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Type	Presentation
Textversion	author



# *About IUGONET*

*1st Kyoto University Research Data Management Workshop*

6 Oct., 2018

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Masahito Nose[1][4], Satoru UeNo[5] and IUGONET Project Team

[1] ISEE, Nagoya Univ., [2] NIPR, [3] ICSWSE, Kyushu Univ.,  
[4] DACGSM, Kyoto Univ., [5]Kwasan and Hida Obs. Kyoto Univ.



# About IUGONET

4. Project Details

3. Research group or research active area

The Research Organization of Information and Systems (ROIS),  
National Institute of Polar Research (NIPR)

Polar Environment Data Science Center  
Space and Upper Atmospheric Sciences Group

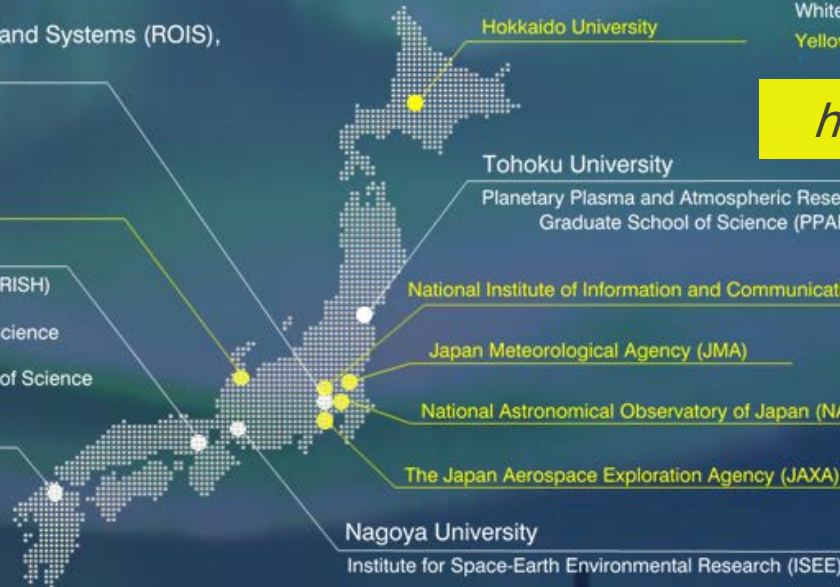
Kanazawa University

Kyoto University

Research Institute for Sustainable Humanosphere (RISH)  
Data Analysis Center for Geomagnetism  
and Space Magnetism, Graduate School of Science  
(DACGSM, WDC for Geomagnetism, Kyoto)  
Kwasan and Hida Observatories, Graduate School of Science

Kyushu University

International Center for Space Weather Science  
and Education (ICSWSE)



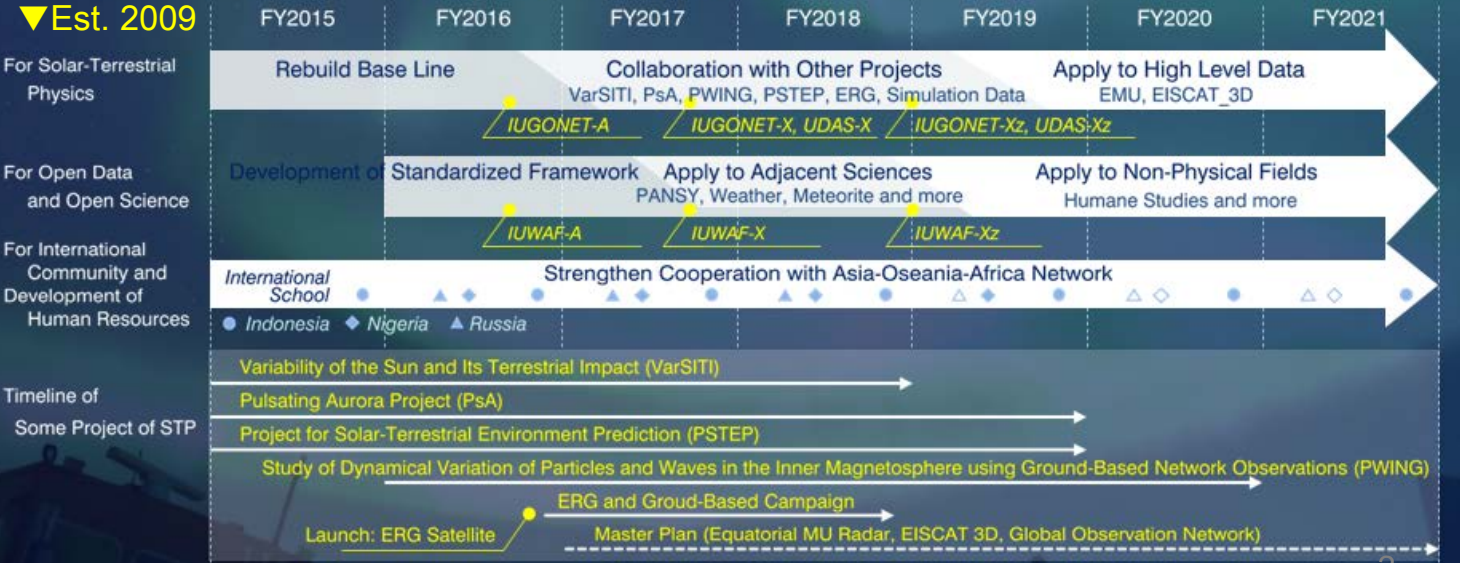
White: Host Organization  
Yellow: Cooperators

