

# THE SPASE METADATA MODEL FOR HELIOPHYSICS DATA AND MODELS

Thieman, James<sup>1</sup>; Roberts, D Aaron<sup>1</sup>; King, Todd<sup>2</sup>; Fung, Shing<sup>1</sup>; Bargatze, Lee<sup>2</sup>

1. NASA Goddard Space Flight Center, Greenbelt, United States

2. Department of Earth, Planetary, and Space Sciences, University of California, Los Angeles, California,

# What is SPASE

## SPASE

Space Physics Archive Search and Extract

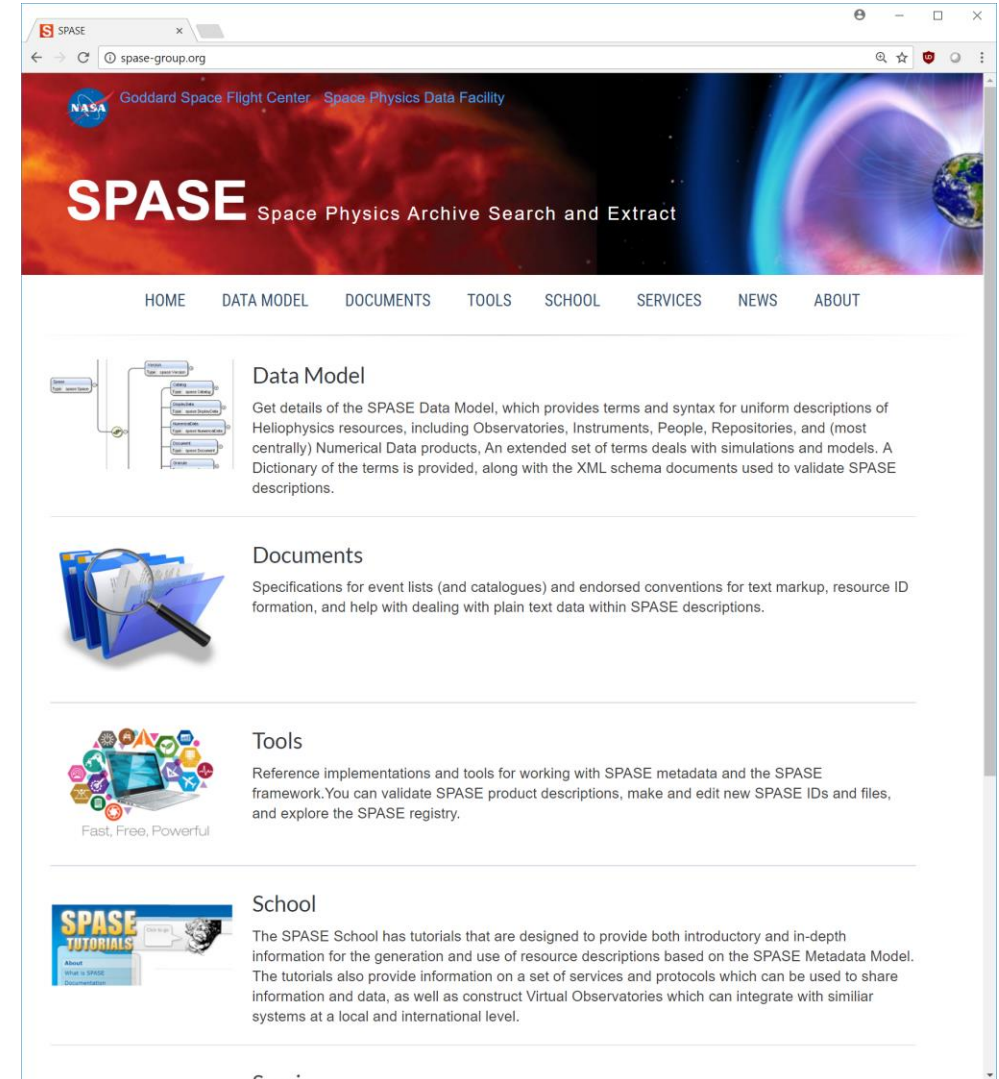
Community developed metadata standard

Used by the NASA-funded space and solar physics community

Used by the international community  
and by other U.S. agencies (NOAA)

