CV Michele Bianco

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I am fourth year PhD student, part of the Reionization group lead by Prof. Ilian T. Iliev, in the Astronomy Centre at the University of Sussex. My main focus is the study of the Epoch of Reionization (EoR). With the help of Radiative Transfer and N-body simulations, I provide numerical support for the Low-Frequency Array (LOFAR) and Square Kilometre Array (SKA) EoR experiments.

Personal Data
Date of birth: July 10th, 1990, Sorengo, Ticino, Switzerland
Citizenship: Swiss, Italian
Languages: Italian (Native), English (fluent), French (fluent), German (good), Spanish (reading)

Education

- **PhD in Astrophysics**: [2017 - to date]
  Astronomy Centre, University of Sussex, Brighton, United Kingdom
  Thesis title: *"Signatures of Cosmic Reionization"*
  Supervisor: Prof. Ilian T. Iliev
- **MSc in Astrophysics**: [2015 - 2017]
  Ludwig-Maximillians-University LMU, Munich, Germany
  Thesis title: *"The Effect of Large Scale Structure Correlation on the Halos Cluster Counts"*
  Supervisor: Prof. Jochen Weller
- **BSc in Physics & Mathematics**: [2011 - 2014]
  University of Fribourg UNIFR, Fribourg, Switzerland

Employments & Academic Experiences

- **Max-Planck Institute for Astrophysics, Munich:**
  LTA program, fieldwork experience [Mar. 2020 - Sep. 2020]
  Project: *"The Effect of Cosmological Parameters on Reionization Observables"*, with the associated researcher Dr. Benedetta Ciardi.
- **University of Stockholm:**
  LTA program, fieldwork experience [Set. 2019 - Feb. 2020]
  Project: *"Deep Learning methods applied to the Epoch of Reionization"*, in collaboration with the reionization group of Prof. Garrelt Mellema
- **University of Sussex:**
  Assistant tutor, *Introduction to Astrophysics* [Winter Semester 2018]
  Led problem-solving workshop and marked the undergraduate year
  Assistant tutor, *Mathematical Methods for Physics* [Winter Semester 2018]
  Led problem-solving workshop and marked the undergraduate year
- **Swiss Army:**
  Fulfilment of the Swiss military service [2014-2015]
  Fusilier Battalion 30/3, Recruit Company 11-3/1

- **University of Fribourg:**
  Assistant tutor, *Physics I & II* exercises [2013-2014]
  Led problem-solving workshop for bio-physics undergraduate year
  Assistant tutor, *Practical Laboratory* for first year [2013-2014]
  Led practical experiment workshop for bio-physicist undergraduate year

Publications & Collaborations

- *Deep learning approach for identification of* H II *regions during reionization in 21-cm observations*
  Monthly Notices of the Royal Astronomical Society, **Submitted**: 12 February 2021
  Neural Information Processing Systems NIPS 2021, under registration, arXiv:2102.06713
  Michele Bianco, Sambit. K. Giri, Ilian T. Iliev and Garrelt Mellema

- *Impact of inhomogeneous subgrid clumping on cosmic reionization II: modelling stochasticity*
  Monthly Notices of the Royal Astronomical Society, **Submitted**: 8 February 2021, arXiv:2101.01205
  Michele Bianco, I. T. Iliev, Yi Mao, J. Koda, P. R. Shapiro, Sambit. K. Giri

- *Impact of inhomogeneous subgrid clumping on cosmic reionization*
  Monthly Notices of the Royal Astronomical Society, Volume 491, Issue 2, January 2020, Pages 1600–1621, **Published**: 24 October 2019, DOI:10.1093/mnras/stz2986,
  Yi Mao, J. Koda, P. R. Shapiro, I. T. Iliev, G. Mellema, H. Park, K. Ahn and **M. Bianco**

Scholarship & Grants

Listed in reverse chronological order. Grants on High-Performance Computers show the principal investigator (PI), I participated as project Co-Investigator (CoI).

