

## ***REPORT ON THE RADIONET3 NETWORKING ACTIVITY***

### **TITLE: LOFAR SCIENCE WEEK 2014**

**A JOINT MEETING COMBINING THE “2014 LOFAR COMMUNITY SCIENCE WORKSHOP”  
AND A SEPARATE, RELATED SYMPOSIUM ON “FIRST SCIENCE WITH LOFAR’S FIRST  
ALL-SKY SURVEY”**

**DATE:** *7 APRIL – 11 APRIL 2014*                      **TIME:** ALL DAY

**LOCATION:** *AMSTERDAM, THE NETHERLANDS*

**MEETING WEBPAGE**                      <http://www.astron.nl/lofarscience2014/>

**HOST INSTITUTE:** *ASTRON (NETHERLANDS INSTITUTE FOR RADIO ASTRONOMY)*

**PARTICIPANTS NO:** *105 (COMMUNITY WORKSHOP) / 62 (SURVEY WORKSHOP)*

**MAIN LEADER:** *ASTRON*

## REPORT:

### 1. Agenda of the meeting

The final programmes for both of the workshops are reproduced in their entirety in Appendix A. The programs and presentations are also available from the conference website.

### 2. Scientific Summary

The LOFAR Science Week for 2014 was held April 7-11, 2014 in Amsterdam, NL and brought together roughly 120 members of the LOFAR science community. The week began on Monday afternoon with a LOFAR Users Meeting, open to the whole LOFAR community, organized by ASTRON and intended to provide a forum for users to both learn about the status of the array as well as provide feedback. Members of ASTRON gave updates on the current operational status, ongoing developments, and plans for the coming year. Representative users from the community were also invited to share their personal experiences from using the system. Robert Pizzo and the Science Support team were on hand to answer questions and gathered a lot of good feedback that they will use to improve the user experience for LOFAR.

The User's Meeting was followed on Tuesday by a two day LOFAR Community Science Workshop where nearly 120 members of the LOFAR collaboration came together to present their latest science results and share ideas and experiences about doing science with LOFAR. An amazing range of results were presented including new record-breaking sub-arc imaging with LOFAR's international baselines, first extragalactic detections of Carbon radio recombination lines (RRLs), the first ever 1000000:1 dynamic range image at these low frequencies, and the most sensitive upper limit on the elusive EoR signal yet obtained. In addition to these exciting science results, users also discussed ongoing work to improve the calibration and imaging capabilities of LOFAR. Members of the French NenuFAR project, the Irish and Polish LOFAR consortia, and the KAIRA project also presented updates on efforts to extend the LOFAR array. It is clear that LOFAR remains a growing and scientifically exciting instrument with an active user community.

The final two days of the week were dedicated to a workshop focused on scientific exploitation of LOFAR's first all-sky survey, the Multifrequency Snapshot Sky Survey (MSSS). Members of the MSSS team gathered together along with scientists from the wider community to discuss progress with the survey, plans for the release of survey data products, and of course getting good science out of these products. Details on the current processing for the survey were presented along with ideas and plans for improving the survey data products through future reprocessing. A first look at some of the potential science from MSSS was also presented by the several of the MSSS science teams on a wide range of topics including giant radio galaxies, AGN and clusters of galaxies, transients and pulsars. The expected public data release of the first MSSS catalog and image mosaics is planned for mid-2014 with a wide range of science papers soon to follow.

