

# Edoardo Altamura

🏠 Flat 154A, 78 Grafton St, M13 9LR, Manchester, UK

☎ +44 (0) 7561598515

📧 edoardoaltamura

✉ edoardo.altamura@student.manchester.ac.uk

🌐 <https://www.linkedin.com/in/edoardoaltamura/>

## EDUCATION

### MPHYS (HONOURS) IN PHYSICS AND ASTROPHYSICS

Manchester, UK

THE UNIVERSITY OF MANCHESTER ▶ SCHOOL OF PHYSICS AND ASTRONOMY

9/2015 – 7/2019

- **OVERALL EXPECTED GRADE:** First Class (Exams transcript to be attached.)
- **FOLLOW-UP ACADEMIC POSITION:** Ph.D. in Theoretical Astrophysics and Computational Cosmology 2019 – 2023  
Position confirmed at the Jodrell Bank Centre for Astrophysics – Cosmology and Extra-galactic Astrophysics group.
- **MASTER PROJECT THESIS:** Substructure in hydrodynamical simulations of galaxy clusters  
By using hydrodynamical simulations of galaxy clusters drawn from the  $\Lambda$ CDM model, the project aims at studying the morphology and evolution of substructures, representing local groups of galaxies. Their interactions with more massive objects largely determine the dynamical processes responsible for shaping the small-scale structures of the Universe. As part of the computational astrophysics and cosmology group at Jodrell Bank Centre for Astrophysics, we use the MACSIS and C-Eagle simulations to probe the properties of substructures, while gaining expertise in numerical analysis, big data programming, presentation of results and science communication.
- **MAIN ACADEMIC PROJECTS:** HI Radio Milky Way survey profiling: used the Jodrell Bank 7-meter telescope to conduct HI observations to be calibrated and analysed with ad hoc Python pipelines. | Computational Methods for Cepheid Variables study in M68 using HST data: developed a period-folding algorithm, based on SAO Image DS9 and Python, for estimating the lightcurve parameters of cepheid variables. | High-Resolution Gamma-ray Spectroscopy of  $^{137}\text{Cs}$ -contaminated soils: estimated the activity of Cesium-contaminated samples and probed the detector sensitivity limit by analysing the  $^{40}\text{K}$  gamma-emission from samples of *Musa Acuminata*. | Solar Physics and narrowband telescopes: developed a calibration/stacking procedure and applied advanced astrophotography techniques, previously used in several independent works.

### SCIENTIFIC HIGH SCHOOL DIPLOMA

Macerata, ITALY

SCIENTIFIC HIGH SCHOOL “GALILEO GALILEI”

9/2010 – 7/2015

- **FINAL GRADE:** 100/100
- **EXAMINATION THESIS:** Chaos and non-linearity in science, philosophy and arts
- **INTERNATIONAL EXPERIENCE:** National High-School Model United Nations (New York City, US) 2014 - 2015

## RESEARCH & WORK EXPERIENCE

### OPTOELECTRONICS RANK PRIZE INTERNSHIP | THE UNIVERSITY OF MANCHESTER

Manchester, UK

- **Project:** Rapid Multispectral Photovoltaic Performance Mapping using Structured Light Illumination  
Assessing the energy-conversion efficiency of different sectors of a solar cell is crucial for characterising and minimising defects and impurities in the semiconductor substrate. This project focused on obtaining the efficiency map across photovoltaic cells, with the ultimate aim of optimising the device performance while keeping low manufacturing costs.
- **Position and contributions:** my role as a research intern involved developing and testing new techniques for mapping the efficiency of a photovoltaic cell, ensuring fast computation time, reliable and stable low-noise output and industrial-grade scalability. The hardware and software introduced were based on research-grade oscilloscopes and source-meters, single-board computers, GPIO device connectivity, Debian-based Linux distributions, low-level Python and C++ programming.
- **Academic collaboration:** as part of the Optoelectronic Materials Spectroscopy Group, I was exposed to a highly collaborative and stimulating environment, where teamwork was key for sharing the members' achievements in meetings, reports, reviewing articles and in delivering presentations.

### CERTIFIED SCHOOLS SCIENCE TUTOR | MYTUTOR & MANCHESTER TUTORS

Manchester, UK

Completed nearly 100 hours of teaching for the subjects Mathematics, Physics, Geography and Chemistry at GCSE, A-Levels and IB levels. A thorough plan for every tutoring session and adjusting the advancement according to the student's progress significantly improved my organisation skills, explanation clarity and flexibility to adapt to different scenarios in the shortest time, while boosting my tutees' achievements and curiosity in the subjects covered. Furthermore, teamwork has often demonstrated to be essential in the interactions with other fellow tutors, coordinators and company managers.