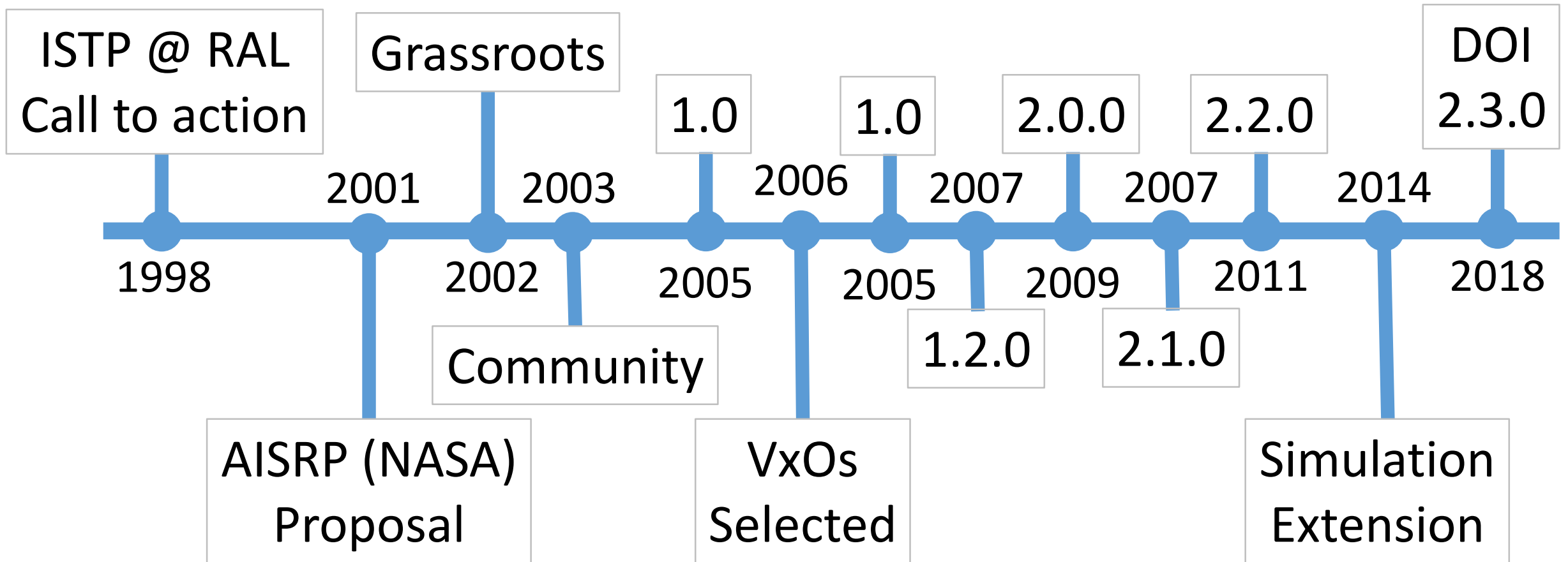
# The SPASE Design Principles

- Pleasantly Parallel
  - Metadata and Data generation are created independently
- Scalable to Big Data
  - Storage of metadata and data are separate - Data is referenced by URL
- Designed for Discovery
  - Metadata is contextually rich (and scientifically useful)



