

Daria Dall'Olio – Curriculum Vitae

- *PhD in Astronomy: defense scheduled for 26 October 2020*
I am currently a PhD student in Astronomy at Chalmers University of Technology, Gothenburg, Sweden.
Thesis title: “Magnetic fields around massive protostars as traced by masers and dust emission”. Supervisor: Prof. Wouter Vlemmings.
- Parental leave from June 2019 to January 2020, part-time parental leave until September 2020.
- *Licentiate degree in Astronomy, August 2017.*
Thesis title: “Methanol masers reveal the large scale magnetic field of the high mass protostar IRAS 18089-1732”. Supervisor: Prof. Wouter Vlemmings.
- *Laurea (master) degree in Astronomy at the University of Bologna.*
Thesis title: “IRAS16293-2422 as seen with ALMA: chemistry and morphology”.
Supervisor: Prof. Loretta Gregorini; co-supervisor: Dr. Jeremie Boissier; also with the co-supervision of the Italian ALMA Regional Centre.
- Born on 19 November 1981 in Ravenna, Italy. Italian citizenship.

Contact

Chalmers University of Technology
Onsala Space Observatory
Observatorievägen 90, Råö
Onsala, Sweden

email: daria.dalolio@gmail.com

Presentation

I obtained my Master degree in Astronomy at the University of Bologna, Italy, in 2013. Then in September 2014, I started my PhD at Chalmers University of Technology, in Göteborg, Sweden. The topic of my research is star forming regions and protostars. During the master thesis I studied the low mass protostar IRAS 16293-2422 and its chemistry as seen by ALMA. Working at my master thesis was for me a very fascinating research, since I discovered that pre-stellar cores are an important chemistry laboratory. They exhibit emission from complex organics molecules (COMs), a number of which might have been implied in the chemical process that led to the development of DNA and life forms. My thesis was the first one done under the supervision of the Italian ARC.

During my PhD, I had the chance to expand my knowledge about the ALMA observatory and the topic of star formation research, focusing on massive protostars and on the role played by magnetic fields in their formation. The Onsala Space Observatory hosts the Nordic ARC and I feel that not only I contributed with my expertise to the researching group but also I acquired the best experience and capabilities to become an excellent researcher. I started collaborations with several researchers abroad, that became coauthors of my proposals and papers. Between 2017 and 2018 I was awarded 6 travel grants, allowing me to participate and present my work in 5 different conferences.

Schools and conferences

- 2018 - *14th European VLBI Network Symposium & Users Meeting*, plenary talk “Revealing magnetic fields towards massive protostars: a multi-scale approach using masers and dust”, Granada, Spain;
- 2018 - *XXX IAU General Assembly*, contributed talk “Revealing magnetic fields towards

- massive protostars: a multi-scale approach using masers and dust” , Vienna, Austria;
- 2018 – *Communicating Astronomy to the Public 2018* meeting, plenary talk “Costellazione Manga: a space journey through animation, comics and astronomy”, Fukuoka, Japan;
 - 2018 - *High Mass Star Formation workshop 2018*, contributed talk “An ALMA view of magnetic fields in the massive star forming region” G9.62+0.20, Yamaguchi, Japan;
 - 2017 – *IV Workshop on millimetre and submillimetre astronomy in Italy* , contributed talk “Revealing the magnetic fields in massive protostars”, Bologna, Italy;
 - 2017 – *IAU Symposium 336 "Astrophysical Masers: Unlocking the Mysteries of the Universe"*, poster “Methanol masers reveal the large scale magnetic field of the high mass protostar IRAS 18089-1732” , Cagliari, Italy;
 - 2017 – “*Big Questions in Astrophysics- Knut and Alice Wallenberg Foundation*” conference - Lund , Sweden;
 - 2016 – “*Surveys for all*” conference - poster: “Feedback in Massive Star Formation: eMERLIN maser polarization observations”, Lund , Sweden;
 - 2016 – “*Origin of Habitable Planets*” conference, Göteborg, Sweden;
 - 2015 - *Astronomdagarna* – poster: “Feedback in Massive Star Formation: eMERLIN maser polarization observations” , Uppsala, Sweden;
 - 2015 – “*45th Young European Radioastronomers Conference*”, contributed talk “Feedback in Massive Star Formation: eMERLIN maser polarization observations”, Ventspils, Latvia;
 - 2015 – “*Soul of high mass star formation*” conference, poster “Feedback in Massive Star Formation: eMERLIN maser polarization observations”, Puerto Varas, Chile;
 - 2013 – “*LVII Congresso SAI*” – conference of the Italian Astronomical Society, Bologna, Italy;
 - 2011 – *International Training School “Astrochemistry with ALMA”*, held in Bologna, Italy.