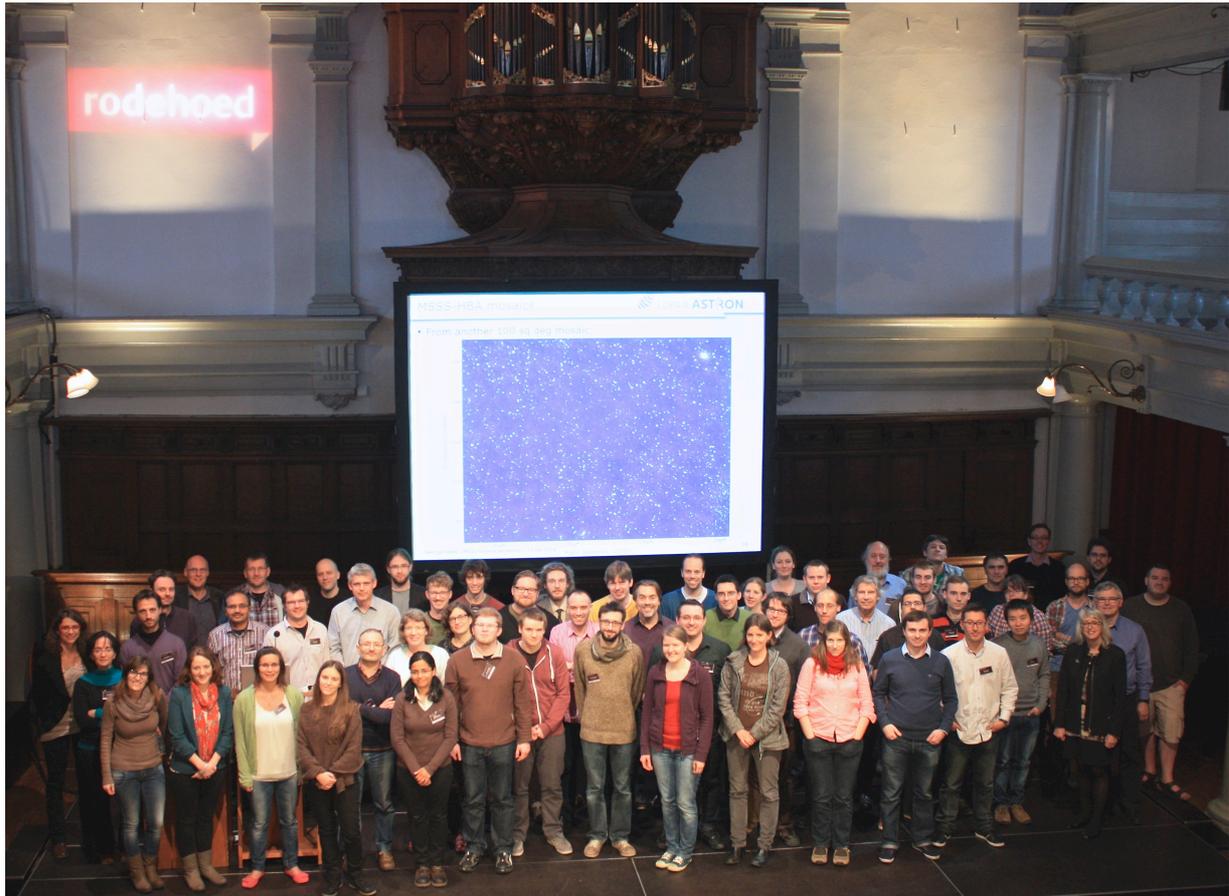


Figure 1: Participants from the 2-day workshop on First Science with LOFAR’s First All-Sky Survey.

### 3. Attendance list (incl. participant names, affiliation and country) signed by the participants and confirmed by the organizer

The LOFAR science week was composed of two distinct LOFAR-related workshops each with their own separate set of attendees. There was, however, significant overlap with many of the participants attending both workshops. The attendance at the workshops was heavily biased toward students and young researchers by design with preference given to them in the selection of the programme of talks.

For the LOFAR Community Science Workshop itself, there were 105 registered participants from 11 different countries. In the case of the workshop on First Science with LOFAR’s First All-Sky Survey, there were 62 registered participants. The gender balance for the workshops was reasonable with a female to male ratio for attendees of approximately 30%. The full attendance list for both workshop including names and affiliations is given below in Appendix B.

Organizer signature:



#### 4. Financial Report / RadioNet3 contribution

A fraction of the RadioNet3 funding was used to support several of the participants for the workshops. A breakdown of the participants and the level of support is collected here.

First Name	Family Name	Institute	Paid fee	Other
Mamta	Pommier	CRAL/l'Observatoire de Lyon	X waived 150 Euros	Travel costs approx. 550 Euros
Song	Chen	Bielefeld University	X waived 150 Euros	N/A
Blazej	Nikiel-Wroczyński	Astronom. Obs., Jagiellonian Univ.	X waived 150 Euros	N/A
Samayra	Straal	University of Amsterdam	X waived 150 Euros (student)	N/A
Klim	Mikhailov	University of Amsterdam	X waived 150 Euros (student)	N/A

The full financial report is included as a separate attachment.

