

MEMORANDUM OF AGREEMENT

Regarding collaboration in the scientific exploitation of data acquired with LSST by specified Principal Investigators (PI) and scientists at NCU.

BETWEEN

**GRADUATE INSTITUTE OF ASTRONOMY
OF
NATIONAL CENTRAL UNIVERSITY
300 Zhongda Road, Zhongli 32001, Taoyuan, Taiwan
hereinafter referred to as NCU**

AND

**THE LARGE SYNOPTIC SURVEY TELESCOPE CORPORATION,
933 N. Cherry Ave., Tucson, AZ 85721**

a United States 501(c)3 non-profit corporation
incorporated in the State of Arizona

hereinafter referred to as "LSSTC",

both hereinafter referred to collectively as "**the Parties**" or individually as "**the Party.**"

RECITALS

WHEREAS LSSTC is a not-for-profit corporation established as a consortium of universities, United States national laboratories and other organizations to develop the LSST project and to raise private and federal funding, principally from United States agencies, to support LSST, and

WHEREAS the LSST Project is being developed in order to advance the science of astronomy and physics, and

WHEREAS LSSTC wishes to enter into agreements with international institutes for partial support of LSST observatory operations costs, and for the mutual scientific benefit of all parties, and

WHEREAS the NCU, has a fundamental interest in the scientific mission of the LSST and has indicated its commitment to support operations of the LSST,

The Parties Understand and Agree As Follows:

Article 1 Purpose

The purpose of this MOA is to enable participation by specified Principal Investigator (PI) scientists at NCU in the scientific exploitation of data and data products produced by LSST before and during its operations phase. For purposes of this document, Principal Investigators are senior scientists with long-term positions at NCU.

Article 2 Financial Agreement

The NCU will contribute a total of \$200,000 USD (in 2013 dollars) for each identified Principal Investigator (PI), on a schedule to be specified in the Implementation Plan (see Article 7). Contributions are designated for the support of LSST operations. It is expected that contributions will be made in ten equal annual installments (adjusted for inflation), commencing no later than the beginning of LSST commissioning. Contributions may be made earlier or more rapidly than the above schedule and may begin at any time prior to LSST commissioning; contributions received before LSST commissioning will be held in escrow until needed for operations.

The PI scientists at NCU are expected to cover the incremental costs of enabling their access to the data, such as the costs of additional bandwidth or computing capacity at the LSST-operated Data Access Centers in the U.S. and Chile.

This commitment by NCU is contingent upon the availability of funds to NCU and upon the success of the LSST Project in obtaining United States federal funding for construction and operations and in obtaining concurrence by U.S. federal agencies to this agreement. Any and all paid contributions to operations will be refunded if the LSST Project fails to reach operational status or if such concurrence is not obtained.

Article 3 Personnel and Their Assignment

In exchange for the above operations contributions, NCU has identified a group of three (3) PI scientific staff that will be active participants in the scientific exploitation of the LSST database. The staff so identified will have benefits equivalent to U.S.-based collaborators, including full access to LSST survey data and data products.

The list of Principal Investigators and their associated junior researchers (see Article 4) shall be updated by institution NCU on an annual basis with written notice given to LSSTC. If the total number of PIs at NCU is increased beyond the three (3) specified in this MOA at any time before the end of LSST operations, an additional cash contribution of \$200,000 USD (in 2013 dollars, adjusted for annual inflation) will be required for each PI above three (3) to a maximum of six (6). PIs who are added above six (6) will be subject to the rate schedule adopted after December 31, 2016. If due to unforeseen circumstances the number of PIs at NCU drops below three (3) prior to the start of LSST commissioning, an appropriate adjustment in the institutional contribution will be made. If the number of PIs drops below three (3) after the start of LSST commissioning, it is expected that NCU will continue to honor its original cash obligations.

Article 4 Rights of Principal Investigators at NCU

Upon execution of this MOA, starting during the LSST construction phase each identified PI will be entitled to: (i) have full access to LSST simulated data and to data products produced through processing of the simulated data; (ii) attend at their own expense LSST meetings open to U.S. and Chilean scientists who are directly participating in the LSST project.

