

REPORT ON THE RADIONET3 NETWORKING ACTIVITY

TITLE: *GAS FOR COSMOLOGY IN THE NEARBY UNIVERSE: the promises of new radio facilities and the predictions from simulations*

Symposium part of the European Week of Astronomy and Space Science

DATE: *2-3 JULY 2012*

TIME: *3 SESSIONS OF 2 H PER DAY*

LOCATION: *ROME, ITALY*

MEETING WEBPAGE *<http://www.astron.nl/ewass2012/Ewass12.html>*

HOST INSTITUTE: *PONTIFICIA UNIVERSITA` LATERANENSE*

PARTICIPANTS NO: *65*

REPORT:

1. Scientific Summary

The meeting was motivated by the fact that in the near future, many new radio facilities will open new exciting ways to study the role of gas in galaxies and their evolution. However, this will have to be complemented by theoretical studies of the detailed processes in galaxies, and their environments, in order to be able to learn about their complicated physics in a cosmological context. Detailed observations of nearby objects will provide crucial input for understanding the observations of more distant objects. A key component that can be studied in detail for nearby objects is the gas, and in particular the cold gas (atomic and molecular). The accretion of gas, and how various processes, such as AGN and star formation, interact with it, regulate the life of a galaxy.

The meeting was attended by 65 registered participants. However, given that the meeting was part of the European Week for Space Science and Astronomy, participants of other meetings of this event also attended some sessions. Given the nature of EWASS, most participants were from European countries, but a fair fraction of them were from the USA and Australia.

The programme of the meeting aimed to provide an overview of the state-of-the-art of the topic of accretion of gas which fuel a galaxy, and gaseous outflows, which may deplete a galaxy of this reservoir of gas. We have done this starting from the observational point of view and then expand to the theories and predictions that will allow to plan the next surveys. The aim to combine theory and observations is underlined by the figure on the poster of the meeting (see Figure 1 below). The figure shows the neutral gas in two galaxies, one being the result of detailed numerical simulations (left), the other of deep HI observations of a real galaxy (right). The two galaxies appear very similar, underlining that now is the moment to start detailed comparisons between observation and theory of gas in galaxies.

The programme started with a look at evidence of gas accretion in the Local Group and nearby galaxies and then expanded this to objects at higher redshift. It is clear that there is a lot of evidence for gas accretion from the IGM, but it is also becoming clear that the observed amounts are much less than what is needed for sustaining star formation in galaxies. Theoretical studies confirm now these results. A particularly interesting presentation was given by Dr. F. Fraternali (Bologna). He suggested that the interaction of hot gas ejected into the halo by star formation with pre-existing gas in the halo, gives a positive feedback for gas accretion and that this may solve the puzzle of small accretion rates.

Particularly interesting was the session on stacking techniques that start to give a glimpse on what deeper future studies of distant objects will bring. The end of the meeting was devoted to an overview of the new instruments. From these presentations it became clear that large-scale cosmological studies, such as large-scale flows or structure formation, will become more and more part of HI studies. Figure 2 (taken from the talk of Dr Fernandez (New York)) illustrates the progress that will be made with the new instruments.

Time was also devoted to AGN and AGN-driven outflows including extensive reviews. An impressive result which was shown by Dr. K. Dasyra (Paris) is the outflow detected in molecular gas in the radio source 4C12.50. Earlier observations done in the HI line had revealed an outflow of atomic gas which is now dramatically confirmed in molecular gas (see Figure 3).

The conference summary was given by Prof. J. van der Hulst (Groningen).

About 40% of the speakers were female and the programme gave particular relevance to young invited speakers and contributed speakers (among whom a number of PhD students and young postDoc).

