

付 録 C 合意書

本計画の進行に当たって現在までに以下の合意書を交わしている。また、これらに基づいた活動について産業科学省 (CONICYT) からの許可も得ている。それらの概要を述べると共に、写しを掲載する。

図 C.1 衛星によるチリ北部の気象データの解析についての MoU

AOC (AURA Observatory in Chile) と、(その後, ESO も含めての 3 者の MoU とした)

図 C.2 TAO 望遠鏡の建設及び運用の際の協力関係についての MoU

チリ大学と。

図 C.3 気象データ取得のための装置をチャナントール山付近に設置・運用するための許可申請書

産業科学省 (CONICYT) へ提出。

図 C.4 気象データ取得のための装置のチャナントール山付近に設置・運用を認める許可書

図 C.3 の申請書を受けて、産業科学省 (CONICYT) より発行。

図 C.5 1m 望遠鏡建設の許可申請書

産業科学省 (CONICYT) へ提出。

図 C.6 1m 望遠鏡建設を認める許可書

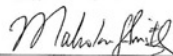
図 C.5 の申請書を受けて、産業科学省 (CONICYT) より発行。

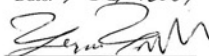
MEMORANDUM OF UNDERSTANDING
BETWEEN
THE AURA OBSERVATORY IN CHILE,
THE INSTITUTE OF ASTRONOMY OF THE UNIVERSITY OF TOKYO,
AND
THE EUROPEAN SOUTHERN OBSERVATORY

In order to pursue their mutual interests in the characterization and monitoring of astronomical sites in Northern Chile, The AURA Observatory in Chile (hereafter AOC), The European Southern Observatory (hereafter ESO), and The Institute of Astronomy of The University of Tokyo (hereafter IoA-UT) agree to the exchange of satellite cloud cover digital data, as follows:

- 1 AOC will provide Meteosat-3 and GOES-8 data covering 1.7.93 - 29.2.96, covering channels 1 (visible), 3 (water-vapor) and 4 (IR) from the National Climatic Data Center (NCDC). The ownership of this dataset will reside with AOC. Distribution to other parties will require the express permission of AOC.
- 2 IoA-UT will provide GOES-8 data covering 1.6.97 - 30.9.99, covering channels 1 (visible), 3 (water-vapor) and 4 (IR) from the NCDC. The ownership of this dataset will reside with IoA-UT, distribution to other parties will require the express permission of IoA-UT.
- 3 ESO will provide GOES-8 data consisting of 6.7 micron data covering 1.1.98 - 30.4.00 and at least one year of 10 micron data. The ownership of this dataset will reside with ESO, distribution to other parties will require the express permission of ESO.
- 4 AOC, ESO, and IoA-UT undertake to share the above datasets. Each will receive a copy of the raw data, plus a pre-processed data set so as to facilitate possible future analyses.
- 5 This memorandum of understanding replaces the memorandum of understanding between Cerro Tololo Inter-American Observatory, National Optical Astronomy Observatories and the European Southern Observatory that was signed by Malcolm Smith on September 17, 1999 and Alvio Renzini on September 28, 1999.

Signed:

Date: 17 Sept. 2001

Malcolm Smith (AOC)

Date: 9 Oct. 2001

Yuzuru Yoshii (IoA-UT)

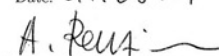
Date: 21.08.01

Alvio Renzini (ESO)

図 C.1: 衛星によるチリ北部の気象データの解析についての MoU

MEMORANDUM OF UNDERSTANDING
for Scientific Cooperation in the
University of Tokyo Atacama Observatory
between
The Astronomy Department of the University of Chile
and
Institute of Astronomy of the University of Tokyo

In consideration of the mutual interest of the Astronomy Department of the University of Chile and Institute of Astronomy of the University of Tokyo (hereafter IoA-UT) in the "University of Tokyo Atacama Observatory" (TAO) project, that is currently planned at IoA-UT, to install a 6.5m infrared-optimized telescope in the territory of the Republic of Chile, both parties agree to the following terms:

The Astronomy Department of the University of Chile and IoA-UT will collaborate in scientific projects of mutual interest.

