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I am a second-year PhD student, part of the Reionization group lead by Prof. Ilian T. Iliev, in the Astronomy Centre at the University of Sussex. I am very keen on solving problems with a scientific approach and I have a particular interest in numerical simulation and statistical analysis. My best traits are versatility, punctuality and rigour. I am also a teamwork enthusiast, able to communicate and cooperate with others to reach a common goal. During my PhD, I have worked under pressure and made decisions in stressful environments to respect deadlines and set objectives, producing work of scientific importance.

Education

- **PhD in Astrophysics** at Astronomy Centre, University of Sussex, United Kingdom [2017 - to date]
PhD focused on numerical aspect of the Epoch of Reionization, this involve the use of radiative transfer and N-body simulation. At the moment I am implementing the sub-grid inhomogeneity of large box ($500 \text{ Mpc}/h$, sample size of $O \sim 10^6$) inferring sub-grid distribution from smaller, high resolute simulation ($5 \text{ Mpc}/h$, sample size $O \sim 10^9$), for the C2-Ray code.
- **MSc in Astrophysics** at Ludwig-Maximilians-University LMU Munich, Germany [2015 - 2017]
Thesis title: *the Effect of Large Scale Structure Correlation on the Halos Cluster Counts*.
With the help of the *PINOCCIO* code, a semi-analytical N-body simulation that generate a merger history catalogues of cosmological dark matter halos. I studied the the statistical error of clusters number counts due the finite size of the measured Fourier mode of the power spectrum.
- **BSc in Physics & Mathematics** at University of Fribourg UNIFR, Switzerland [2011 - 2014]
Combined degree with major in Physics (150 ECTS) and minor in Mathematics (30 ECTS). Varying topics were discussed, from atomic physics to spectroscopy and an introduction to N-body problem, alongside with advance differential analysis, linear algebra and statistical methods with following practical laboratory for a total of 12 month long experiment.

Scholarship & Grants

- Member of the Royal Astronomical Society RAS since 8 Feb. 2018
- Long Term Attachment LTA grants program (1 years) from Jun. 2018 until Set. 2020
- STFC astronomy research grants (3.5 years) from 27 Sep. 2017 until 21 Mar. 2021

Skills

I have acquired a number of essential skills that support my current research:

- **High Performances Computers:**

I am working with a series of Supercomputers, part of the PRACE Consortium.

- Kay, Irish Centre for High-End Computing [started Jul. 2019]
- Marconi, CINECA italian scientific community [started Jan. 2019]
- Jureca, Jülich Research on Exascale Cluster Architectures JSC [ended Oct. 2019]
- Juwels, Jülich Wizard for European Leadership Science JSC [ended Oct. 2019]
- Piz Daint, Swiss National Supercomputer Centre CSCS [ended Feb. 2018]
- MareNostrum IV (2017), Barcellona Supercomputing Centre BSC [ended Feb. 2018]
- APOLLO Cluster, permanent account at the University of Sussex [started Set. 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 (6.5/9, B2), test date: June 27, 2015
 - French: Advanced level (school, academic year at UNIFR)
 - German: Advanced level (school, academic years at LMU and UNIFR)
 - Slovenian: understanding and use of common words (personal interest)
 - Mandarin: recognise and understanding of basic Chinese characters (personal interest)

Publications & Collaborations

- *Impact of inhomogeneous subgrid clumping on cosmic reionization*, [arXiv:1906.02476](https://arxiv.org/abs/1906.02476)
Yi Mao, J. Koda, P. R. Shapiro, I. T. Iliev, G. Mellema, H. Park, K. Ahn and M. Bianco
- *Impact of inhomogeneous subgrid clumping on cosmic reionization II: modelling stochasticity*, [arXiv:pending](#), Michele Bianco, I. T. Iliev

Employments & Academic Experiences

- University of Stockholm:
 - LTA program, fieldwork experience [Set. 1th to Mar. 1th]
 - Collaboration with the reionization group of Prof. 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:
 - On duty as soldier, Fusilier Battalion 30/3, Recruit Company 11-3/1 [2014-2015]
Fulfilment of the required military service
- 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
 - Physic Students Council Cashier

Conferences & Workshops

- *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

- Professor Ilian T. Iliev,
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- Professor Garrelt Mellema,
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- Professor Jochen Weller
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- Professor Philipp Aebi
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