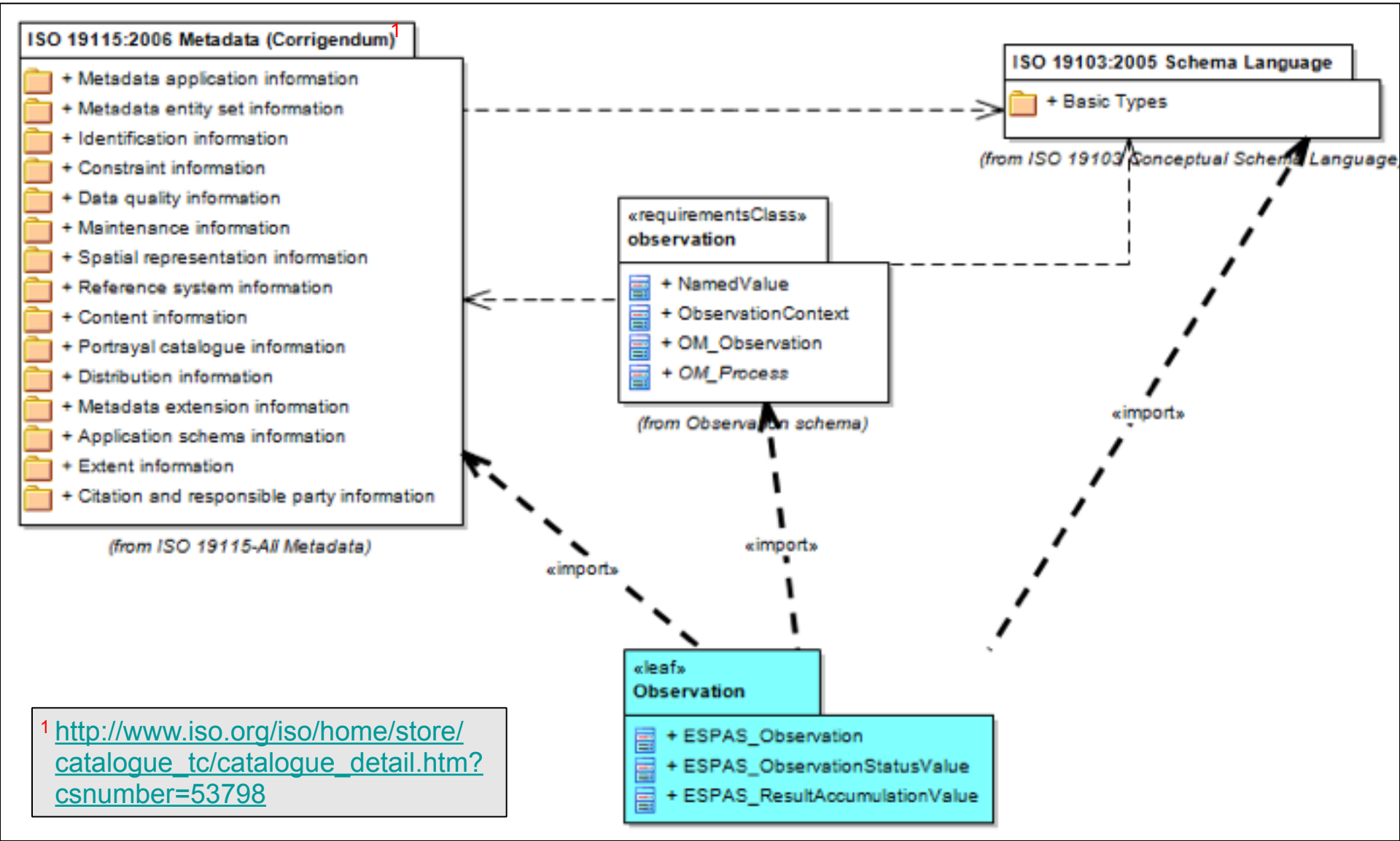
- A platform to integrate heterogeneous data from earth's thermosphere, ionosphere, plasmasphere & magnetosphere
- Provides unique access to scientific near-earth space data
- Offers Web-based applications and services

satellite experiments, using a mixture of in-situ and remotely sensed techniques. The results of searches will be delivered in a scientist-friendly manner based on existing standards and protocols. The infrastructure will also be used as a test-bed for development of methodologies and standards for validation of models of the near-Earth environment. This will lead to validated predictions of conditions in that environment, and thus promote the

ESPAS User Interface:
http://www.espas-fp7.eu
Next ESPAS release: October 2013
Final ESPAS release: November 2015

Page last updated by Matthew Wild on We

Part of ESPAS's data model based on ISO 19xxx and OGC standards



[1] http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=53798

GFZ ISDC Semantic Web Project*

GFZ Helmholtz Centre Potsdam

GFZ Department 1.1

GFZ ISDC

Github repositories

ISDC Drupal 7 Open Semantic Framework

We have a separate Virtual Machine for the Open Semantic Framework stack, including Drupal 7. The stack includes, amongst others:

- Apache Solr
- Open Link Virtuoso
- OWL API
- GATE
- PHP/Java Bridge
- Memcached

There is a live version and a Git repository (as always with further information inside the README) on-hand.

ISDC Drupal 7 proof of concept

There is a live version, a Git repository and a Github Wiki available.

On the main VM a clone of the ISDC Drupal proof of concept is provided.

On the test VM another clone of the ISDC Drupal proof of concept is provided.

GFZ ISDC* Portal Homepage: http://isdc.gfz-potsdam.de

GFZ POTSDAM

INFORMATION SYSTEMS AND DATA CENTER

Global Earth Science Data

Welcome to ISDC - Information System and Data Center, rit - MyAccount | Logout

Home
PN Administration

Information
Projects in ISDC
Product Types
Documents
Software
FAQ
Links
Education
Statistics

Data Access
How to get data

MyRetrieval
Product Browser
MyDirectory
MyRequests

MyAdmin
CHAMP-Admin
MET-Admin
MyMonitor
MyKeywordEditor

Collaboration
MyAccount
Forum
Contact

There are 1 registered user online.

You are logged-in as **rit**.

Search

W3C XHTML 1.0

Report Bug

Welcome to the Information System and Data Center for geoscientific data

ISDC's online service portal is an access point for all manner of geoscientific geodata, its corresponding metadata, scientific documentation and software tools. The majority of the data and information, the portal currently offers to the public, are global geomonitoring products such as satellite orbit and Earth gravity field data as well as geomagnetic and atmospheric data for the exploration. These products for Earths changing system are provided via state-of-the art retrieval techniques. The ISDC portal's design and the operation is a project of the ISDC-team within the GFZ's Data Center. We invite you to use our services and they will benefit your scientific work. If you have any queries while using the site, please use the ?-Symbol to get context-sensitive help. Try it now ?.

ISDC Participation at 2007 Geohazards Week |

ISDC is taking part on the esa 2007 Geohazards Week and the 2007 GGOS Workshop in Italy, Frascati, November 5-9.
Read full article: 'ISDC Participation at 2007 Geohazards Week'

Posted by: rit on Oct 29, 2007 - 01:03 PM

ISDC Participation at CEOS WGISS-24 |

ISDC is taking part on the Committee on Earth Observation Satellites (CEOS) 24th Working Group on Information Systems and Services (WGISS) and Subgroup Meetings in Germany, Oberpfaffenhofen, October 15-19.

