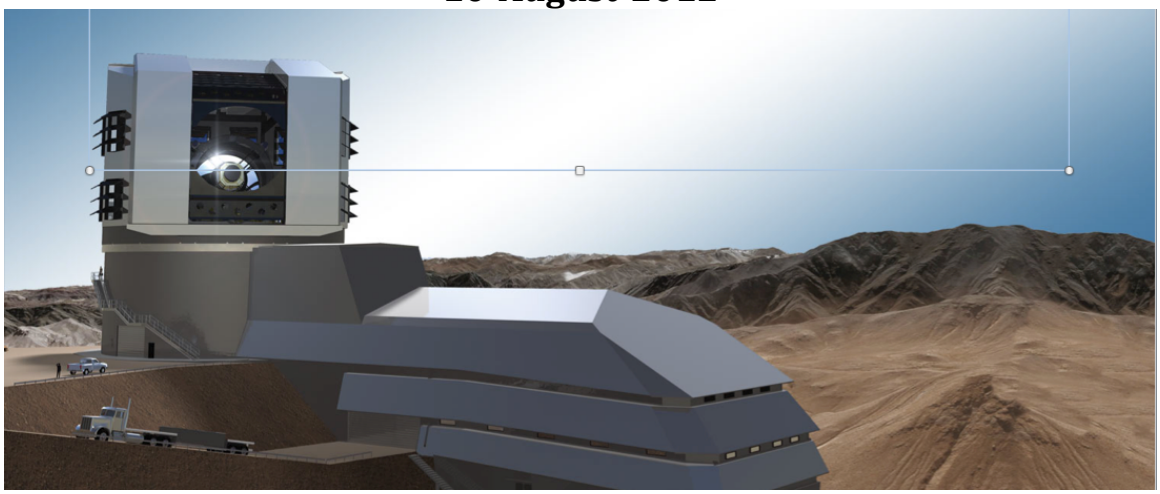
# South American Astronomy Coordination Committee (SAACC)
# Meeting Notes
# 10-August-2012



## 1. Welcome Remarks Introduction

Dr. Chris Smith of CTIO and chair of the SAACC, and Dr. Julio Ibarra, PI of AmLight provided welcome remarks and introduction to all attending the virtual meeting. Sites for this virtual meeting were the NOAO office in Tucson, AZ.; RNP in Rio de Janeiro and Campinas, Brazil; NRAO, US-ALMA office in Virginia; CTIO office in La Serrena, Chile; REUNA office in Santiago, Chile; AMPATH and AmLight project office at FIU in Miami.

### 1.1 Attending:

Chip Cox, AmLight Co-PI
Luis Lopez, ANSP
Jeff Kantor, PM DM of LSST
Heidi Alvarez, Co-PI AmLight
Julio Ibarra, AmlIght PI
Michael Stanton, RNP
Alex Moura, RNP
Leandro Ciuffo, RNP
Jeronimo Aguiar, AmLight
David Halstead, ALMA
Derek Hart, network manager
Ron Lambert, AURA
Sandra Jaque, REUNA
Giorgio Filippi, ALMA/Chile
Chris Smith, AURA
James Grace, AmLight

All of the presentations files may be found at the AmLight web site at http://www.amlight.net/saaccmeeting/saaccmeeting.html

### 1.2 Introduction

The SAACC aims to support the AST science community and connectivity between North and South America.

Chris Smith reported on news from the following group of telescopes: the GMT, CTIO/DECam, ALMA, GCAT and LSST.

GMT is a next generation telescope. GMT is a partnership led by Carnegie Mellon University. Mirrors are already being polished.

Cerro Tololo Inter-american Observatory (CTIO)/ Dark Energy Camera (DECam) will be in operation starting September 2012. What is the DECam and what is its purpoase? The DECam will be mounted a top which telescope?

- Goal: measure how much bandwidth the DECam is using. Are flows to NCSA operating as they should?

## 2. Science Project Status Reports since the 27-March-2012 meeting

Representatives of the science project/centers were asked to report on two topics: (1) Changes to science requirements, and their impact on science applications and resources needed from the network; and (2) Updates or resolutions to network issues

### 2.1 AURA and affiliated facilities (Ron Lambert)

Firewall at CTIO is impacting performance of data transfers to and from the archive center at NCSA. CTIO is operating a PIX firewall. 100Mbps port is the bottleneck. While external link is 500M, firewall is limiting flow to a maximum throughput rate of 100Mbps.

The Campanas site is having trouble transferring data back. The firewall needs to be upgraded. Ron to provide trace routes for Las Campanas.

### 2.2 LSST (Kantor)

Jeff Kantor discussed Alert production. Alert production refers to near real time capability, looking for transient events, 60s requirements to detect and notify. 15 TB up to the U.S.

*LSST International Dataflow diagram:* Refer to slide titled "One System, Two Continents, Four Sites".

Data Releases: Last Data Release contained many PBs. Accumulate ~100s PB. Data shipped with hardware updates.