<http://www.iugonet.org/>

## IUGONET TIMELINE

▼ Est., Polar Environment Data Science Center

General Budget [FY2015-]



## Organizations and Members

IUGONET consists of host organizations, cooperators (data providers) and partners. \*1: Steering Committee, \*2: Developers

### Planetary Plasma and Atmospheric Research Center, Graduate School of Science (PPARC), Tohoku University

Takahiro Obara\*1, Naoki Terada, Yasumasa Kasaba, Takeshi Sakanoi, Hiroaki Misawa, Atsushi Kumamoto, Fuminori Tsuchiya, Yuto Katoh, Masato Kagitani

### Polar Environmental Data Science Center, The Research Organization of Information and Systems (ROIS) Space and Upper Atmosphere Sciences Group, National Institute of Polar Research (NIPR)

Ryoichi Fujii\*1, Toshitaka Tsuda\*1, Takuji Nakamura\*1chair, Akira Kadokura, Hiroshi Miyaoka, Masaki Okada, Yasunobu Ogawa, Yoshihiro Tomikawa, Natsuo Sato, Yoshimasa Tanaka\*2Representative

### Institute for Space-Earth Environmental Research (ISEE), Nagoya University

Kazuo Shiokawa\*1, Yoshizumi Miyoshi, Yuichi Otsuka, Tatsuki Ogino, Norio Umemura\*2, Atsuki Shinbori\*2, Tomoki Nakayama, Tomoo Nagahama, Satonori Nozawa, Kenichi Fujiki, Yutaka Matsubara, Nozomu Nishitani, Fumio Abe

*me (Researcher, ICT Engineer?)*

### Research Institute for Sustainable Humanosphere (RISH), Kyoto University

Mamoru Yamamoto, Hiroyuki Hashiguchi\*1, Jun-ichi Furumoto, Masanori Yabuki

### Data Analysis Center for Geomagnetism and Space Magnetism, Graduate School of Science (DACGSM, WDF for Geomagnetism, Kyoto), Kyoto University