Posted by: rit on Oct 05, 2007 - 11:09 AM

ISDC Participation at the PV 2007 Conference |

ISDC is taking part at the PV 2007 Conference for "Ensuring the Long-Term Oreservation and Value Adding to Scientific and Technical Data" in Germany, Oberpfaffenhofen, October 9-11, 2007.
Read full article: 'ISDC Participation at the PV 2007 Conference'

Posted by: rit on Oct 05, 2007 - 10:28 AM

GRACE Monthly Report from August 2007 available |

The GRACE Science Data System Monthly Report from August 2007 is available now. Read full article: 'GRACE Monthly Report from August 2007 available'

Posted by: vivienm on Oct 02, 2007 - 09:02 AM

Project day at the science campus "Albert Einstein" |

High school diploma students are visiting the science campus "Albert Einste
are contributions from all different geoscience instituts and organisations a

Forum

LAST FORUM POSTS

RE: To delete files ... (2)
by naz2004
on 20. Oct at 19:27

Attitude data for Ch... (0)
by fch_chr
on 12. Sep at 09:38

[Access Forum]

FORUMS
- ISDC
- CHAMP
- GRACE
- GGP
- GGOS
- GGSP

Personal Block

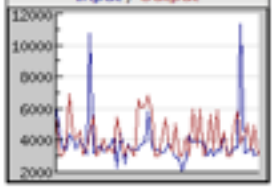
favorite product types :
- CH-AI-3-ATM
- CH-ME-2-FGM-FGM
- CH-OG-3-PDO
- GPS-OG-3-FSO
- GX-OG-_2-GCM
- IGS-NRT-OBS
- iMET-DWD-GME-TEMP-A

declare your favorites

Request Limits (24h)

Data Flow (last 60d)

Input / Output



Product Statistics

In ISDC archive are stored:
- **10.27 TB** of data
- **16.06 Mio** products

*Information System and Data Center

NASA's Global Change Master Directory (GCMD)

Directory Interchange Format (DIF)

Need for metadata as a standard in geoscience data management

- *NASA's idea of an interoperable Earth science data catalog at an ESADS workshop … **the ability to find information about data held at other sites** — **1987**
- CEOS International Directory Network (IDN) to foster the exchange of information among international agencies — **1990**
- GCMD serves as NASA's **FGDC** Clearinghouse node for geospatial metadata — **1994**
- **ISO** 19115/TC211 geospatial metadata standard was adopted June **2004** — **2004**
- DIF-based **OGC** catalog web service CWIC in GEOSS — **2012**

year

- DIF is used to create directory entries describing *only* a group of data *no granuales*
- DIF standard uses free text fields & controlled keywords

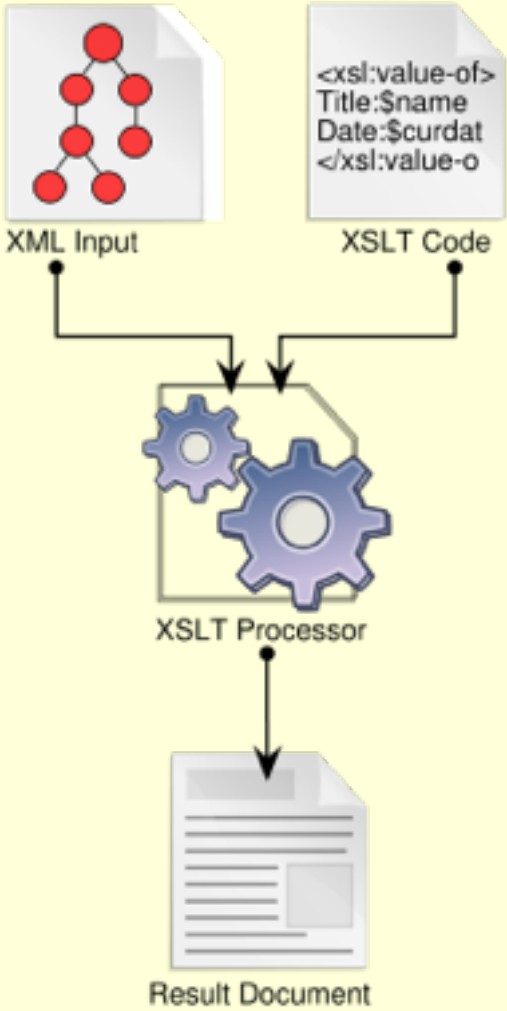
*http://gcmd.nasa.gov/add/difguide/whatisadif.html

Mapping of Standards

DIF XML metadata file
(DIF Version 9.0 XSD)

DIF <=> ISO
XSL Transformation

ISO 19115 XML metadata file
(ISO 19115/19139 XSD)



Problem: Complete/correct attribute mapping,
e.g. DIF "Project" does not exist in ISO 19115

XSD: XML Schema Definition
XSL: Extensible Stylesheet Language

Source: http://en.wikipedia.org/wiki/Xslt

WWW => Semantic Web

- World Wide Web (1991*)
  - **about documents**
    - HTML pages
    - URL links
    - HTTP protocol

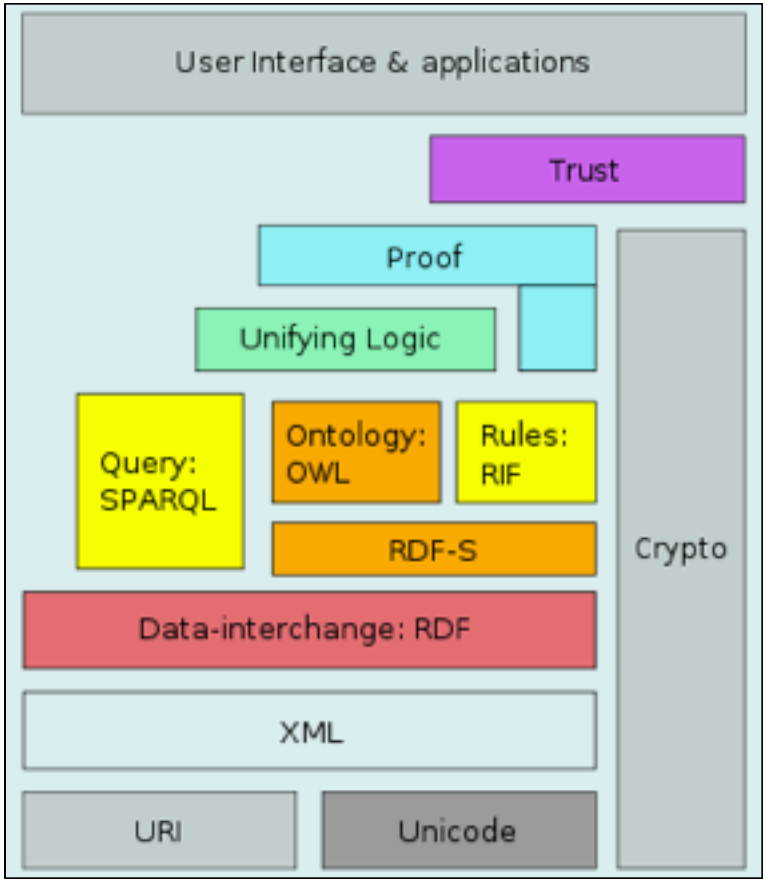
- Semantic Web (2001*)
  - **about structured data**

based on WWW

- URI (resource id)
- RDF triples

Actor	Query (URI)	Answer
Human	***HTTP request***	***HTML page***
Machine	***HTTP request***	***RDF data***