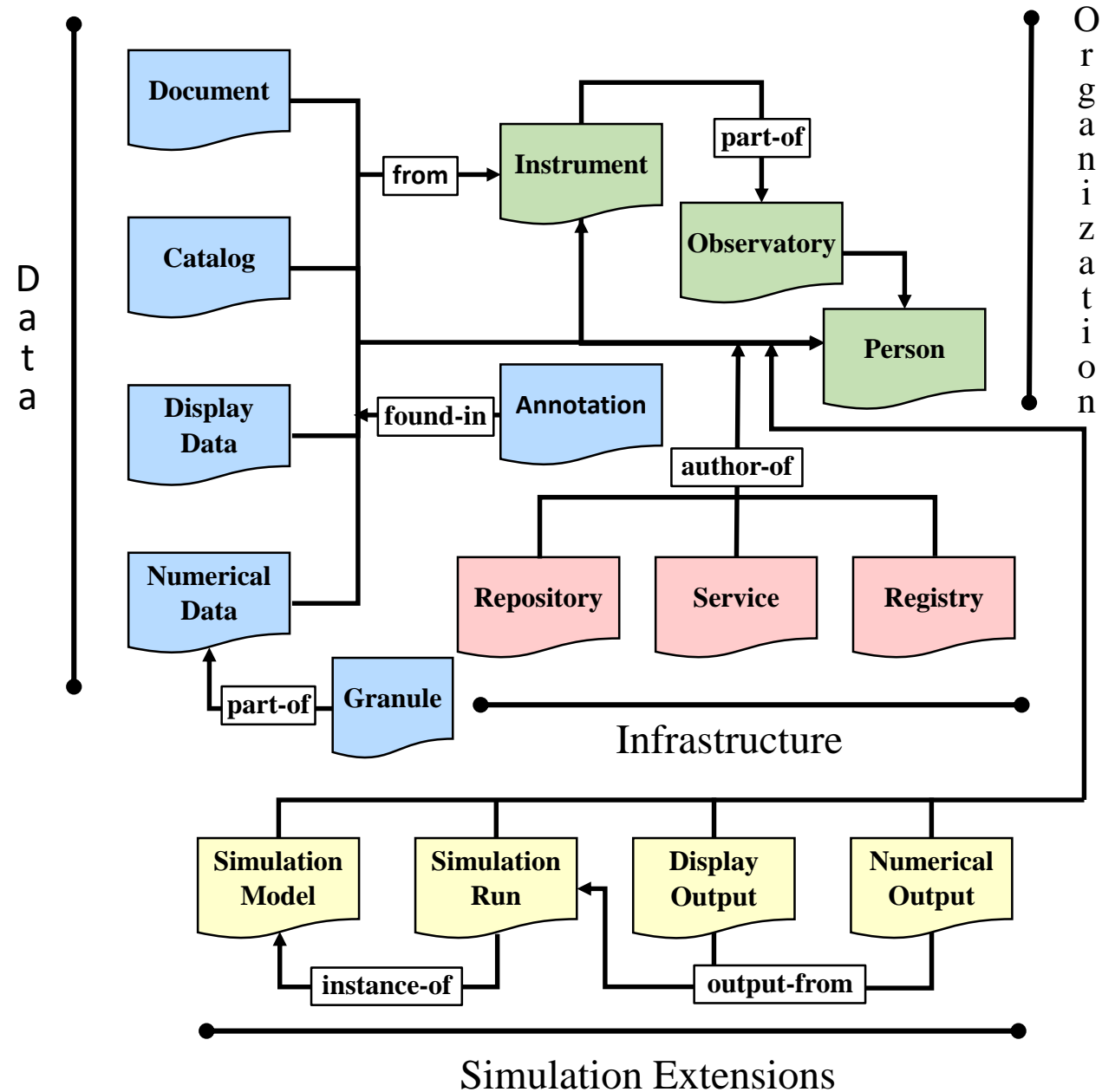
<http://spase-group.org>

# A Brief Time Line

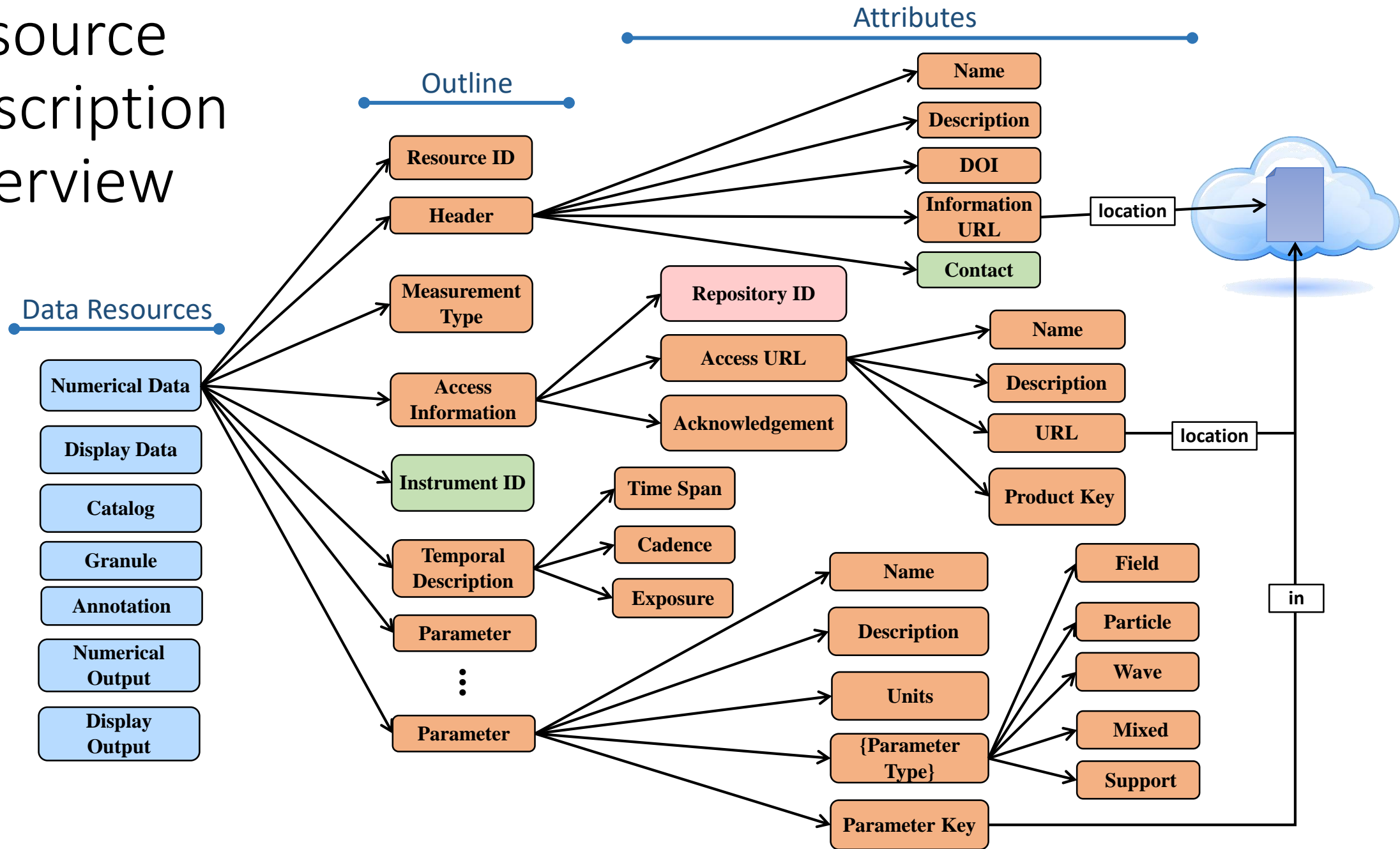


# SPASE Metadata Model

Base Model  
12 Resource Types



# Resource Description Overview



# Simulation Extensions

- Based on the work done by the EU's Framework 7 Integrated Medium for Planetary Exploration (IMPEX) project.
- Extensions have been adopted by the multi-agency Coordinated Community Modeling Center (CCMC) to describe supported models and run results.