**HIGH-ENERGY ASTROPHYSICS INTERNSHIP** | INAF/IUSS – PAVIA INSTITUTE FOR ADVANCED STUDIES AND INAF/IASF NATIONAL INSTITUTE FOR ASTROPHYSICSPavia and Milan  
ITALY

6/2016 – 8/2016

- **Project and position:** I worked as a collaborator in the *EXTraS – Exploring the X-ray Transient and variable Sky* project, in partnership with the extragalactic high-energy astrophysics research group at IASF-Milan. The project involved the use of Unix bash-scripts, TopCat, Python GUIs and VNCs.
- **Academic collaboration:** the truly engaging research group significantly stimulated me in sharpening my learning curve in X-ray astrophysics and high-performance computing, while becoming part of a network of researchers and devolving my best efforts in contributing to the project.
- **Contributions:** the major result of my research at IUSS involved the construction of a catalogue of 300+ X-ray transient sources candidates, which were captured by the XMM-Newton Space Observatory and identified via Bayesian algorithms implemented in the ICARO (IUSS node) computing cluster. Such catalogue was created to allow the EXTraS collaborators to correlate its objects with the candidates from different independent searches, with the aim of identifying and probing shock-breakout extragalactic supernovae.

**SALTARA SUMMER INTERNSHIP** | MUSEO DEL BALI' ASTRONOMICAL OBSERVATORYSaltara (PU)  
ITALY

6/2014 – 7/2014

I collaborated in the development of astronomy-related projects for high-school students, with the aim of both promoting public scientific outreach and encouraging the teaching of astronomy and astrophysics within the Italian education system. The success of such initiative is evident in the large attendance at the Saltara Summer School of Astrobiology 2014. I was responsible for the commissioning and testing of the observatory facilities, including CCDs, spectrometers, absolute encoders and software drivers.

**HIGH-SCHOOL WORK EXPERIENCE** | INAF – ITALIAN NATIONAL INSTITUTE FOR ASTROPHYSICS

Bologna, ITALY

4/2014 – 6/2014

I was responsible for the construction and commissioning of the 3-meter teaching radio-telescope, while developing calibration schedules and statistical data reduction procedures using OriginLab and MATLAB. Furthermore, I familiarised myself with the Linux OS for data analysis in IRAF, acquired optical images and spectra with the 1.52-meter Cassini telescope at Loiano Astronomical Observatory, and ultimately characterised solid-state CZT detectors for hard X-ray detection using radioactive isotopes.

**LANGUAGES, SKILLS & ACTIVITIES**

<b>LANGUAGES</b>	<ul style="list-style-type: none"> <li>• <b>ENGLISH</b> (FLUENT – C1 LEVEL)</li> <li>• <b>FRENCH</b> (INTERMEDIATE – B1 LEVEL)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>ITALIAN</b> (NATIVE SPEAKER)</li> </ul>
<b>IT SKILLS</b>	<b>Python</b> (advanced)   <b>C++</b> (advanced)   <b>Mathematica</b> (advanced)   <b>MATLAB</b>   <b>LaTeX</b>   <b>Ruby</b>   <b>Linux/Unix</b> (Debian-based & Scientific Linux)   <b>Windows</b> programming   <b>Git</b>   <b>MS Office</b> (ECDL certificate) & <b>Visual Studio</b>   <b>Single-Board Computers and Microcontrollers</b> (Arduino, Raspberry PI, Beagle Bone)   <b>Adobe Creative Cloud</b>   <b>AutoCAD</b>	
<b>AWARDS &amp; HONOURS</b>	<ul style="list-style-type: none"> <li>– <b>Rank Research Prize</b> (Optoelectronics)</li> <li>– <b>Richard Davis Prize</b> (Best experimental achievements, year 2)</li> <li>– <b>Don Butler Prize</b> (Best experimental achievements, year 1)</li> <li>– 29<sup>th</sup> Italian National Physics Olympiad – Bronze medal</li> <li>– GV Schiaparelli Prize (SAIt – Italian Astronomical Society)</li> <li>– 18<sup>th</sup> International Astronomy Olympiad – 3<sup>rd</sup> best observational round</li> <li>– 16<sup>th</sup> International Astronomy Olympiad – Bronze medal</li> </ul>	<ul style="list-style-type: none"> <li>Manchester, UK - 2018</li> <li>Manchester, UK - 2017</li> <li>Manchester, UK - 2016</li> <li>Senigallia, Italy - 2015</li> <li>Siracusa, Italy - 2014</li> <li>Vilnius, Lithuania - 2013</li> <li>Almaty, Kazakhstan - 2011</li> </ul>
<b>ACTIVITIES &amp; POSITIONS</b>	<ul style="list-style-type: none"> <li>• <i>Secretary</i> and <i>Vice-Chair</i> of the University of Manchester STEM Society</li> <li>• Peer Assisted Study Sessions – <i>PASS Leader</i> (School of Physics and Astronomy)</li> <li>• <i>Chair, Astrophotographer</i> and <i>Vice-Chair</i> of the University of Manchester Astronomy Society. <i>Speaker/manager</i> of the Astrophotography Talk &amp; Workshop Series 2016-17.</li> <li>• <i>Coordinator</i> of the Telemetry and Telecommunication division for the Mancunian Balloonian project – Manchester Students for the Development and Exploration of Space.</li> <li>• <i>Delegate</i> of the Democratic Republic of Latvia and member of the Legal Committee – National High School Model United Nations, NYC, US.</li> </ul>	<ul style="list-style-type: none"> <li>2017 – Present</li> <li>2016 – 2017</li> <li>2015 – Present</li> <li>2015 – 2016</li> <li>2014 - 2015</li> </ul>
<b>INTERESTS</b>	Astrophysics   Computer Science & Electronics   Music: piano & guitar   Stargazing & Photography   Science outreach and public speaking   Travelling   Hiking & Fitness	