- JUWELS (Jüulich, Germany) CoI (PI: S. Gottl öober): computing time grant 10/20 - 10/21
  Tier-0, project *"Near Field Cosmology"* (3.5M core-h + 0.1M GPU-h = Euro 175,000)

- DECI0380 CoI: (PI: I. Iliev) Partnership for Advanced Computing in Europe (PRACE) 07/19 - 11/20
  Tier-1 (DECI-15 program), project *"SubgridEoR"* (20.16M core-h, standartised hours)

- SNIC 2019/1-19 CoI: (PI: G. Mellema) SNAC computing time grant 07/19 - 01/20
  Tier-1 SNIC Large Compute, project *"The end of cosmic reionization"* (2.5M core-h)

- JUWELS (Jülich, Germany) CoI: (PI: I. Iliev): computing time grant 07/18 - 10/19
  Tier-0 project (3.5M core-h = 175,000€)

- Long Term Attachment LTA grants program (1 years, 12,000£ per annum) 01/19 - 07/20

- Member of the Royal Astronomical Society RAS since Feb. 2018

- STFC travel grants (3.5 years, 1,250£ per annum) 09/17 - 03/21

- STFC astronomy PhD research grants (4 years, 15,000£ per annum) 09/17 - 09/21

Skills

My technical and languages skills, as well as a list of Super Computers I had access during my PhD.

- **High Performaces Computers:**
  Beskow & Tegner, CRAY XC40, KTH PCD Center 2019
  Kay, Irish Centre for High-End Computing 2019
  Marconi, CINECA italian scientific community 2019
  Jureca & Juwels, Jülich Research on Exascale Cluster Architectures JSC 2019
  Piz Daint, Swiss National Supercomputer Centre CSCS 2018
  MareNostrum IV (2017), Barcellona Supercomputing Centre BSC 2018
  APOLLO Cluster, permanent account at the University of Sussex 2017

- **Coding languages:**
  Python (NumPy, Pandas, SciKit, TensorFlow, Keras), Fortran, C/C++, HTML/CSS, Java, Batch Script

- **Astronomical and Scientific tools:**
  DS9, TopCat, Aladin Sky Atlas, LaTex, R, Matlab, Wolfram Mathematica, Maple (2017)

- **Visualization tools:**
  VTK, MayaVi

- **Languages**:
  Italian: Native Language
  English: IELTS (B2), test date: June 27, 2015
  French: Advanced level (school, academic year at UNIFR)
  German: Advanced level (school, academic years at LMU and UNIFR)
  Spanish: Basic level (school)
  Slovenian: understanding and use of some common words (personal interest)
  Japanese: understanding of basic component of the Japanese writing system (personal interest)

Conferences & Workshops

- *SAZREC: The 21-cm Signal from Cosmic Dawn and the Epoch of Reionisation* meeting at IIT Indore, gave a talk: *"Machine learning approach for identification of H* II *regions during reionization in 21-cm observations"*, Online 2021
- *Observing First Billion Year of the Universe* meeting at IIT Indore, gave a talk: *"Modelling Recombinations in Large EoR Simulations"*, Indore IN, 2020
- *NGCM Summer Academy*, workshop on VTK, ML and GPU acceleration, Southampton UK, 2019
- *EuroHPC & PRACEdays19*, HPC user meeting, gave a talk: *"Multi-scale Reionization"*, Poland, 2019
- *PRACE Winter School 2019*, Introduction to Machine Learning for Scientists, Belgium, 2019
- *Parallel and GPU Programming in Python*, PRACE training held by SURFsara, the Netherlands, 2018
- *GPU Programming with CUDA*, PRACE training held by EPCC at Imperial College London, UK, 2018
- *South Coast Cosmology*, gave a talk: *"Sub-grid Recombination in EoR Simulations"*, Brighton UK, 2018

- *RAMSES User Meeting 2018*, organized by the Centre de Recherche Astrophysique Lyon, France, 2018
- *LOFAR-EoR Plenary Meeting 2018*, Groningen, Netherlander, 2018
- *MPI, OpenMP and Advanced Topics in Parallel Programming*, held by HLRS Stuttgart, Germany, 2017

References

- **Prof. Ilian T. Iliev** (PhD supervisor), University of Sussex, Sussex House, Falmer Brighton, BN1 9RH United Kingdom; email: I.T.Iliev@sussex.ac.uk, telephone: +44 1273 873737
- **Prof. Garrelt Mellema** (LTA PhD supervisor), Stockholm University, SE-106 91 Stockholm, Sweden; email: garrelt.mellema@astro.su.se, telephone: +46 08-553 785 52
- **Dr. Benedetta Ciardi** (LTA PhD supervisor), Max Planck Institute for Astrophysics, Karl-Schwarzschild Straße 1, D-85748 Garching, Germany; email ciardi@mpa-garching.mpg.de, telephone: +49 89 30000 2018
- **Prof. Jochen Weller** (MSc supervisor), Universitäts-Sternwarte, Ludwig-Maximilians-Universität München, Scheinerstr. 1, D-81679 München, Germany; email jochen.weller@usm.lmu.de, telephone: +49 89 2180 5976