

REPORT ON THE RADIONET3 NETWORKING ACTIVITY

TITLE: HIGH MASS STAR FORMATION: FROM LARGE TO SMALL SCALES IN THE ERA OF HERSCHEL AND ALMA.

DATE: 21-25 JAN. 2013

TIME: (WHOLE DAY)

LOCATION: *LEIDEN, THE NETHERLANDS*

MEETING WEBPAGE *<http://www.lorentzcenter.nl/lc/web/2013/542/info.php3?wsid=542>*

HOST INSTITUTE: *LEIDEN UNIVERSITY*

PARTICIPANTS NO: *49*

REPORT:

1. Programme of the meeting

See attachment

2. Scientific Summary

High mass stars are some of the most dynamic objects in our Galaxy. They are key ingredients for a number of astrophysical processes; from stirring up the gas in their surroundings to forming all heavy elements. They are key drivers of the evolution of galaxies, and it is their light that we use to study the distant universe. However, to date, we still do not understand how they form. High mass stars do not form as often as their lower mass counterparts, and their formation timescales are so short that they are already on the main-sequence by the time they are visible at optical wavelengths. Add to this the increased complexity of high mass stars forming in clustered environments, and it is clear that this is a much bigger problem to tackle than isolated low mass star formation. While great strides have already been made, in order to move the field forward we need to combine detailed studies with understanding of the global (Galactic) properties. The unprecedented sensitivities of Herschel and ALMA provide us with the tools to do this properly for the first time.

Herschel is enabling us to sample the peak of the spectral energy distributions of large numbers of embedded protostars and young stellar objects because of its high sensitivity, resolution and mapping speed. It is revealing the intricate nature of star formation and the impact it has on its environment. With full ALMA becoming available, we will soon be able to probe high-mass star formation (HMSF) deeper, further and in much greater detail than has ever been possible before. We are on a precipice of discovery. As a community, those of us studying high-mass star formation needed a venue to get together and discuss how to take the collective leap. We are a strong, dynamic and collaborative group of researchers, building on years of expertise. The purpose of the workshop was therefore to bring together the HMSF community for a week-long focused discussion of the field. Participants came from all over the world, although the majority are based in the EU. Our aim was to build consensus within the community with regards to our future goals, which requires input from theorists, modelers and observers alike. Each of these groups was well represented at the workshop.

We started the week by discussing large-scale structures, and continued to smaller scales as the week progressed, all the while looking at the properties of both the gas and dust in HMSF regions. Interspersed in these talks was plenty of time for discussions in both large and small groups.

There was general consensus among the participants as to how we think the field should move forward, some avenues of which will require large-scale coordinated effort to complete. The group recognized that when feasible, methyl cyanide could be included in future proposals. Choosing a common species between disparate science cases allows for the possibility of direct cross comparison amongst studies. The radiatively decoupled K-ladders of methyl cyanide transitions gives an excellent diagnostic of temperature, and there are many transitions available throughout each of the ALMA bands. It is a much higher density tracer than, for instance, ammonia and probes the physical conditions present in high-mass star forming regions of all ages.

We were very pleased with the enthusiastic and constructive discussions held during the workshop. We have high hopes for increased collaboration within our field, and that the quality of future observing proposals can only be enhanced by the consensus built at this workshop. We will go forward in a coordinated fashion, and this will enable a greater legacy quality to the data that we will obtain over the next few years.

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

Maite Beltran

(Firenze, Italy)

Henrik Beuther

Ian Bonnell

Sylvain Bontemps

Simon Bruderer

Riccardo Cesaroni

Antonio Chrysostomou

Timea Csengeri

Nichol Cunningham

James Dale

Maria Drozdovskaya

David Eden

Edith Fayolle

Siyi Feng

Gary Fuller

Ciriaco Goddi

Martin Hennemann

Tracey Hill

Melvin Hoare

Sana Hugues

Liz Humphreys

Katharina Immer

Katharine Johnston

Attila Juhasz

Lex Kaper

Pamela Klaassen

Carsten König

Steven Longmore

Gaius Manser

Luke Maud

Elisabeth Mills

Toby Moore

Frédérique Motte

Joseph Mottram

Quang Nguyen

Luong

Aina Palau

Nicolas Peretto

Michele Pestalozzi

Thomas Peters

Jaime Pineda

Rene Plume

Sarah Ragan

Jill Rathborne

Irene San Jose Garcia

Mark Thompson

James Urquhart

Floris Van der Tak

Malcolm Walmsley

Kuo-Song Wang

(Heidelberg, Germany)

(St Andrews, United Kingdom)

(Floirac, France)

(Garching, Germany)

(Firenze, Italy)

(Hatfield, United Kingdom)

(Bonn, Germany)

(Leeds, United Kingdom)

(Garching bei München, Germany)

(Leiden, Netherlands)

(Birkenhead, United Kingdom)

(Leiden, Netherlands)

(Heidelberg, Germany)

(Manchester, United Kingdom)

(Dwingeloo, Netherlands)

(Gif-sur-Yvette, France)

(Gif-sur-Yvette, France)

(Leeds, United Kingdom)

(Amsterdam, Netherlands)

(Garching, Germany)

(Bonn, Germany)

(Heidelberg, Germany)

(Leiden, Netherlands)

(Amsterdam, Netherlands)

(Leiden, Netherlands)

(Bonn, Germany)

(Garching bei München, Germany)

(Bedford, United Kingdom)

