

Project No. : 16006 Core Institution in Japan: National Astronomical Observatory of Japan

**JSPS Core-to-Core Program -Strategic Research Networks-
FY2007 Research Report**

Project No.	16006
Research Theme	Establishment of Japanese Virtual Observatory in relation with International Virtual Observatory by utilizing state-of-the-art information technology
Duration of Project	April, 2006 -- March, 2009
Core Institution in Japan	National Astronomical Observatory of Japan

Implementing Organizations

Country	Japan
Core Institution	National Astronomical Observatory of Japan
Co-Chair (name and title)	Ohishi, Masatoshi / Associate Professor
Number of Cooperating Institutions	7
Cooperating Institutions	Aoyama Gakuin university, Tokyo Institute of Technology, University of Tokyo, JAXA/ISAS, Tokyo Gakugei university, Ibaraki university, Graduate University for Advanced Studies

Country	the United States of America
Core Institution	Space Telescope Science Institute
Co-Chair (name and title)	Robert James Hanisch / Project Manager
Number of Cooperating Institutions	9
Cooperating Institutions	The Johns Hopkins University, California Institute of Technology, National Center for Supercomputing Applications, National Radio Astronomy Observatory, National Optical Astronomy Observatories, San Diego Supercomputing Center, Smithsonian Astrophysical Observatory, NASA Goddard Space Flight Center, Dominion Astrophysical Observatory
Matching Fund	US National Science Foundation, NSF grant, No. AST012244

Country	the United Kingdom
Core Institution	Cambridge University
Co-Chair (name and title)	Nicholas Andrew Walton / AstroGrid Project
Number of Cooperating Institutions	7
Cooperating Institutions	Jodrell Bank Observatory, University of Edinburgh, Rutherford Appleton Laboratory, The University of Manchester, Mullard Space Science Laboratory, University of Leicester, The Queen's University of Belfast
Matching Fund	European Commission, EU FP6, EURO-VO-DCA

Country	Germany
Core Institution	European Southern Observatory
Co-Chair (name and title)	Paolo Padovani / EURO-VO Project Scientist
Number of Cooperating Institutions	2
Cooperating Institutions	Strasbourg Data Centre, European Space Astronomy Centre
Matching Fund	European Commission, EU FP6, EURO-VO-DCA

Result of Program Implementation

We held two IVOA (International Virtual Observatory Alliance, <http://www.ivoa.net/>) interoperability meetings as the "Seminars" in May and September, 2007. The former was held in Beijing, China, with more than 90 participants. The meetings adopted new standard protocols, standard data models, and standard interfaces to interoperate individual VO projects around the world. We also held two seminars jointly with the Open Grid Forum to exchange state-of-the-art information on the Grid technology. Japanese Virtual Observatory project has successfully opened its data service since 2008 March (<http://jvo.nao.ac.jp/portal/>). The JVO portal has already been accessed by many users worldwide, resulting in data download of more than 1 TBytes. Japan and the UK have developed a easy-to-use workflow builder system. The JVO has been regarded as a core of the new Astronomy Data Center of the NAOJ, that started in April 2006 on, and an international review to the ADC concluded that JVO has quite high activity. The concept of VO has been disseminated in other research areas, such as the Solar Terrestrial Environment and Geophysics.

Achievements in FY2007 (Self Review)

We have successfully implemented the JVO portal system since 2008 March. Visit at <http://jvo.nao.ac.jp/portal/>. Anyone can access and download the observed data from more than 1,300 sites in the world. More than 1 TBytes of data have already been downloaded. We implemented a prototype for a workflow builder system based on the Taverna in order to easily construct data query and data analysis processes on a graphical user interface. Similar system has also been built in the UK, and we plan to compare our systems toward better, common system. In the course of such development JVO contributed to the standardization in the International Virtual Observatory Alliance (IVOA); Ohishi acted as the executive committee member and the chair for the Astro-RG group, and Shirasaki worked as a vice-chair of the VOQL working group. Some program members were invited to give talks on the virtual observatory in several international meetings. It should be noted that the Core-to-Core program members published 104 academic papers, including 8 invited talks. Clearly these quantities verify that the Japanese VO activity level has been very high, that was accelerated by the Core-to-Core program of the JSPS.

Future Plan (Measures toward Achieving Research Objectives)

NAOJ has adopted the VO infrastructure as the core of the Astronomy Data Center that started since April 2006. Since the data service has been opened for the astronomy research community, the JVO project plans to develop easy-to-use workflow builder system and federated distributed data storage system together with the European and the US counterparts. JAXA/ISAS plans to implement VO-enabled databases, jointly with the European Space Astronomy Centre, in order to publish newly observed data such as AKARI and SUZAKU satellites. In parallel with the development of the operational system, we plan to prepare to treat data products from the ALMA (Atacama Large Millimeter/submillimeter Array) through discussion with international ALMA community.