- Planned use to describe results from simulation research.

# Tools and Services

## Registry Services

A web app that includes resolver, search, render and download services for SPASE XML resource descriptions.

<http://spase-group.org/tools/registry/>

## Resource Tools

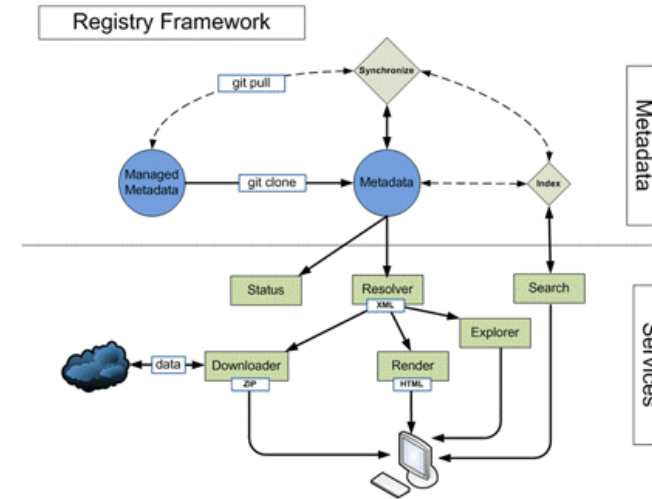
A set of command-line applications which can be used to generate, validate, referentially check, use and organize resource descriptions written in SPASE XML.

