Report from the event supported by RadioNet

TITLE	*A WORKSHOP TO DISCUSS SCIENCE/TECHNICAL ASPECTS OF THE **A**TACAMA **L**ARGE-**A**PERTURE **S**UBMM/MM **T**ELESCOPE (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*

RadioNet has received funding from the EU's Horizon 2020 research and innovation programme under the grant agreement No 730562

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 buiding) 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.

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European Southern Observatory

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26 Feb 2018

Participants

Last update took place on: 15.01.2018 - 14:30 CET

Current number of participants: 107

	Last Name	First Name	Institution
1	Aston	Sylas	NRAO
	Baars	Jacob	Max-Planck-Institute für Radioastronomie
	Badescu	Toma	Argelander Institut fur Astronomie
	Barcons	Xavier	ESO Garching
	Baryshev	Andrey	Kapteyn Astronomical Institute NOVA
	Baselmans	Jochem	SRON Netherlands Institute for Space Research
	Basu	Kaustuv	University of Bonn
	Belitsky	Victor	GARD, Chalmers University
	Bergman	Per	Onsala Space Obs/Chalmers University Technology
	Bertoldi	Frank	Bonn
11	Beuther	Henrik	Max Planck Institute for Astronomy
	Bontemps	Sylvain	Université de Bordeaux
	Bourne	Nathan	University of Edinburgh
	Burkutean	Sandra	IRA-INAF
	Chen	Chian-Chou	ESO Garching
	Chiong	Chau Ching	ASIAA
	Cicone	Claudia	INAF-Osservatorio Astronomico di Brera
	Conway	John	Onsala Space Obs/Chalmers University Technology
	Cooray	Asantha	UC Irvine
	Dannerbauer	Helmut	Instituto de Astrofísica de Canarias
21	De Beck	Elvire	Onsala Space Observatory, Chalmers University of Technology
	De Breuck	Carlos	ESO Garching
	Desmaris	Vincent	Chalmers University of Technology - GARD
	Dicker	Simon	University of Pennsylvania
	Eiichiro	Komatsu	Max Planck Institut for Astrophysics
	Endo	Akira	Delft Universtiy of Technology
	Finger	Ricardo	Universidad de Chile
	Fuller	Gary	Jodrell Bank Center of Astrophysics, University of Manchester
	Geach	Jim	University of Hertfordshire
	Golwala	Sunil	California Institute of Technology
31	Graf	Urs	University of Cologne
	Greve	Thomas	University College London
	Hacar Gonzalez	Alvaro	Sterrewacht Leiden
	Hargrave	Peter	Cardiff University
	Harrington	Kevin	Argelander-Institut für Astronomie, Universität Bonn
	Hatziminaoglou	Evanthia	ESO Garching
	Hayatsu H.	Natsuki	ESO Garching
	Hesper	Ronald	Kapteyn Astronomical Institute, University of Groningen
	Higgins	Ronan	University of Cologne
	Hills	Richard	University of Cambridge
41	Huang	Yua De	Academia Sinica Institute of Astronomy and Astrophysics
	Hughes	David	Instituto Nacional de Astrofísica, Óptica y Electrónica (INAOE)
	Hurtado	Norma	NOVA Optical and IR Instrumentation Group at ASTRON
	Immer	Katharina	JIVE
	Ivison	Rob	ESO Garching
	Jiménez-Andrade	Eric Faustino	Argelander Institute for Astronomy/Uni Bonn
	Johnstone	Douglas	NRC-Herzberg
	Kainulainen	Jouni	Chalmers University of Technology
	Kärcher	Hans J.	MT Mechatronics
	Kauffmann	Jens	MIT Haystack
51	Karoumpis	Christos	Argelander-Institut für Astronomie (AIfA)
	Kawabe	Ryohei	NAOJ
	Khudchenko	Andrey	NOVA/Kapteyn Institute
	Klaassen	Pamela	UK Astronomy Technology Centre
	Kohno	Kotaro	The University of Tokyo
	Lagache	Guilaine	Marseille
	Lutz	Dieter	Max-Planck-Institute für Extraterrestrische Physik
	Maercker	Matthias	Onsala Space Obs/Chalmers University Technology
	Magnelli	Benjamin	Argelander-Institut für Astronomie
	Matsushita	Satoki	ASIAA
61	Mena	Patricio	Universidad de Chile
	Monfardini	Alessandro	CNRS Grenoble
	Mroczkowski	Tony	ESO Garching
	Mühle	Stefanie	Argelander-Institut, University of Bonn
	Noroozian	Omid	NRAO
	Okada	Yoko	Physikalisches Institut der Universitaet zu Koeln
	Omont	Alain	Institut Astrophysique de Paris
	Oshima	Tai	National Astronomical Observatory of Japan
	Otarola	Angel	TMT International Observatory
	Paladino	Rosita	Istituto di Radioastronomia
71	Pavolotsky	Alexey	Chalmers University of Technology - GARD
	Plunkett	Adele	ESO Santiago
	Reveret	Vincent	CEA Saclay
	Riechers	Dominik	Cornell University
	Roy	Alan	Max-Planck-Institut für Radioastronomie
	Sarazin	Marc	ESO Garching
	Saro	Alex	OATS - INAF
	Schilke	Peter	University of Cologne
	Schinnerer	Eva	Max-Planck-Institute für Radioastronomie
	Schneider	Nicola	University of Cologne

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81	Schuster	Karl-Friedrich	IRAM
	Sean	Bryan	Arizona State University
	Siebenmorgen	Ralf	ESO Garching
	Simon	Robert	I. Physikal. Institut, Universität zu Köln
	Spinoglio	Luigi	Istituto di Astrofisica e Planetologia Spaziali - IAPS Istituto Nazionale di Astrofisica - INAF
	Staguhn	Johannes	John Hopkins University & NASA/GSFC
	Stroe	Andra	ESO Garching
	Stutzki	Jürgen	Universität zu Köln, I. Physik Institut
	Takekoshi	Tatsuya	University of Tokyo
	Tan	Gie Han	ESO Garching
91	Tan	Jonathan	Chalmers University of Technology - GARD
	Testi	Leonardo	ESO Garching
	Tilanus	Remo	Leiden Observatory
	Travouillon	Tony	TMT International Observatory
	Vlemmings	Wouter	Onsala Space Obs/Chalmers University Technology
	Wagg	Jeff	SKAO Jodrell Bank Observatory
	Weiss	Axel	Max Planck Institut for Radioastronomy
	Wiedner	Martina	LERMA, Paris Observatory, CNRS
	Wiesemeyer	Helmut	Max-Planck-Institute for Radio Astrononomy
	Wootten	Al	NRAO
101	Wyrowski	Friedrich	MPIfR
	Xie	Jinjin	NAOC/University of Manchester
	Yagoubov	Pavel	ESO Garching
	Zwaan	Martin	ESO Garching

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. RadioNet financial contribution

The 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:

- Jacob Baars - Max-Planck-Institut für Radioastronomie, Bonn/DE
- Simon Dicker - University of Pennsylvania, Philadelphia/USA
- Richard Hills - University of Cambrdige, Cambridge/UK
- Omid Noroozian - Central Development Laboratory, NRAO, Charlottesville/USA
- Alain Omont – IAP, Paris/FR
- Tony Travouillin – TMT, Pasadena/USA

5. Publications

Omid Noroozian https://zenodo.org/record/1161107#.WpaC5YIiEQ8

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