

## **Memorandum of Understanding (DRAFT)**

This Memorandum of Understanding (MOU) sets for the terms and understanding between Tohoku University of Community Service and Science (refer to as “Koeki University”), The Brera Astronomical Observatory (refer to as “Brera Observatory), Keio University and GOTO INC (refer to as GOTO) for operation, maintenance and management of “Internet Telescope” which was jointly installed by the four parties in the headquarters of the Brera Observatory in Merate, Italy (refers at the Merate Observatory).

### **Preamble**

- (1) Koeki University, based in Sakata-shi, Yamagata, Japan, owns the control server of “Internet Telescope System”, and develops and provides the software for its browser.
- (2) Brera Observatory, based in Milan, Italy, makes available the Marcon dome with a sliding roof and its accompanying equipment for the Internet Telescope installed in the Merate Observatory.
- (3) GOTO, based in Fuchu-shi, Tokyo, Japan, develops designs, produces and installs the observation equipment and the control system.
- (4) Keio University, based in Minato-ku, Tokyo, Japan, provides the equipment for the Internet Telescope System, and conducts the Internet Telescope Project activities

### **1. Definition**

- (1) “Internet Telescope” refers to the telescope, the observation equipment and related control system installed at the Merate Observatory.
- (2) “Internet Telescope System” refers to the connection network between the telescopes installed at GOTO, Keio Academy of New York, the Merate Observatory, Akita University (Akita-shi, Akita, Japan), National Defense Academy (Yokosuka-shi, Kanagawa, Japan) and Tokai University (Hiratsuka-shi, Kanagawa, Japan), as well as the control server and the browser to control the overall system.

- (3) “Internet Telescope Project” refers to a research project which is set up in Research and Education Center for Natural Science, Keio University. The project conducts research and observation using the Internet Telescope managed by Koeki University, Brera Observatory, GOTO and Keio University.

## 2. Management of parts and equipment

- (1) The ownership of parts and equipment of the Internet Telescope is indicated in the Appendix Table 1.
- (2) Documents and materials required to use the Internet Telescope are shown in Appendix Table 2.

## 3. Sharing of roles

- (1) The Koeki University holds a control center on campus to control the Internet Telescope Network System, and operates, maintains and manages the control center.
- (2) The Brera Observatory maintains the functions of electricity supply network and network sliding roof in order to make the Internet Telescope work properly, and carry out periodic maintenance and update of the telescope with the assistance of the Kohoku University and GOTO.
- (3) The Brera Observatory reports on the situations of management of the Internet Telescope to the Kohoku University and GOTO.
- (4) The Koeki University continually makes modifications and improvements on the browser software as need arise.
- (5) The four parties collaborate with each other in experiments, events and educational activities of the project conducted by the Internet Telescope Project with an aim to promote utilization of the Internet Telescope.
- (6) Should either party identify any malfunction, it informs the fact to the other parties.
- (7) Although the Keio University owns a part of the equipment, it delegates responsibility for its operation and management to the other parties.
- (8) With advice and information from GOTO, the Brera Observatory repairs and maintains the telescope on a best effort basis and at no cost by providing its

personnel and standard types of materials or equipment required for the repairs and maintenance.

- (9) Koeki University, Brera Observatory, GOTO and Keio University take responsibility for their own role.

4. Validity period and amendment of the MOU

This MOU shall be effective for five (5) years from May 1<sup>st</sup> in 2018 or until the moment when the Internet Telescope is forced to be dismantled due to force majeure.

During the validity period, any question arising out of, or in connection with, this MOU or any matter not stipulated herein shall be settled each time in good faith upon consultation between the four parties.

IN WITNESS WHEREOF, the parties hereto have agreed to these terms and conditions in duplicate by placing their signatures and seals thereon, and each party shall keep one copy of the originals.

For: Tohoku University of Community Service and Science

By: \_\_\_\_\_

Name: Noboru Yoshimura

Title: President

Address: 3-5-1 Iimoriyama, Sakata-shi, Yamagata 998-8580 Japan

Date: \_\_\_\_\_

For: Brera Astronomical Observatory

By: \_\_\_\_\_

Name: Gianpiero Tagliaferri

Title: Director

Address: Via Brera 28, 20121 Milano, Italy

Date: \_\_\_\_\_

For: GOTO INC

By: \_\_\_\_\_

Name: Nobutaka Goto

Title: President and CEO

Address: 4-16 Yazakicho, Fuchu-shi, Tokyo 183-8530 Japan

Date: \_\_\_\_\_

For: Keio University

By: \_\_\_\_\_

Name: Akira Haseyama

Title: President

Address: 2-15-45 Mita, Minato-ku, Tokyo 108-8345 Japan

Date: \_\_\_\_\_

## Appendix 1 Ownership of parts and equipment

	Parts and equipment	Q'ty	Owner
1	Main telescope (MEADE LX200R-30) + Equatorial mounting (MEADE ULTRAWEDGE) + Pillar (60cm)	1	Keio University
2	ZWOptical ASI185MC	1	
3	Sub-telescope (miniBORG 60ED) +ZWOptical ASI174MM	1	
4	High-sensitive astronomical camera with wide-angle lens (MINITRO MTV-63V6HN+TC0812)	1	
5	PC server for control and camera (DELL Precision T3620)	1	
6	CCD camera for weather monitoring (MINITRON MTV-63V6HN +130° Fisheye lens)	1	
7	Network camera for dome monitoring (ELECOM MCC-EWMP100WH)	2	
8	Telescope, Network control device, Control software	1 set	
9	Sliding-roof-type of telescope shed	1	Brera Observatory
11	Mount of internet telescope	1	
12	Electric wiring, Data, Equipment installation room (with air-conditioning)	1	
13	UPS for PC server	1	
14	Cloud sensor (Clarity II)	1	

## Appendix 2 Documentations and materials

	Documentations and materials	Description	In charge
1	System instruction manual	<p>Instruction manual of browser and image processing, etc.</p> <p>*<a href="http://arcadia.koeki-u.ac.jp/itp/">http://arcadia.koeki-u.ac.jp/itp/</a></p> <p>To be posted when available</p>	Koeki University
2	Equipment instruction manual	<ul style="list-style-type: none"> <li>- Necessary instruction manuals for telescope users and facility maintenance persons to operate the equipment</li> <li>- Instruction manuals attached to each equipment</li> <li>- Documents, drawings and others useful for troubleshooting in case of trouble</li> </ul>	GOTO
3	Wiring diagram	Material which clearly shows wiring and functions between the equipment.	
4	Maintenance and management manual	Materials and drawings necessary for periodic inspections and etc.	<p>Brera Observatory</p> <p>Koeki University</p> <p>GOTO</p>