<http://spase-group.org/tools/registry/>

`npm install -g spase-resource-tools`

## On-line Validator and Editor

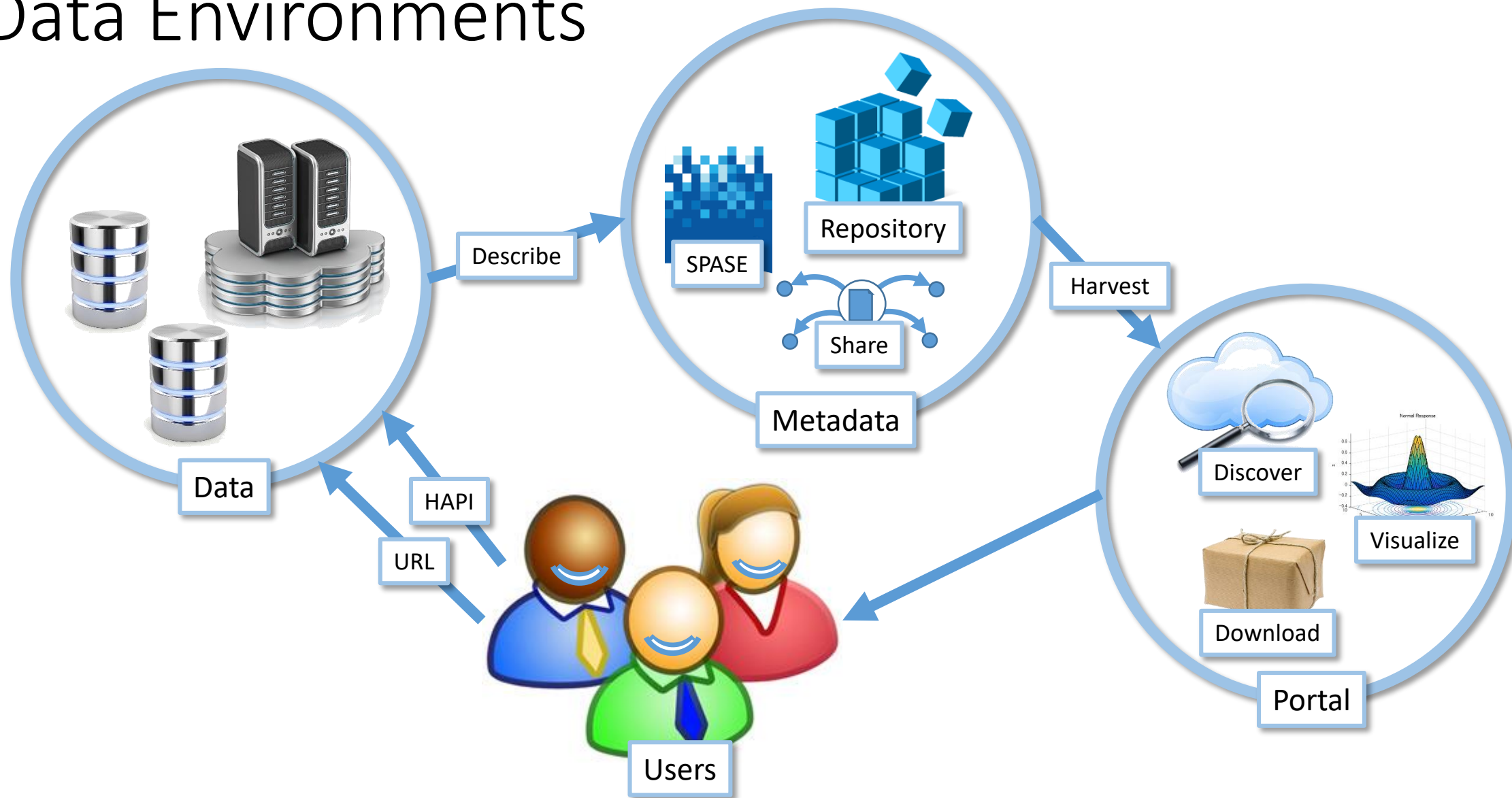
<http://spase-group.org/tools>



Fast, Free, Powerful



# Data Environments



# Digital Object Identifier (DOI) Integration

DOI for data = Citable data

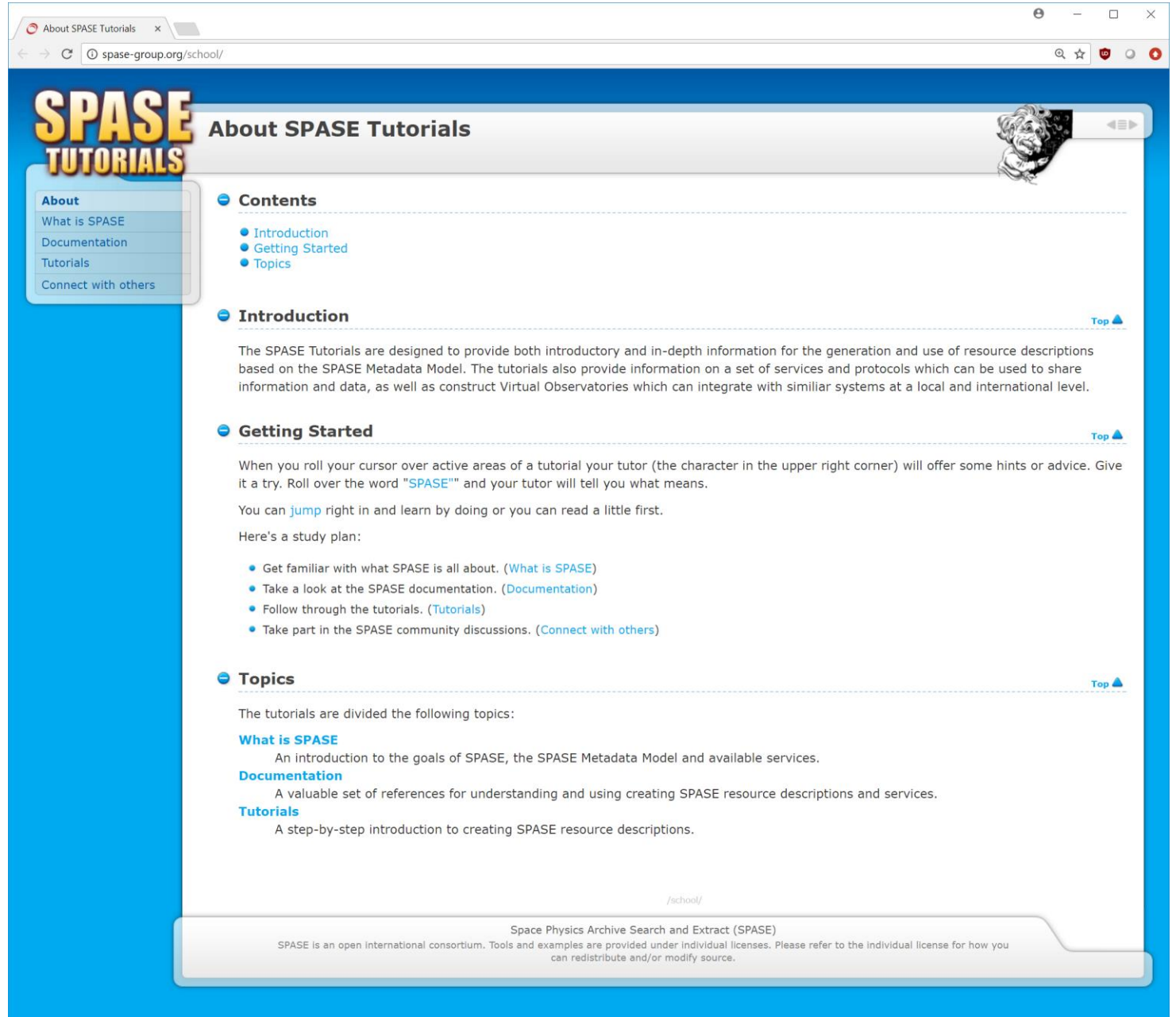
- DOI assign by a registration authority (SPASE Group can do this)
- Required DOI information (title, authors, publisher, etc.) can be extracted from SPASE descriptions.
- Assigned DOI can be included in SPASE description.
- Landing page provided by registry (<http://spase.info>)
- Data access provided through AccessURL (and portals)

More publications for researchers.

# SPASE School

- Tutorials
- Examples
- ... and more

<http://spase-group.org/school>



The screenshot shows a web browser window with the address bar displaying "spase-group.org/school/". The page has a blue header with the "SPASE TUTORIALS" logo on the left and a navigation menu. The main content area is titled "About SPASE Tutorials" and contains sections for "Contents", "Introduction", "Getting Started", and "Topics". A sidebar on the left lists "About", "What is SPASE", "Documentation", "Tutorials", and "Connect with others". The footer contains information about the Space Physics Archive Search and Extract (SPASE) consortium.

