



# ALMA AOS/OSF-SCO Communication Infrastructure

Update for the 5<sup>th</sup> SAACC meeting

2014-04-14

G. Filippi (JAO/ADC)

*The Atacama Large Millimeter/submillimeter Array (ALMA), an international astronomy facility, is a partnership among Europe, North America and East Asia in cooperation with the Republic of Chile.*





# Background

ALMA OSF-SCO currently uses a 100Mbps Microwave (MW) link. The projected needs for full array operations is 300Mbps. Some recent developments may even move upward such value.

Need for a communication infrastructure between the ALMA Observatory site near San Pedro de Atacama and the JAO offices in Santiago capable of:

- Providing a long term (>15 years) solution infrastructure
- Coping with projected operations needs (>1Gbps) and scale further
- Minimize latency between the end sites
- Being available as soon as the array is completed (end 2013)
- Having reasonable upfront CAPEX and very low future OPEX
- If cost effective, taking advantage of the existing EVALSO capacity





# Project Timeline

Feasibility study completed (2011)

Project Plan completed (Mar2012)

ALMA Board approved the recommendation (Apr2012)

Procurement for AOS/OSF-Antofagasta optical path (May-Oct).

Contract with Silica and Telefónica signed on November 2012

- Contract updated with new path and future redundant link (Jun2013)
- Contract with REUNA for equipping & operating AOS-SCO link (Aug2013)
- Fiber AOS-CALAMA: Construction start: Dec 2013 (55km done by Mar31)
- Lambda CALAMA-ANTOFAGASTA: provisionally accepted (Dec 2013)
- DWDM equipment selected (PADTEC) (Feb 2104)

**System expected operational for 4thQ 2014**





# OSF-ANTOFAGASTA Optical Path







# Construction Status at 2014-03-31







# Fiber Cable installation 1/3



trench cutting



caterpillar equipped with “ripper” to insert the cable into the loose soil in the trench





## Fiber Cable installation 2/3



Warning strip and trench filling



Installation of chamber (~every 4km), clearing and conditioning of the surface





# Fiber Cable installation 3/3



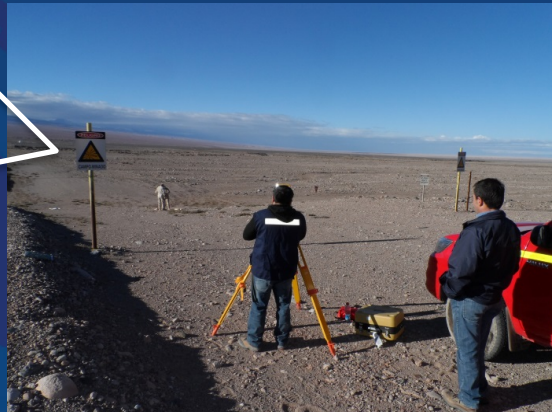
MOVIE (4m 24s)





## Fiber: other activities

fiber cable delivered to  
Storage area



Minefields: marking for the following clearing activity.





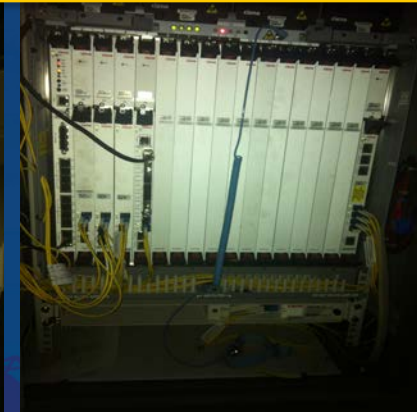
## $\lambda$ CALAMA – ANTOFAGASTA (Telefónica)

LAMBDA Calama-Antofagasta has been provisionally accepted (Dec 2013) and it is ready for integration with DWDM equipment