The presentations have been made available (in pdf format) at the web site of the meeting:
<http://www.astron.nl/ewass2012/Programme.html>

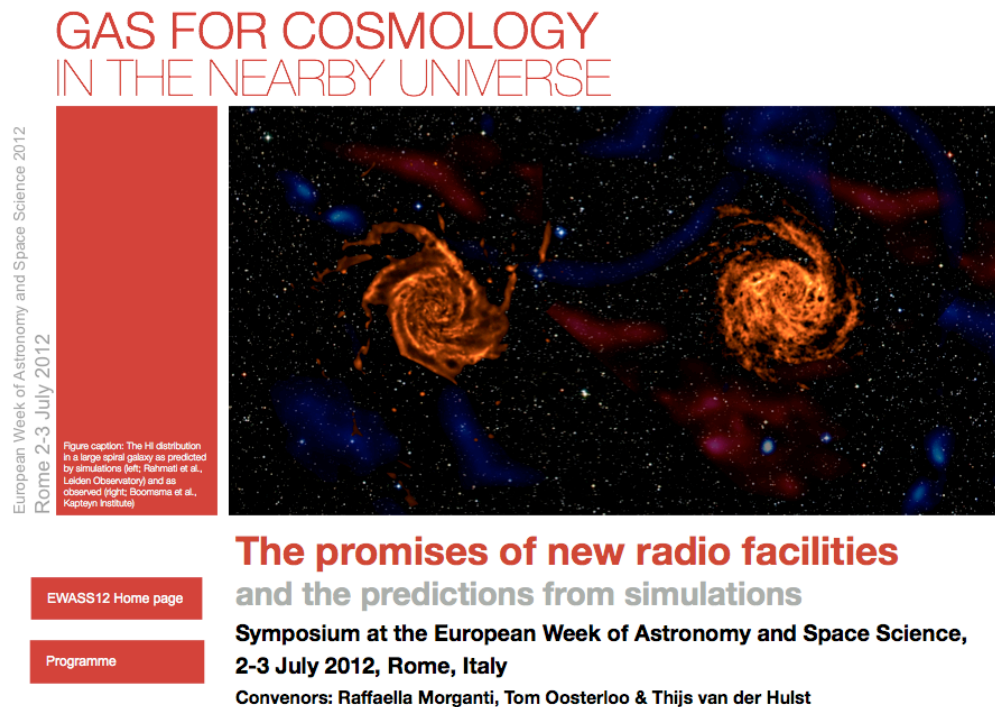
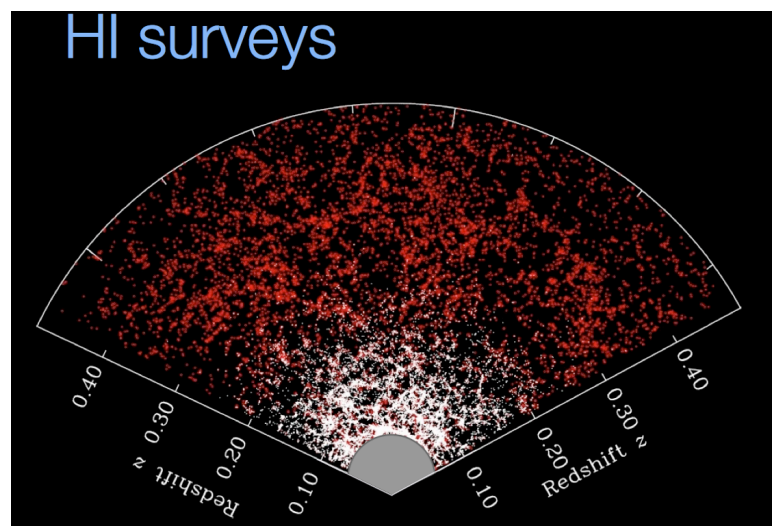


Figure 1: Illustration of the poster of the meeting.

Figure 2: Redshift wedge showing the progress that will be made in redshift coverage in HI detected objects. The grey area shows the redshift coverage of the currently deepest and largest HI survey (the ALFALFA survey), the white dots what is expected from near-future shallow surveys, and the red dots that from future deep surveys (from the presentation of Dr X. Fernandez)



