



Report from the event supported by RadioNet

TITLE *A WORKSHOP TO DISCUSS SCIENCE/TECHNICAL ASPECTS
OF THE **ATACAMA LARGE-
APERTURE SUBMM/MM TELESCOPE (ATLAST)***

DATE: *2018 JANUARY 17-19*

LOCATION: *GARCHING B. MÜNCHEN, GERMANY*

MEETING WEBPAGE: *<https://www.eso.org/sci/meetings/2018/AtLAST2018.html>*

HOST INSTITUTE: *EUROPEAN SOUTHERN OBSERVATORY*

**RADIONET
BENEFICIARY / NO:** *ESO/13*

Report:

1. SCIENTIFIC SUMMARY

This event explored the potential for a large (25-50 meter) submillimeter/millimeter telescope in the southern hemisphere. Specifically, we discussed potential telescope designs, sites, operational models, first and next generation instrumentation, and a few high-impact science cases. We compared these with the state of the art instruments available now, and discussed their synergies and work as pathfinders for this next-generation telescope. The project is called “the Atacama Large Aperture Submm/mm Telescope” (AtLAST).

The RadioNet community is thriving with current facilities such as ALMA, NOEMA, the IRAM 30-meter, LOFAR, SKA, and much more, but there is a clear gap in capabilities now that will keep these facilities competitive, specifically at high frequencies (e.g. 100GHz – 1 THz). This gap is submm/mm mapping speed; a dramatic improvement will be necessary to find the most interesting sources for ALMA follow-up.

In addition to complementing radio/microwave telescopes, AtLAST will serve as a powerful complement to optical, UV, and near-IR facilities when probing the dusty universe over large areas.

AtLAST will complement Athena and eROSITA’s studies of the “hot and energetic universe” (in particular galaxy groups/clusters and AGN).

<https://www.eso.org/sci/meetings/2018/AtLAST2018.html>

2. AGENDA OF THE EVENT

From: <https://www.eso.org/sci/meetings/2018/AtLAST2018/program.html>

| Wednesday, 17 Jan | | |
|-------------------|--|----------------|
| 09:00-10:15 | Coffee Reception | |
| | Overview talks (Chair: Klaassen) | |
| 10:15 | Welcome | Xavier Barcons |
| 10:30 | Introduction/background on ESO Large Single Dish Study | Leonardo Testi |
| 10:55 | The Atacama Large Aperture Submm/mm Telescope (AtLAST) Project | Frank Bertoldi |
| 11:30 | New 50-m-class single dish telescope: Large Submillimeter Telescope(LST) | Ryohei Kawabe |
| 12:05 | Chajnantor Sub/millimeter Survey Telescope (CSST) | Sunil Golwala |
| 12:25-13:25 | Lunch | |
| | Telescope/Overview talks (Chair: Noroozian) | |

