

## CURRICULUM VITAE

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### Personal details

- *Name:* Andrea Bracco
- *Date and place of birth:* July 15, 1986 – Rome, Italy
- *Nationality:* Italian
- *Place of work:* Rudjer Bošković Institute, Bijenička cesta 54, 10000, Zagreb, Croatia
- *Current position:* Marie Skłodowska-Curie fellow
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- *GitHub:* <http://github.com/abracco/cosmicodes>

### Research experience

- **February 2020 – present:** Marie Skłodowska-Curie fellow at Rudjer Bošković Institute (Zagreb, HR) with the MUSICA project, MSCA grant agreement No. 843008.
- *November 2018 – January 2020:* postdoctoral researcher LPENS within the French national grant ANR-BxB led by Francois Boulanger.
- *October 2017 – September 2018:* postdoctoral researcher at Nordita under the supervision of Axel Brandenburg
- *April 2015 – September 2017:* postdoctoral researcher at IRFU/CEA Saclay (France) within the ERC-grant ORISTARS led by Philippe André
- *January 2015 – March 2015:* researcher at Institut d’Astrophysique Spatiale (IAS) (Orsay/France)
- *December 2011 – December 2014:* PhD in Astrophysics at Institute d’Astrophysique Spatiale (IAS) (Orsay/France) within the ERC-grant MISTIC  
*Thesis title:* ‘Statistical properties of the Galactic magnetic field observed with the *Planck* satellite’  
*Supervisor:* François Boulanger (CNRS, IAS)
- *February 2010 – August 2010:* visiting researcher at University of California Irvine (UCI, CA, USA) under the supervision of Professor Asantha Cooray (UCI)

### Higher education

- *December 2008 – November 2011:* M.S. in Astronomy and Astrophysics at ‘La Sapienza’ University of Rome (Italy). *Thesis title:* ‘Statistical Properties of Galactic Cirrus in the GAMA-9 hour Science Demonstration Phase Field’.  
*Grade:* 110/110 cum laude. *Supervisor:* Alessandro Melchiorri (INFN, Italy).
- *September 2005 – November 2008:* B.S. in Physics and Astrophysics at ‘La Sapienza’ University of Rome (Italy). *Thesis title:* ‘Formation of large scale structures’.  
*Grade:* 110/110 cum laude. *Supervisor:* Alessandro Melchiorri (INFN, Italy).

### Patents, Grants, and Achievements

- 2019: *Marie Skłodowska Curie (MSC) individual fellowship* with the *MUSICA* project on the origin of magnetic structures in the diffuse interstellar medium obscuring the *Cosmic dawn* (€ 147,463.68, Period: 2020-2022, at Roger Bošković Institute, Zagreb, Croatia).
- 2019: “*Cosmologie et structuration de l’Univers*”, action of the Paris Observatory (€ 2,500)
- 2018: “*Gruber Cosmology Prize 2018*”, <http://gruber.yale.edu/cosmology/2018/planck-team>
- 2017: *Seal of Excellence*, MSC proposal 2016
- 2016: *Qualification aux fonctions de maître de conférences*, French qualification for academic teaching
- 2009: AST (Italian federate Athenaeum of Science and Technology), grant for master thesis abroad (€ 2.821)
- 2005/06, 2006/07, 2007/08, ENEA (Italian national agency): merit-based grants of € 568, € 568, € 600, respectively

### Teaching, Tutoring, and Outreach

- 2019: **co-supervision** of one master student (Marta Colakovic-Benceric) from the Erasmus+ program
- 2019: “*Nébuleuse*”, **outreach program** in Astronomy in collaboration with Radio Royans and the ChänChän artistic group (<https://www.radioroyans.fr/evasions-sonores-et-loisirs/nebuleuse.html>)
- 2014: teaching assistant at University Paris-Sud for ‘Methodologie en Cosmologie’ (Computational methods in Cosmology) in the context of the Master 2 NPAC (<http://npac.lal.in2p3.fr/home/>), **40 hours**

### Responsibilities: refereeing and organization experience

- 2019: organization of the journal club, *AstroLunch*, at LPENS
- 2018: member of the scientific organizing committee (SOC) of the **focus meeting (FM4)** on magnetic fields in star formation during the 2018 IAU General Assembly (<https://escience.aip.de/iau30-fm4/>)
- Several referee experiences for the following journals: **Astronomy & Astrophysics (A&A)**, **Astrophysical Journal (ApJ)**, **Nature Astronomy**

