



# IUGONET

Metadata DB for Upper Atmosphere

超高層大気長期変動の全球地上ネットワーク観測・研究  
Inter-university Upper atmosphere Global Observation NETwork

## **Inter-university Upper atmosphere Global Observation NETwork (IUGONET) - Development of metadata database -**

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3. Kwasan and Hida Observatories, Kyoto Univ.
4. SERC, Kyusyu Univ.,
5. STE Lab., Nagoya Univ.,
6. NIPR,
7. PPARC, Tohoku Univ.

Purposes of this 6-year (2009-2014) project are:

- to develop a metadata database (DB) of the upper atmosphere (UA) data accumulated over 50 years since IGY by Japanese institutes/universities.
- to promote effective use of the observational data and comprehensive studies of the UA.
- to investigate mechanism of long-term variation in the UA

This project is supported by Special Educational Research Budget (Research Promotion), MEXT, Japan

## Participating universities and research institutes

- Planetary Plasma and Atmospheric Research Center, Tohoku University
- National Institute of Polar Research
- Solar Terrestrial Environment Laboratory, Nagoya University
- Research Institute for Sustainable Humanosphere, Kyoto University
- World Data Center for Geomagnetism, Kyoto University
- Kwasan and Hida Observatories, Kyoto University
- Space Environment Research Center, Kyushu University

- Tohoku Univ.  
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[S. UeNo, N. Kaneda](#)
  - SERC, Kyushu Univ.  
K. Yumoto  
[S. Abe](#)
- [Member of core development team](#)  
[\(\\*\) Lead of development team](#)

**Iceland**  
aurora imager x2  
magnetometer x3

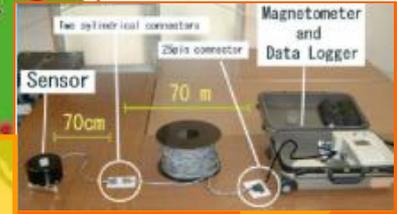
**Svalbard:** IS radar (EISCAT),  
meteor radar, aurora imager