In particular, joint measurements of the atmospheric transparency and stability in the optical and infrared wavelength regions will be conducted in north Chile as part of the site testing necessary for the installation of the TAO 6.5m telescope.

The Astronomy Department of the University of Chile will obtain the necessary permits to place equipments in the aforementioned place.

When the funding for the TAO project is granted, the Astronomy Department of the University of Chile and IoA-UT will make their best efforts toward the signature of an agreement between the University of Chile and the University of Tokyo, to allow the importation, installation, and operation of the TAO and related instrumentation in Chile.

Date: May 10, 2001

M. Teresa Ruiz

Professor María Teresa Ruiz
Director
Departamento de Astronomía
Universidad de Chile

Date: 10/5/01

Yuzuru Yoshii

Professor Yuzuru Yoshii
Director
Institute of Astronomy
University of Tokyo

図 C.2: TAO 望遠鏡の建設及び運用の際の協力関係についての MoU



School of Science
University of Tokyo

Prof. Y. Yoshii

Institute of Astronomy
University of Tokyo
Mitaka, Tokyo 181-0015, Japan

Telephone +81-422-34-5027
Facsimile +81-422-34-5041

E-mail yoshii@mtk.ioa.s.u-tokyo.ac.jp

21 March 2001

Dr. Eric Goles Chacc,
Presidente de CONICYT,
Canada 308, Providencia,
Casilla 297-V, Santiago 21,
Chile

Dear Dr. Goles,

The Institute of Astronomy of the University of Tokyo, hereafter IoA-UT, represented by its director, Yuzuru Yoshii, in collaboration with Departamento de Astronomia, Universidad de Chile, wishes to execute studies and work in the area near Cerro Chajnantor, inside the Scientific Preserve administered by CONICYT, to the South-East of San Pedro de Atacama in the second administrative region of the Chilean territory.

The studies and work in question consist of the installation and operation of a meteorological station. We wish to install the station at an altitude of 4900 meters at the coordinates of $23^{\circ}00'01''\text{S}$ and $67^{\circ}43'09''\text{W}$. The meteorological station consists of a 3m high pole on top of a tripod stand with 1m long legs, and the data recording equipment contained within a 0.5m cube at the ground level. Instruments for measuring wind, temperature, humidity, infrared radiation, etc. will be attached to this pole. The equipment will be used to investigate and characterize the atmospheric conditions affecting astronomical research in the optical and infrared wavelength regions of the electromagnetic spectrum.

We hereby request permission so that we can carry out the studies and work as above.

In connection with the above studies and work to investigate and characterize the atmospheric conditions affecting astronomical research in the optical and infrared wavelength regions of the electromagnetic spectrum at the Scientific Preserve of Chajnantor in the second administrative region of Chile, we are pleased to make a commitment to the following conditions:

図 C.3: 気象データ取得のための装置をチャナントール山付近に設置・運用するための許可申請書

a) Places of historical interest, archeological, anthropological or paleontological interest:

If we encounter remains, ruins, utensils, places of worship, etc. we will suspend work and advise the authorities.

b) Environment:

We will adopt all the safeguards necessary to avoid a negative environmental impact. We will carry out our work according to the norms and procedures that are administered by the respective national environmental commission of the second administrative region of Chile.

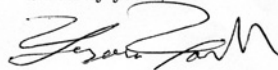
c) Antipersonnel mines:

We note that there is a possibility of existence of antipersonnel mines in the region, although the Ministry of Defense claims that the site area is free of them. We will be alert to the possibility, and we understand that our work in this area is our exclusive responsibility.

d) Non-interference with other projects:

We note that CalTech operates the "Cosmic Background Imager" in Chajnantor, and that atmospheric studies are being carried on there for the ALMA project as well. We undertake that we will inform of our exploration and coordinate the effort with the other groups working in the area so as not to perturb their operation.

Sincerely yours,



Yuzuru Yoshii
Director of IoA-UT
Professor of Astronomy

Institute of Astronomy,
The University of Tokyo,
Osawa 2-21-1, Mitaka
Tokyo 181-0015
Japan

図 C.3: 気象データ取得のための装置をチャナントール山付近に設置・運用するための許可申請書 (つづき)



GOBIERNO DE CHILE
CONICYT

SANTIAGO, July 19, 2001.