### Observational expertise

- 2019: **PI**, together with J. Dawson, **of ongoing observations (170 hours)** with the Parkes telescope, on the origin of translucent molecular clouds in the diffuse ISM
- 2018: **PI** of one accepted proposal (**17.5 hours**) with the BLAST-TNG balloon-borne experiment for far-infrared polarization measurements of a star-forming region. *Postponed for technical problems of the balloon*
- 2015-2017: **3 weeks** of commissioning for the NIKA2 mm-camera (total intensity and polarization) at IRAM-30m telescope (Granada, Spain). Experience in the acquisition process of the data and in their preliminary reduction through the pipeline
- 2013: **53 hours** as co-PI for radio spectroscopic observations at IRAM-30m telescope (Granada, Spain), ‘Probing the formation of filamentary and clumpy structures in the Polaris flare’, PI: D. Arzoumanian

I took part in the realization of several observational proposals **accepted** by the following international facilities:

- 2 with IRAM-30m
- 2 with LOFAR
- 1 with ATCA
- 1 with Mopra
- 2 with PARKES (**co-PI on going**)
- 1 with BLAST-TNG (**PI on going**)
- 1 with Nobeyama
- 1 ALMA (PI A. Maury)

### **Major collaborations**

**I am involved, and I have extensively contributed, to existing and future big observational facilities that are of great interest for the French community:**

- **December 2011 - present:** the *Planck* consortium  
**Role:** Analysis of the statistical properties of the data in polarization at high frequency. I produced template modeling of the Galactic signal in polarization for foreground removal in CMB-cosmology.
- **September 2014 - present:** the NIKA2 consortium  
**Role:** Commissioning of NIKA2 detectors in polarization: three-week experience at the telescope site; beam characterization; contribution to and testing of the acquisition pipeline. **The commissioning phase in polarization is still ongoing.** Definition of the large program in polarization called B-FUN (PI. Ph. André) to measure the orientation of interstellar magnetic fields in molecular clouds.
- **December 2015 - present:** *Herschel* Gould Belt Survey  
**Role:** Calibration of the SPIRE-*Herschel* fluxes based on the *Planck* data. Writing of the UPHO (Using *Planck* and *Herschel* for ORISTARS) pipeline, now property of CEA-Saclay (**Bracco et al. in prep.**).
- **January 2018 - present:** SKA science working group “Cosmic Magnetism”.  
**Role:** Participation to the regular meetings and to the definition of the science cases on the Galactic magnetic field. Contribution to the writing of the White Book of “Maison SKA-France”.
- **November 2018 - present:** LOFAR magnetism key science project (MKSP)  
**Role:** Analysis of the statistics of the data in polarization with the High-Band Array (HBA). Modeling for foreground removal for extragalactic signals: EoR, Intensity mapping, primordial magnetic fields.
- **November 2019 - present:** SPICA interstellar medium and star formation science working group.  
**Role:** Writing of the White Book for the B-BOP polarizer. Contribution to the Galactic polarization science case for the Yellow Book for the ESA M5-Mission.

I gave several talks in *internal meetings* of the collaborations during the following periods:

- *Planck* Collaboration: July and September 2012; April 2013; March 2015.
- NIKA2 Collaboration: May 2016, November 2017.
- *Herschel* SPIRE Specialist Astronomy Group 3 (SAG 3): December 2016, June 2018.

### **IN SHORT: seminars, scientific publications, conferences, schools**

- **11** invited seminars in international institutes.
- **34** publications in international refereed journals, **6** as first author, **1** conference proceeding.  
*Astrophysics Data System (ADS)* statistics: **1398 citations, h-index of 18**
- **20** scientific contributions (talks/posters) in international conferences.
- **5** participations in international schools and programs.

**Invited seminars** (reverse chronological order)

- *'Exploring the cosmos through the magnetized interstellar medium'*. 24 September 2019 @ **Observatory of Cagliari (Cagliari, Italy)**
- *'The magnetized & diffuse interstellar medium through Faraday tomography of the radio sky'*. 5 April 2019 @ **LERMA (Paris, France)**
- *'Exploring the cosmos through the magnetized interstellar medium'*. 14 December 2018 @ **Macquarie University (Sydney, Australia)**
- *'Ongoing work on E-B modes of dust polarization: observations and modeling'*. 14 June 2018 @ **IRAP (Toulouse, France)**
- *'Faraday tomography of the diffuse, magnetized, ISM'*. 13 March 2018 @ **ENS (Paris, France)**
- *'The Planck era: a new perspective on the magnetized interstellar medium'*. 30 March 2017 @ **IAS (Orsay, France)**
- *'And now for something completely different: exploring interstellar magnetic fields in the Milky Way'*. 30 November 2016 @ **University of Rijeka (Rijeka, Croatia)**
- *'And now for something completely different: exploring interstellar magnetic fields in the Milky Way'*. 29 November 2016 @ **RBI (Zagreb, Croatia)**
- *'The role of the interstellar magnetic field in the formation of matter structures as seen by Planck'*. 19 January 2015 @ **CITA (Toronto, Canada, <https://www.youtube.com/watch?v=v6Mn4WqvOzc>)**
- *'Statistical analysis of the relative orientation between the magnetic field and dust filaments as seen by Planck'*. 13 November 2014 @ **MPIfR (Bonn, Germany)**
- *'Statistical analysis of the relative orientation between the magnetic field and dust filaments as seen by Planck'*. 7 novembre 2014 @ **LERMA (Paris, France)**