Invited talks and seminars

September 2018 – “Revealing magnetic fields towards massive protostars: a multi-scale approach using masers and dust”, Osservatorio Astrofisico di Arcetri, Firenze;

March 2018 – “Magnetic fields in high-mass star-forming regions” , NAOJ - Mitaka campus, Tokyo, Japan;

November 2017 – “Magnetic fields in massive star formation”, Osservatorio Astrofisico di Arcetri, Firenze;

June 2013 – “The low mass protostellar core IRAS16293-2422 as seen with ALMA”, National Observatory of Athens – Institute of Astronomy, Astrophysics, Space Applications and Remote Sensing (NOA/IAASARS), Greece.

Computer skills

- Astronomical Software: CASA, AIPS, ParselTongue, GILDAS.
- Programming: Python.
- Operating system: MacOS, Linux, Windows.
- Softwares: office, graphics software (gimp, inkscape, krita).

Languages

- Italian: native speaker
- English: fluent both in reading and speaking
- Swedish: basic knowledge
- Japanese: basic knowledge (writing system, elementary grammar).

Teaching experience

2016 – assistant teacher for the course of Image processing (Prof. Alessandro Romeo) at Chalmers University of Technology.

Observing experience

2015, 2016: astronomer on duty at the APEX telescope in Atacama, Chile.

Grants and awards

- 2018 – I was awarded a travel grant from Chalmerska forskningsfonden for the CAP meeting, Japan;
- 2018 – I was awarded a travel grant from the Åforsk foundation for the CAP meeting, Japan;
- 2018 – I was awarded a travel grant from RadioNet for the EVN User meeting, Spain;
- 2018 – I was awarded a travel grant from IAU for the IAU General Assembly, Austria;
- 2017 – I was awarded a travel grant from RadioNet for a workshop in Italy;
- 2017 – I was awarded a travel grant from IAU for their Symposium 336 in Italy.

Other skills

I have good drawing skills, both on physical media and digital, also using Wacom tablets. I applied my knowledge in star formation to draw images that were used by teachers at schools and in the planetarium. I also contributed with images to press release of papers published in the magazine Nature.

As an example, this is a video where I'm drawing live, realized for the press release of a paper published in Nature Astronomy : <https://youtu.be/2X2d5ZbTdlY> .

Communicating Astronomy with the public

I think that science communication is a core value for a researcher. Before I began my PhD, I had been involved in intensive activities in communicating science and astronomy, publishing outreach papers and organizing shows in the planetarium of my home town.

I strongly believe that being able to communicate my own research is an important skill which needs to be constantly improved. It allows me to describe my work in an interesting and convincing manner to other scientists, and also to people with different levels of knowledge. For this reason I've been interested in pedagogy and in teaching methodology, and I have successfully attended the courses about teaching, learning and evaluation and about public speaking and presentation techniques offered by Chalmers University of Technology. I had the chance to directly apply what I have learnt about pedagogy during my PhD, when I acted as teacher assistant for the course of “Image processing”. For that occasion, I investigated the most effective way to convey messages to students. Therefore I have matured a consistent background on education. Moreover I won two grants to participate at the CAP meeting in Japan in March 2018, where I had the chance not only to increase my expertise in the field of astronomy communication and astronomy education, but

also to present my project "Manga Constellation" in a plenary talk. The project concerns the popularization of astronomy through Japanese comics and animation (manga and anime), and it is described in two refereed papers entitled "Costellazione Manga" (published in the Italian journal "Giornale di Astronomia" in 2015), and "Costellazione Manga: Explaining Astronomy Using Japanese Comics and Animation" (published in the IAU's CAP Journal, 2018). "Manga Constellation" is a quite unique project, due to the fact that I make a use of an innovative and non-conventional way to light up the curiosity for science, i.e. through astronomical references presented in Japanese comics and animations.