Professor
Yuzuru Yoshii
Director Institute of Astronomy
University of Tokyo
Osawa 2-21-1, Mitaka
Tokyo 181-0015
Japan

Dear professor Yoshii:

With regards to the installation and operation of a meteorological station near Cerro Chajnantor, with the goals of characterizing the atmospheric conditions for astronomical research, we are pleased to acknowledge your commitment to the conditions established in your letter of 21 March 2001, regarding (a) Places of historical interest, (b) Environmental Impact, (c) Antipersonal Mines, and (d) Non interference with other projects.

Under such conditions we grant permission for the described activities to be carried out within the Scientific Reserve under the administration of CONICYT.

Sincerely Yours,

ERIC GOLES CHACC
President
National Commission for
Scientific and Technological Research

● COMISION NACIONAL DE INVESTIGACION CIENTIFICA Y TECNOLOGICA

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図 C.4: 気象データ取得のための装置のチャナントール山付近に設置・運用することを認める CONICYT から出された許可書



School of Science
University of Tokyo

Prof. Y. Yoshii

Ms. Vivian Heyl,
Presidente de CONICYT,
Canada 308, Providencia,
Cassilla 297-V, Santiago 21,
Chile

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University of Tokyo
Mitaka, Tokyo 181-0015, Japan

Telephone +81-422-34-5027
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May 12, 2007

Dear Ms. Heyl,

The Institute of Astronomy of the University of Tokyo (hereafter IoA-UT), represented by its director, Prof. Yuzuru Yoshii, in collaboration with Departamento de Astronomía, Universidad de Chile (hereafter DAS-UCH), wishes to install two telescopes on the summit of Co. Chajnantor. The said site, Co. Chajnantor, is inside the scientific preserve administered by CONICYT.

The present letter requests permission so that IoA-UT, in collaboration with DAS-UCH, can fabricate, install, and operate the two telescopes on the summit of Co. Chajnantor for research in infrared astronomy. The first telescope with a 1m aperture would be installed by the end of 2007, and the second telescope, with a 6.5m aperture, is expected to be installed soon after. The background, the scope, and the conditions of the permission are described below.

BACKGROUND:

1. IoA-UT has a plan to have the University of Tokyo Atacama Observatory (hereafter TAO), the major facility of which is a 6.5m infrared-optimized telescope (hereafter 6.5m IR telescope), in the territory of the Republic of Chile.

2. With the wish of the University of Chile (hereafter UCH) to cooperate with the realization of the said plan and to promote scientific and technical collaborations in astronomical investigations between both universities, a scientific cooperation agreement has been signed by the President of the University of Tokyo (hereafter UT) and the Rector of UCH in Tokyo of Japan on 16 January 2003. The legalization of the said agreement has been completed at the Ministry of Foreign Affairs of the Republic of Chile on date 3 April 2007.

3. On 19 July, 2001, CONICYT granted a permission for IoA-UT to install and operate a meteorological station at an altitude of 4900 meters on the Llano de Chajnantor, inside the science preserve, with the goals of characterizing the atmospheric conditions for astronomical research.

4. On 25 August, 2005, CONICYT granted a permission for IoA-UT to carry out the following studies and work on the summit of Co. Chajnantor at an altitude of 5640 meters, the primary candidate site where the 6.5m IR telescope will be installed:

- (1) astronomic characterization of the atmosphere for observation within the optical and infrared ranges on the summit of Co. Chajnantor via the use of meteorological station, seeing monitor instrument, and cloud monitor instrument as well as data-gathering equipment;
- (2) soil characterization, in order to perform structural studies associated to the foundations for the 6.5m telescope. To realize the above studies, the permission includes construction of a road to carry the instruments to monitor the atmospheric conditions and the equipment to investigate the soil conditions. This road has been completed in April, 2006, and the

図 C.5: 1m 望遠鏡建設の許可申請書

instruments are now in operation on the summit.