Toshihiko Iyemori\*1, Hiroaki Toh, Masahiko Takeda, Masahito Nosé\*2

### Kwasan and Hida Observatories, Graduate School of Science, Kyoto University

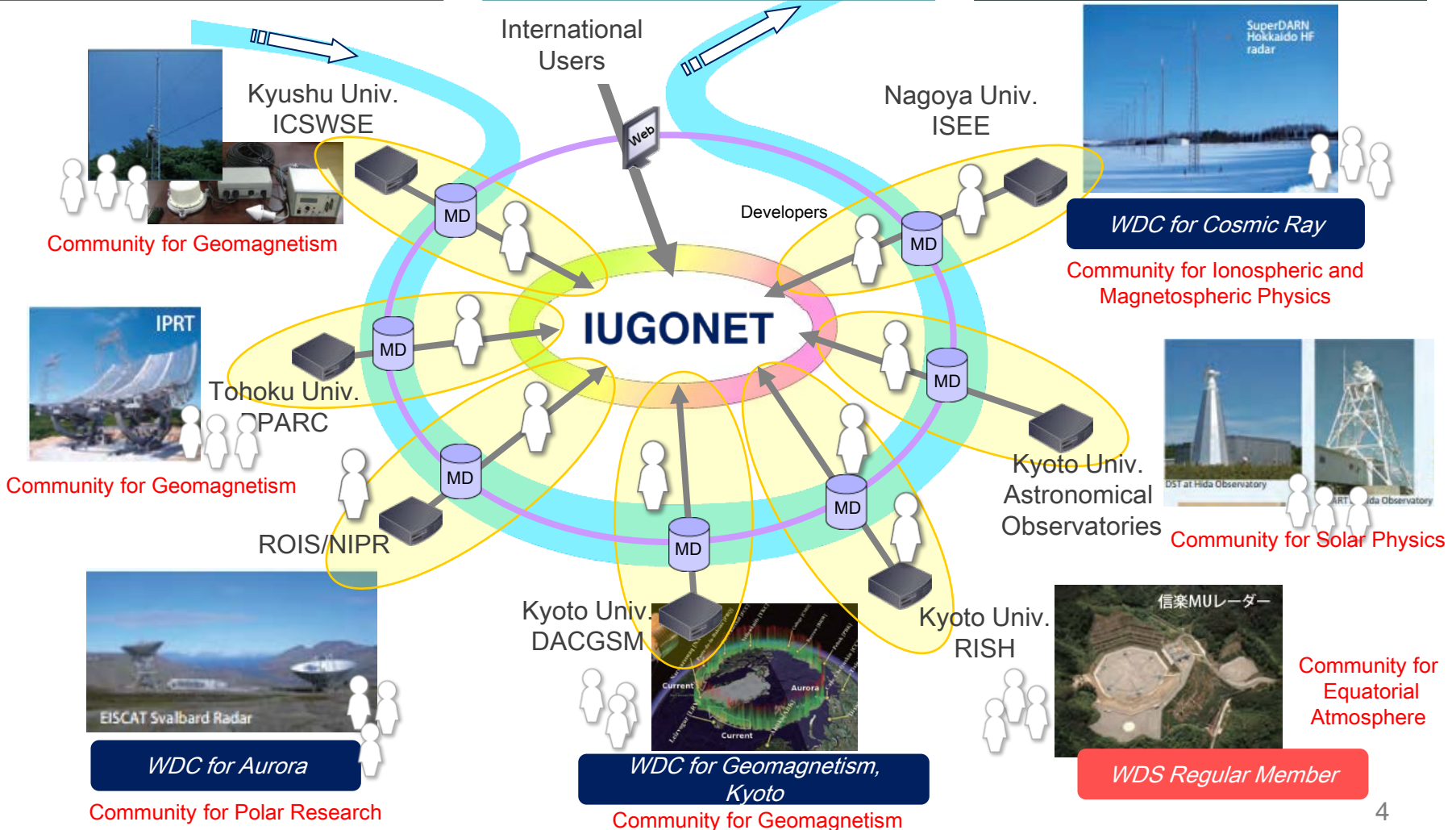
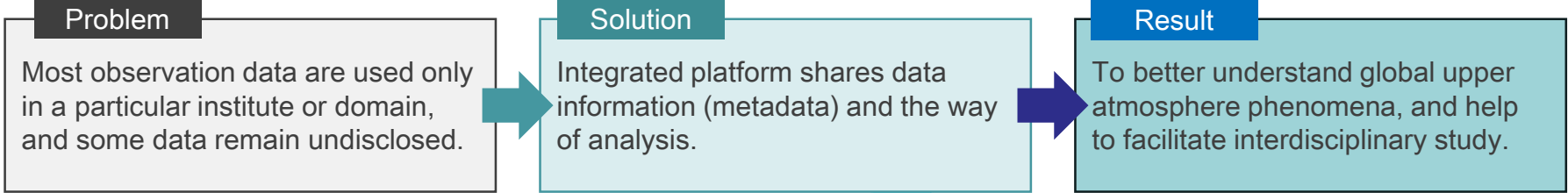
Kazunari Shibata\*1, Satoru UeNo\*2

### International Center for Space Weather Science and Education (ICSWSE), Kyushu University

Akimasa Yoshikawa\*1, Tohru Hada\*1, Daisuke Ikeda, Kiyohumi Yumoto, Shuji Abe\*2

## Cooperators

Kakioka Magnetic Observatory, Japan Meteorological Agency (JMA)  
 The Solar Observatory, National Astronomical Observatory of Japan (NAOJ)  
 Integrated Science Data System Research Laboratory, National Institute of Information and Communications Technology (NICT)  
 Graduate School of Natural Science & Technology, Kanazawa University  
 Institute of Space and Astronautical Science (ISAS), Japan Aerospace eXploration Agency (JAXA)