#### 5. Conference Proceedings and Web page

No conference proceedings are planned for either of the workshops. The conference website can be found here:

<http://www.astron.nl/lofarscience2014/>

Copies of the presentations (where author permissions are granted) will be available for download from the website.

## Appendix A. Programmes

### A1. LOFAR Community Science Workshop Schedule

Tuesday, 8 April 2014

#### Workshop Begins

08:30 - 09:00		<i>Registration</i>
09:00 - 09:05	R. Vermeulen	<i>Welcome address</i>
09:05 - 09:10	M. Wise	<i>Workshop overview</i>

#### Session I: Surveys and Techniques (Chair - H. Röttgering)

09:10 - 09:30	G. Heald	<i>MSSS: Overview and Update</i>
09:30 - 09:50	F. de Gasperin	<i>Correcting the Ionospheric effect</i>
09:50 - 10:10	A. Deller	<i>Identifying calibrators for International LOFAR observations</i>
10:10 - 10:30	L. Morabito	<i>Discovery of Carbon Radio Recombination Lines in M82</i>

10:30 - 10:50	<b>Coffee break</b>	
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#### Session I: Surveys and Techniques (cont.)

10:50 - 11:10	A. Bonafede	<i>LOFAR High Band observations of the Coma cluster</i>
11:10 - 11:30	R. Morganti	<i>Radio archaeology with LOFAR: relics and AGN deep time</i>
11:30 - 11:50	V. Heesen	<i>Radio galaxy physics with LOFAR</i>
11:50 - 12:10	E. Mahony	<i>The Lockman Hole Project: a Multi-frequency Study of the Faint Radio Population down to 60 MHz</i>
12:10 - 12:30	R. Coppejans	<i>Searching for the first generation of black holes in Boötes</i>

12:30 - 13:30	<b>Lunch break</b>
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### Session II: Transients (Chair - R. Fender)

13:30 - 13:50	J. Broderick	<i>LOFAR high-band observations of the microquasars SS 433 and GRS 1915+105</i>
13:50 - 14:10	A. Stewart	<i>A Short Duration Transient Candidate At The North Celestial Pole</i>
14:10 - 14:30	A. Rowlinson	<i>Training the TraP: Finding optimal transient search thresholds using observations and simulations</i>
14:30 - 14:50	S. ter Veen	<i>FRATs: Commensal Real-Time Searches for Fast Radio Transients</i>
14:50 - 15:10	A. Siemion	<i>Searching for Extraterrestrial Intelligence with LOFAR</i>

15:10 - 15:30	<b>Coffee break</b>
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### Session III: Pulsars (Chair - J. Hessels)

15:30 - 15:50	S. Cooper	<i>The LOFAR Tied-Array All Sky Survey</i>
15:50 - 16:10	A. Archibald	<i>Scintillation and scattering both: studying the interstellar medium with LOFAR</i>
16:10 - 16:30	A. Bilous	<i>PSR B0943+10 at the very low radio frequencies</i>
16:30 - 16:50	V. Kondratiev	<i>Millisecond pulsars at low frequencies with LOFAR</i>
16:50 - 17:10	C. Sobey	<i>A plethora of emission characteristics from PSR B0823+26</i>
17:10 - 17:30	M. Pilia	<i>Pulsar Profile Evolution at Low Frequency with LOFAR</i>
17:30	<b>Day 1 of Workshop Concludes</b>	

19:30 - 22:00	<b>Workshop Dinner at Restaurant Pakhuis de Zwijger</b>
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**Wednesday, 9 April 2014**

**Workshop Begins**

08:30 - 09:00	<i>Registration</i>
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**Session IV: Extending LOFAR (Chair - M. Wise)**

09:00 - 09:10	P. Zarka	<i>The project NenuFAR</i>
09:10 - 09:20	R. Vermeulen	<i>The POLFAR collaboration</i>
09:20 - 09:30	D. Morosan	<i>Status update on the I-LOFAR initiative</i>