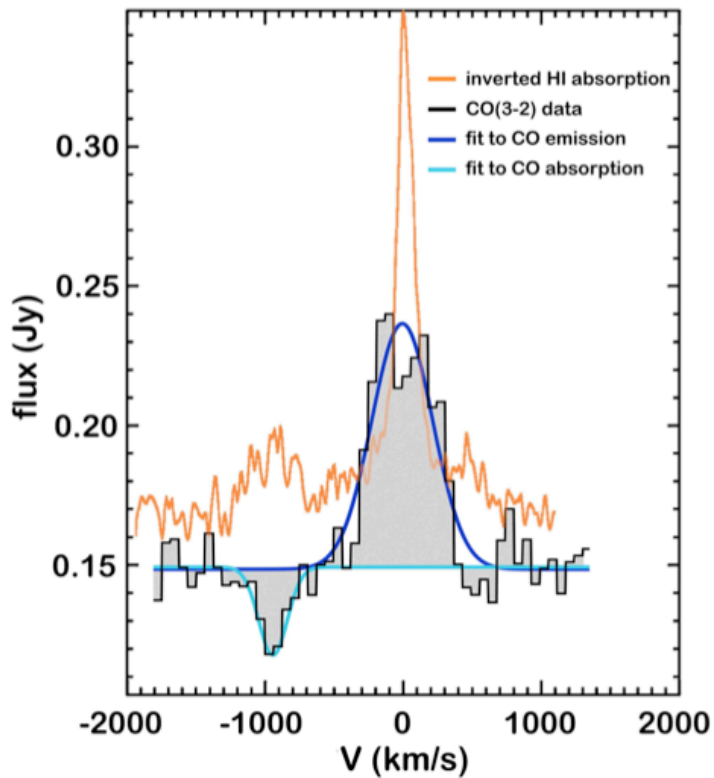


Figure 3: CO(3-2) absorption as presented by Dr. K. Dasyra shown together with the HI absorption profile detected earlier. In both gas phases, a component is detected redshifted by 1000 km/s with respect to the systemic velocity

Figure 4: Thijs van der Hulst giving the conference summary



2. Financial Report / RadioNet3 contribution

RadioNet support has been key to support some of the invited speakers coming from more distant institutes and make it possible to have an healthy mix of experience speakers (always important for setting the scene of the meeting and giving the broad picture of problem and opportunities) and the younger ones (who are the ones who will actually using the facilities coming available!)

Joe Silk (Oxford University)	700 euro
Freeke van de Voort (Leiden Observatory, Cordoba University Argentina)	800 euro
Nadya Ben Bekhti (Argelander-Institut für Astronomie (AlfA) University of Bonn)	600 euro
Ryan Joung (Columbia New York, USA)	800 euro
Danail Obreschkow (ICRAR, Perth)	1000 euro
Lister Staveley-Smith (University of Western Australia, Perth)	500 euro
Lisa Young (New Mexico Institute of Mining and Technology, Socorro)	500 euro
Filippo Fraternali (Bologna University)	250 euro

3. Conference Proceedings and Web page

The presentations have been made available (in pdf format) at the web site of the meeting: <http://www.astron.nl/ewass2012/Programme.html>. The programme of the meeting is attached

The promises of new radio facilities and the predictions from simulations

Symposium at the European Week of Astronomy and Space Science, 2-3 July 2012, Rome, Italy

July 2

Setting the Scene

11:30-11:40	Tom Oosterloo	Welcome
11:40-12:10	Guinevere Kauffmann	An HI perspective on galaxy formation
12:10-12:40	Joe Silk	The interplay between gas accretion, outflows, star formation and AGN

Cold gas accretion and its fate: star formation in the Local Group

12:40-13:10	Filippo Fraternali	The fate of the gas: the connection between star formation and gas accretion
13:10-13:30	Antonino Marasco	Supernova driven gas accretion in the Milky Way
14:30-15:00	M. Ryan Joung	Gas accretion in cosmological AMR simulations of a Milky Way-mass galaxy at low z
15:00-15:20	Nadya Ben Bekhti	The distribution of gas in the halo of the Milky Way
15:20-15:40	Verena Darmstaedter	Towards a revised picture of Compact High-Velocity Clouds: New Results from EBHIS and GASS

Fate of the gas in external galaxies

15:40-16:00	Federico Lelli	Gas dynamics in starbursting dwarf galaxies
16:30-16:50	Alexei Moiseev	A new polar ring galaxies catalogue
16:50-17:10	Witold Maciejewski	Circular motion, radial flows and everything between: H ₂ kinematics in galactic nuclei from SINFONI IFU
17:10-17:40	Lisa Young	Cold gas (CO and HI) in early-type galaxies: the view from the ATLAS3D project
17:40-18:00	Paolo Serra	Observed and simulated HI: a new probe of the formation of early-type galaxies
18:00-18:30	Freeke van de Voort	Gas flows in galactic haloes and the nature of HI clouds