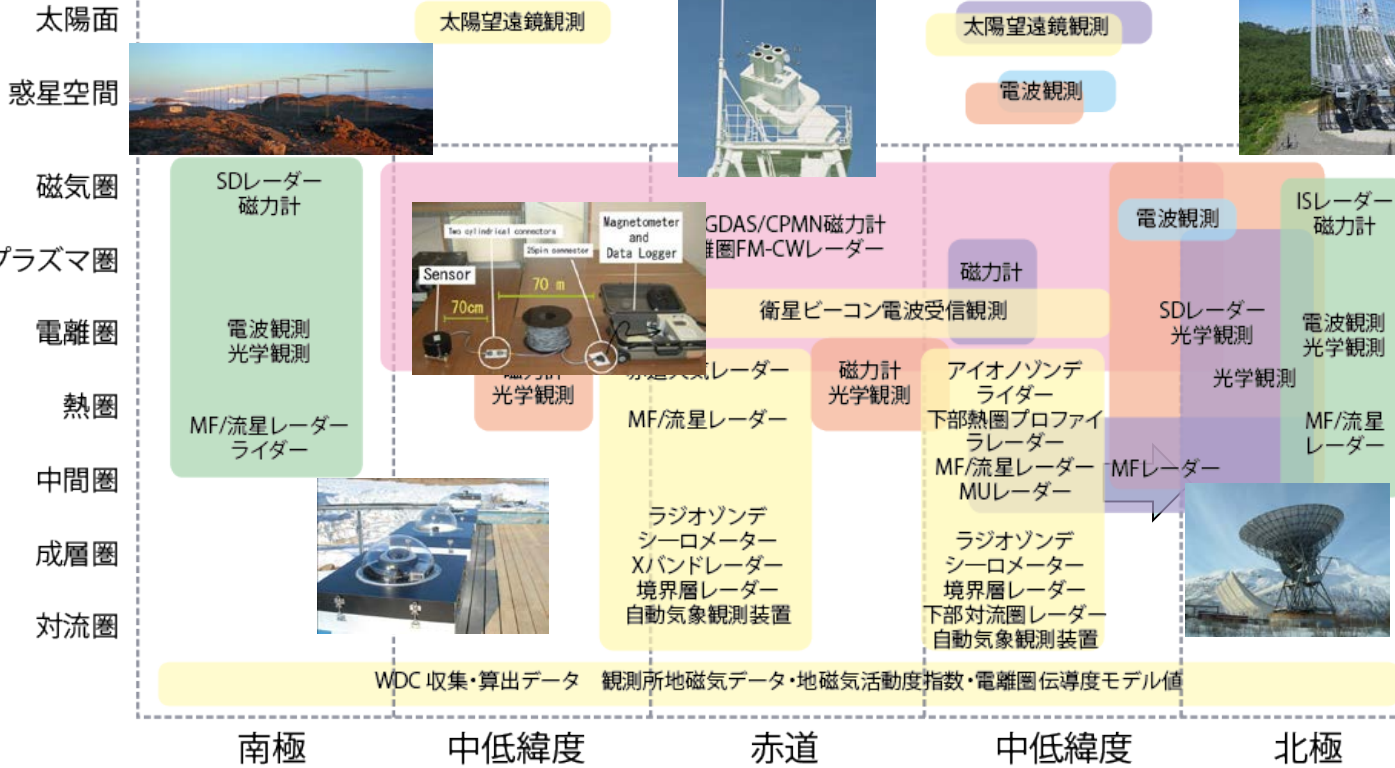


- 東北大学
- 京都大学
- 九州大学
- 国立極地研究所
- 名古屋大学
- メタデータ提供協力機関

高度

電離大気

中性大気



- 様々な装置で観測された多種多様な物理量データ
- 太陽～地球下層大気にある様々な領域で取得されたデータ

7. Characteristics (a: observational)

8. Data Types (b: from instruments)

.cdf (common data format: NASAが中心となり策定している分野固有フォーマット) での公開が通例。

再現・再採取が不可能なデータ。未説明現象が多い。

10. Importance (b: important)

**データサービス IUGONET Type-A:** IUGONET参画機関が保有する観測データに対する情報を検索することができる。

**解析ソフトウェアUDAS/SPEDAS:** 複数のプロジェクト・機関が持つ様々な観測データを同一プラットフォームで可視化、解析することができる。

IUGONET Type-A (Web)



UDAS/SPEDAS (CUI/GUI)