Semantic Web Stack
=> W3C standards



*Sir Tim Berners-Lee

W3C Semantic Web

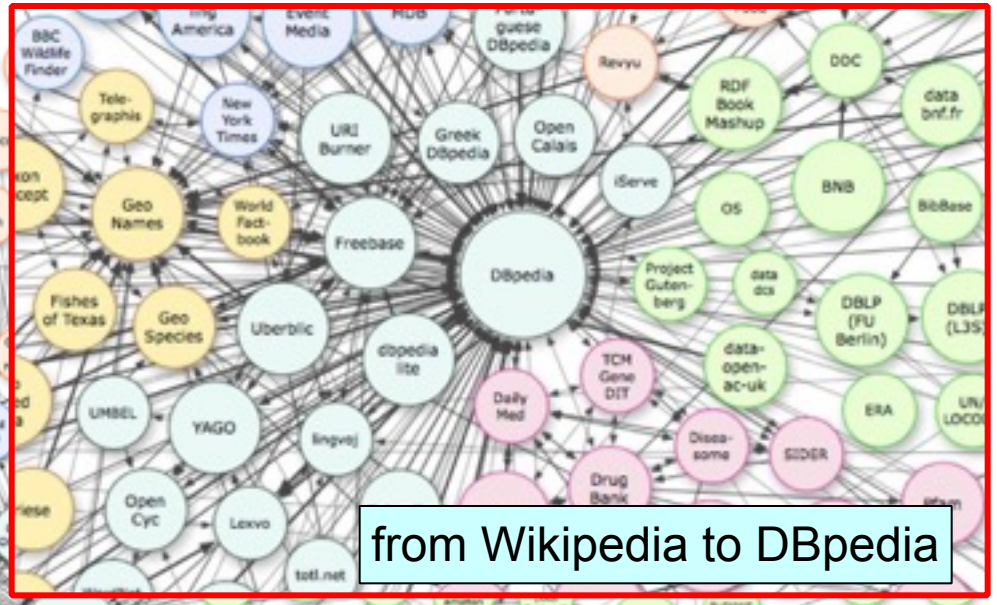
http://de.wikipedia.org/wiki/Semantisches_Web

Linked (open) Data Cloud[1]

Linked Data is about using the Web to connect related structured data for automatic access and processing*

*added by B. Ritschel

*http://linkeddata.org/home



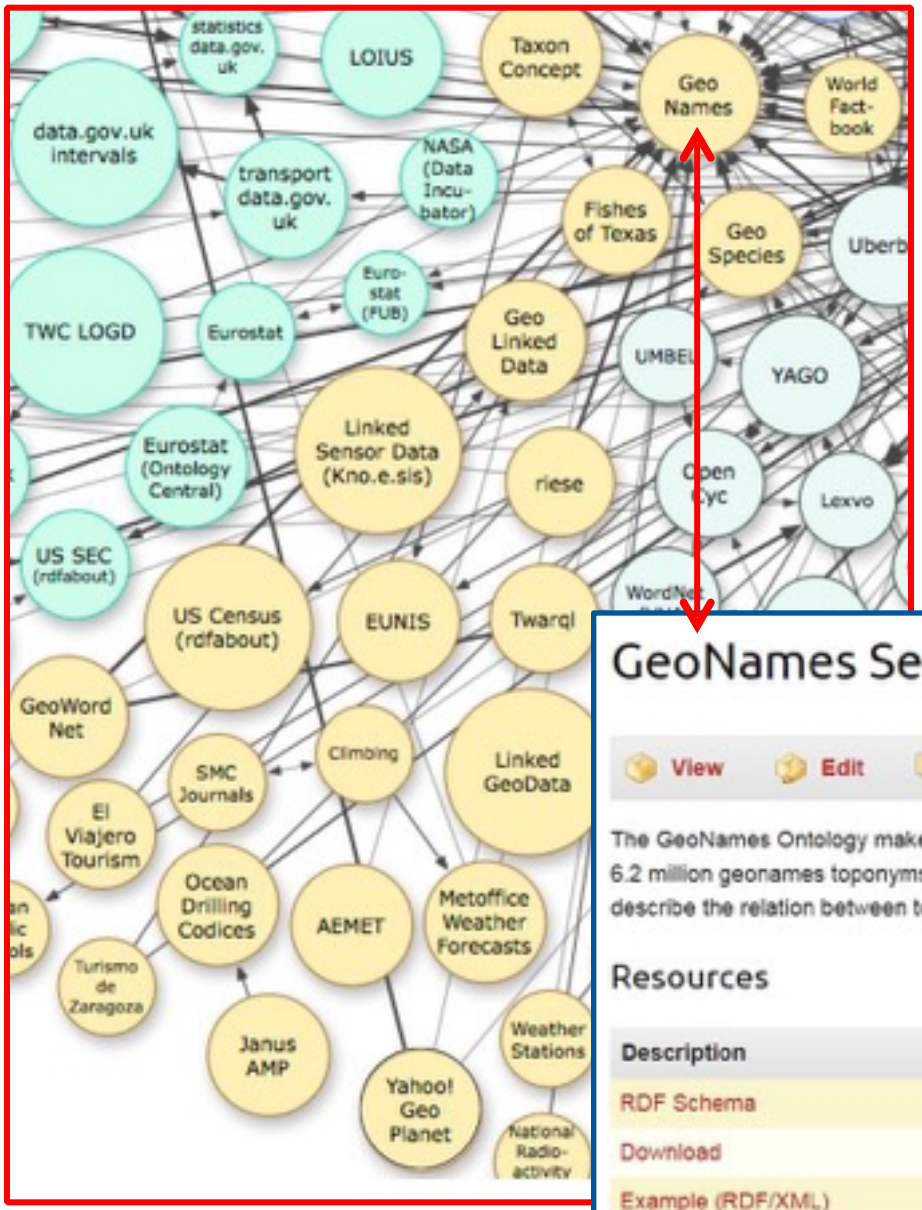
*Linked Data is "a term used to describe a recommended best practice for exposing, sharing, and connecting pieces of data, information, and knowledge on the Semantic Web using URIs and RDF."

*http://en.wikipedia.org/wiki/Linked_data

Government
Cross-domain
Life sciences
As of September 2011

[1]http://richard.cyganiak.de/2007/10/lod/lod-datasets_2011-09-19_colored.html

Linked Data in the Geo-X Domain



- NASA (Data Incubator)
- World Factbook (CIA)
- Geo Names
- Geo Species
- Taxon Concept
- Geo Linked Data
- Linked Sensor Data
- GeoW

GeoNames Semantic Web

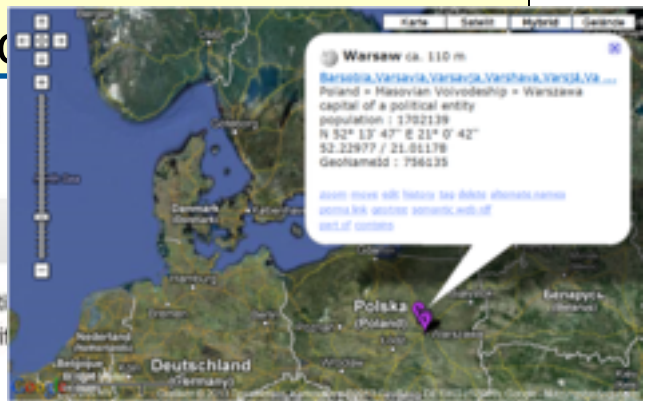
View Edit History

The GeoNames Ontology makes it possible to add geospati
6.2 million geonames toponyms now have a unique URL wi
describe the relation between toponyms.

