

SUPPLEMENTARY AND CLARIFYING AGREEMENT
BETWEEN
THE UNIVERSIDAD DE CHILE
AND
THE ASSOCIATION OF UNIVERSITIES FOR RESEARCH IN ASTRONOMY, Inc.
COVERING THE
USE OF THE LARGE SYNOPTIC SURVEY TELESCOPE ON CERRO PACHÓN

This Supplementary and Clarifying Agreement is between the Association of Universities for Research in Astronomy, Inc. (henceforth AURA), represented by its President, Dr. William Smith, and the Universidad de Chile (henceforth UCH), represented by its Rector, Professor Víctor Pérez Vera. This document updates the supplementary and clarifying agreement, dated October 16th 1998, covering operating rules for the implementation of the 1961 cooperative agreement between AURA and the University of Chile, by adding “THE LARGE SYNOPTIC SURVEY TELESCOPE” (henceforth LSST) to paragraph numbered 4, and establishes the “principles” and rules for operation of same.

According to said Supplementary and Clarifying Agreement of 16th October 1998:

“Ten percent of observing time on all telescopes installed on AURA’s property in Chile ... will be set aside each year for Chilean astronomy... The University of Chile will be responsible for setting up a special Time Allocation Committee on behalf of the Chilean national community to administer this time. The same criteria will apply to any new instrument or telescope installed in Chile by AURA Inc.”

“Moreover, as an exception to the arrangements set out...”{above} “...the parties agree that in the case of telescopes constructed to meet a specific science objective, such as an all-sky survey or a long-term study of solar oscillations, the University of Chile and AURA Inc. will agree, in each particular case, the conditions for appropriate access to scientific information or its equivalent for Chilean astronomers on these telescopes....

Recognizing that LSST will be used to conduct a large scale survey with near real-time public access to the data, the UCH and AURA see that the maximum benefit to both Chilean astronomy and LSST astronomy is to have the LSST provide equivalent benefits in lieu of a request for 10% of the time on LSST directly, in accordance with paragraph 4 of the Supplementary and Clarifying Agreement, of 1998, as quoted above. This present document serves to detail the benefits agreed upon to provide said equivalence in the specific case of the LSST. These benefits, enumerated below, are designed to allow Chilean astronomers and engineers to partake fully in the project and to take maximum advantage of LSST science and technology in Chile.

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RECITALS:

I. The AURA is a party to Cooperative Agreement No. AST-0132798 with the National Science Foundation (NSF), an instrument of the United States Government, to operate the National Optical Astronomy Observatory (NOAO), and its facilities in Chile. UCH recognizes that AURA's participation in this Agreement and its obligations hereunder may be subject to the approval of the NSF under cooperative Agreement AST-0132798 (the Cooperative Agreement, or CA) and that such obligations are effective and enforceable only while the Cooperative Agreement and any successor Operating Agreement between the NSF with AURA remains in effect.

II. AURA in collaboration with the Large Synoptic Survey Telescope Corporation (LSSTC) will install its 8.4 m aperture Large Synoptic Survey Telescope (LSST) on the El Peñón site located on Cerro Pachón, part of the AURA property near Vicuña, Chile. The LSST is a survey project designed to repeatedly image all of the accessible sky to very faint magnitudes every few days. The principal science missions of the LSST Project are the study of dark energy and dark matter; the mapping of solar system objects; the identification and study of transient events; the study of galactic structure and the solar neighborhood.

PRINCIPLES:

AURA and UCH agree that for the use of the LSST an approximate monetary valuation of all of the benefits defined below is roughly \$33M USD (year 2006) over the 10-year duration of the LSST Project and is roughly equivalent to 10% of the estimated operations budget, including both telescope operations in Chile and operations based in the US. We further estimate that 10% of the operating budget in Chile, estimated as 42% of the total operations budget, will be devoted to implementation of a LSST Chilean Data Access Center (DAC) in La Serena, to meet the obligations for supporting Chilean research with LSST data as outlined below.

1. Chilean Participation in LSST Science

- Chile will become an institutional member of the LSST Corporation (LSSTC)
 - Chile will gain full access to the LSST data and data products on a par with the level of access granted to the other LSSTC members
 - The UCH will appoint a permanent full member to the LSST Board, with voting status
 - The annual LSSTC membership fee will be waived
- Chilean scientists (defined as researchers affiliated to Chilean institutions) will be offered un-competed membership in all LSST Science Collaborations.