CALAMA



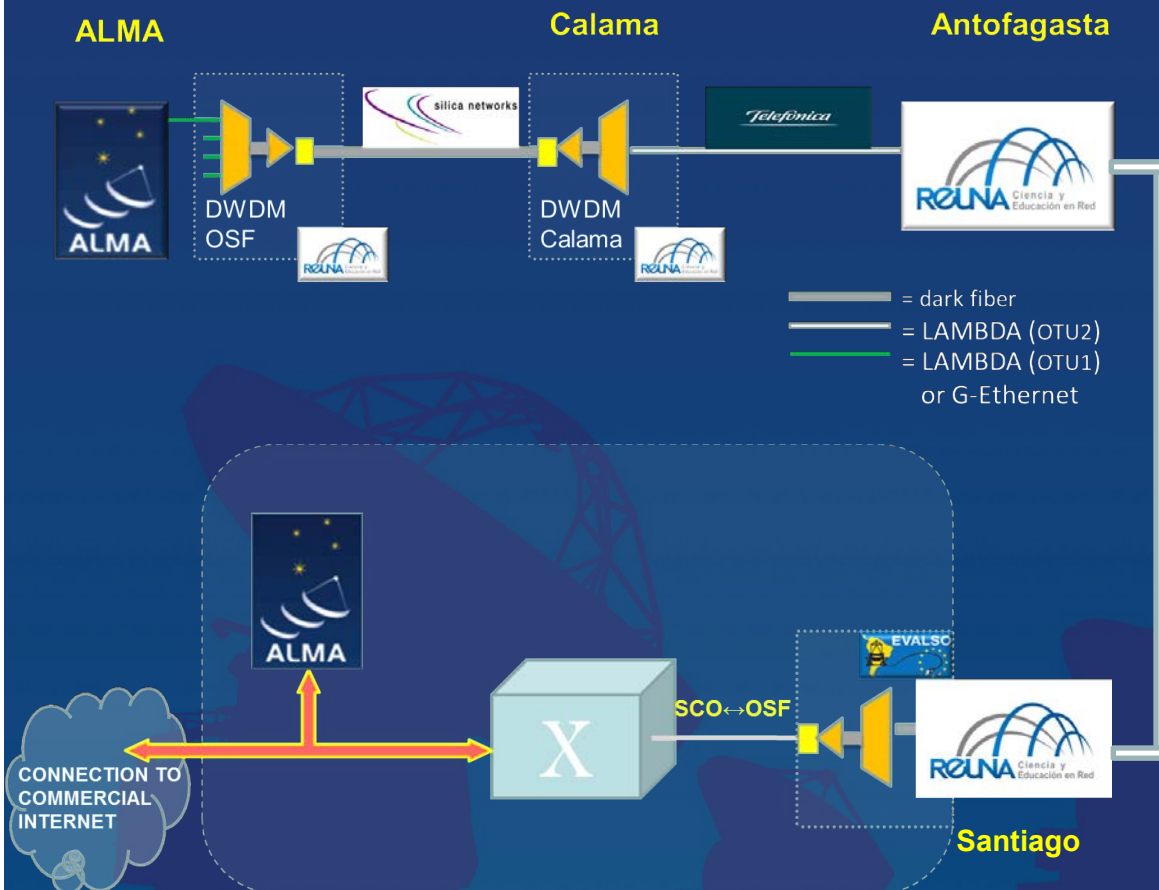
ANTOFAGASTA







# DWDM equipping & Operation (REUNA)



## DONE

- Contract formalized: REUNA is in charge of equipping and operate the complete link (Santiago-ALMA site)
- Design started
- PADTEC DWDM equipment