Resources

Description	Format
RDF Schema	meta/rdf-schema
Download	application/rdf+xml
Example (RDF/XML)	example/rdf+xml
Example (Mother Earth)	

http://ckan.net/dataset/geonames-semantic-web

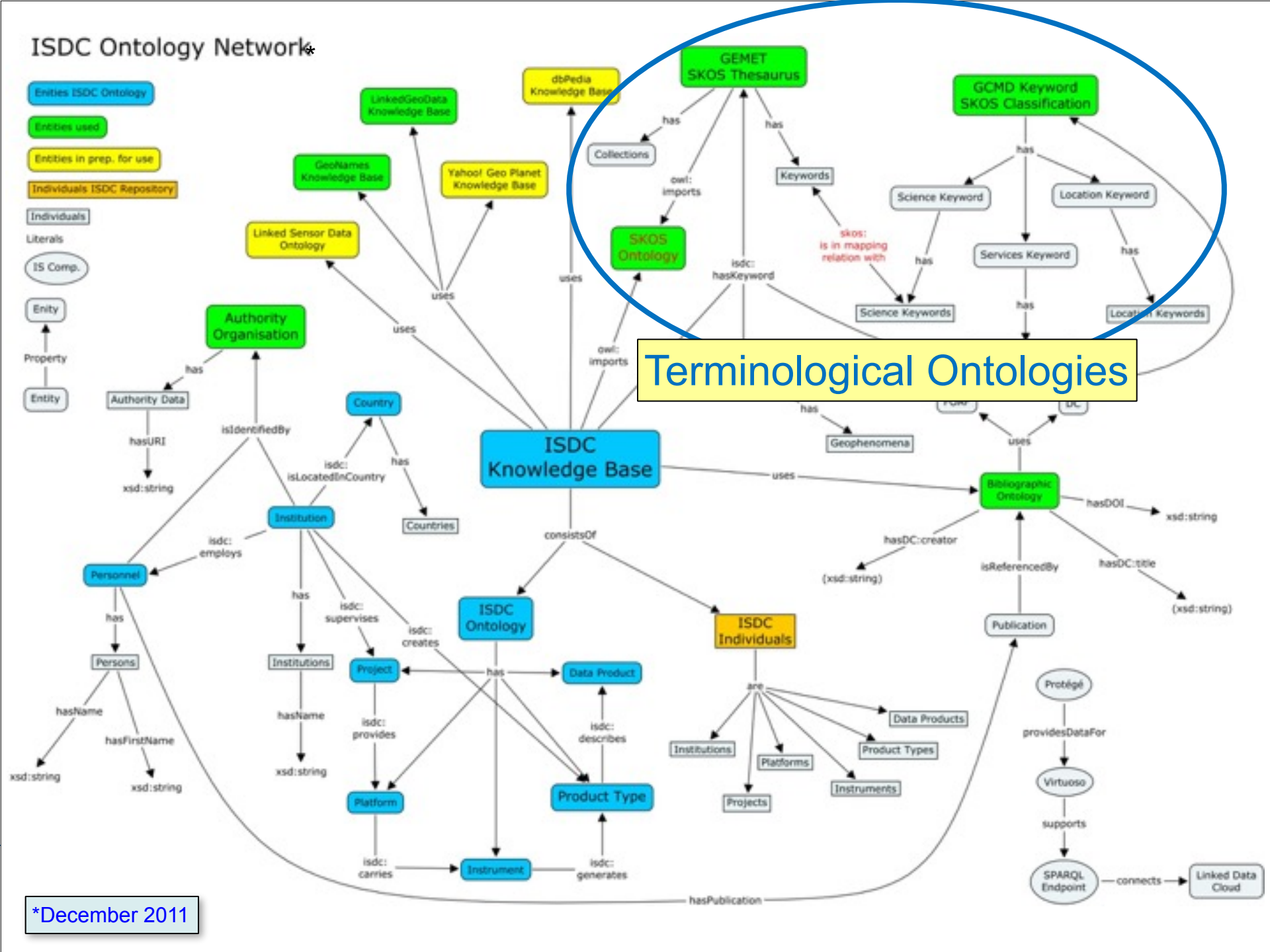


Warsaw-URI: GeoNameId = 756135

Turmbau zu Babel - Pieter Bruegel, Brüssel, 1563

Babylonische Sprachverwirrung

http://de.wikipedia.org/w/index.php?title=Datei:Brueghel-tower-of-babel.jpg&filetimestamp=20080330134740


ISDC Ontology Network*
Enities ISDC Ontology
Entities used
Entities in prep. for use
Individuals ISDC Repository
Individuals
Literals
IS Comp.
Enity
Property
Entity
GEMET SKOS Thesaurus
GCMD Keyword SKOS Classification
dbPedia Knowledge Base
LinkedGeoData Knowledge Base
GeoNames Knowledge Base
Yahoo! Geo Planet Knowledge Base
Linked Sensor Data Ontology
Collections
Keywords
SKOS Ontology
Science Keyword
Location Keyword
Services Keyword
Science Keywords
Location Keywords
has
owl: imports
skos: is in mapping relation with
isdc: hasKeyword
uses
Terminological Ontologies
Authority Organisation
Authority Data
hasURI
xsd:string
isIdentifiedBy
Country
Countries
isdc: isLocatedInCountry
Institution
isdc: employs
Personnel
Persons
hasName
hasFirstName
Institutions
Project
isdc: supervises
isdc: creates
isdc: provides
Platform
isdc: carries
Instrument
isdc: generates
ISDC Knowledge Base
consistsOf
ISDC Ontology
Data Product
isdc: describes
Product Type
ISDC Individuals
are
Data Products
Institutions
Platforms
Product Types
Instruments
Projects
Geophenomena
Bibliographic Ontology
hasDOI
hasDC:creator
(xsd:string)
isReferencedBy
hasDC:title
Publication
hasPublication
Protégé
providesDataFor
Virtuoso
supports
SPARQL Endpoint
connects
Linked Data Cloud
*December 2011

Metadata, Data Models, Frameworks

Differences

- Metadata
  - SPASE (IUGONET)
  - ISO/OGC (ESPAS)
  - NASA DIF (ISDC)
- Metadata models
  - SPASE version 2.2.2
  - ISO/OGC 19xxx
  - ISDC ontology version 1.4
- Frameworks/Apps
  - DSpace
  - D-Net
  - OSF software stack (Drupal/Virtuoso/Solr/…)

Commons

- Data (scientific domain related)
- Metadata & Metadata model entities
  - Data (granuals/products)
  - Catalog (classification)
  - Instruments
  - Platforms (observatories)
  - Persons and Institutions
  - Projects and Phenomena
- Vocabulary entities
  - Classifications (keywords)
  - Thesauri (keywords+links)

*SPASE „allowed values“ Classification

Observatory Region — Enumeration

A spatial location distinguished by certain natural features or physical characteristics where an observatory is located.