*International Collaborators:* Link between NCSA and Lyon data center, will be in order of 10G. Half annual data processing in Lyon, France.

NSF director authorized funds for LSST construction in a future budget request. Means allows NSF to request funds from Congress.

Please refer to the LSST Status report slides for additional information.

### 2.3 ALMA/NRAO (David Halstead)

#### 2.3.1 NRAO update:

.5 Mbps is bandwidth to several antenna sites in Chile.
Challenge: getting data to Santiago to transfer to U.S., Europe and East Asia.

Network performance problem solved. Utilization now exceeds 700Mbps of throughput. Huge improvement. Sandra at REUNA is working with Giorgio to get improvements to other regions.

U.S. Embassy hosted an education event where teachers moved telescope in Green Bank.

Projects: GAVRT (Gold Stone telescope). Robert C. Byrd ($20M?)

#### 2.3.2 ALMA:

Correlator can produce data rates into the Gbps. Factor of 10 projected for next year and 2014. Data rate capped at ~60Mbps.

Insufficient funds from the NSF: ~$1.2B.

Data sets do vary. First data set was 1 TB. Expectation was a few GB. This will vary depending on proposal needs.

*Performance discussion:*
IPsec tunnel is set up.
Network utilization went up from 10Mbps to 100Mbps. 100Mbps should be good through Cycle 1, through 2013. Ahead of other regions. Another 100Mbps and up to 1Gbps will probably be needed in 2013-2014 timeframe.

### 2.4 ALMA Chilean and International Connectivity (Filippi)

Please refer to the ALMA OSF-SCO Optical Infrastructure slides for additional information.

Item 1: owned.

Item 2: Perhaps to be part of Chilean network.

Item 3: Already exists.

Community of Users: How do we share the highway? ALMA has no real time requirement.

Prioritization: Fair share use of bandwidth? High prioritization is not a requirement. Best effort is sufficient.

### 2.5 CCAT (Giorgio Filippi presenting for Jeff Zivick of Cornell)

Please refer to the CCAT slides for additional information.

CCAT is funded by NSF and managed by Cornell. Comparable to ALMA.

- Possible synergies with ALMA communications.
- Also TAO and other projects in Chacnantor working group.

Requirements:

- Remote Control
- Data transfer (not bulk?). Perhaps comparable to ALMA.

### 2.6 Auger/LAGO/CTA/ANDES (Xavier Bertou)

Please refer to Astro-particle projects in South America for more information Auger, LAGO, CTA and ANDES projects.

The astro-particle physics (Auger/LAGO/CTA/ANDES) should be more linked to the astronomy community. Network needs are usually important, heritage of the particle physics way of working (huge chunks of data, massive parallel data processing and simulation).

Astro particle physics community:

- Science is more related to astro physics.
- Large data sets, high computational requirements.

Networks use is limited. New link to Europe. Sent from Argentina to data center in Lyon France. Transferring ~ 250GB, less than 10GB per day. Prioritization is not a requirement, best effort is sufficient. Remote shifts wanted people taking data from Europe.

Ask what the connections are for these experiments. Confirm if there's a 1G link from Auger to RedCLARA.

CSmith: there are fibers involving LSST, potential synergy.

New projects:

- One square kilometer
- 8 years. Underground laboratory

The following four sub-sections were provided by Xavier Bertou.

#### 2.6.1 Pierre Auger Observatory

18 countries, 59 institutions, +400 physicists worldwide. 4 countries in Americas: Argentina, Brazil, Mexico, USA

The observatory is in Malargüe, Argentina, south of Mendoza province. Construction started in 2001, data acquisition in 2004, and the observatory was completed in 2008. It is connected to Red Clara via Auger Access.

The bandwidth is about 4Mb/s to the observatory, and 30Mb/s from the observatory to the outside world, used mainly to push data to the main data center, in Lyon, France (CCIN2P3).

The current used average bandwidth is 4Mb/s out, and 700kB/s in.

The used bandwidth is foreseen to increase as detector operation is moved from onsite shifts to remote online operation.

The observatory is also opening as an interdisciplinary observatory where new instruments could be installed, requiring eventually more bandwidth.

### 2.6.2 LAGO (Large Aperture GRB Observatory)

7 Latin American countries, about 70 physicists.

It is a small project with detectors in remote areas in all 7 Latin American countries (high mountain site), where most of the issue is getting the data from a remote site to a connected lab and not really a backbone issue. I would not focus on it given its "small" size. It is more than anything a way to develop experimental astro-particle physics in countries without experience in the topic.

### 2.6.3 Future Projects: CTA (Cherenkov Telescope Array)

More than 1000 members in 27 countries, 4 of them in America (Argentina, Brazil, Mexico, USA).

The site has not yet been selected and could be in Argentina (close to El leoncito in San Juan, or close to San Antonio de los Cobres, in Salta), or in Africa (Namibia or South Africa). If in Argentina, it would be connected with fiber by the local government.