**Toromso**  
IS radar (EISCAT)  
meteor radar  
MF radar

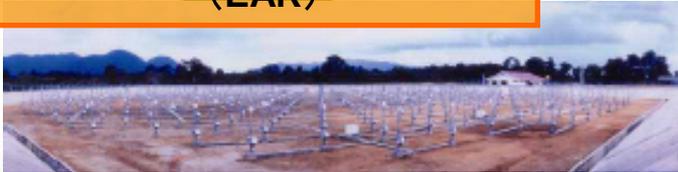
**MU radar  
@Shigaraki**

**SuperDARN  
Hokkaido HF radar**



**Solar  
observatory  
(Kyoto Univ.)**

**Equatorial Atmospheric Radar  
(EAR)**



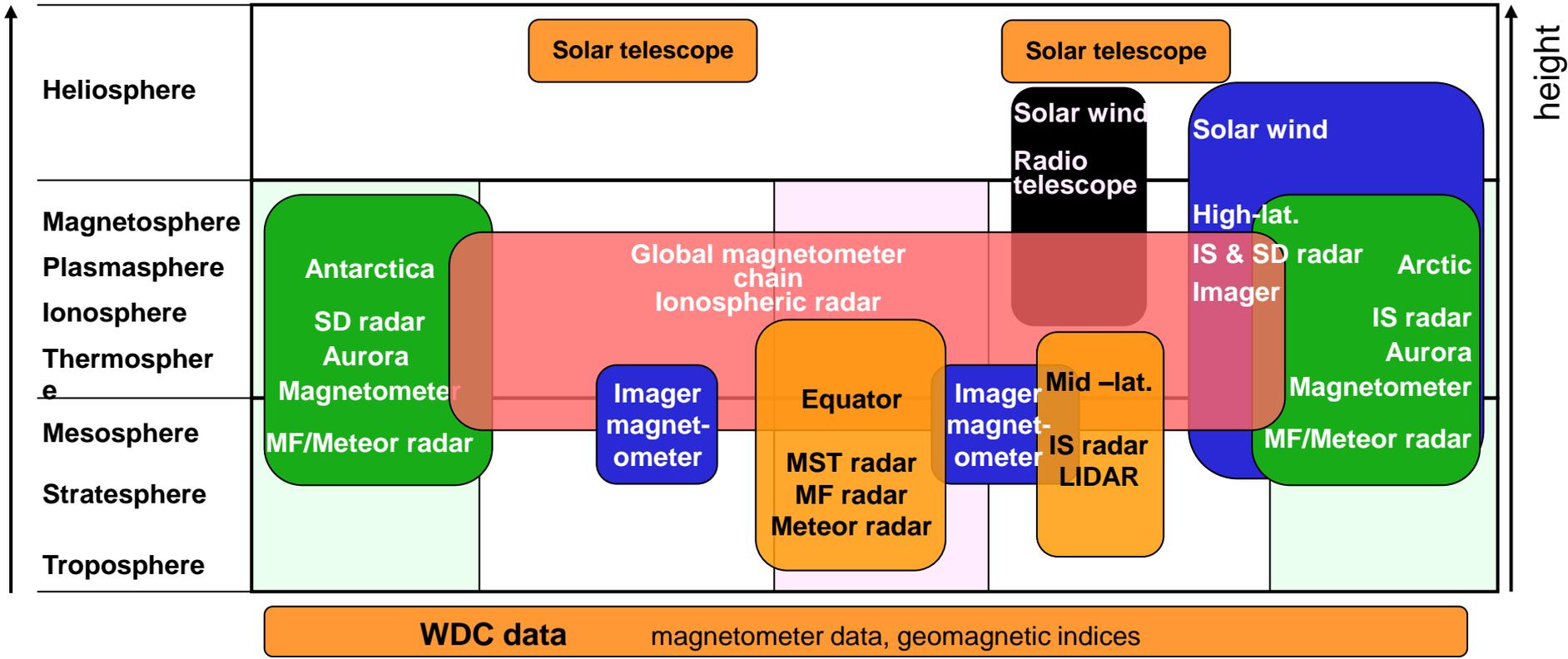
**Iitate, Onagawa  
radio telescope  