Allowed Values:

Top Concept

Concepts (hierarically structured)

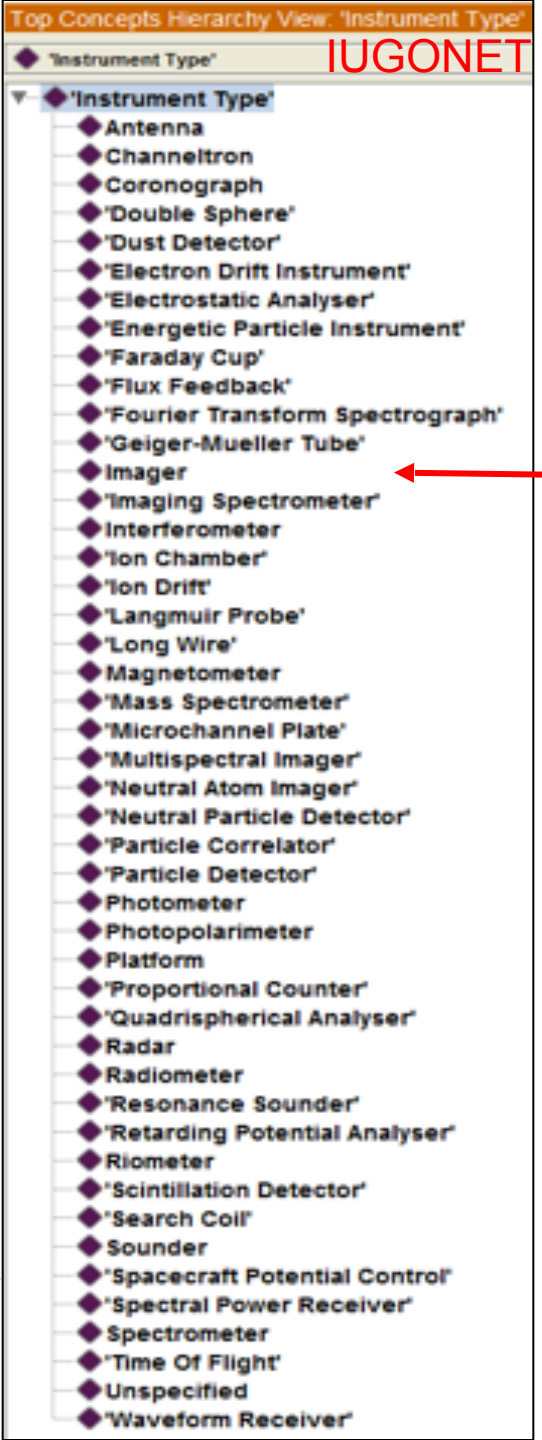
- Asteroid
- Comet
- Earth
- Earth.Magnetosheath
- Earth.Magnetosphere
- Earth.Magnetosphere.Magnetotail
- Earth.Magnetosphere.Main
- Earth.Magnetosphere.Polar
- Earth.Magnetosphere.Radiation Belt
- Earth.Near Surface
- Earth.Near Surface.Atmosphere
- Earth.Near Surface.Auroral Region
- Earth.Near Surface.Equatorial Region
- Earth.Near Surface.Ionosphere
- Earth.Near Surface.Ionosphere.D-Region
- Earth.Near Surface.Ionosphere.E-Region
- Earth.Near Surface.Ionosphere.F-Region
- Earth.Near Surface.Ionosphere.Topside
- Earth.Near Surface.Mesosphere
- Earth.Near Surface.Plasmasphere
- Earth.Near Surface.Polar Cap
- Earth.Near Surface.South Atlantic Anomaly Region

***A Space and Solar Physics Data Model from the SPASE Consortium**
Version: 2.2.2
Release Date: 2011-02-27
Document Generated: 2012-Feb-28

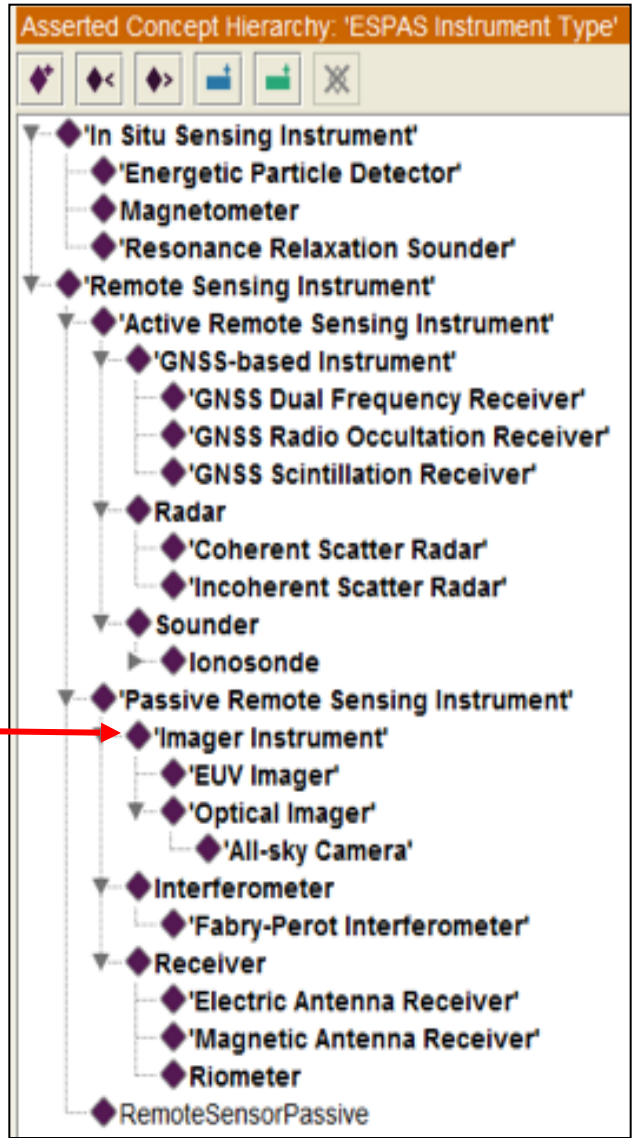
Transferred into SKOS standard

SPASE

SPASE "allowed values" <=> ESPAS ontology
(Collaboration project between ESPAS and IUGONET)