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| 13:25 | The role of APEX as a pathfinder for ATLAST | Friedrich Wyrowski |
| 13:45 | Applicable Lessons from the IRAM 30m Telescope | Karl Schuster |
| 14:05 | The Large Millimeter Telescope (LMT/GTM 50-meter) | David Hughes |
| 14:25 | The CCAT-Prime Extreme Field-of-View Submillimeter Telescope: Paving the Way for AtLAST | Dominik Riechers |
| 14:45 | AtLAST Science Overview and Introduction to the Working Groups | Pamela Klaassen |
| 15:30 | WG Breakaway sessions / Coffee & Posters available in Fornax | |
| 17:00 | Discussion | |
| 17:30 | End of Day 1 | |
| Thursday, 17 Jan | | |
| | Telescope talks continue (Chair: Bertoldi) | |
| 09:00 | The Origins Space Telescope (OST) | Johannes Staguhn |
| 09:20 | What we have learned from the ALMA Long Baseline Campaigns | Satoki Matsushita |
| 09:40 | Prospects for future synergies between SKA and AtLAST | Jeff Wagg |
| 10:00 | Poster Overview I: Instruments and Complementary Facilities | |
| 10:20-10:40 | Coffee | |
| | Talks on Instruments (Chair: Mroczkowski) | |
| 10:40 | The NIKA2 large field-of-view millimeter continuum camera for the 30-m IRAM telescope | Alessandro Monfardini |
| 10:55 | The polarization-sensitive bolometers for SPICA and their potential use for ground-based application | Vincent Reveret |
| 11:10 | A Review of Some Superconducting Technologies for AtLAST: Parametric Amplifiers, Kinetic Inductance Detectors, and on-chip Spectrometers | Omid Noroozian |
| 11:25 | Large format, background limited arrays of Kinetic Inductance Detectors for sub-mm astronomy | Jochem Baselmans |
| 11:40 | First light of DESHIMA on ASTE: on-chip filterbank spectrometer for submillimeter wave astronomy | Akira Endo |
| 11:55 | Heterodyne Array Receiver Development at KOSMA | Urs Graf |
| 12:10 | Blind spectroscopic galaxy surveys using an ultra-wide-band imaging spectrograph on AtLAST and LST | Kotaro Kohno |
| 12:25-13:25 | Lunch | |
| 13:25 | Poster Overview II: Science and Techniques | |
| 14:15-16:00 | Coffee Break, poster session, and breakaways Instrumentation: Eridanus | |

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| | Site & Operations: Columba (Skylight room at top of stairs in old building) Telescope: Tucana (A.2.02) | |
| | Science Talks (Chair: Geach) | |
| 16:00 | Ground-based submillimeter spectroscopic cosmological surveys and synergies with space FIR surveys | Luigi Spinoglio |
| 16:15 | Continuum and line emission of star-forming galaxies and development of a new sub-mm IFU | Guilaine Lagache |
| 16:30 | Galaxy cluster astrophysics and cosmology from a large aperture sub-millimeter telescope | Kaustuv Basu |
| 16:45 | Time-Domain Sub-mm Astronomy. Measuring the Accretion Variability of Deeply Embedded Protostars. | Doug Johnstone |
| 17:00 | Cosmic Star Formation --- Seen from the Milky Way with AtLAST | Jens Kauffmann |
| 17:15 | GEco - Galactic Science with CCAT-p | Peter Schilke |
| 17:45 | Town Hall: Open discussion of AtLAST | |
| 18:30 | End of Day 2 | |
| 19:30 | Workshop Dinner | |
| Friday, Jan 19 | | |
| | Working Group reports (Chair: Bertoldi) | |
| 9:00 | Report from the Science WG | Pamela Klaassen / James Geach |
| 9:50 | Discussion of EU Funding Sources | Andrew Williams |
| 10:20-10:40 | Coffee / Workshop Photo | |
| 10:40 | Report from the Telescope WG | Peter Hargrave |
| 11:15 | Report from the Site Selection and Operations WG | Carlos De Breuck |
| 11:50 | Report from the Instrumentation WG | Tony Mroczkowski / Omid Noroozian |
| 12:30-13:30 | Lunch | |
| 13:30 | Closing discussions / breakaway | |
| 16:00 | End of Day 3 | |

3. PARTICIPANTS

In total, we had about 110 participants from across the globe. These included 15 from North America, 4 from Chile, and 7 from East Asia.

We had a good fraction of postdocs, but only 3 students. The fraction of women was 20%, which we are seeking to improve as the community grows. We also had many invited experts with experience in building the science and technical cases for previous submm or mm wave facilities.

The RadioNet support was key in bringing in a few of these experts.



4. RADIO NET FINANCIAL CONTRIBUTION

With 2500€, RadioNet has supported a total of 6 participants, because of their expertise and experience in the field, it was important that they could attend the meeting and contributed in the form of oral presentations, leading participation in the working groups, or contributed to the written report that follows from the workshop discussions and presentations.

5. PUBLICATIONS

Omid Noroozian <https://zenodo.org/record/1161107#.WpaC5YliEQ8>

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