**Contributions in scientific conferences** (reverse chronological order)

- **Poster**. *Exploring the Infrared Universe: The Promise of SPICA*. Crete, Greece. 20-23 May 2019.
- **Poster**. *New Science enabled by New Technologies in the SKA Era*. Manchester, UK. 8-12 April 2019.
- **Invited Talk**. *First TagKASI International Conference: Cosmic Dust and Magnetism*. Daejeon, South Korea. October 30 - November 2, 2018.
- **Talk**. *The Dynamical Universe for All*. Lund, Stockholm. 5-6 February 2018.
- **Invited Talk**. *Phase transition in Astrophysics, from ISM to planets*. Stockholm, Sweden. 7-13 May 2017.
- **Talk**. *6 years of ISM-SPP*. Cologne, Germany. 13-17 February 2017.
- **Talk**. *PCMI: AstroLille 2016*. Lille, France. 24-28 October 2016.
- **Talk**. *VIA LACTEA 2016*. Rome, Italy. 26-30 September 2016.
- **Talk**. *Star Formation 2016*. Exeter, United Kingdom. 21-26 August 2016.
- **Talk**. *Star formation, magnetic fields, and diffuse matter in the Galaxy*. Madison, USA. 23-27 May 2016.
- **Poster**. *Magnetic Fields in the Universe IV: From Laboratory and Stars to the Primordial Structures*. Cargèse, France. 5-9 October 2015.
- **Poster**. *IAU XXIX General Assembly*. Honolulu, USA. 3-7 August 2015.
- **Talk**. *Workshop on Interstellar Magnetic Fields*. Toulouse, France. 27-29 April 2015.
- **Talk**. *AAS 225th meeting*. Seattle, USA. 4-8 January 2015.

- **Poster.** *PLANCK 2014 - The microwave sky in temperature and polarization.* Ferrara, Italy. 1-5 December 2014.
- **Poster.** *PCMI: AstroRennes 2014.* Rennes, France. 27-30 October 2014.
- **Poster.** *GESF2014: From Galactic to Extragalactic Star Formation.* Marseille, France. 8-12 September 2014.
- **Poster.** *OSSF14: The Olympian Symposium on Star Formation.* Paralia Katerini, Greece. 26-30 May 2014.
- **Poster.** *Magnetic Fields in the Universe IV: From Laboratory and Stars to the Primordial Structures.* Playa del Carmen, Mexico. 4-8 February 2013.
- **Talk.** *Elbereth 2012 - Conference of PhD students in the Paris Area.* Paris, France. 11-14 December 2012.

#### **Attended summer schools and programs** (reverse chronological order)

- *5th LOFAR data processing school.* Dwingeloo, the Netherlands. 17-21 September 2018.
- *The interstellar medium beyond 3D.* Orsay, France. July 2017.
- *School-Workshop on polarization with ALMA.* Bologna, Italy. 25-28 June 2013.
- *International Young Astronomer School: Exploiting the Herschel and Planck data.* Sevres, France. 15-19 April 2013.
- *Astronomical data analysis (ADA) 7th Conference.* Cargèse, France. 14-18 March 2012.

#### **Languages and computational skills**

- Italian (**native**), English (**fluent**), French (**fluent**).
- *Programming:* IDL, Python, Fortran.
- *Operating systems (OS):* Linux, Macintosh, Windows.

#### **Reference contacts**

- François Boulanger: [francois.boulanger@ens.fr](mailto:francois.boulanger@ens.fr)
- Philippe André: [philippe.andre@cea.fr](mailto:philippe.andre@cea.fr)
- Axel Brandenburg: [brandenb@nordita.org](mailto:brandenb@nordita.org)

#### **Other activities**

- *May 2018 - September 2018:* volunteer for the Cyklopen association in Stockholm, Sweden, (<http://cyklopen.se/>)
- *October 2015 - August 2017:* volunteer and manager of volunteers for ‘Péniche du coeur’, soup kitchen and social residence in Paris hosting 80 people (<http://penicheducoeur.unblog.fr/>).
- I am a passionate amateur photographer who participated in several photo-contests accomplishing one photo-exhibition in the Paris area (<https://www.lensculture.com/andrea-bracco>).