ESPAS Instrument Type



ESPAS SKOS resource browser:
espas.spaceweatherservices.com

RDF + OWL + SKOS

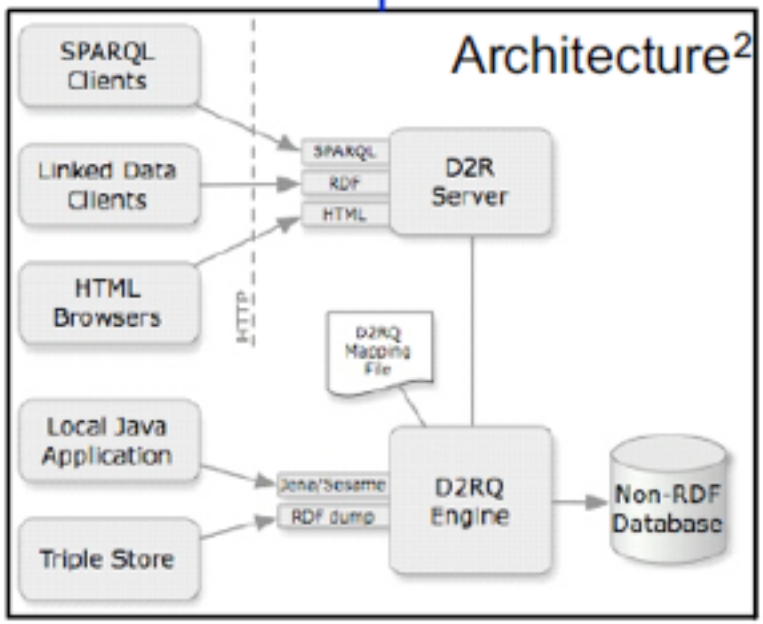
iugonet:Imager

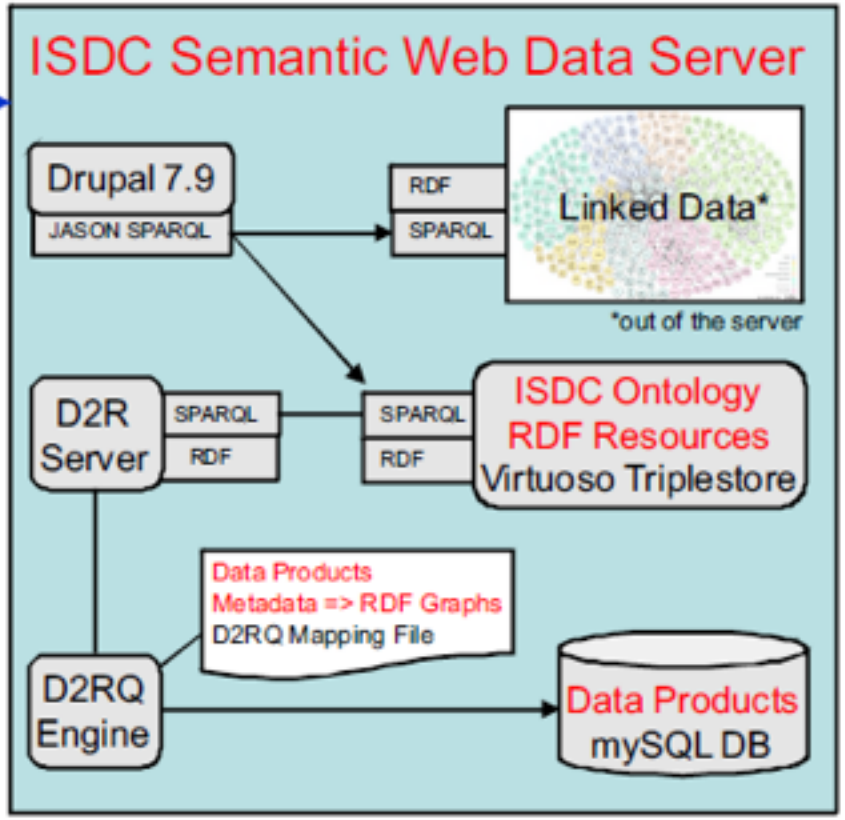
owl:closeMatch

espas:Imager Instrument
espas:Optical Imager
espas:All-sky Camera

D2RQ for mashup of RDBMS with Triple Stores

- D2RQ Platform: accessing relational databases as virtual, read only RDF graphs[1]
- D2R Server: tool for publishing content of relational databases on the Semantic Web





[1] http://d2rq.org/

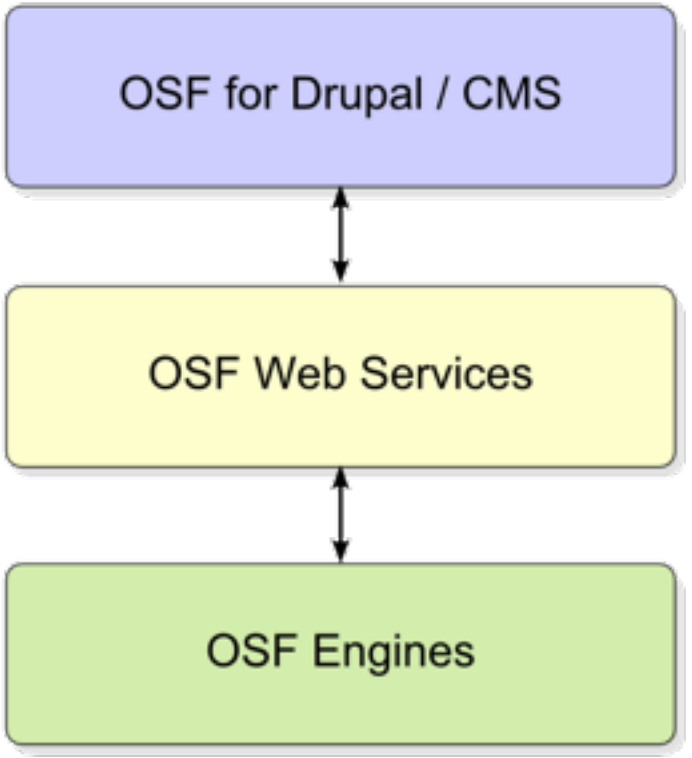
[2] http://d2rq.org/images/architecture.png

Open Semantic Framework (OSF)

Frédérick Giasson

Web-oriented architecture

- Data is generally exposed/open and universally available as linked data
- SPARQL endpoints and APIs are generally RESTful in design
- The overall architecture is modular, with inherent decentralized and distributed aspects
- All display and visualization aspects are cross-browser ready and capable.



http://opensemanticframework.org/
http://structureddynamics.com/index.php
http://fgiasson.com/blog/

Mashup of IUGONET, ESPAS and ISDC data server

Mapping of terminological ontologies

- IUGONET: SPASE, GCMD science keywords
- ESPAS: ESPAS ontology
- ISDC: GCMD keywords, SPASE, GEMET