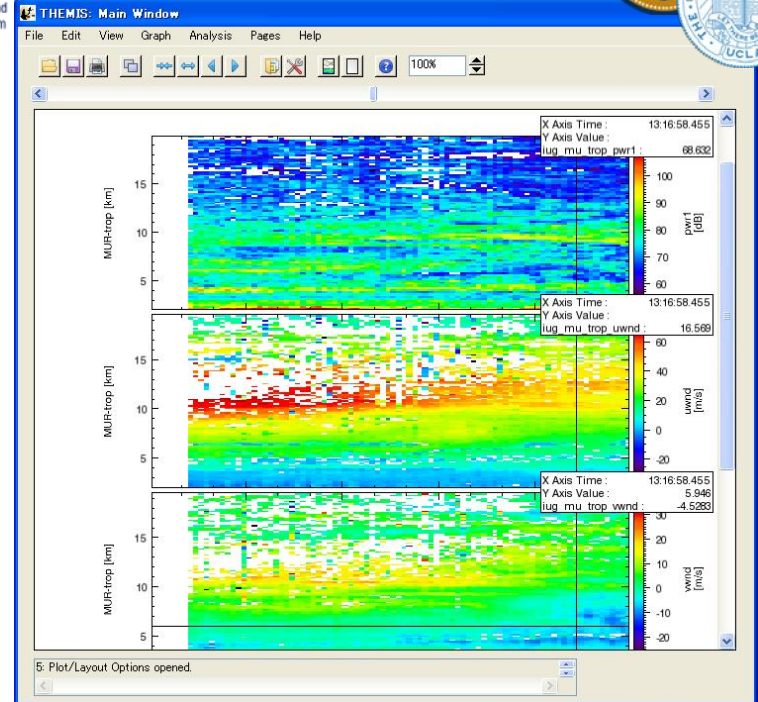
**IUGONET Web Service**  
 Type-A  
 UDAS web Available! | Rules of the Road | About US

**IUGONET DataSet** [LIST] [MAP]

Instrument Type	Observed Region
<input type="checkbox"/> <b>Satellite:</b> <input type="checkbox"/> AKEBONO <input type="checkbox"/> CHAMP	
<input type="checkbox"/> <b>Ground-Based:</b> <input type="checkbox"/> SMART (Telescope) <input type="checkbox"/> DST (Telescope) <input type="checkbox"/> FMT (Telescope) <input type="checkbox"/> Refractor (Telescope) <input type="checkbox"/> Muon (Telescope) <input type="checkbox"/> Geomagnetic Indices <input type="checkbox"/> WDC Geomag. Kyoto <input type="checkbox"/> Geomag. Kakioka <input type="checkbox"/> Magnetometer <input type="checkbox"/> Induction <input type="checkbox"/> MAGDAS <input type="checkbox"/> MM210 <input type="checkbox"/> AWS <input type="checkbox"/> Imager <input type="checkbox"/> EA Radar <input type="checkbox"/> MU Radar <input type="checkbox"/> MF Radar <input type="checkbox"/> MW Radar <input type="checkbox"/> X-Band Radar <input type="checkbox"/> GPS Receiver <input type="checkbox"/> Na-Lidar <input type="checkbox"/> FISCAT <input type="checkbox"/> OMTI <input type="checkbox"/> SuperDARN <input type="checkbox"/> VHF Radar <input type="checkbox"/> VLF/ELF <input type="checkbox"/> Ionosonde <input type="checkbox"/> Radiosonde <input type="checkbox"/> BL/LT/WP Radar <input type="checkbox"/> Riometer <input type="checkbox"/> Others	

Keyword:   
 Timespan:  To  [Set Detail] [Search]

**Information**  
 Open IUGONET Type-A, 1 Nov. 2016.  
 New IUGONET System 'IUGONET Type-A' Opened. The new functions are  
 - Search Data using List/Map  
 - Combination Search using List/QLs  
 - Show Data Information with Quick Image/Plot  
 - Show How to Plot  
 - UDAS web (Web-Based Interactive Tool to Create Plot) \*Now, Under Maintenance.  
 We will continue the development on the basis of the opinion of users. Thank you.

