Jakub Dranczewski

I am a Physics PhD student at Imperial College London and IBM Research Europe with a passion for experimental investigation and threading interesting theory into it.

+44 7440 348965
jakub.dranczewski@gmail.com
jdranczewski.github.io

Education

2021- **PhD student**, *Imperial College London & IBM Research Europe - Zürich*
Supervisors: Prof. Kirsten Moselund, Prof. Riccardo Sapienza

- H2020 Marie Skłodowska-Curie Innovative Training Networks project (GA no. 859841): "COntrolling network RAndom Lasers on chip" (CORAL)

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

- First-Class Honours, graduated top of the class, grade: 82.48%
- Masters thesis: *Time-Varying and Nonlinear Effects in an Indium Tin Oxide Nanolayer*
- Awarded the Abdus Salam Undergraduate Prize, Governors' MSci Prize in Physics, 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 – 29.07.2020 **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.
- Studied ray and wave optics, accelerating Python code, and quaternion-based rotational dynamics.

5.08 – 27.09.2019 **Undergraduate Research Opportunities Programme placement with the Experimental Solid State group**, *Imperial College London*
Supervisors: Prof. Riccardo Sapienza, Dr Stefano Vezzoli

- Gained basic understanding of multiple concepts in nonlinear optics and nanostructure design.
- Work involved designing and preparing experimental equipment and procedures, taking measurements, analysing data and applying existing theoretical models; contributed to a publication.

6.08 – 28.09.2018 **Undergraduate Research Opportunities Programme placement with the Plasma Physics Group**, *Imperial College London*
Supervisor: Dr Jack Hare

- Developed *Magic2*, a fully functional GUI programme used in the research group for interferometry data processing, as well as other scripts used for data analysis. Work resulted in 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 placements in two laboratories. Shadowing and independent experimental work related to measuring photoluminescence decays and spectra of quantum dots, as well as imaging graphite with a scanning tunneling microscope.

2016–2017 **Research on the behaviour of ferrofluids in inhomogeneous magnetic fields, and on the balloon air horn**, *as team UK Captain 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.

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).**

Nanofabrication — **Experience working in a research cleanroom environment**, work with plasma etching, material deposition, e-beam and optical lithography.

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

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

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*

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

Selected Publications

2023 — **Designed Semiconductor Network Random Lasers**, *D Saxena, A Fischer, J Dranczewski, WK Ng et al.*, Laser & Photonics Rev., 2024, 19, 2400623

2023 — **Plasma etching for fabrication of complex nanophotonic lasers from bonded InP semiconductor layers**, *J Dranczewski, A Fischer, P. Tiwari, M. Scherrer et al.*, Micro and Nano Engineering, 2023, 19, 100196

2022 — **Saturable Time-Varying Mirror Based on an Epsilon-Near-Zero Material**, *R Tirole, E Galiffi, J Dranczewski, T. Attavar et al.*, Phys. Rev. Applied, 2022, 18, 054067

2020 — **Efficient third harmonic generation from $FAPbBr_3$ perovskite nanocrystals**, *A Rubino, T Huq, J Dranczewski et al.*, J. Mater. Chem. C, 2020, 8, 15990-15995

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

Volunteering and Interests

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

- Production manager and lighting designer for multiple shows and events. Skills in detailed planning, team management, budgeting, creativity, and ability to work with a large variety of equipment.

2020-2021 — **Imperial College Science Fiction and Fantasy Society Systems Administrator**

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

- Web development, graphic design, part of organising teams for city-wide events.

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