magnetometer**



**SYOWA base**  
SuperDARN radar x2  
MF radar  
aurora imagers  
magnetometer chain  
ELF obs. (conjugate with  
Onagawa)

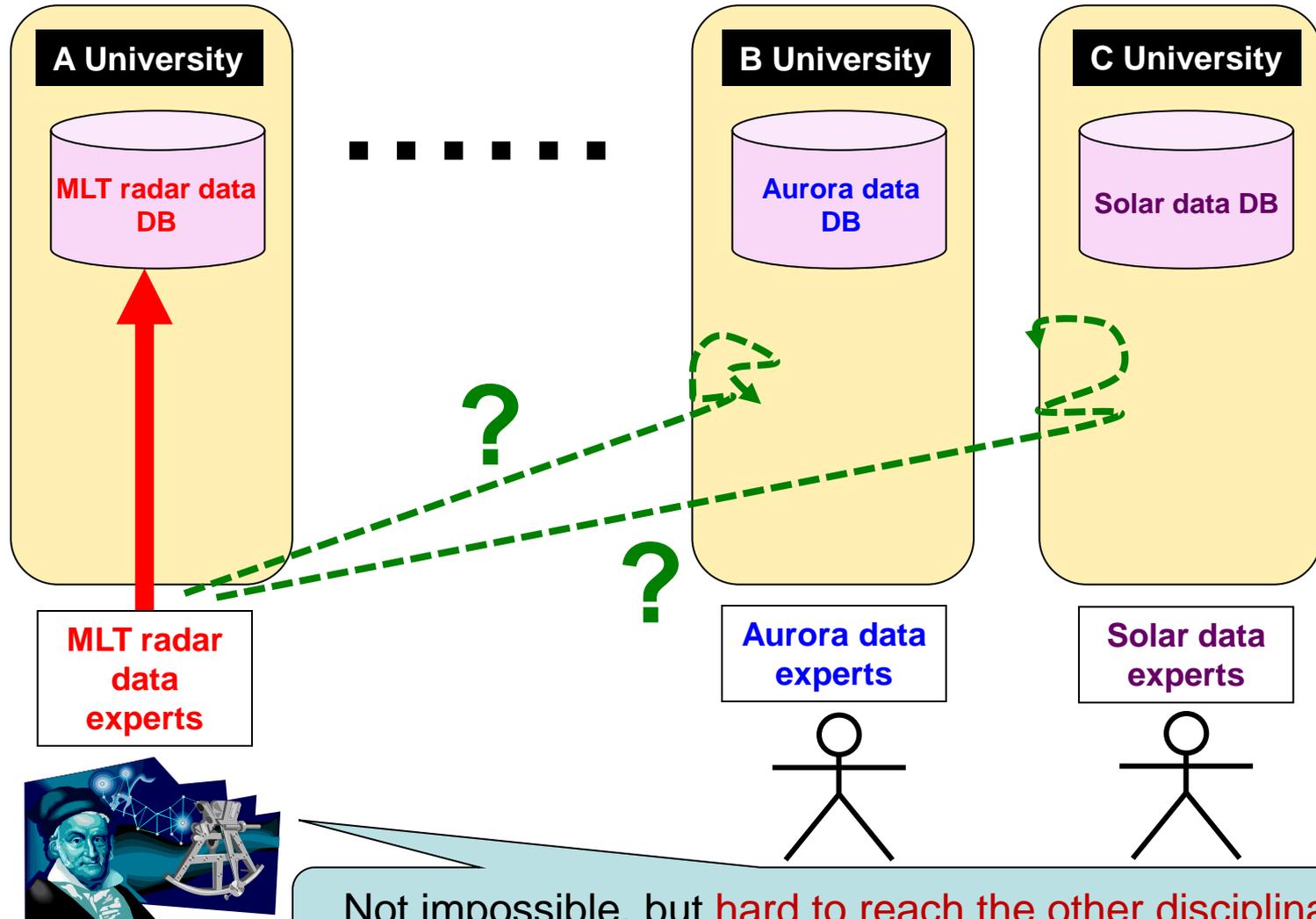
- MST radar
- ▲ MF / meteor radar
- ◆ MAGDAS magnetometer
- ★ FM-CW radar
- OMTI imager
- WDC magnetometer