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July 3

Tracing the gas and its properties to redshifts as high as possible

11:00-11:20	Barbara Catinella	HI and star formation properties of the most HI-rich galaxies up to $z \sim 0.2$
11:20-11:40	Jian Fu	The Effect of Star Formation on the Redshift Evolution of Interstellar Metals, Atomic and Molecular Gas in Galaxies
11:40-12:00	Katinka Gereb	The global HI properties of galaxies up to $z \sim 0.1$
12:20-12:40	Ximena Fernandez	The JVLA HI Deep Field: Observing the COSMOS field in $0.2 > z > 0$
12:40-13:00	Laura Hoppman	Deep 21-cm HI Observations with the Arecibo Telescope
14:30-14:50	Burcu Beygu	HI Morphology and Kinematics and Optical Properties of Void Galaxies
14:50-15:10	Neeraj Gupta	Tracing the evolution of cold gas in galaxies using 21-cm absorption

Gas outflows. Starburst vs AGN. Can we quantify the impact?

15:10-15:30	Matt Lehnert	Gas outflows: why is it difficult to distinguish AGN from starbursts?
15:30-16:00	Alvaro Labiano	3C236: Molecular gas and feedback in a highly efficient star forming radio galaxy
16:30-16:50	Kaliopi Dasyra	Where to look for AGN-driven molecular outflows? The warm and cold phases of the same outflow

Expectations from the new radio telescopes: HI and molecular gas view

16:50-17:20	Francoise Combes	Gas accretion and outflows: the molecular gas view expectations from ALMA, NOEMA,...
17:20-17:50	Lister Staveley-Smith	Expectations for new radio telescopes: the HI view
17:50-18:20	Danail Obreschkow	The message of cold gas in the nearby Universe
18:20-18:30	Thijs van der Hulst	Meeting summary

4. Conference Participants

EWASS 2012 (Roma, 1-6 July 2012)

Symposium 3

Participants

1 Ruben	ANDREASYAN
2 Francesca	ANNIBALI
3 Philip	APPLETON
4 Hakim	ATEK
5 John	BECKMAN
6 Nadya	BEN BEKHTI
7 Burcu	BEYGU
8 Stefano	BIANCHI
9 Roy	BOOTH
10 Frederic	BOURNAUD
11 Elias	BRINKS
12 Enzo	BROCATO
13 Paula	BROCHADO
14 Barbara	CATINELLA
15 St�phanie	CAZAUX
16 Jonathan	CHARDIN
17 Francoise	COMBES
18 Carla	COPPOLA
19 Enrico M.	CORSINI
20 Thierry	COURVOISIER
21 Steve	CURRAN
22 Verena	DARMSTAEDTER
23 Kalliopi	DASYRA
24 Mauro	D'ONOFRIO
25 Bjorn	EMONTS
26 Ximena	FERNANDEZ
27 Bi-Qing	FOR
28 Filippo	FRATERNALI
29 Priscila	FREITAS-LEMES
30 Katinka	GEREB
31 Neeraj	GUPTA
31 Leonid	GURVITS
32 Seyit	HOCUK
33 Laura	HOPPMANN
34 Natasha	HURLEY-WALKER
35 Marek	JAMROZY
36 Eva	JUETTE
37 Alvaro	LABIANO
38 Matthew	LEHNERT
39 Federico	LELLI

EWASS 2012 (Roma, 1-6 July 2012)

Symposium 3

Participants

40 Savino	LONGO
41 Luciano	LORENZI
41 Maxim	LYUTIKOV
42 Wjtold	MACIEJEWSKI
43 Manuela	MAGLIOCCHETTI
44 Antonino	MARASCO
45 Karen	MASTERS
46 Giorgio	MATT
47 Alexei	MOISEEV
48 Raffella	MORGANTI
49 Danail	OBRESCHKOW
50 Tom	OOSTERLOO
51 Svea	PROFT
52 Claudio	RICCI
53 Wolfgang	SCHMIDT
54 Paolo	SERRA
55 Joe	SILK
56 Monica	TOSI
57 Alessio	TRAFICANTE
58 Sotira	TRIFOURKI
59 Freeke	VAN DE VOORT
60 Thijs	VAN DER HULST
61 Anne	VERHAMME
62 Dmitry	VIBE
63 José M.	VILCHEZ
64 Gerard	WILLIGER
65 Lisa	YOUNG

R Morganti