Public outreach activities

- 2014 to present – outreach activities at the Onsala Space Observatory, such as open days, guided tours, popular talks, lectures for visitors and student class. I'm also part of the organizing group of the "*Astronomy on Tap*" events in Göteborg, for which I drew the logo. These activities are under the supervision of Dr. Robert Cumming, communications officer of the Onsala Space Observatory, Sweden;
- 2011 to present – I'm the creator and the leader of the project "Costellazione Manga: a space journey through Japanese comics and animation";
- 2009 to present – Public conferences, outreach events, planetarium shows, activities for schools and public sky observations organized in collaboration with the Planetarium of Ravenna, Italy;
- 2009 to present – Outreach articles published on: "Oculus Enoch", magazine of the Planetarium of Ravenna; "Astronomia UAI", magazine of the Italian amateur astronomers union; "Il giornale di Astronomia", magazine of the Italian Astronomical Society;
- 2015 – As a member of the Radionet3 QueSera group I helped in the production of the outreach comic on EVN history "Eagle View Network", and I helped in the organization of the meeting of the group held at the Onsala Space Observatory, Sweden.

Topic of my talks or articles are astronomical news and issues of the latest scientific discovery. Example of titles of conferences or events are "Molecular clouds and protostars: cocoons of life" where I described the latest discoveries made by ALMA; "One, no-one, one hundred thousand... a journey in the elementary particles world" and "Quantum mechanics made simple and attractive" where I guided the participants in the fascinating world of quantum mechanics; "A star trekking for the new natural environment guide", where I showed the constellations to the natural guides, pointing out the "zoo" living in the starry sky and the mythology related to these figures; "A day as an astronaut" where I explained the work and the life of an astronaut in space, organizing a cosplay in a Lunar setting; "The sky of the samurais" where I described the traditional Japanese constellations, and differences and similarities between European and East Asia culture.

I also proposed conferences about the cultural impact of the astronomical activities in society. For example in "Not only science with SKA" I pointed out the connections with art, music and traditions, precious links with local cultures in Africa and Australia. In "The SKA eye and the astronomy of the future" I analyzed the impact of building new big observatory on scientific networks and the problems of dealing with an huge amount of data; in "Ethic and Sustainable development in Astronomy", I investigated the impact of building telescopes in remote places and the problems occurring to preserve the natural environment and the culture of the local inhabitants and the accessibility of the astronomical data to the other scientist and public.

Other activities

I have many interests, both inside and outside astrophysics. I have organized and realized events about astronomy, natural environment, and Japanese culture, each time trying to join different realities of my home town. I have built a network of collaborations that has become strong and fertile during the years. I devoted many resources to acquire competence about the natural environment of my country in order to obtain the license of Natural Environment Guide. I am active in public outreach of astronomy and physics: I guide public observations of the sky and I hold conferences and talks at the Planetarium of Ravenna. After a permanence of about 9 months in Japan, I started to popularize many aspects of the Japanese culture with the Association for cultural exchanges between Italy and Japan (ASCIG) of Ravenna.

Hereafter is a list of selected activities that I organised and led:

- 2007–2020 – “Japanese October Festival” – Ravenna, Italy – activity of the association for Italian–Japanese cultural exchanges (ASCIG) of Ravenna. In collaboration with the General Japanese Embassy of Milan and the Japanese Institute of Culture of Rome.
- 2010–2014 – Natural Environment Guide – in collaboration with the Italian State Forestry Corps, guides and public activities in the pinewoods and dunes of the Natural Park “Delta del Po” of Ravenna, Italy.
- 2008–2014 – Organization of “Festival Naturae” – Lido di Classe, Italy – held yearly every July. It includes guided tours in the pinewood in collaboration with the Italian State Forestry Corps.
- 2011 – Guidebook Publication – “Walking in the Pinewood”– A short guidebook (16 pages) about the natural pinewood environment of Ravenna, Italy (Italian language).

Göteborg, 26 August 2020

Daria Dall'Olio