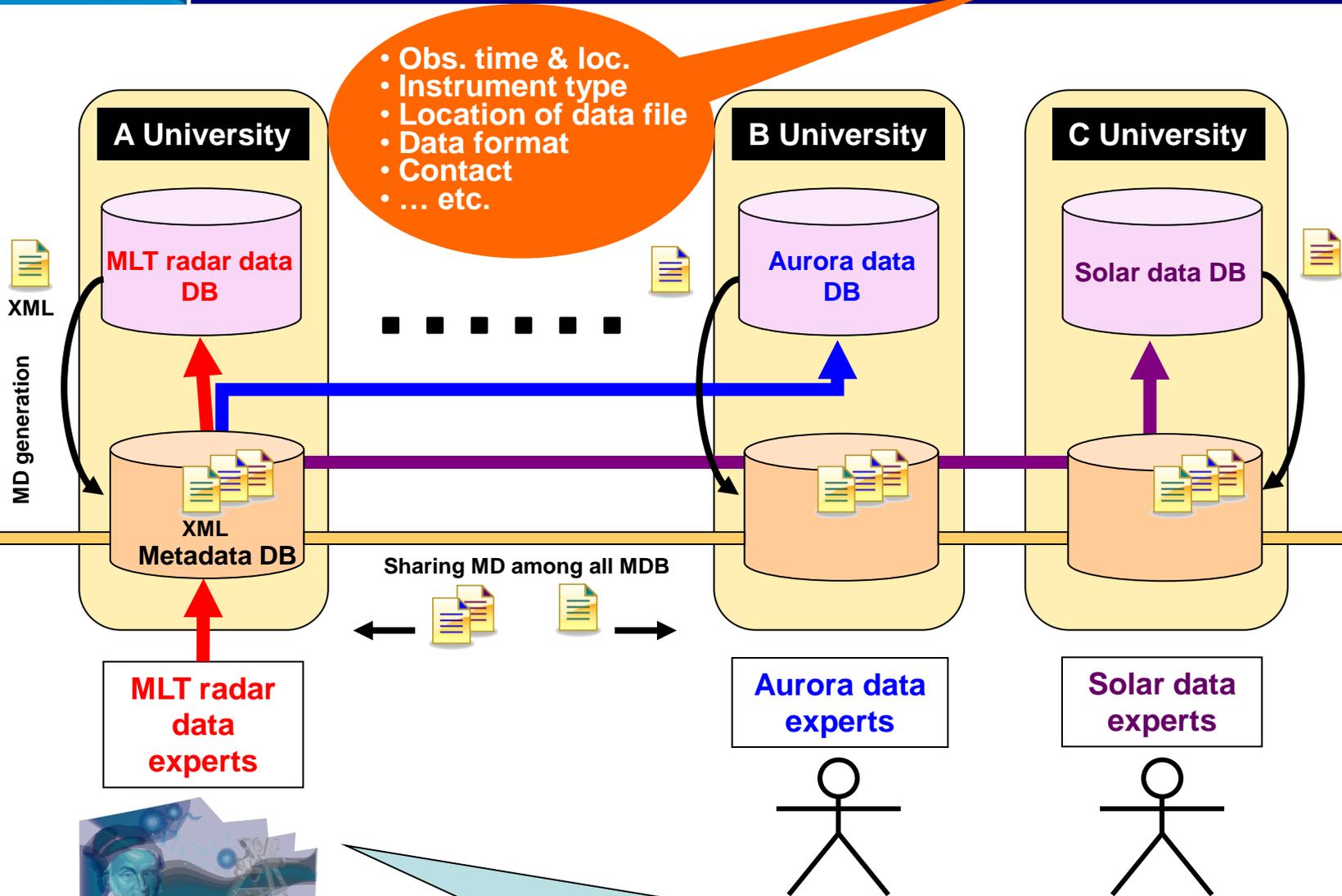


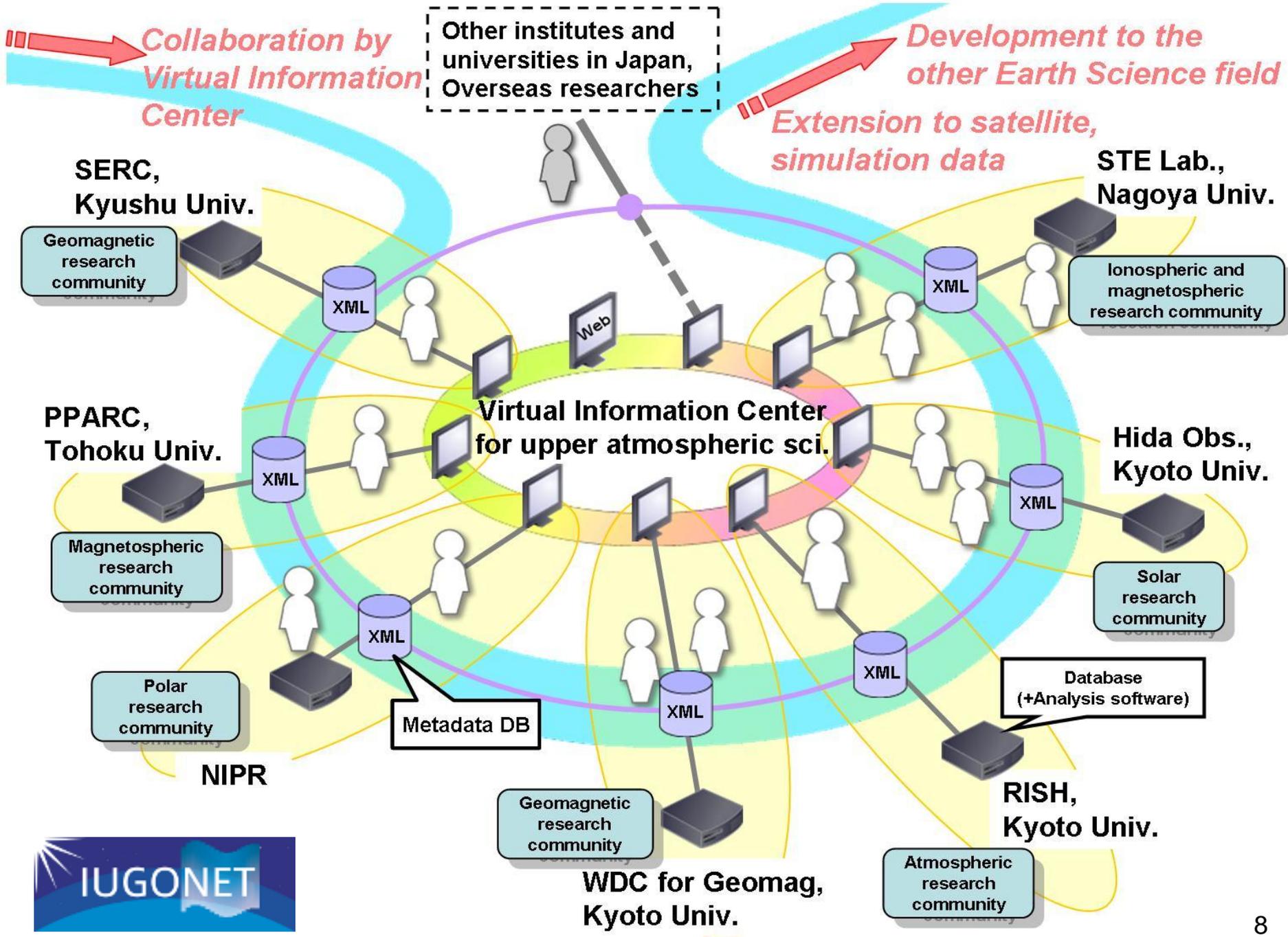


Antarctica Low-mid lat. Equator Low-mid lat. Arctic

- NIPR
- Kyushu Univ.
- Kyoto Univ.
- Tohoku Univ.
- Nagoya Univ.

