Jakub Dranczewski

I am an undergraduate Physics student at Imperial College London with a passion for experimental investigation and threading interesting theory into it.

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Education

2017-2021 **MSci Physics student**, *Imperial College London.*

- First-Class Honours in year one (grade: 84.8%, ranked 2nd in year), year two (85.2%, ranked 2nd), and year three (84.54%, ranked 4th)
- Awarded the Ken Allen Prize for Academic Excellence (twice) and the Richard Learner Prize for Excellence in Second Year Laboratory.

2016-2017 **A Levels course**, *Dulwich College London.*

- Physics, Mathematics, Further Mathematics, Computer Science; A*A*A*A*.
- Course accelerated, completed in a year as a scholarship organised by the Polish Children's Fund.

2014-2016 **I Liceum Ogólnokształcące w Zielonej Górze**, *Polish high school.*

Research and Work Experience

2017–2020 **Teaching at the undergraduate and secondary school level**.

- Demonstrating for Year 1 Laboratory and the Python Helpdesk at Imperial College London (2020).
- Private tutoring of A Level students in Physics and Computer Science, including Python.

2.07 – 29.08.2020 **Remote Undergraduate Research Opportunities Programme (UROP) placement**, *Imperial College London.*

Supervisor: Prof. Roland A. Smith

- Produced a ray tracing solution for predicting optical trapping of arbitrarily-shaped targets, while gaining an understanding of the underlying Physics and applications.
- Project involved investigation of numerical methodology, ray and wave optics, accelerating Python code, and rotational dynamics through the use of quaternions.

5.08 – 27.09.2019 **Undergraduate Research Opportunities Programme placement with the Experimental Solid State group**, *Imperial College London.*

Supervisors: Dr Riccardo Sapienza, Dr Stefano Vezzoli

- Participated in multiple stages of research, from designing and preparing equipment and procedures, through taking measurements, to analysing data and applying existing theoretical models. Work contributed to a publication.
- Gained basic understanding of multiple concepts in nonlinear optics and nanostructure design, and applied it to various experiments.

6.08 – 28.09.2018 **Undergraduate Research Opportunities Programme placement with the Plasma Physics Group**, *Imperial College London.*

Supervisor: Dr Jack Hare, Prof. Sergey Lebedev

- Developed *Magic2*, a fully functional GUI program used in the research group for interferometry data processing, as well as other scripts used for data analysis. Work contributed to a publication.
- Maintenance work on the Mega Ampere Generator for Plasma Implosion Experiments (MAGPIE); gained insight into designing and building scientific equipment.

2016, 2017 **Research Internships in the Institute of Physics of the Polish Academy of Sciences**, *organised through the Polish Children's Fund.*

Supervisors: Dr Łukasz Kłopotowski, MSc Julia Miłosz, MSc Zygmunt Miłosz

- Three distinct placements in two laboratories, involved shadowing and independent experimental work related to measuring photoluminescence decays and spectra of quantum dots, as well as using a scanning tunneling microscope to image graphite.

2016–2017 **Research on the behaviour of ferrofluids in inhomogeneous magnetic fields, and on the balloon air horn**, *as part of preparations for the* International Young Physicists' Tournament *2017 finals in Singapore.*

- Created multiple experimental set-ups for measurements involving sound, surface tension, surface instability inspection, object tracking in video, magnetic permeability and fluid density.
- Organised the work of the whole group as the Captain of the United Kingdom team; developed public speaking and debating skills through the 'Physics Fight' format of the competition.

Publications

2020 **Efficient third harmonic generation from $FAPbBr_3$ perovskite nanocrystals**, *A. Rubino, T. Huq, J. Dranczewski et al.*, Journal of Materials Chemistry C 8, no. 45 (2020): 15990–95, https://doi.org/10.1039/D0TC04790B.

2019 **Two-colour interferometry and Thomson scattering measurements of a plasma gun**, *J. D. Hare, J. MacDonald, S. N. Bland, J. Dranczewski et al.*, Plasma Phys. Control. Fusion 61 085012, https://doi.org/10.1088/1361-6587/ab2571.

Achievements and Awards

2020 **International Research Opportunities Programme placement at the Massachusetts Institute of Technology (MIT)**, *including bursary of £5600*, cancelled due to Covid-19, part of funds granted for a remote UROP project at Imperial College London.

2019 **EPSRC Vacation Bursary**, *£2581*, funding for the UROP project with the Experimental Solid State Group.

2018, 2019 **Finalist (2018) and Runner-up (2019) in the Royal College of Science Union *Science Challenge***, for popular science videos on quantum algorithmics and strong AI.

2016–2017 **During the year in Dulwich College:**

- Finalist of the *BAFTA Young Game Designers Game Making Award*
- Gold and a Top 50 mark in the second stage of the *British Physics Olympiad*
- Team captain of team UK in the *International Young Physicists' Tournament* 2017 in Singapore
- Finalist of the *UK Bebras Computational Thinking Challenge*

2016 **Laureate of the second edition of the Adamed SmartUP scientific and educational programme**, awarded a personal tutoring programme, including participation in two editions of the *Science: Polish Perspectives* conference.

2014–2016 **Scholarship of the Marshal for the Lubusz Voivodeship (twice), The *Pasjopolis* scholarship**, *total of £1300*, awarded to students showing the best academic performance, future prospects, and passion for their field.

2013, 2014 **Laureate of the Junior High School Olympiads in Physics, Mathematics, Chemistry, and Polish Literature**, awarded on the voivodeship level, the *laureate* title grants exemption from Poland's GCSE-equivalent exams.

Skills

Programming **Fluent in Python (numpy/scipy, matplotlib, Jupyter Notebooks, data analysis, graphical interfaces)**, web development (JavaScript, PHP, MySQL), LaTeX, basic experience with C, C++, and Matlab.

Software **Experience with the Microsoft Office suite, Origin Pro for data analysis and graphing**, basic experience with LabView.

Electronics **Experience working with the Arduino platform, Raspberry Pi computers, low-level microprocessor programming**, as well as basic electronics.

Experiments **Worked with optical table equipment, short and high-energy laser pulses, oscilloscopes and signal generators, time tagged time-resolved data collection, computer measurement systems, and advanced imaging equipment (STM, SEM).**

Languages **English**, advanced (IELTS mark 8.5/9); **Polish**, native speaker; **German**, basic.

Volunteering and Interests

2019-2021 **Committee Member of the Imperial College Dramatic Society**.

- Taken on roles ranging from production manager to lighting designer for multiple shows and events, which all required detailed planning, team management, budgeting, creativity, and ability to work with a large variety of equipment (often at short notice).

2020-2021 **Imperial College Science Fiction and Fantasy Society's Systems Administrator**.

2014-2017 **Member of the *Młodzi Lokalni (Young Locals)* voluntary association**.

- Responsibilities included managing the web presence of the association, developing websites, creating graphic designs, and taking part in organisation of some city-wide events.

Hobbies **New technologies, photography, science-fiction and fantasy, art and poetry, cycling.**