(Leeds, United Kingdom)

(Los Angeles, United States)

(Birkenhead, United Kingdom)

(Gif-sur-Yvette, France)

(Leiden, Netherlands)

(Toronto, Canada)

(Bellaterra, Spain)

(Gif sur Yvette, France)

(Rome, Italy)

(Zürich, Switzerland)

(Manchester, United Kingdom)

(Calgary, Canada)

(Heidelberg, Germany)

(Marsfield, Australia)

(Leiden, Netherlands)

(Hatfield, United Kingdom)

(Bonn, Germany)

(Groningen, Netherlands)

(Firenze, Italy)

(Leiden, Netherlands)



pp Pamela Klaassen

4. Financial Report / RadioNet3 contribution

Steven Longmore (ESO, Germany) and Malcolm Walmsley (Firenze, Italy) received funding for travel and hotel costs. This funding should cover 5 hotel nights and flights for each, totalling to less than 900 euro per person.

5. Conference Proceedings and Web page

The presentations are published on the workshop web page.

Program

Note: if you bring a poster this should be A0 (portrait) sized

Monday 21 January 2013

09:30- 10:30	Arrival and coffee
10:30- 10:45	Welcome by Henriette Jensenius of Lorentz Center
10:45- 11:00	Welcome by Joseph Mottram & Pamela Klaassen
11:00- 11:30	Invited Observational Overview: Mark Thompson
11:30- 12:00	Invited Theoretical Overview: Jim Dale
12:00- 13:30	Lunch@ Snellius Restaurant
13:30- 14:30	Group discussion (plenary), <i>moderator</i> Sarah Ragan
14:30- 15:00	Coffee/tea break
15:00- 16:30	Recent Survey Results:
15:00- 15:30	Invited review of Radio & sub-mm: Melvin Hoare
15:30- 16:00	Invited review of IR: Sylvain Bontemps
16:00- 16:20	Jill Rathborne
16:20- 17:20	End of Day Discussions (plenary)
17:30	Wine and Cheese Party @ Common Room

Tuesday 22 January 2013

09:00- 10:30	GMC & Clusters:
09:00- 09:30	Invited review: Ian Bonnell
09:30- 09:50	Martin Hennemann
09:50- 10:10	David Eden
10:10- 10:30	Tracey Hill
10:30- 11:00	Coffee/tea break
11:00- 12:00	Timescales:
11:00- 11:30	Invited review: Steven Longmore
11:30- 11:50	Katharina Immer
12:00- 13:30	Lunch@ Snellius Restaurant
13:30- 14:30	Small Group Discussions

14:30- 15:00	Coffee/tea break
15:00- 16:10	HC/UCHII Regions
15:00- 15:30	Invited review: James Urquhart
15:30- 15:50	Maite Beltran
15:50- 16:10	Katharine Johnston
16:10- 17:10	End of Day Discussions (plenary)

Wednesday 23 January 2013

09:00- 10:30	Interferometry of HMSF:
09:00- 09:30	Invited review: Henrik Beuther
09:30- 09:50	Riccardo Cesaroni
09:50- 10:10	Michele Pestalozzi
10:10- 10:30	Ciriaco Goddi
10:30- 11:00	Coffee/tea break
11:00- 12:00	ALMA Results & Capabilities:
11:00- 11:30	Invited review of recent ALMA results: Gary Fuller
11:30- 12:00	ALMA Capabilities: Liz Humphreys
12:00- 13:30	Lunch@ Snellius Restaurant
13:30- 14:30	Small group discussions
14:30- 15:00	Coffee/tea break
15:00- 16:30	ALMA Q & A: <i>moderator</i> Malcolm Walmsley
16:30- 17:30	End of Day Discussions (plenary)
19:00- 21.30	Workshop dinner @ Restaurant Olivier

Thursday 24 January 2013

09:00- 10:30	RT Modelling & CASA Simulator:
09:00- 09:30	Invited tutorial on RT modeling: Simon Bruderer
09:30- 10:00	Invited tutorial on ARTIST and LIME Attila Juhasz
10:00- 10:30	Invited tutorial of the CASA simulator: Pamela Klaassen

10:30- 11:00	Coffee/tea break
11:00- 12:00	MYSOs:
11:00- 11:20	Luke Maud
11:20- 11:40	Irene San-Jose Garcia
12:00- 13:30	Lunch@ Snellius Restaurant
13:30- 14:40	Largescales:
13:30- 14:00	Invited review: Rene Plume
14:00- 14:20	Edith Fayolle
14:20- 14:40	Nicholas Peretto
14:40- 15:10	Coffee/tea break
15:10- 16:30	Small Group Discussions

Friday 25 January 2013

09:00- 10:30	Triggering and Feedback:
09:00- 09:30	Invited review: Jim Dale
09:30- 09:50	Toby Moore
09:50- 10:10	Quang Nguyen Luong
10:10- 10:30	Thomas Peters
10:30- 11:00	Coffee/tea break
11:00- 12:00	Small Scale Chemistry:
11:00- 11:20	Nichol Cunningham
11:20- 11:40	Kuo-Sung Wang
11:40- 12:00	Timea Csengeri
12:00- 13:30	Lunch@ Snellius Restaurant
13:30- 14:30	Summaries of Proposals, <i>moderator</i> Lex Kaper
14:30- 15:00	Coffee/tea break
15:00- 16:30	Final Discussions

---- End of workshop ----