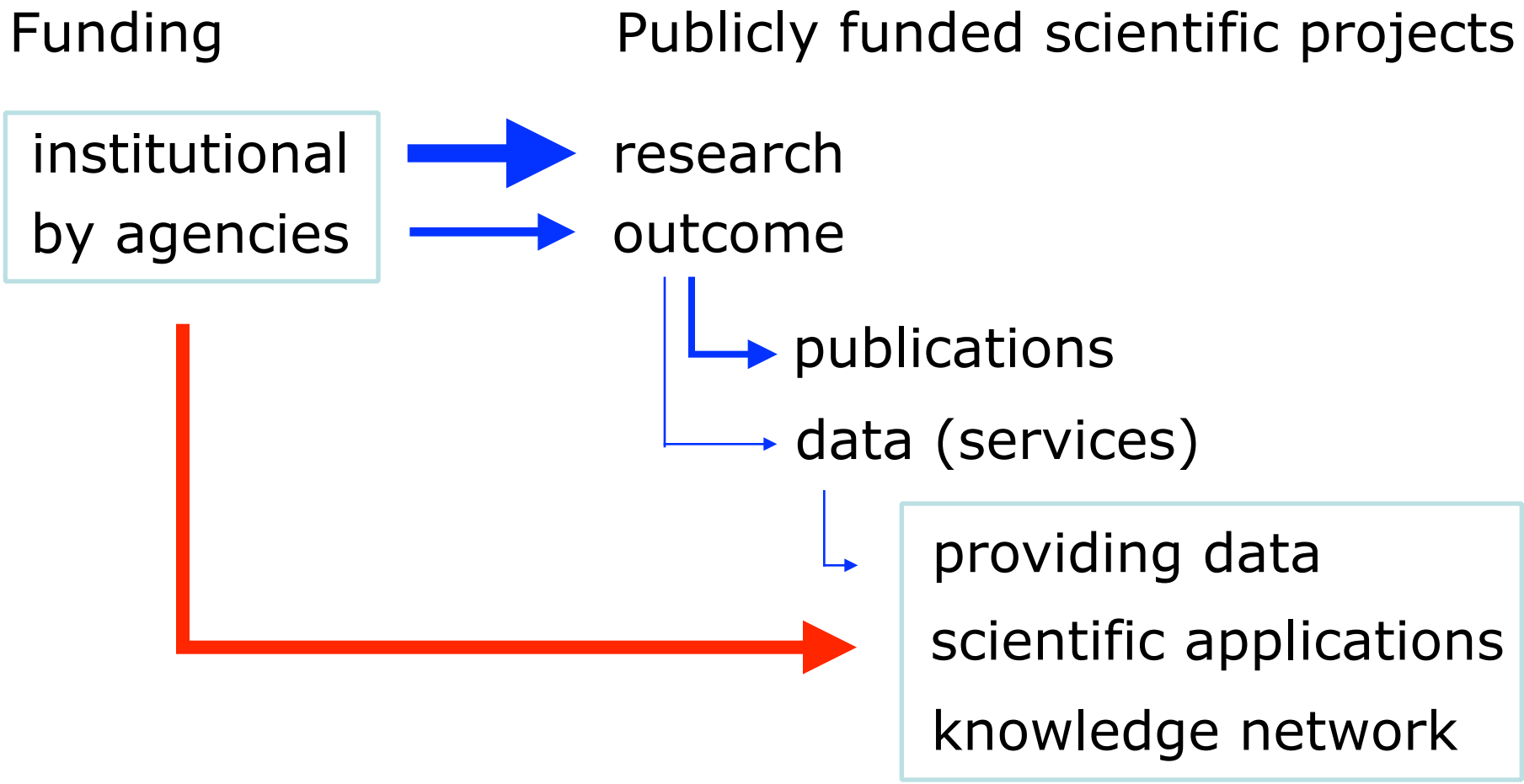
and/or mapping of domain models using DCAT domain ontology

depending on engineering resources

Proof of concept (keyword based mashed-up catalog queries):

- Open Semantic Framework for application
- Ontology based (mashup of particular catalog entities)
- IUGONET API: DSpace OpenSearch Query
- ESPAS API: under construction
- ISDC API: SPARQL
- Integration of context data via LOD: SPARQL

From project-oriented research to sustainable open (data based) science services



GFZ Helmholtz Centre Potsdam

current flow of money

future additional required flow of money

Role of Scientific Libraries in Open Science

- Body or agency of institutional scientific data, information and knowledge (application) provider
- Librarians (become) and data scientists bridging the gap between domain sciences and e-sciences
- Libraries host the infrastructure (data server/services, information systems, open applications)
- Powerful use cases are necessary (scientific one, educational, data publications, societal, decission making, ...) to show the benefit of this approach
- (Some) money, reputation and power has to flow from the scientific projects to the libraries for providing these services (overcoming egoism)

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At GFZ Potsdam this approach failed because of too many egoisms

Planed Actions

Creation of a Semantic Knowledge Network

- WDS is establishing a Knowledge Network (KN) for scientific metadata (similar to Web of Science)*

Whether looking at data, books, journals, proceedings or patents, Web of Science provides a single destination to access the most reliable, integrated, multidisciplinary research. Quality, curated content delivered alongside information on emerging trends, subject specific content and analysis tools make it easy for students, faculty, researchers, analysts, and program managers to pinpoint the most relevant research to inform their work.

THOMSON REUTERS

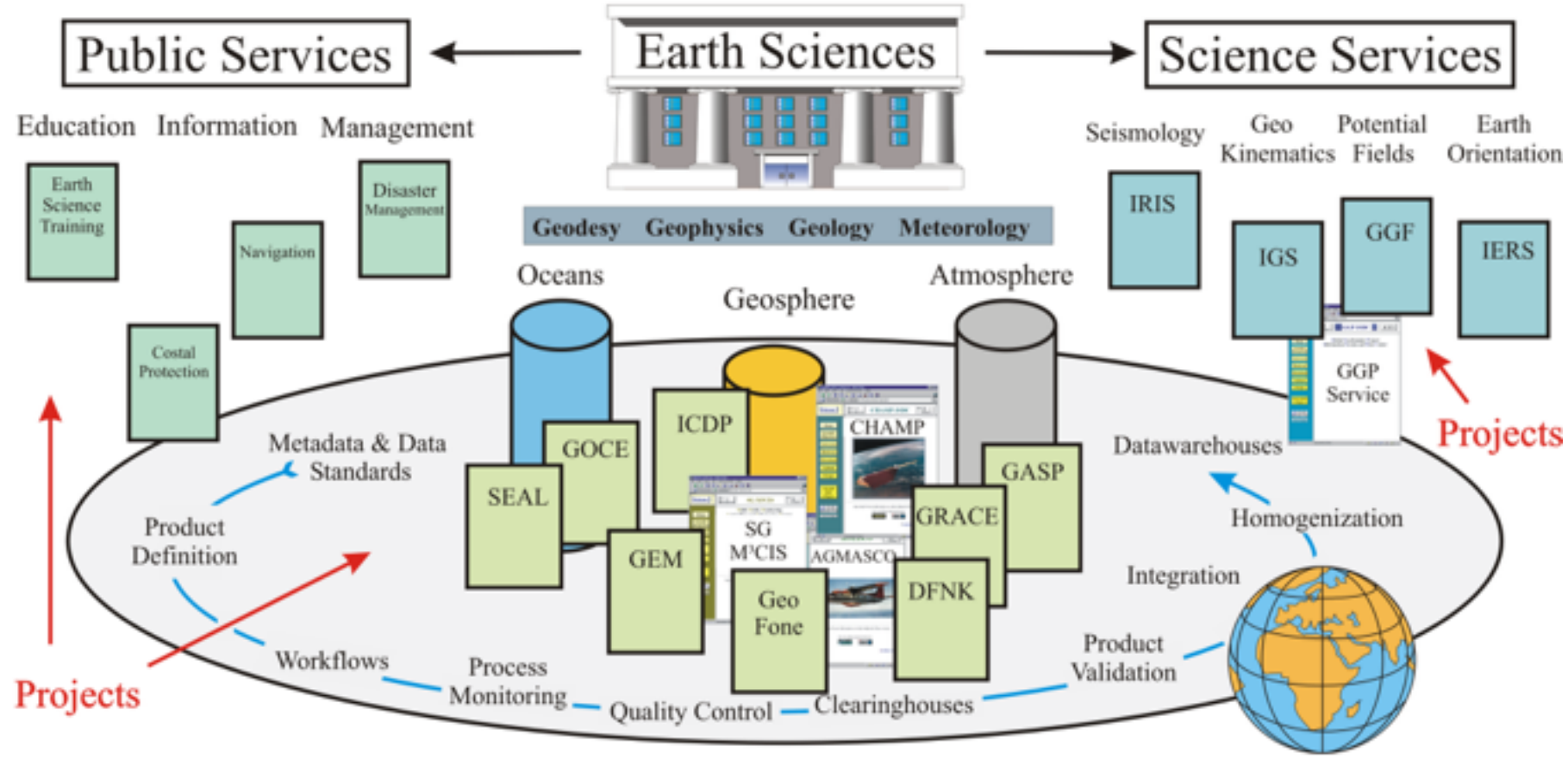
- KN implementation working group in WDS
  - D2RQ Framework (e.g. using GFZ/FHP experiances)
  - Mashup of semantic/vocabulary resources (e.g. IUGONET, ESPAS, ISDC)
  - ...