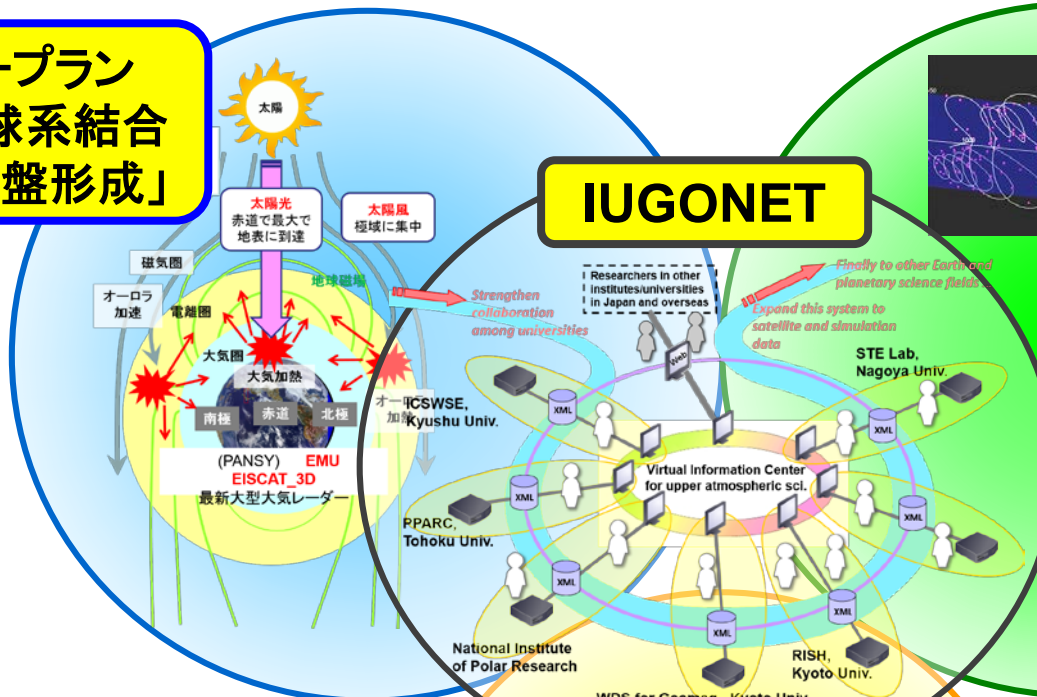


<http://search.iugont.org/iugonet/>

<http://www.iugonet.org/software.html>

Integrated Platform (Database and Analysis Software)

マスタープラン  
「太陽地球系結合  
過程の基盤形成」



情報・システム研究機構  
DS共同利用基盤施設  
極域環境DSC

- 多様なデータの公開・共有
- 検索・解析ツールの提供
- 国際ネットワークの構築
- 人材育成



迅速、且つ、高度な研究成果の創出

国内外のSTP分野  
他プロジェクト



- 新しいデータサイエンス手法の応用
- 異分野融合による分野横断型研究への発展
- オープンサイエンスへの展開



分野の壁を越えた新しい発見





*at Covenant Univ. in Nigeria, Sep. 2017  
collaborated with ISELLI-2*

### 解析講習会を開催。(年4~5回程度)

- 国内外プロジェクト・プログラムと連携して、研究基盤構築を支援、即時解析の体制へ
- FY2016~2017: 査読あり学術論文39本 (うち学生主著12本、学位論文5本)
- 若手からシニアまで
- 衛星と地上観測を組合せた総合解析
- 30年以上の長期変動解析も



