



# Dr. Dario Colombo

## Curriculum Vitae

### Experience

- 2015–today **Postdoctoral Researcher, working in the sub-mm/mm department**, MAX PLANCK INSTITUTE FOR RADIO ASTRONOMY, Germany.
- 2014–2015 **Postdoctoral Fellow, working with Prof. E. Rosolowsky**, UNIVERSITY OF ALBERTA, Canada.

### Education

- 2010–2013 **Doctor of Science (PhD in Astronomy)**, UNIVERSITY OF HEIDELBERG, Germany.  
Grade – Magna cum Laude (1.4)
- 2007–2010 **M.sc. in Astrophysics and Space Physics**, UNIVERSITY OF MILANO-BICOCCA, Italy.  
Grade – 110/110
- 2003–2006 **B.sc. in Physics**, UNIVERSITY OF MILANO-BICOCCA, Italy.  
Grade – 103/110

### Theses

- Title *Gas organization in M51 - The impact of spiral arm dynamics on Giant Molecular Cloud properties*
- Referees Prof. Dr. H-W. Rix and PD Dr. J. Heidt
- Supervisor Dr. Eva Schinnerer
- Description Analytical study of the atomic and molecular gas relationships with the large scale dynamics of a spiral galaxy.
- Title *Study of TRL calibration at low temperature for CMB polarization devoted experiments*
- Referee Prof. Dr. Massimo Gervasi
- Description Experimental study of the influence of cryogenic calibration setups on the cosmic background radiation polarization measurements using real and simulated data.
- Title *Study of long-term stability of MIPol polarimeter through the 1/f noise spectrum*
- Referee Prof. Dr. Massimo Gervasi
- Description Preliminary data analysis of the first observation campaign for the MIPol instrument for the measurement of the cosmic background radiation polarization.

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📄 dcolombo.github.io

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## Awards

- 2016 IAA 2016 Award - Outstanding Publication in Astrostatistics by a PostDoc
- 2013 221st AAS Meeting - Chambliss Astronomy Achievement Student Awards
- 2010–2013 Member of the International Max Planck Research School (IMPRS)
- 2003–2005 University of Milano-Bicocca CIDI S Scholarship
- 2003 “Famiglia Legnanese” Association Scholarship
- 2003 APIL Distinguished High School Student Award

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## Relevant lectures, seminars & outreach talks

### Lectures

- Title *“IRAM 30m Summerschool 2019”*, school
- Description Invited lecturer and exerciser for “Nearby galaxies” class.
- Data & place September 2019; Granada, Spain
- Title *“Machine Learning: The elegant way to extract information from data”*, school
- Description Two blackboard lectures with focus on clustering, support vector machines, and artificial neural networks.
- Resources <https://blog.mpifr-bonn.mpg.de/imprs/events/event/maschine-learning/>
- Data & place February 2016; Bonn, Germany

### Seminars

- Title *“AstroDat 2019”*, workshop
- Description Invited talk: “Spectral Clustering for Interstellar Molecular Emission Segmentation”.
- Data & place November 2019; Saclay, France
- Title *“EWASS 2019 - SS33”*, conference
- Description Invited review: “A brief journey across machine learning tools in astronomy”.
- Data & place June 2019; Lyon, France

### Outreach

- Title *“AstronomiAmo”*, online event
- Description Invited talk: “Astronomy and AI: how machines learn about stars”.
- Data & place November 2020; Online
- Title *“UofA observing night”*, outreach event
- Description Invited talk: “Recognizing patterns in the sky”.
- Data & place February 2015, Edmonton, Canada

### Interdisciplinary

- Title *“Bocconi University interdisciplinary lectures”*, course lecture
- Description Invited seminar for accounting students: “Machines learn Astronomy”.
- Data & place October 2019; Milano, Italy
- Title *“Rethinking the Impact of Liberal Arts I: Astronomy”*, conference
- Description Invited seminar for literature students: “Recognizing patterns in the sky”.
- Data & place July 2018; Cologne, Germany

## Relevant project involvement

### Observational – as PI

- Title *“Unveiling the inside-out star formation quenching of green valley galaxies”*  
Description 30 quenching nearby galaxy to be observed across the L-band with JVLA; 120 hours
- Title *“Resolving the star formation quenching mechanisms of green valley galaxies”*  
Description 10 quenching nearby galaxy to be observed in  $^{12}\text{CO}$  with NOEMA; 50 hours
- Title *“Understanding star formation quenching in nearby galaxies with APEX”*  
Description 450 nearby galaxy centers observed in  $^{12}\text{CO}$  with APEX; 450 hours
- Title *“Structure, Excitation and Dynamics of the Inner Galactic Interstellar Medium (SEDIGISM)”*  
Description High resolution  $^{13}\text{CO}$  observation of the Milky Way IV quadrant with APEX; 780 hours

### Observational – as Co-I

- Title *“Outer Galaxy High Resolution Survey (OGHReS)”*  
Description High resolution  $^{12}\text{CO}$  observation of the Milky Way III quadrant with APEX; 800/1300 hours
- Title *“Molecular Line Emission as a Tool for Galaxy Observations (LEGO)”*  
Description Mapping of several molecular clouds across the 3 mm window with IRAM30; 430 hours
- Title *“Star-formation quenching in nearby galaxies”*  
Description HI mapping of 37 nearby galaxies at different evolutionary stages with uGMRT and VLA; 100+72 hours
- Title *“The Extragalactic Database for Galaxy Evolution (EDGE)”*  
Description Large CO lines mapping of CALIFA galaxies with CARMA and ACA; 760+144 hours

### Computational – as PI

- Title *“Spectral Clustering for Interstellar Molecular Emission Segmentation (SCIMES)”*  
Description Molecular cloud identification through dendrogram, graph theory, and clustering  
Github <https://github.com/Astroua/SCIMES>  
Documentation <https://scimes.readthedocs.io/en/latest/>
- Title *“Data reduction pipeline for IRAM 30m”*  
Description Data reduction pipeline for multi-line data which combines python and GILDAS CLASS  
Availability not released yet
- Title *“Radio frequency interference (RFI) filtering routine”*  
Description RFI identification routine for Effelberg C-band data based on support vector machines  
Availability not released yet
- Title *“70  $\mu\text{m}$ -dark source identification routine”*  
Description identification of 70  $\mu\text{m}$ -dark regions based on morphological reconstruction  
Availability not released yet

## Mentorships

PhD Thesis *“A high resolution view of the LMC and SMC molecular clouds with LAsMA”*

Candidate MSc Konstantin Grishunin

Supervisors A. Weiss, D. Colombo

Period January 2020 – today

MSc Thesis *“The SEDIGISM survey: the morphology of the molecular clouds in the inner Galaxy”*

Candidate BSc Kartik Rajan Neralwar

Supervisors D. Colombo

Period October 2019 – today

## IT skills

Programming PYTHON, IDL, BASH

System Mac OS X, UNIX (Linux), Microsoft Windows

Typesetting L<sup>A</sup>T<sub>E</sub>X, Office

Packages GILDAS, CASA, sklearn, skimage, networkx

Others Github, DS9, Gimp, iMovie

## Languages

Italian **Mothertongue**

English **Negotiating level**

German **Basic**