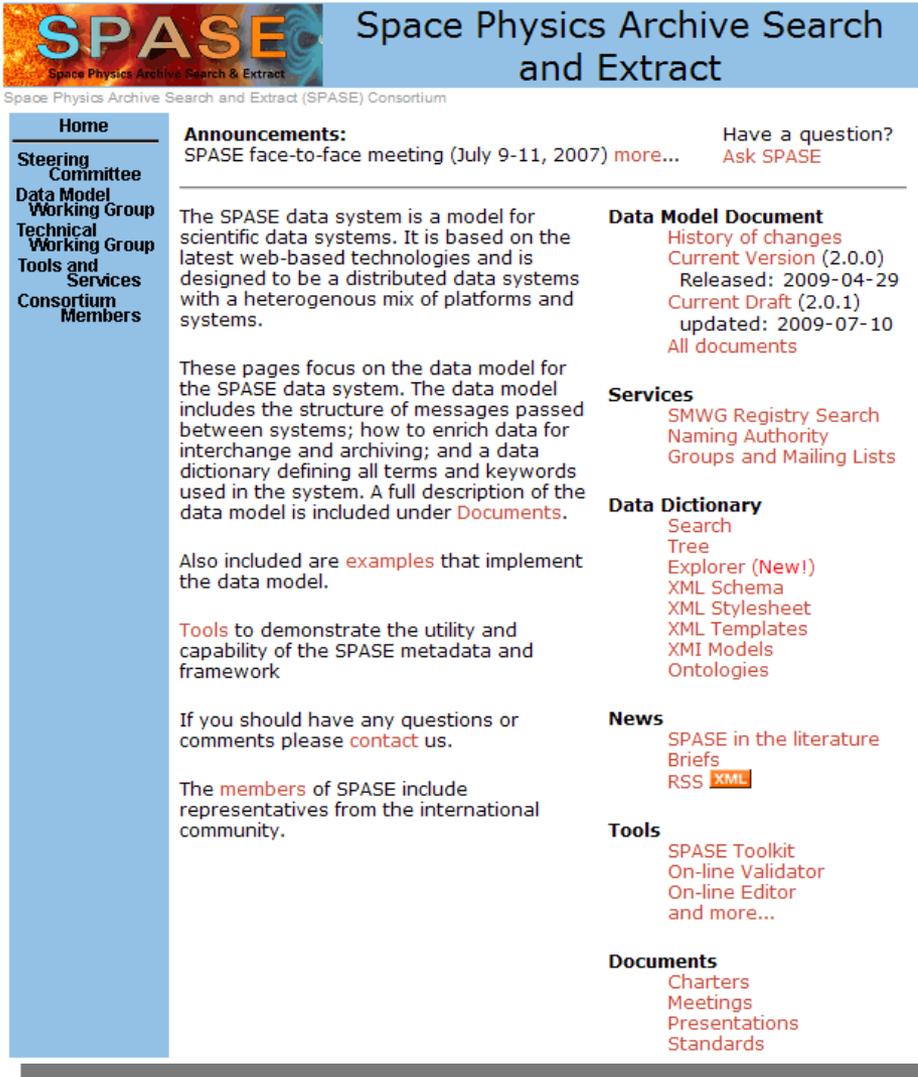






Task	Y2009	Y2010	Y2011	Y2012	Y2013	Y2014	Detail
Virtual information center (VIC) of UA studies	System installation			System update			Construct the integrated research environment (TV-conference system, ..)
Development of metadata DB system	Prototype system devel.		Open to public				Design and develop the metadata DB system
Design the Metadata format standards	Ver.1 format						Release the format ver.1 and keep updating if necessary
Development of data analysis software tools	Specifications and basic design		Open to public				Develop and release analysis softwares for UA data
Maintenance&extension of existing DBs of Observation data							Incorporate non-DB'd data into the DBs
Metadata generation							Generate metadata in the designated format and add to metadata DB
Operation of metadata DB							Release the metadata DB for community
VIC extension to related fields							Wrap up the project and discuss further extension

## Ver. 1 metadata format : SPASE with some modifications



**SPASE** Space Physics Archive Search and Extract  
Space Physics Archive Search & Extract  
Space Physics Archive Search and Extract (SPASE) Consortium

**Home**  
 Steering Committee  
 Data Model Working Group  
 Technical Working Group  
 Tools and Services  
 Consortium Members

**Announcements:**  
 SPASE face-to-face meeting (July 9-11, 2007) [more...](#)  
 Have a question? [Ask SPASE](#)

The SPASE data system is a model for scientific data systems. It is based on the latest web-based technologies and is designed to be a distributed data systems with a heterogeneous mix of platforms and systems.

These pages focus on the data model for the SPASE data system. The data model includes the structure of messages passed between systems; how to enrich data for interchange and archiving; and a data dictionary defining all terms and keywords used in the system. A full description of the data model is included under [Documents](#).

Also included are [examples](#) that implement the data model.

[Tools](#) to demonstrate the utility and capability of the SPASE metadata and framework

If you should have any questions or comments please [contact](#) us.

The [members](#) of SPASE include representatives from the international community.

**Data Model Document**  
[History of changes](#)  
[Current Version \(2.0.0\)](#)  
 Released: 2009-04-29  
[Current Draft \(2.0.1\)](#)  
 updated: 2009-07-10  
[All documents](#)

**Services**  
[SMWG Registry Search](#)  
[Naming Authority](#)  
[Groups and Mailing Lists](#)

**Data Dictionary**  
[Search](#)  
[Tree](#)  
[Explorer \(New!\)](#)  
[XML Schema](#)  
[XML Stylesheet](#)  
[XML Templates](#)  
[XMI Models](#)  
[Ontologies](#)

**News**  
[SPASE in the literature](#)  
[Briefs](#)  
[RSS](#) [XML](#)

**Tools**  
[SPASE Toolkit](#)  
[On-line Validator](#)  
[On-line Editor](#)  
 and more...

**Documents**  
[Charters](#)  
[Meetings](#)  
[Presentations](#)  
[Standards](#)

## SPASE

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

Data model and associated metadata format developed by international consortium to comprehensively describe research resources regarding heliospheric and magnetospheric physics

### Features:

- Suitable for STP data (ongoing development/improvement)
- Applicable to upper atmosphere (UA) data
- Widely-used, such as VxO
- Format, related software are open for community
- Elements/terms easily appendable (XML)
- Metadata description with XML files

- **Resource ID** assigned for all resources. Each MD is described as XML
- Registered in DB by category