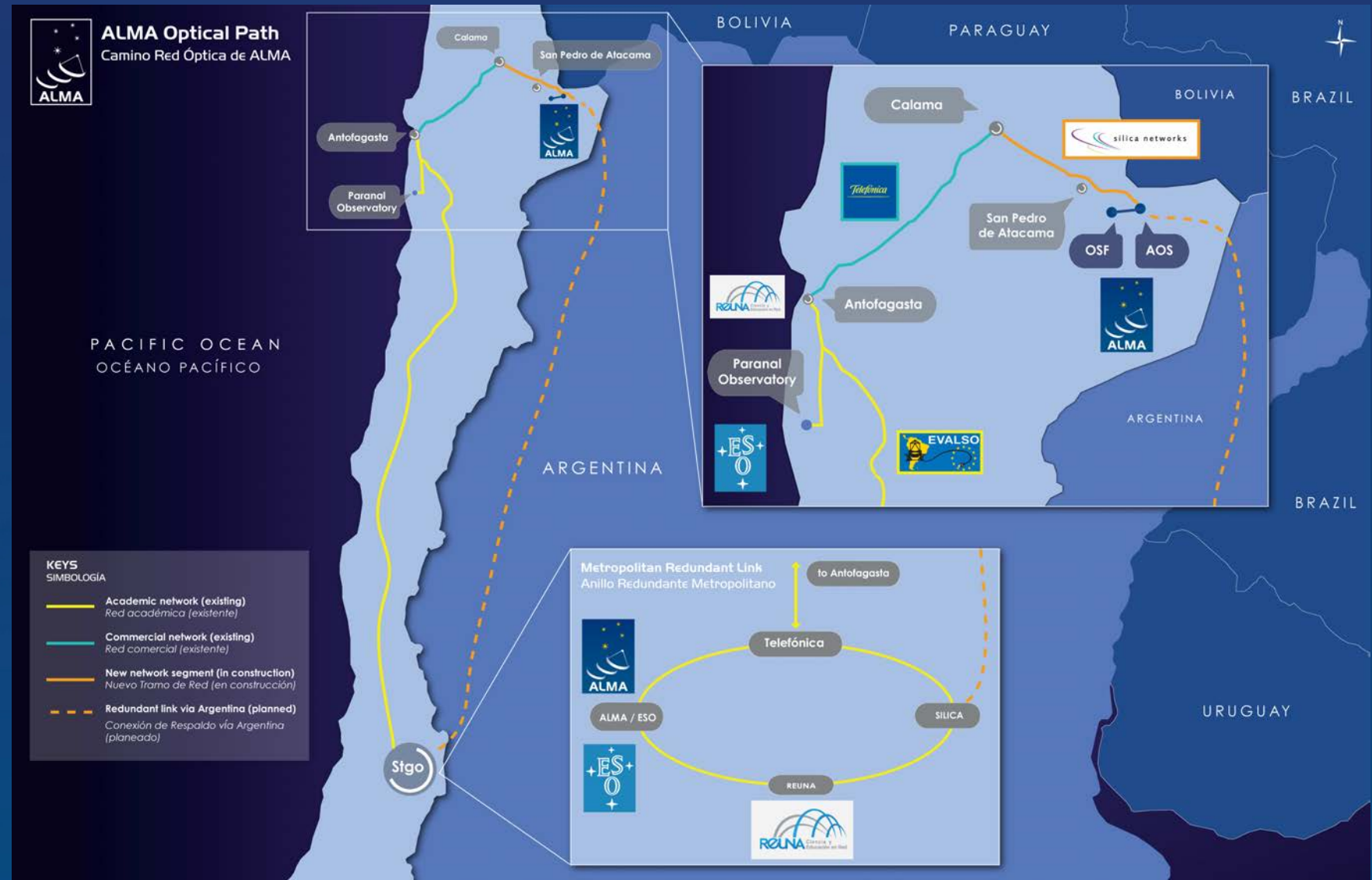
## NEXT

- Equipment installation including testing at 5000m (AOS). If not ok, the DWDM will be installed at OSF (3000m) and ALMA OSF-AOS fiber used





# OSF-ANTOFAGASTA Optical Path: future redundancy







# JAO/ADC Contact Point Info

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