*in Bandung, Indonesia, Mar. 2018  
collaborated with ISELION*

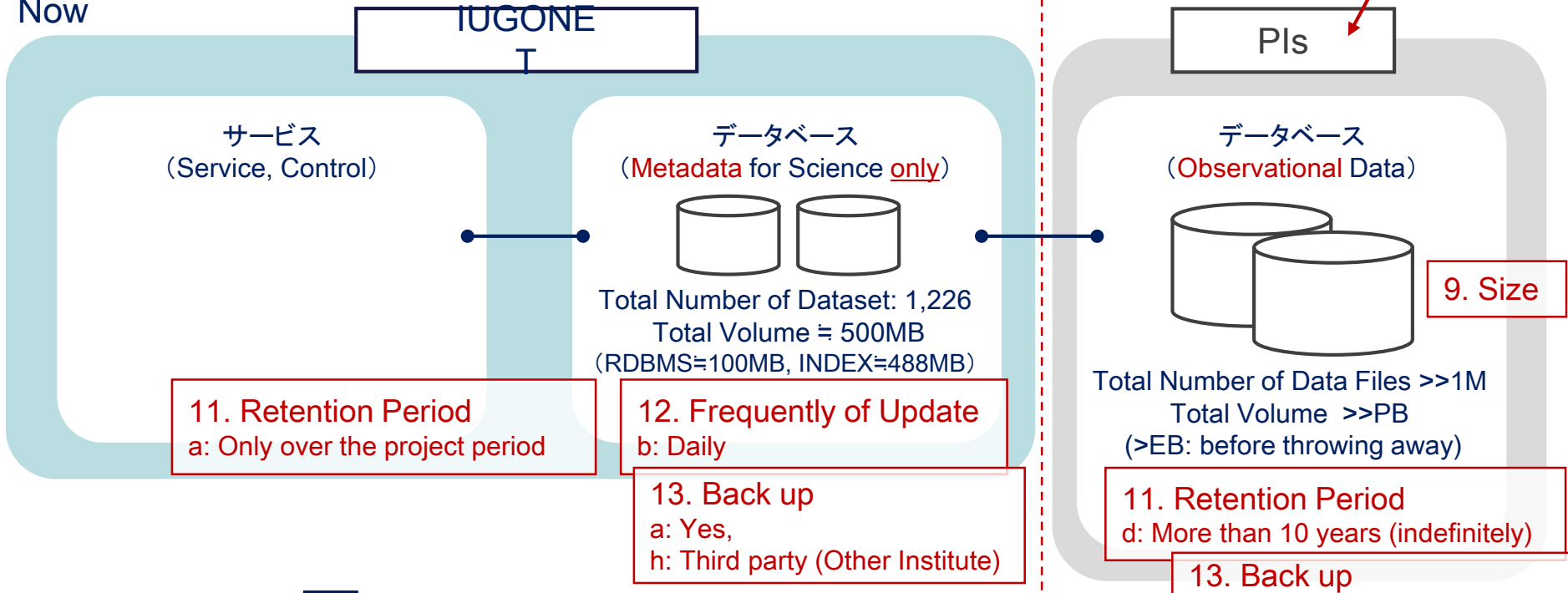


*in Tokyo, May. 2018  
collaborated with Harris Geospatial Inc.*



*in Malaysia, Aug. 2018  
collaborated with ICeSSAT*

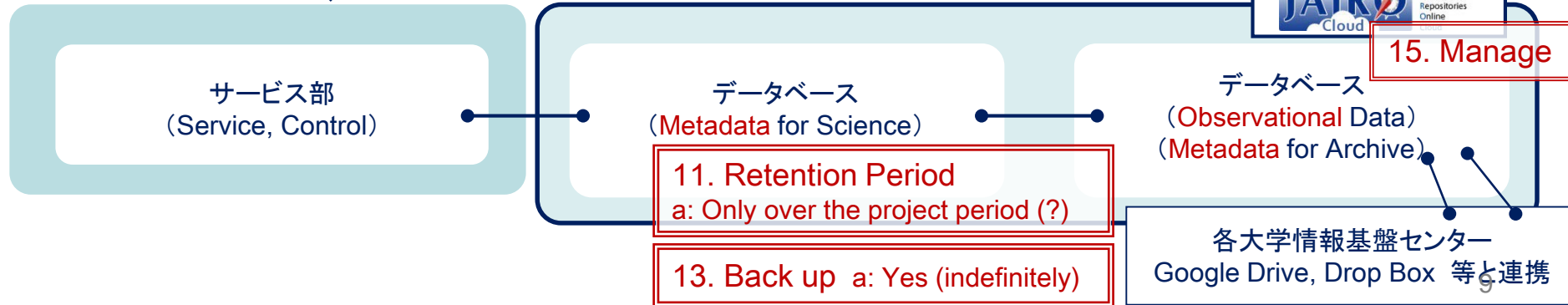
Now



Future Planning



## 共用システムとの連携を積極的に検討



Now

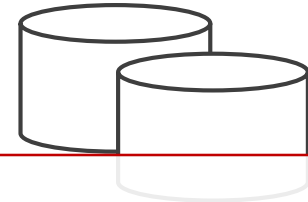


サービス  
(Service, Control)

データベース  
(Metadata for Science only)



データベース  
(Observational Data)



## 14. Formal Research Data Management Plan a: Yes

- Rights: Owned and controlled by PI's. IUGONET has only introduced data information, and promoted data usage.
- Data Archive: Indefinitely (General policy on Space Physics)
- Metadata Archive: Indefinitely (General policy on IUGONET Project.)
- Acknowledgement: Acknowledgement to IUGONET and PIs.
  - Include the word of "IUGONET" apparently in your paper.
  - Follow the instructions of PI (Contact, Agreement before use, Refer paper etc.)
- Incentive: ???

