

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

**TITLE:** Astrochemistry in the ALMA Era

**DATE:** *28 – 31 JANUARY 2013*      **TIME:** (WHOLE DAY)

**LOCATION:** *COPENHAGEN, DENMARK*

**MEETING WEBPAGE** *<http://youngstars.nbi.dk/alma2013/Home.html>*

**HOST INSTITUTE:** *STAR AND PLANET FORMATION CENTER, UNIV OF COPENHAGEN*

**PARTICIPANTS NO:** *57*

## REPORT:

### 1. Agenda and/or programme of the meeting

<http://youngstars.nbi.dk/alma2013/Program.html>

### 2. Scientific Summary

The first three days of the workshop were dedicated to presentations and discussions about science themes related to projected astrochemistry studies using ALMA as well as lessons learned from Herschel. The 11 invited talks and 22 contributed talks covered aspects concerning astrochemistry in the environments of young low- and high-mass and evolved stars, comets and in extragalactic regions. Also, a number of talks described recent laboratory and modelling efforts. Although early in the life in ALMA a number of speakers could already show results from first ALMA observations as part of science verification and cycle 0 programs. These results all demonstrated the great potential for ALMA for astrochemical studies.

One of the key purposes of the workshop was to discuss the interaction between laboratory and observational astrophysics communities; for example, in terms of defining the relevant scientific questions and the needs in terms of data (line lists and collision rates, for example) for interpreting the wealth of data coming from ALMA. The first data for example already illustrate the need for wide variety of spectral line observations that has previously only been considered to a smaller degree, for example for vibrationally excited states and isotopologues. Another issue that was discussed at the workshop was the infrastructure needs for ALMA - for example, the accessibility of new data and the possibilities for searching in the ALMA archive. All of these issues have been taken-up in three lively plenum discussions and are being summarized in a white paper that will be circulated for comments from the community.

The fourth day of the workshop was dedicated to hands-on demonstration of three packages (ARTIST, CASSIS and XCLASS in CASA) usable for quantitative analysis of submillimeter observations with a particular eye on astrochemistry. Each of the three packages was briefly presented, and afterwards the participants were divided into separate groups where they had the chance to play around with the different tools. The participants were enthusiastic about these sessions even though it was only possible to scratch the surface of possibilities with the different tools.

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

See attached list.

### 4. Financial Report / RadioNet3 contribution

RadioNet3 supported the travel expenses in Copenhagen for two young researchers:

Rebeca Aladro (ESO): approx DKK 1650 - hotel

Aleksi Suutarinen (Open University, UK): approx DKK 2180 – Hotel

TBC: RadioNet3 also supported the expenses for the organization of refreshments during the workshop.

### 5. Conference Proceedings and Web page

The tools and exercises using during the tutorial are available at the webpage:

<http://youngstars.nbi.dk/alma2013/Links.html>

No proceedings have been planned for this workshop.

# Participants in *Astrochemistry in the ALMA Era* Copenhagen January 28th-31st, 2013

Rebeca Aladro	ESO-Chile
Suzanne Bisschop	Centre for Star and Planet Formation, Copenhagen University
Dominique Bockelee-Morvan	Observatoire Paris-Site de Meudon
Christian Brinch	Niels Bohr Institute & Centre for Star and Planet Formation
Jane Buckle	Cavendish Laboratory, University of Cambridge
Emmanuel Caux	IRAP
Jose Cernicharo	CSIC Centro de Astrobiologia
Steven Charnley	NASA Goddard Space Flight Center
Rumpa Choudhury	I. Physikalisches Institut der Universität zu Köln
Yanett Contreras	CSIRO
Martin Cordiner	NASA Goddard - Astrochemistry Laboratory
Audrey Coutens	Niels Bohr Institute & Centre for Star and Planet Formation
Maria Drozdovskaya	Leiden Observatory
Alexandre Faure	Observatory of Grenoble
Cecile Favre	Department of Astronomy - University of Michigan
Siyi Feng	Max-Planck Institute for Astronomy
David Field	Institute for Physics and Astronomy, Aarhus University
Francesco Fontani	INAF - Arcetri Observatory
Helen Fraser	Open University, Astronomy Division
Søren Frimann	Niels Bohr Institute & Centre for Star and Planet Formation
Robin Garrod	Cornell
Wolf Geppert	Stockholm University
Maryvonne Gerin	LERMA
Javier Goicoechea	CAB CSIC-INTA
Viviana Guzman	IRAM
Henrik Hartman	Lund Observatory
Jes Jørgensen	Niels Bohr Institute & Centre for Star and Planet Formation
Heidi Korhonen	Niels Bohr Institute
Johan Lindberg	Centre for Star and Planet Formation, Copenhagen University
Harold Linnartz	Leiden University
Darek Lis	Caltech
Julie Maria Lykke	NBI/Starplan
Diego Mardones	Universidad de Chile /Astronomy Dept
Laurent Margules	University of Lille
Sergio Martin	ESO
Joseph Mottram	Leiden Observatory

Sebastien Muller	Onsala Space Observatory
Holger Müller	I. Physikalisches Institut der Universität zu Köln
Birgitta Nordström	Niels Bohr Institute
Laurent Pagani	LERMA/Observatoire de Paris
Magnus Persson	Centre for Star and Planet Formation
Jaime E. Pineda	ESO & UK ARC Node, University of Manchester
Jill Rathborne	CSIRO Astronomy and Space Science
Peter Schilke	I. Physikalisches Institut der Universität zu Köln
Gwendoline Stephan	I. Physikalisches Institut der Universität zu Köln
Alexi Suutarinen	The Open University/Department of Astronomy
Leonardo Testi	ESO
Tomoya Tokudome	Department of Physics, University of Tokyo
Ewine van Dishoeck	Leiden University
Charlotte Vastel	IRAP
Susanne Wampfler	StarPlan Copenhagen
Yoshimasa Watanabe	Department of Physics, University of Tokyo
Susanna Widicus Weaver	Emory University
Laurent Wiesenfeld	Laboratoire d'Astrophysique Grenoble
Eva Wirström	Department of Earth and Space Sciences/Onsala Space Observatory, Chalmers
Friedrich Wyrowski	Max-Planck Institute for Radioastronomy
Satoshi Yamamoto	Department of Physics, University of Tokyo

On behalf of the LOC & SOC...



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