### NumericalData:

**ResourceID:** spase://IUGONET/NumericalData/superdam/hok  
**ResourceHeader:**  
**ReleaseDate:** 2006-11-06  
**ExpirationDate:** 2199-12-31  
**Description:** The Hokkaido HF radar, a member of Super Dual Auroral Network Radar (SuperDARN)  
**Contact:**  
**PersonID:** spase://IUGONET/Person/Nozomu.Nishitani  
**Role:** PrincipallInvestigator  
**InformationURL:**  
**URL:** http://center.stelab.nagoya-u.ac.jp/hokkaido/  
**AccessInformation:**  
**AccessRights:** Restricted  
**RepositoryID:** spase://IUGONET/Repository/STEL/superdam/hok  
**AccessURL:**  
**URL:** http://center.stelab.nagoya-u.ac.jp/hokkaido/  
**Format:** Binary  
**Encoding:** BZIP2  
**InstrumentID:** spase://IUGONET/Instrument/superdam/hok  
**MeasurementType:** Dopplergram  
**SpectralRange:** RadioFrequencies  
**ObservedRegion:** Earth.NearSurface.Ionosphere.FRegion  
**ObservedRegion:** Earth.NearSurface.Ionosphere.ERegion

For dataset (NumericalData)

### Instrument:

**ResourceID:** spase://IUGONET/Instrument/superdam/hok  
**ResourceHeader:**  
**ResourceName:** SuperDARN Hokkaido HF radar  
**ReleaseDate:** 2006-11-06  
**Description:** The Hokkaido HF radar, a member of Super Dual Auroral Network Radar (SuperDARN)  
**Contact:**  
**PersonID:** spase://IUGONET/Person/Nozomu.Nishitani  
**Role:** PrincipallInvestigator  
**InformationURL:**  
**URL:** http://center.stelab.nagoya-u.ac.jp/hokkaido/  
**InstrumentType:** Dopplergram  
**ObservatoryID:** spase://IUGONET/Observatory/superdam/hok

For observation instrument (Instrument)

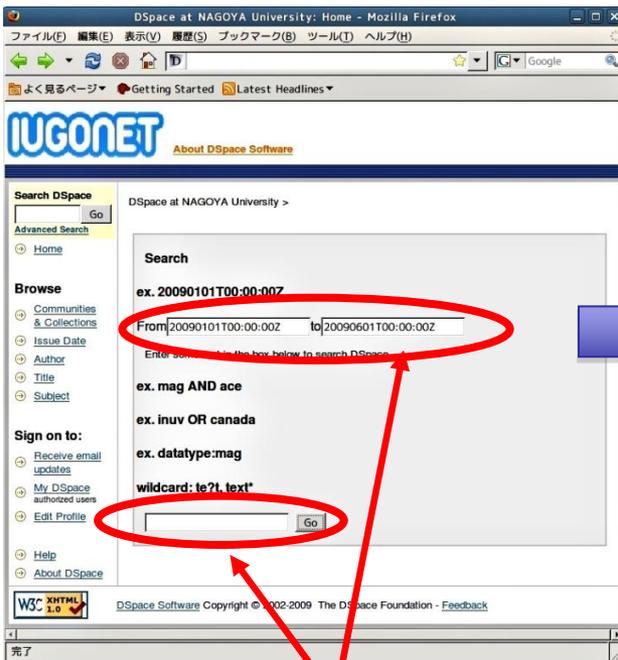
### Observatory:

**ResourceID:** spase://IUGONET/Observatory/superdam/hok  
**ResourceHeader:**  
**ResourceName:** SuperDARN Hokkaido HF radar  
**ReleaseDate:** 2006-11-06  
**Description:** The Hokkaido HF radar, a member of Super Dual Auroral Network Radar (SuperDARN)  
**Contact:**  
**PersonID:** spase://IUGONET/Person/Nozomu.Nishitani  
**Role:** PrincipallInvestigator  
**InformationURL:**  
**URL:** http://center.stelab.nagoya-u.ac.jp/hokkaido/  
**Location:**  
**ObservatoryRegion:** Earth.Surface  
**CoordinateSystemName:** GEO  
**Latitude:** 43.53  
**Longitude:** 143.61  
**Elevation:** 480.0