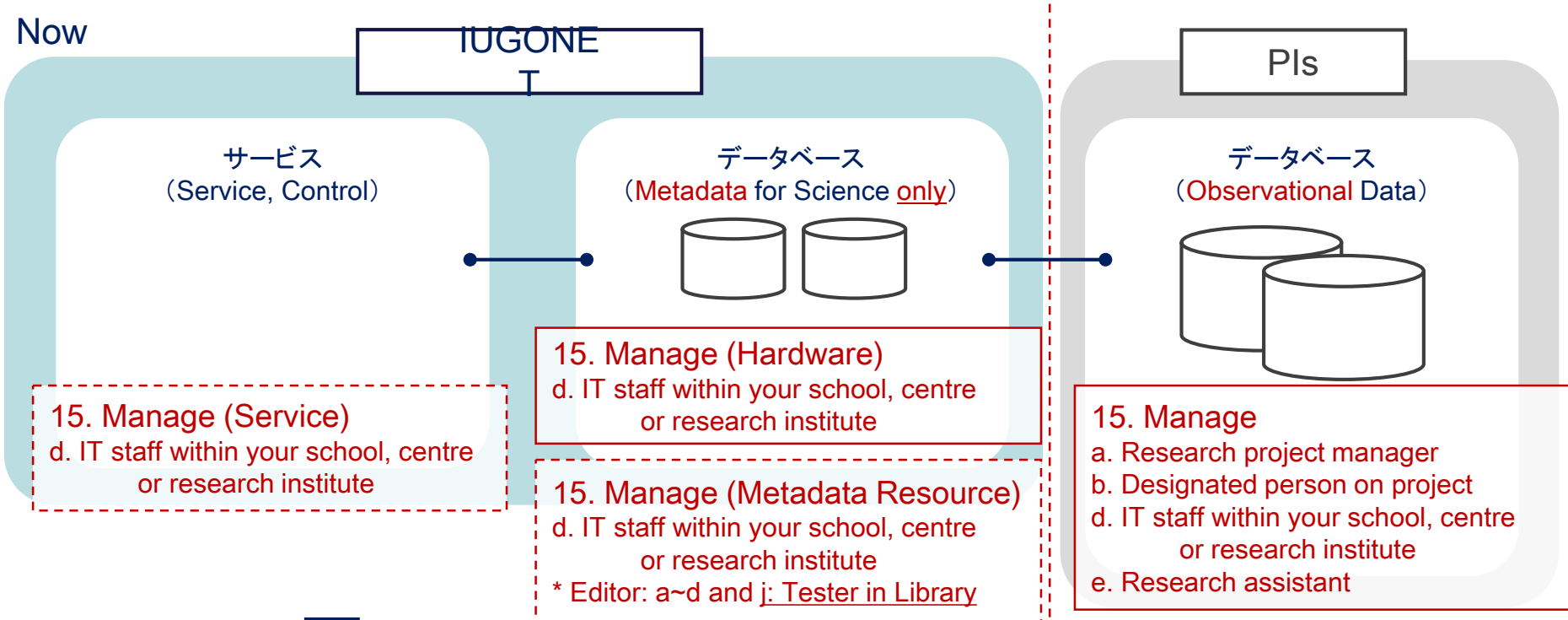
サービス部  
(Service, Control)

データベース  
(Metadata for Science)

データベース  
(Observational Data)  
(Metadata for Archive)

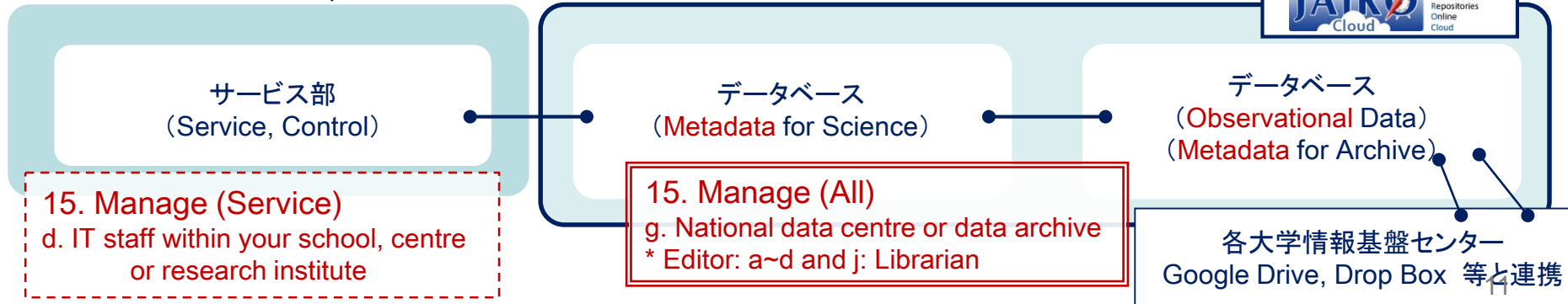
各大学情報基盤センター  
Google Drive, Drop Box 等と連携

Now



Future Planning

**共用システムとの連携を積極的に検討**



## Problems (So Far)

### 5. Description of Data

No way to know data itself.

### 15. Manage, 9. Size of Data, 11. Retention Period, 13. Back up

Limit to manage in each laboratory.

Require many cost. No rules to hire ICT technician and Curator. \*\* Issues specific to Japan.

### 14. Formal Research Data Management Plan

Loose

### X. Usage Trends

Use specific data.

## Improvement and Future Planning

Data location and policy became clear.

Science results and paper has been published.  
(including emerging countries.)

*In Progress*

Infra-structure

Under planning with NII. (Ready!)

How pay when project end?  
Ideal: Each university manage data?

Human Resource

Outsource to third when one needs?

*In Planning*

Have a unified policy (inside of IUGONET).  
Some group that wants to imitate appears!!

What is specific incentive???

I hear, some group has started to give researchers the rights to collaborative research as incentive.

*Unsolved*

Integrated results and paper has been published.

Many researchers are still inclined to see specific data.

*Unsolved*

Link