- The UCH will appoint a permanent full membership to the LSST Science Advisory Council (SAC) which will remain proportional to 10% of the committee size in order to ensure full Chilean scientific participation in the LSST Project science.
- The UCH will appoint a permanent full member to the LSST Science Council (SC)
 - The Chilean LSST SC member will ensure that Chilean scientific investigations are adequately enabled by the LSST design and operational planning (including scheduling, generation of data products, and data access), within the limits of the objectives of the LSST Project.
- The UCH will form a scientific coordination committee (CNSCC, hereafter), which will have the following functions:
 - Coordination and development of new scientific projects proposed by the Chilean community
 - Coordination and support of Chilean participation in existing LSST Science Collaborations
 - Provide advice and input to the Chilean SAC member to take to the LSST SAC
 - Provide advice and input to the Chilean SC member to take to the LSST SC.
 - Provide advice and input to the Chilean Board member to take to the LSSTC Board

2. Computational Resources

- Chilean access to 10% of global LSSTC-funded “community resources” (*Community resources are the resources which comprise the Data Access Centers, dedicated to support of community science. These do not include the operational resources required for effective production of the fundamental data products LSST will be responsible for producing.*)
 - To be allocated by Chileans through their resource allocation committee (CNRAC), in parallel to the LSSTC RAC.
 - Access to resources distributed throughout LSST system
- The UCH will appoint a resource allocation committee (CNRAC, hereafter) which will include members from the LSSTC
- CNRAC purposes will be
 - Collaborate with LSSTC to refine the technical characteristics of the Chilean LSST Data Access Center to optimally support Chilean science
 - Allocate the Chilean portion of LSST community resources, including optimization of those resources in support of Chilean science (e.g., deciding which LSST and related data to store in the Chilean LSST Data Access Center, etc.)
- Chilean LSST Data Access Center in La Serena (DAC)
 - Will contain greater than 10% of the global LSSTC-funded community resources

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- The Chilean LSST DAC will have at least: the most recent LSST released catalog, the previously released catalog, the current source catalog, and half of all of the raw data from LSST.
- Will give priority to use by Chilean scientists
- Will be fully integrated into the Chilean Grid (specifically for astronomical computing and with links to institutional Chilean astronomical data centers)
- Will support theoretical calculations related to broadly defined LSST science.
- Will provide office space for Chilean scientists to visit and work closely with LSST staff in La Serena

3. Networking

- AURA will make its best faith effort to ensure that investment for LSST in Chile supports preferential bandwidth access for Chilean astronomical institutions.
- AURA will make its best faith effort to ensure that investment for LSST in the “Chilean backbone” for the required LSST operational bandwidth benefits Chilean astronomy, through participation in Chilean research and educational networking infrastructure, “last mile” issues, or similar efforts that support Chilean astronomical infrastructure, including participation in the Chilean Grid.
- LSST contingency bandwidth will be available for Chilean astronomical use (when not being used in emergency/contingency situations by LSST)

4. Human Resources

- LSST Support Funding
 - Annual budget of \$500K/yr (in USD as of date of signing of this Supplementary and Clarifying Agreement, to be inflated by standard U.S. inflation rates) in support of participation in LSST-related science (inc. scholarships, postdoctoral positions, etc) beginning at the start of operations funding and ramping up in a manner proportional to the \$500K in relation to full operations funding. These funds will be proposed as part of the U.S. Federal support for operations and will be contingent on that funding.
 - These funds are to be allocated by a committee appointed by the UCH
 - During design, development, and construction, LSST will seek and support the active participation of Chilean astronomers, engineers, and students in the development of the telescope and instrumentation
 - During design, development, and construction, LSST will provide support funding for Chilean participation in LSST board meetings, SAC meetings, SC meetings, Science Collaborations, and LSST “all-hands” face-to-face meetings.

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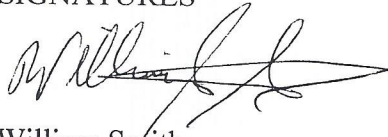


5. Implementation Committee

- AURA, UCH, and LSST shall establish an “implementation committee” (henceforth IC) to manage/oversee implementation of this Supplementary and Clarifying Agreement
 - Committee charge includes development of implementation plan, to begin soon after the signing of this Supplementary and Clarifying Agreement
 - Committee charge also includes oversight of the execution of the plan, and the management of the evolution of the plan as LSST develops its operations and policies.
 - The IC will also provide input into the disposition of obsolete equipment, subject to the constraints imposed by U.S. Federal policies.
 - Membership would include one or more LSST representatives (e.g., LSST Site Director), one or more AURA representatives (e.g., AURA-Observatory director), and representatives appointed by the UCH. The Chilean representation on the committee shall always amount to no less than 50% of the total membership.
 - Arbitration to resolve conflicts involves the AURA-O director, representatives of the UCH Rector (in both cases representing the signatories to this Supplementary and Clarifying Agreement), and a LSST representative.

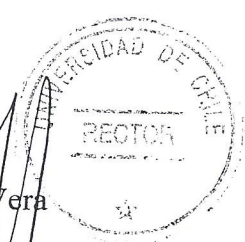

This Supplementary and Clarifying Agreement is executed in two counterparts each of which shall have the same meaning and date. Each Party shall keep one counterpart of this Agreement.

SIGNATURES



William Smith
President
Association of Universities
for Research in Astronomy, Inc.

Date: 5/16/08



Víctor Pérez Vera
Rector
Universidad de Chile

Date:

