



Report from the event supported by RadioNet

TITLE *HI ABSORPTION 2017: A WORKSHOP ON THE STATUS OF AND PREPARATION FOR THE UPCOMING SURVEYS*

DATE: *14-16 JUNE, 2017*

LOCATION: *DWINGELOO, THE NETHERLANDS*

MEETING WEBPAGE *<http://www.astron.nl/HIabsorption2017/>*

HOST INSTITUTE: *ASTRON*

PARTICIPANTS NO: *35*

**RADIONET
BENEFICIARY / NO** *ASTRON / 2*

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Report:

1. SCIENTIFIC SUMMARY

One of the ways to explore gas in the Universe is using HI absorption observations. The new radio telescopes (ASKAP, MeerKAT and Apertif on the WSRT) offer exciting new possibilities for science using HI absorption. With data from these radio telescopes, pathfinders/precursors of SKA slowly starting to appear, it was a good time to have a community get-together for those who are interested in using these telescopes for these types of studies.

The workshop on **Hi Absorption 2017: A Workshop On The Status Of And Preparation For The Upcoming Surveys** (14-16 June 2017, Dwingeloo/NL) organized at ASTRON has covered science topics that can be addressed using HI absorption (intervening and associated), including what we can learn about the feedback effects of AGNs on galaxy evolution, the properties of the ISM of galaxies at higher redshift, and the cosmic evolution of HI. HI absorption observations are complementary to those tracing the HI gas in emission because they allow detecting gas much distant objects and to image the gas at very high spatial resolution, i.e. at parsec scales reachable by VLBI. Thus, HI absorption observations are ideal to study the gas e.g. in the surrounding active nuclei.

The workshop covered a number of important topics, from the status of the new (or upgraded) telescopes, and of the tools to exploit the upcoming surveys, to the science we want to do with the data and the complementarity of the various surveys.

The schedule of the workshop included ample time for discussion. Each session had presentations of participants and was followed by a discussion about open issues.

A number of action points have been decided, hopefully providing a better coordination among the various groups. A wiki is in the process of being setup to collect information about the status of software and preliminary results so that groups can coordinate and share this knowledge.

The presentations and some pictures of the workshop are posted on the web site <http://www.astron.nl/HIabsorption2017/>



Figure 1 – workshop opening

2. AGENDA OF THE EVENT

Tuesday 13 June

18:00 Reception at Hotel de Borken

Wednesday 14 June

9:00 Registration

9:15 Welcome

Status of the telescopes and data available for early science;

Chair: E. Sadler

9:30	James	Allison	CSIRO Astronomy & Space Science	ASKAP Status Update
9:55	Bradley	Frank	University of Cape Town	MeerKAT
10:20	Yogesh	Chandola	NAOC	FAST status and update

10:45 Coffee

11:15	Betsy	Adams	ASTRON	Apertif
11:35	Tom	Oosterloo	ASTRON/Kapteyn Astronomical Institute	Status and progress of Apertif
11:55	Zsolt	Paragi	JIVE	Opportunities from VLBI

12:15 Discussion: Status of the telescopes (chair: E. Sadler)

13:00 Lunch

Experience built and tools available for the handling and analysis of new data

Chair: N. Gupta

14:00	Ravi Sharma and Dolly Gyanchandani	ThoughtWorks	Automated data processing for uGMRT and MeerKAT absorption line surveys	
14:25	Filippo	Maccagni	ASTRON - Kapteyn Institute	The Last Survey of the old WSRT: tools and results for the future HI absorption surveys
14:50	Stephen	Curran	Victoria University of Wellington	Machine learning for HI absorption

15:15 Coffee

15:45	James	Allison	CSIRO Astronomy & Space Science	A statistical method for measuring the HI spin temperature
16:10	Martin	Meyer	ICRAR/UWA	Status of SKA for HI absorption

16:35 Discussion: Status of the analysis tools (chair: N. Gupta)

circa 17:30:00 Drinks

Thursday 15 June

Planning for the HI absorption surveys

Chair: T. Oosterloo

9:30	Eric	Wilcots	University of Wisconsin	Using HI Absorption to Probe the CGM and IGM in Galaxy Groups
9:55	Lister	Staveley-Smith	ICRAR/UWA	Evolution of Cosmic Gas Density
10:20	Elaine	Sadler	University of Sydney	A successful search for intervening 21 cm HI absorption at $0.4 < z < 1$ with ASKAP

10:45 Coffee

11:15	Neeraj	Gupta	IUCAA	Blind HI and OH absorption line search: status update on MALS and early results from uGMRT
11:40	Raffaella	Morganti	ASTRON/Kapteyn Inst	SHARP: the HI absorption survey with Apertif

12:05 Discussion: Planning for large surveys (chair: T. Oosterloo)

12:45 Lunch

Early science results before the large surveys

Chair: J. Allison

14:00	Julie	Davis	University of Wisconsin-Madison	HI Absorption with CHILES
14:25	Attila	Popping	ICRAR/UWA	Linking absorption and emission measurement of the CGM with IMAGINE
14:50	Sanchayeeta	Borthakur*	Johns Hopkins University	Tracing the coolest neutral gas component of galaxies <i>(to be confirmed)</i>
15:15	Stephen	Curran	Victoria University of Wellington	The spin temperature of damped Lyman-alpha absorption systems and star formation history

15:40 Coffee

16:00	Rajeshwari	Dutta	IUCAA	Distribution of cold gas around galaxies
16:25	Yogesh	Chandola	NAOC	HI absorption towards low luminosity radio AGNs of different accretion modes and WISE colours
16:50	Aditya	JNHS	IUCAA	Cold Gas in High Redshift Active Galaxies

17:15 Discussion part I: Strategy for optical/mm/other follow-up of the large surveys (chairs: Allison and van der Hulst)

17:45 End second day

Social dinner

Friday 16 June

Early science results before the large surveys (continue)

Chair: T. van der Hulst

9:30	Elizabeth	Mahony	University of Sydney	Searching for HI absorption in the brightest southern radio galaxies
9:55	Bjorn	Emonts	Centro de Astrobiologia	Atomic gas in the halo of a massive proto-cluster galaxy: prospects for high-z HI studies

10:20 Discussion part II: Strategy for optical/mm/other follow-up of the large surveys (chairs: Allison and van der Hulst)

10:50 Coffee

Follow-up and synergies

Chair: N. Maddox

11:20	Robert	Schulz	ASTRON	Probing HI outflows on parsec scales in radio galaxies with VLBI
11:45	Martin	Zwaan	ESO	Parsec-scale HI absorption structure in a low-redshift DLA galaxy

12:10 Lunch

13:30	Vanessa	Moss	ASTRON	Connecting HI and soft X-ray absorption in distant AGN with next-generation telescopes
13:55	Alastair	Edge	Durham University	HI and CO absorption against the cores of Brightest Cluster Galaxies
14:20	Raymond	Oonk	ASTRON / Leiden	The role of the cold atomic gas in our Galaxy and beyond.
14:45	Kimberly	Emig	Leiden Observatory	Unveiling the physical conditions of neutral gas with radio recombination lines

15:10 Final wrap up and discussion chaired by the SOC

15:40 End of workshop

3. PARTICIPANTS

A total of 34 astronomers attended the workshop, coming from eight different countries (with particularly large groups from Australia and India). About 1/3 of the participants were female and about half were young PostDocs and PhD students. In short: a very lively community ready to start exploiting the data beginning to appear from all telescopes.



Figure 2 - Group photo under the historic Dwingeloo radio telescope

4. RADIONET FINANCIAL CONTRIBUTION

We have used RadioNet support to help the trip for 3 three key participants:

- One presenting the status of FAST
- One presenting some new results obtained with GMRT as part of his PhD thesis and relevant for the effort to push HI absorption observations and detections to high-z
- One presenting work on synergy between molecular and HI for radio galaxies.

For these participants we have covered the hotel and the transport inside the Netherlands.

5. PUBLICATIONS

The presentations and some pictures of the workshop are posted on the web site

<http://www.astron.nl/HIabsorption2017/>