During LSST operations, each identified PI shall: (i) have full access to LSST image data, daily release catalogs, and annual data release catalogs, equivalent to U.S. and Chilean scientists; (ii) have access to LSST-operated Data Access Centers equivalent to what is provided to U.S. and Chilean scientists, with the same privileges and responsibilities conferred, with the proviso that the PI will be responsible for the incremental costs associated with accessing the data; and (iii) have access to products prepared for Education and Public Outreach activities.

The rights above of each PI shall be extended to up to four (4) junior researchers working under the supervision of the PI. The junior researchers can be any mixture of graduate students and postdoctoral researchers, with the restrictions that: (i) the mix shall include no more than three (3) postdoctoral researchers at any given time; and (ii) the junior researchers must be present at and associated with institution NCU.

If a PI or any of his/her junior researchers leaves institution NCU, all of the above rights thereupon become null and void for the person who leaves. As noted above, if the PI leaves after the start of LSST commissioning, this does not alter NCU's financial commitment to LSSTC.

Article 5 Responsibilities of Principal Investigators at NCU

At no time may PIs or their junior associates: (i) redistribute LSST data, data products, or their own derived catalogs for a sizeable fraction of the LSST survey beyond their postdoctoral and graduate students and other authorized users, except in summary form as part of a scientific publication in the open literature; (ii) apply for additional computational resources at U.S. sponsored LSST-operated Data Access Centers except in collaboration with a U.S. scientist as PI on the proposal or unless financial arrangements have been made to support those computational resources; or (iii) make third party agreements to redistribute or reassign LSST data and access rights that are provided to the PI through this MOA.

Article 6 Effective Date and Duration

This MOA will be effective from the dates set forth below and remain in full force and effect through the end of the nominal LSST operations phase or until it is superseded by an amendment, replaced by a new MOA, or terminated.

Possible support and data access for an extended LSST mission phase (additional telescope operations and/or data processing) would be the subject of future negotiation.

Article 7 Implementation Plan

This MOA is a statement of principles governing the relationship between the LSSTC and NCU. It will be followed by an Implementation Plan that covers specific arrangements including such items as:

- 1) Names of PIs and their scientific interests;
- 2) Expected type of engagement during the survey (access to catalog data only; creation of local data access center, etc.);
- 3) Date of first payment toward operations and an agreed upon payment schedule (with first payment not later than the then-current estimated date for beginning of LSST commissioning and with additional payments not later than October 1 in subsequent years). The “commissioning date” used throughout the MOA is always the estimated commissioning date as written in the MOA implementation plan. Ten equal annual inflation-adjusted payments will be the default schedule and the slowest acceptable payment schedule; as noted in Article 2, a faster or earlier payment schedule is permissible.

Article 8 Assignment

This MOA shall inure to the benefit of and shall be binding upon the respective successors and assigns of the parties hereto, but may not be voluntarily assigned in whole or in part by either party without the prior written consent of the other. However, this MOA may be assigned to a third party should LSSTC be succeeded by some other organization to raise and manage international funds for LSST operations.

Article 9 Termination

The NCU may terminate this MOA upon two years prior written notice to LSSTC. All rights received under the terms of this MOA will be forfeited upon termination.

LSSTC shall have the right to terminate this MOA at any time for the other party’s default by notifying such party in writing. If LSSTC so desires, the defaulting party shall have thirty (30) days after the receipt of written notice of the nature of the default, to correct the same, before such termination is given by the non-defaulting party.

Article 10 Settlement of Disputes

In the event of any dispute or difference arising out of the interpretation or implementation or application of the provisions of this MOA, the Parties shall settle it amicably through consultation or negotiation that may result in appropriate amendments to this MOA.

IN WITNESS WHEREOF:

The undersigned authorized institutional representatives have executed this Memorandum of Agreement

FOR NCU:

LSSTC

SIGNATURE:



SIGNATURE:



NAME: Wen-Ping Chen

NAME: David MacFarlane

TITLE: Director of Graduate Institute of
Astronomy, NCU

TITLE: Chair of the Board

Date:

19 Nov 2016

Date:

1 December 2016