**Session V: Solar and Space Weather (Chair - M. Wise)**

09:30 - 09:50	G. Mann	<i>Tracking an electron beam through the corona with LOFAR</i>
09:50 - 10:10	D. Morosan	<i>Imaging Low Frequency Type III Solar Radio Bursts with LOFAR</i>
10:10 - 10:30	R. Fallows	<i>Probing the Ionosphere with Broadband Low-Frequency Observations of Ionospheric Scintillation</i>
10:30 - 10:50	D. McKay-Bukowski	<i>KAIRA Riometry: using LOFAR technology to study the aurorae</i>

10:50 - 11:10	<b>Coffee break + KAIRA Video Presentation</b>	
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**Session VI: Cosmic Rays (Chair - H. Falcke)**

11:10 - 11:30	A. Nelles	<i>Measuring air showers of cosmic rays at LOFAR</i>
11:30 - 11:50	A. Corstanje	<i>The shape of the radio wavefront of cosmic ray air showers as measured with LOFAR</i>
11:50 - 12:10	S. Buitink	<i>Cosmic-ray mass composition from radio measurements</i>
12:10 - 12:30	G. Trinh	<i>Effects of atmospheric electric fields on radio emission from air showers</i>

12:30 - 13:30	<b>Lunch break</b>
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### Session VII: Magnetism (Chair - G. Heald)

13:30 - 13:50	R. Beck	<i>Observing nearby galaxies at low frequencies - first results from the LOFAR MKSP</i>
13:50 - 14:10	D. Mulcahy	<i>Results from observations of M51 and NGC891</i>
14:10 - 14:30	E. Varenus	<i>Subarcsecond imaging of M82 with LOFAR</i>
14:30 - 14:50	M. Iacobelli	<i>Studying Galactic interstellar turbulence through fluctuations in synchrotron emission with LOFAR</i>
14:50 - 15:10	A. Noutsos	<i>Low-Frequency Pulsar Polarisation with LOFAR</i>

15:10 - 15:30	<b>Coffee break</b>
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### Session IX: Epoch of Reionization (Chair - G. de Bruyn)

15:30 - 15:50	S. Zaroubi	<i>Upper limit on the Epoch of Reionization from LOFAR</i>
15:50 - 16:10	V. N. Pandey	<i>High Dynamic Range Imaging of the EoR-3C196 Field with LOFAR</i>
16:10 - 16:30	S. Yatawatta	<i>LOFAR Ultra Deep Imaging</i>
16:30 - 16:50	V. Jelic	<i>Galactic polarized emission detected in the LOFAR-EoR observing windows</i>
16:50 - 17:10	H. Vedentham	<i>The LOfar COsmic-dawn Search (LOCOS): Chasing the lunar shadow</i>
17:10 - 17:30	M. Mevius	<i>Extracting Ionospheric Statistics from EoR Data</i>

### Workshop Conclusion

17:30 - 18:00	H. Falcke	<i>Workshop Summary</i>
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## Workshop Conclusion

18:00 - 18:10	M. Wise	<i>Workshop Conclusion</i>
18:10	<b>Day 2 of Workshop Concludes</b>	

## Poster Presentations

	S. Daiboo	<i>Tomography of the ionosphere at LOFAR</i>
	I. Iliev	<i>Observability of the Epoch of Reionization: What do large-scale simulations tell us?</i>

## A2. LOFAR MSSS Survey Workshop Schedule

Thursday, 10 April 2014

### Session I: Overview, Survey Design, and Data Policies (Chair: Roberto Pizzo)

9:00 - 9:05	Michael Wise	<i>Welcome</i>
9:05 - 9:35	George Heald	<i>MSSS overview</i>
9:35 - 9:55	Alex Clarke	<i>Data processing and creation of image mosaics</i>
9:55 - 10:10	Chiara Ferrari	<i>Source finding overview</i>
10:10 - 10:40	Rene Breton	<i>The MSSS verification field catalogue</i>
10:40 - 11:00	<b>Coffee break</b>	
11:00 - 11:30	all	<i>Discussion: Data usage and release policies</i>
11:30 - 11:50	David Rafferty	<i>Correcting for Ionospheric Effects in MSSS Data</i>
11:50 - 12:10	Adam Stewart	<i>Optimising the 'Spare Beam' Transient Search in the Continuation of MSSS-LBA</i>
12:10 - 12:30	all	<i>Discussion: MSSS-LBA strategy</i>
12:30 - 13:30	<b>Lunch break</b>	