The plan is to operate it as a virtual observatory, with observation requests from outsiders of the collaboration, as an open observatory. There is no official number I know of for its bandwidth (I am not part of the CTA collaboration), but it is stated that a typical observation raw data is at the level of 10TB, and will therefore have to be massively processed to read manageable levels of tens of Mb. It is not clear to me how mucho of the processing will be done on site.

### 2.6.4 Future Projects: ANDES (Agua Negra Deep Experiment Site)

Planned as the first deep underground laboratory in the Southern hemisphere. Of specific interest as it would be an international laboratory (with strong presence of Argentina, Brazil, Chile and Mexico). Furthermore it would be in a tunnel between Argentina and Chile, where fiber would naturally improve the backbone between Argentina and Chile. Worthwhile also that the Chilean side is the Elqui vale, where there are many major telescopes.

The laboratory would therefore be in the middle of a loop providing a second Argentina-Chile connection complementary of the Mendoza-Santiago one.

It is difficult to evaluate what will be the typical bandwidth needs for a laboratory in 2020, when the opening is foreseen (if the tunnel is built according to the plans), but one can consider 50Mb/s as a minimum requirement. Given the remoteness of the tunnel, a higher bandwidth to allow remote operation will likely be planned.

## 3. Updates from International and National Network Providers

Representatives from the AmLight project and network operators reported on operational changes since the last SAACC meeting or changes that are planned that could affect the SAACC community.

### 3.1 AmLight (Cox/Ibarra)

*NOC Services:*
SAACC and LSST are very interested in AmLight providing a single point of entry for NOC Support.

*Performance Management:*
perfSONAR is being used to measure performance of the different astronomy applications moving data sets between Chile and the U.S. Coordination of perfSONAR instruments deployed in Chile and the U.S. was discussed. perfSONAR instruments have been deployed at CTIO in northern Chile, at REUNA in Santiago Chile, at AMPATH in Miami, at NCSA in Urbana-Champagne, and at NOAO in Tucson.

Establish contact at NCSA engineering. Jeff Kantor to make that connection. Use DES as a case study.

*Performance Management Actions:*
- Characterize path to Tucson.
- Characterize path between La Serena and Victoria Canada; Santiago and Chalotesville.
    - NRAO resources in New Mexico have to go through Charlottesville.
    - Add vlan from La Serena – Santiago – Miami.
- Characterize path to NCSA

### 3.2 10min – REUNA (Jaque)

The REUNA backbone was upgraded to 2.5Gbps along a subset of the backbone that includes La Serrena, serving AURA. A key driver for the project was the EVALSO project (refer to slides at http://amlight.net/SAACCFILES2012/files/REUNA-SAAC-Aug2012.pdf).

An HPC facility was described connected by REUNA. It is a project of the CMM mathematics research center at the University of Chile.

### 3.3 10min – RNP (Ciuffo)

RNP is peering with Esnet over dynamic circuits, using AmLight. LineA will be the first project using this system. Will involve NCSA, John Hopkins.

LineA is a virtual laboratory hosted by national university in Brazil. Download data from several AST project. DES sites are data they download.

FermiLab, SLAC, and CTIO are sites they connect to. Sites connected via I2 and Esnet.

Leandro will send a summary of projects RNP is involved.

LineA is downloading latest release of DES from John Hopkins. Reporting bit rate of less than 2Mbps.

### 3.4 10min – ANSP (Lopez)

Luis Lopez provided an update on the ANSP and Kyatera networks. ANSP is peering with the following networks: RNP, CENIC, Internet2, NLR, RedCLARA, and others. His slides can be found at
http://amlight.net/SAACCFILES2012/files/ANSP_july2012_Tucson.pdf

## 4. Roundtable discussion:

*Expanding the SAACC to include the LHC community:*
Inviting the high-energy physics (LHC) community to the SAACC was discussed. Participation by DOE.

David Halstead requested information on Internet2 Net+. Heidi Alvarez was contracted by Internet2. She fielded the question and agreed to present on the Internet2 Net+ concept at the next SAACC meeting.

*Expanding SAACC to include Mexico:*
Mexico has the Large Millimeter Telescope (LMT), ALMA data access. Connections are possible via AmLight West and Central links. The LMT is a project between the University of Massachusetts and the INAEO in Mexico.

Education and outreach usage of AmLight bandwidth. Chris wants SAACC members to think about this. This is in addition to science use of network bandwidth.

Outreach event to schools in Santiago … teachers in Chile using Goldstone telescope to do experiments. Also using Bird telescope and move the telescope in the classroom. If these projects could run over AmLight would be good addition to AmLight and SAACC.

Heidi will share with Chris a database on U.S. campuses in Latin America and Caribbean.

## 5. Next Steps:

Face-face in Santiago August 2013. Eduardo Vera will be hosting 3rd Pucon conference, 22-24 of August are tentative dates. Symposia will be great venue to connect with users.

Proposal by Chris is to have 1-day meeting in Santiago on Monday that week, August 19th. Those interested can travel to Pucon, August 21-23 in Pucon.