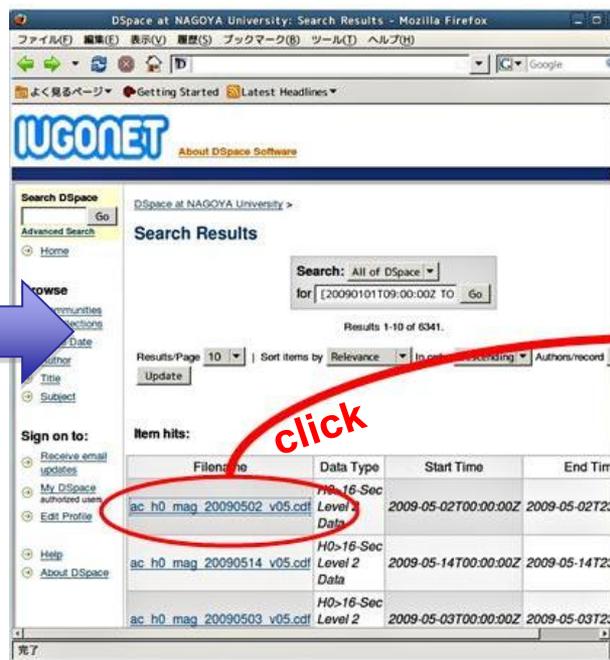
For observation site (Observatory)

Relation between resources is described by "ResourceID"

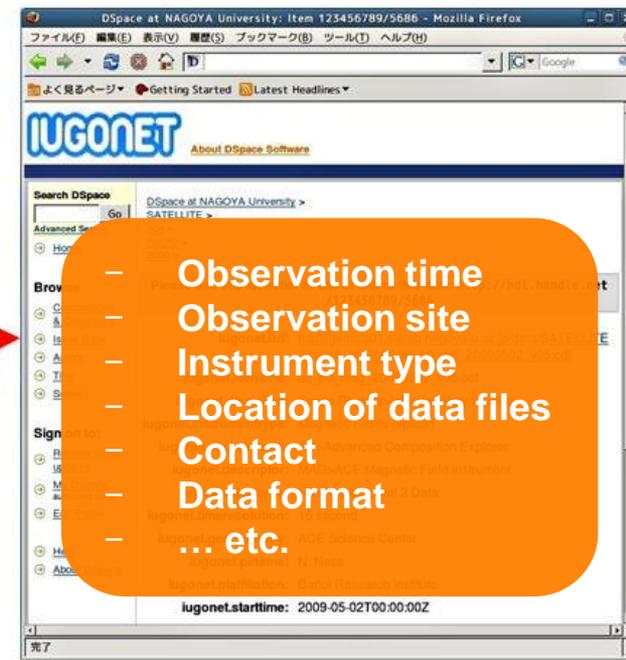
We are now developing the prototype of system for **registering, searching, providing, and collecting** metadata of our research field using a repository software (DSpace).



Search system by time range and/or free keywords (ex. meteor radar)



List of data sets/files satisfying the input conditions



Detailed metadata  
→ Lead to data files!

## URL : <http://www.iugonet.org/en>



The screenshot shows a web browser window displaying the IUGONET website. The browser's address bar shows the URL <http://www.iugonet.org/en/>. The website header features the IUGONET logo and the text "Inter-university Upper atmosphere Global Observation NETWORK" and "Metadata DB for Upper Atmosphere".

### IUGONET

The Inter-university Upper atmosphere Global Observation NETWORK, IUGONET, is a six-year research project of the National Institute of Polar Research (NIPR), Tohoku University, Nagoya University, Kyoto University, and Kyushu University to build a metadata database (MDB) of ground-based observations of the upper atmosphere. We have various kinds of observational data acquired so far by a global network of radars, magnetometers, optical sensors, helioscopes, etc., but these data are archived in individual databases at each site. By developing the MDB, which will give the location and other information about the observational data, we intend to provide researchers with a seamless data environment linking databases spread across the member institutions. This MDB will be of great help in conducting comprehensive analyses with various observational data to clarify the mechanisms of the long-term variations in the upper atmosphere.

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日本語版 [Japanese Version](#)



Objectives

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Contact on this page: [webmaster@iugonet.org](mailto:webmaster@iugonet.org)

last update: 2010-01-21

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- The “IUGONET” project has just started up.
- We develop a **metadata DB** to facilitate the efficient use of the upper atmospheric data, and thereby promote comprehensive, multi-disciplinary studies.
- Currently the metadata DB system is being developed on the basis of **DSpace** in which metadata are stored in the **SPASE-based format**.
- The metadata DB will also be of great help for the Asian-Oceanian radar community to facilitate new researches by utilizing each other’s data.