## Session II: Science with MSSS: Extragalactic objects (Chairs: Mathias Hoeft, Anna Scaife)

13:30 - 13:50	Gianfranco Brunetti	<i>Cluster-scale radio emission: what can we learn from first LOFAR surveys?</i>
13:50 - 14:10	Georgi Kokotanekov	<i>First results on strong AGN cluster feedback systems in MSSS</i>
14:10 - 14:30	Chiara Ferrari	<i>MSSS observations of galaxy clusters detected by Planck</i>
14:30 - 14:50	Mamta Pommier	<i>Giant Radio Galaxies</i>
14:50 - 15:10	V.N. Pandey	<i>Calibrating the Calibrator in the EoR-3C196 field</i>
15:10 - 15:40	<b>Coffee break</b>	
15:40 - 16:00	Blazej Nikiel-Wroczyński	<i>Exploring Low-Frequency spectra of nearby galaxies with MSSS data</i>
16:00 - 16:20	Sjoert van Velzen	<i>Low-frequency spectra of radio galaxies and quasars</i>
16:20 - 16:40	Eskil Varenus	<i>Studying low frequency spectra of nearby LIRGs and ULIRGs with MSSS</i>
16:40 - 17:00	Jonas Trüstedt	<i>The MOJAVE Blazar Sample at Low Radio Frequencies</i>
19:30 - 22:00	<b>Workshop Dinner at Restaurant <i>Kantjil &amp; De Tijger</i> (Indonesian cuisine)</b>	

## Friday, 11 April 2014

### Session III: Added value from MSSS (Chair: Cathy Horellou)

9:00 - 9:20	David Mulcahy	<i>All sky polarization survey with MSSS</i>
9:20 - 9:40	Andreas Horneffer	<i>A search for polarized sources with MSSS-HBA</i>
9:40 - 10:05	Carole Jackson	<i>GLEAM - a new low-frequency MWA survey; the view from the South</i>
10:05 - 10:30	Alexander van der Horst	<i>Searching for Transients in MSSS</i>
10:30 - 11:00	<b>Coffee break</b>	

### Session IV: Science with MSSS: Pulsars and Galactic objects (Chairs: Alexander van der Horst, Glenn White)

11:00 - 11:20	Rene Breton	<i>Pulsars in MSSS data</i>
11:20 - 11:40	Jason Hessels	<i>Turning MSSS into a Millisecond Pulsar Treasure Map</i>
11:40 - 12:00	Charlotte Sobey	<i>Measuring RMs towards pulsars with MSSS</i>
12:00 - 12:30	all	<i>Discussion: MSSS publication policy and timescales</i>
12:30 - 13:30	<b>Lunch break</b>	
13:30 - 13:50	David Mulcahy	<i>The Great MSSS Supernova Remnant Hunt</i>
13:50 - 14:10	Jason Hessels	<i>Searching for Pulsar Wind Nebulae with MSSS</i>
14:10 - 14:30	Emilio Enriquez	<i>Finding brown dwarfs with MSSS</i>
14:30 - 14:50	Anna Scaife	<i>Low Mass Star Formation Stacking Experiments</i>
14:50 - 15:20	<b>Coffee break</b>	

### Session V: Bringing MSSS to the outside world (Chair: Michael Wise)

15:20 - 15:50	Mike Sipior	<i>MSSS Observation Database and the VO</i>
15:50 - 16:20	all	<i>Discussion: MSSS data products and access patterns</i>
16:20 - 16:30	George Heald	<i>Wrap-up and summary</i>