*Wim Hugo, Membmer of the Scientific Committee of the ICSU WDS

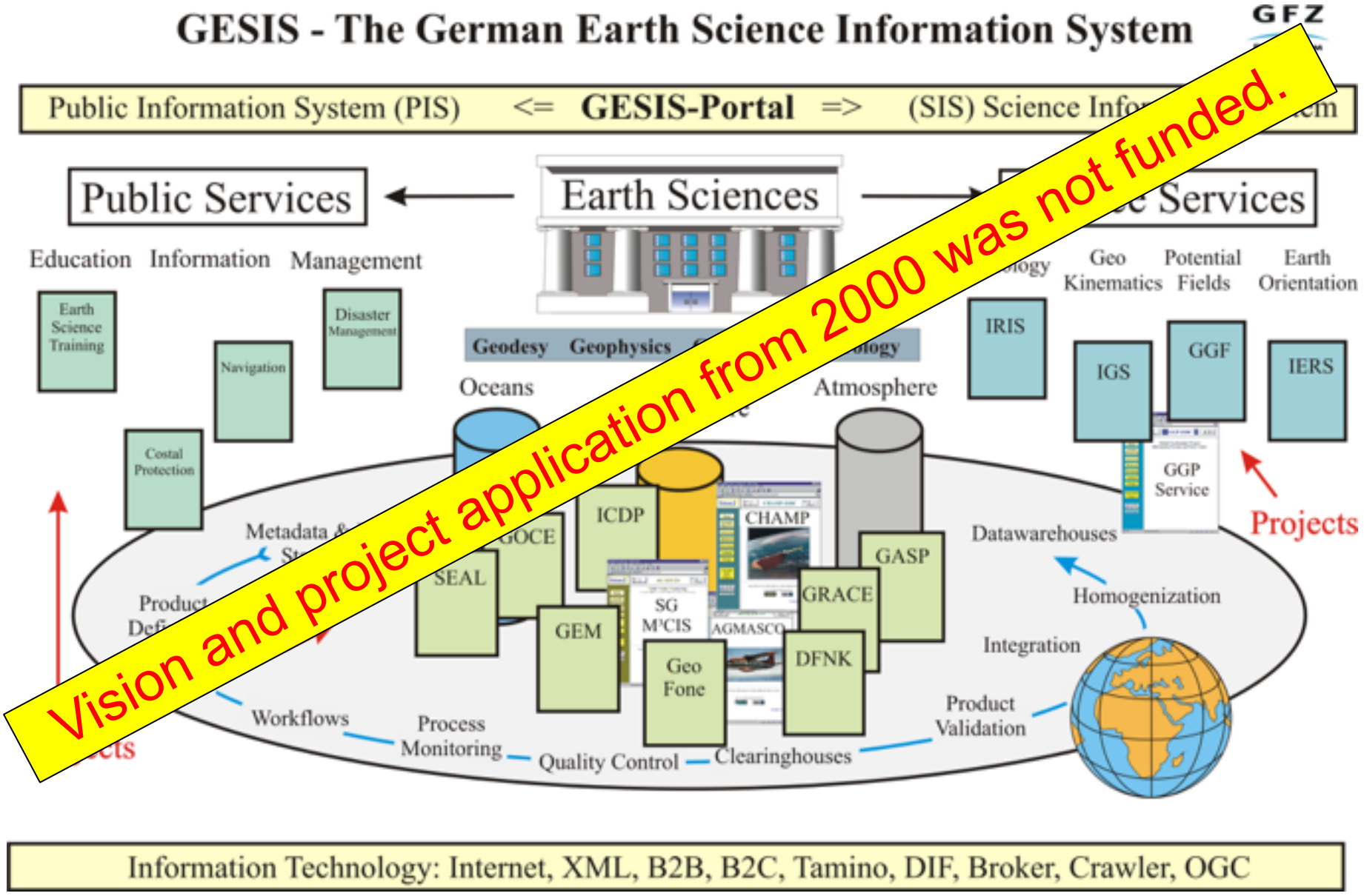
GESIS - The German Earth Science Information System

GFZ Potsdam

Public Information System (PIS) <= **GESIS-Portal** => (SIS) Science Information System



Information Technology: Internet, XML, B2B, B2C, Tamino, DIF, Broker, Crawler, OGC


GESIS - The German Earth Science Information System
GFZ
Public Information System (PIS) <= GESIS-Portal => (SIS) Science Info
Public Services
Earth Sciences
Education
Information
Management
Earth Science Training
Navigation
Disaster Management
Costal Protection
Geodesy
Geophysics
Oceans
Atmosphere
IRIS
Geo Kinematics
Potential Fields
Earth Orientation
IGS
GGF
IERS
GGP Service
Projects
Datawarehouses
Homogenization
Integration
Product Validation
Clearinghouses
Quality Control
Process Monitoring
Workflows
Product Def
Metadata &
GOCE
SEAL
ICDP
CHAMP
GRACE
GASP
GEM
SG M³CIS
AGMASCO
Geo Fone
DFNK
Vision and project application from 2000 was not funded.
Information Technology: Internet, XML, B2B, B2C, Tamino, DIF, Broker, Crawler, OGC

Call for design of scientific vocabularies

CAWSES-II Nagoya 2013, AGU/EGU/JpGU/AOGS 2013/2014/2015

Please help to create a well agreed keyword vocabulary for space weather and climate including neighbor disciplines such as e.g. earth magnetic field or solar-terrestrial physics.

- Report the keyword vocabulary you are using
- Find common agreement in the use => standard
- Discuss and agree about concordances and mash-ups in your own domain and cross-domain

Please contact IUGONET or ESPAS:
iyemori@kugi.kyoto-u.ac.jp, rit@gfz-potsdam.de


War is Peace.
Freedom is Slavery.
Ignorance is Strength.
George Orwell, 1984
Can we trust the Web any longer?
- data spying
- censorship
- manipulation
- deceiving
- controlling
- erasing
ありがとう　ございました。しつもんが
ありますか。
rit@gfz-potsdam.de
ritschel@kugi.kyoto-u.ac.jp
Thank you, Questions?