SPASE TUTORIALS

About SPASE Tutorials

Contents

- Introduction
- Getting Started
- Topics

Introduction

The SPASE Tutorials are designed to provide both introductory and in-depth information for the generation and use of resource descriptions based on the SPASE Metadata Model. The tutorials also provide information on a set of services and protocols which can be used to share information and data, as well as construct Virtual Observatories which can integrate with similar systems at a local and international level.

Getting Started

When you roll your cursor over active areas of a tutorial your tutor (the character in the upper right corner) will offer some hints or advice. Give it a try. Roll over the word "SPASE" and your tutor will tell you what means.

You can [jump](#) right in and learn by doing or you can read a little first.

Here's a study plan:

- Get familiar with what SPASE is all about. ([What is SPASE](#))
- Take a look at the SPASE documentation. ([Documentation](#))
- Follow through the tutorials. ([Tutorials](#))
- Take part in the SPASE community discussions. ([Connect with others](#))

Topics

The tutorials are divided the following topics:

**What is SPASE**  
An introduction to the goals of SPASE, the SPASE Metadata Model and available services.

**Documentation**  
A valuable set of references for understanding and using creating SPASE resource descriptions and services.

**Tutorials**  
A step-by-step introduction to creating SPASE resource descriptions.

Space Physics Archive Search and Extract (SPASE)

SPASE is an open international consortium. Tools and examples are provided under individual licenses. Please refer to the individual license for how you can redistribute and/or modify source.

# A few Stats

11 Repositories (all on <https://github.com/hpde>)

ASWS, CCMC, CSSDP, ESA, GBO, ISWI, JAXA, NOAA, NSF, SMWG, VSPO

SMWG (Organization and Infrastructure resources)

1,885 Observatories

2,268 Instruments

4,904 Persons

147 Repositories

15 Services

# A Few More Stats

## Described Resources

ASWS : 150

CCMC : 7

ESA : 185

GBO : 1,222

JAXA : 56

VSPO : 2,446

=====

4,066

# Happenings

- Improvements to web site and services
- Continuous additions of SPASE descriptions  
(lead by Spase Metadata Working Team - SMWT)
- New Web based editor
- HAPI time series data access
- International Heliophysics Data Environment (IHDE)

# Summary

Overall SPASE metadata is capable of providing the infrastructure to connect data, documents, people, software, services and published works.

... and when SPASE metadata is harvested by a portal it can enable rich discoverability.

... and we're constantly improving and enhancing the metadata model and services to meet the needs of the community.

thank you

tusind tak  
謝謝 dakujem vám  
ngiyabonga  
dziękuje  
merci  
baie dankie  
धन्यवाद molte grazie  
gracias  
obrigada  
takk  
obrigado  
teşekkür ederim  
شكرا  
tack så mycket  
gràcies  
tānan  
dank u  
teşekkür edire  
mahalo  
suksema  
danke



# Abstract

The Space Physics Archive Search and Extract (SPASE) Metadata standard is a community developed standard that is being supported and used by the NASA-funded space and solar physics community. It is also in use by the international community and by other U.S. agencies (NOAA). SPASE metadata has long been used to describe experimental data, software, documents and more. The most recent additions to the SPASE information model are extensions to support describing a simulation or model and the results generated from a run. These extensions are based on the work done by the EU's Framework 7 Integrated Medium for Planetary Exploration (IMPEX) project. In addition to IMPEX, these extensions have been adopted by the multi-agency Coordinated Community Modeling Center (CCMC) to describe supported models and run results. These extensions, along with the core SPASE metadata, enable the discovery of related observational and theoretical data resources through search portals such as NASA's Heliophysics Data Portal. In addition, SPASE provides a variety of tools and services related to generating and validating resource descriptions. One new service is that SPASE now provides support for issuing Digital Object Identifiers (DOI) for resources that are described with SPASE. The SPASE Metadata Working Team (SMWT) will work with data producers who lack other avenues for producing DOI so that their registered data may be referenced in publications. SPASE also provides generated landing pages based on the content of SPASE resource descriptions which can be used for any DOI. Overall SPASE metadata is capable of providing the infrastructure to connect data, documents, people, software, services and published works. And when SPASE metadata is harvested by a portal an ability to have rich discoverability.