## Appendix B. Participants List

FirstName	FamilyName	Institute	Email	Mon day	Tue/ Wed	Thu/ Fri
Björn	Adebahr	MPIfR	adebahr@mpifr-bonn.mpg.de	yes	yes	yes
Anne	Archibald	ASTRON	archibald@astron.nl	yes	yes	no
Khan Muhammad Bin	Asad	Kapteyn Astronomical Institute	khan@astro.rug.nl	no	yes	no
Rainer	Beck	MPIfR	rbeck@mpifr-bonn.mpg.de	yes	yes	yes
Anna	Bilous	Radboud University Nijmegen	hanna.bilous@gmail.com	yes	yes	no
Annalisa	Bonafede	Hamburg University	annalisa.bonafede@hs.uni-hamburg.de	no	yes	no
Frank	Breitling	Leibniz-Institut für Astrophysik	frank.breitling@gmx.de	yes	yes	no
Rene	Breton	University of Southampton	r.breton@soton.ac.uk	no	no	yes
Marisa	Brienza	ASTRON	brienza@astron.nl	no	yes	yes
Jess	Broderick	University of Oxford	Jess.Broderick@astro.ox.ac.uk	yes	yes	yes
Gianfranco	Brunetti	INAF-IRA	brunetti@ira.inaf.it	no	yes	yes
Stijn	Buitink	Radboud University Nijmegen	s.buitink@astro.ru.nl	yes	yes	no
Sander	Bus	Kapteyn Astronomical Institute	s.bus@astro.rug.nl	no	yes	no
Dario	Carbone	Astronomical Inst. Anton Pannekoek	d.carbone@uva.nl	yes	yes	yes
Yvette	Cendes	Astronomical Inst. Anton Pannekoek	yvette.cendes@gmail.com	no	yes	yes
Song	Chen	Bielefeld University	songchen@physik.uni-bielefeld.de	no	no	yes
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Arthur	Corstanje	Radboud University Nijmegen	a.corstanje@astro.ru.nl	no	yes	no
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Cathy	Horellou	Chalmers University of Technology	Cathy.Horellou@chalmers.se	yes	yes	yes
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Carole	Jackson	ICRAR-Curtin	carole.jackson@curtin.edu.au	no	no	yes
Vibor	Jelic	Kapteyn Astron. Institute/ASTRON	vjelic@astro.rug.nl	yes	yes	no
David	Jones	IMAPP/Radboud University Nijmegen	d.jones@astro.ru.nl	yes	yes	yes
Wojciech	Jurusik	Astronom. Obs., Jagiellonian Univ.	jurusik@oa.uj.edu.pl	yes	yes	yes
Georgi	Kokotanekov	Astronomical Inst. Anton Pannekoek	gkokotanekov@gmail.com	yes	yes	yes
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Fabian	Krause	Kapteyn Astronomical Institute	krause@astro.rug.nl	no	yes	no
Elizabeth	Mahony	ASTRON	mahony@astron.nl	yes	yes	yes
Derek	McKay-Bukowski	Sodankylä Geophysical Observatory	derek@sgo.fi	yes	yes	no

John	McKean	ASTRON/Kapteyn Astron. Institute	mckean@astron.nl	yes	yes	yes
Garrelt	Mellema	Stockholm University	garrelt@astro.su.se	yes	yes	no
Maaijke	Mevius	Kapteyn Astronomical Institute	m.mevius@rug.nl	no	yes	no
Klim	Mikhailov	University of Amsterdam		no	yes	no
Arpad	Miskolczi	Ruhr-Universität Bochum	Miskolczi@astro.rub.de	yes	yes	yes
Leah	Morabito	Leiden Observatory	morabito@strw.leidenuniv.nl	yes	yes	yes
Raffaella	Morganti	ASTRON/Kapteyn Astron. Institute	morganti@astron.nl	no	yes	yes
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Anna	Nelles	Radboud University Nijmegen	a.nelles@astro.ru.nl	yes	yes	no
Blazej	Nikiel-Wroczyński	Astronom. Obs., Jagiellonian Univ.	iwan@oa.uj.edu.pl	no	no	yes
Aristeidis	Noutsos	MPIfR	anoutsos@mpifr-bonn.mpg.de	no	yes	no
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Rosita	Paladino	University of Bologna	paladino@ira.inaf.it	yes	yes	yes
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Ajinkya	Patil	Kapteyn Astronomical Institute	patil@astro.rug.nl	yes	yes	no
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Katharina	Sendlinger	Ruhr-Universität Bochum	ksend@astro.rub.de	yes	yes	yes
Timothy	Shimwell	Leiden Observatory		no	yes	no
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Samayra	Straal	University of Amsterdam		no	yes	no
John	Swinbank	University of Amsterdam	j.swinbank@uva.nl	yes	yes	no
Sander	ter Veen	Radboud University Nijmegen	s.terveen@astro.ru.nl	yes	yes	no
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