5. In 2005, the Japan Society for the Promotion of Science (JSPS), Japanese counterpart of CONICYT, has granted the director of IoA-UT a fund to build and operate a 1m telescope on the summit of Co. Chajnantor as a pilot telescope of the 6.5m IR telescope. The university of Tokyo has recently decided to carry on the said plan of the 6.5m IR telescope.

SCOPE OF THE PERMISSION

To promote installation and operation of the two telescopes in the Chilean territory, we request CONICYT permissions for the following work:

1. The installation and operation of the 1m telescope, that would consist of: (1) widening the current road to carry massive components and heavy machinery to the summit; (2) constructing the foundations and fabricating the telescope on it; (3) operating the telescope for research in astronomy and testing instrumentation for the 6.5 m.
2. Once the 6.5m telescope installation starts, we would do the same work as stated above but with larger scales.

CONDITIONS OF THE PERMISSION

1. The installation and work aforementioned above would be performed in such a way that these activities would not interfere with other astronomical projects that will be under construction or operation in the vicinity. IoA-UT would inform of her activities and coordinate the effort with other groups working in the area so as not to perturb their construction and operation.
2. Should other agencies, institutions, or groups require authorization to perform studies, work, or other scientific projects near the IoA-UT instrumentation, IoA-UT would expect CONICYT to coordinate the interest of the parties.
3. IoA-UT makes a commitment, with respect to the following: (a) Places of historical interest, archeological, anthropological or paleontological interest: If IoA-UT encounter remains, ruins, utensils, places of workshop, etc., IoA-UT would suspend work and advice the authorities. (b) Environment: IoA-UT would adopt all the safeguard necessary to avoid a negative environment impact. IoA-UT would carry out her work according to the norms and procedures that are administrated by the respective national environment commission of the second administrative region of Chile. (c) Anti-personnel mines: IoA-UT notes that there is a possibility of existence of anti-personnel mines in the region, although the Ministry of Defense claims that the site area is free of them. IoA-UT would be alert to the possibility, and understand that her work in this area is her exclusive responsibility.

Sincerely yours



Yuzuru Yoshii
Director of IoA-UT
Professor of Astronomy

図 C.5: 1m 望遠鏡建設の許可申請書 (つづき)

March 24, 2008

Prof. Yuzuru Yoshii
Institute of Astronomy
University of Tokyo
Japan

Dear Prof. Yoshii:

CONICYT is pleased to inform you that authorization for setting up the 1-m monitoring telescope has been approved, according to the characteristics described in your letter dated May 2007 and complementary description documents.

In this context, we must inform you that authorization for setting up the above mentioned instrument will be subject to compliance with provisions in force in our country concerning security issues and environment protection during road improvement phase, setup and future operation.

In particular, Tokyo Atacama Observatory will be subject to comply with the following requirements:

Access road improvement project and its future operation shall be subject to supervision by CONICYT.

The road should comply with safety requirements as described in the "Ministry of Public Construction Road Handbook" (*Manual de Carreteras del Ministerio de Obras Públicas*). If the road does not meet the established safety standards according to the technical characteristics requirements, all the needed changes in the road improvement project should be done, according to the remarks made by the CONICYT person designated for revision. Remarks should be taken into account in subsequent executions.

Additionally, Tokyo Atacama Observatory is asked to provide monthly reports of the project progress.

“Authorization for the second phase of the project does not dispense Tokyo Atacama Observatory from the obligation to obtain all authorizations or licenses necessary for the development of the project, according to the legislation in force in Chile.”

In accordance with the above mentioned provision, it is recommended to ask the Regional Commission for Environment of Antofagasta for the pertinence of joining SEIA (*Sistema de Evaluación de Impacto Ambiental*) at this phase of the project, regarding the installation of temporary facilities (*instalación de faenas*) and authorizations or pronouncements from the Dirección de Obras de la Ilustre Municipalidad de San Pedro de Atacama in case it will be required.

Sincerely yours,

UHL
Vivian Hey
President





CG/MR

図 C.6: 1m 望遠鏡建設を認める CONICYT から出された許可書 (つづき)