

# Commercialisation & Impact

Gary BOORMAN  
RHUL and ANGARA Technology

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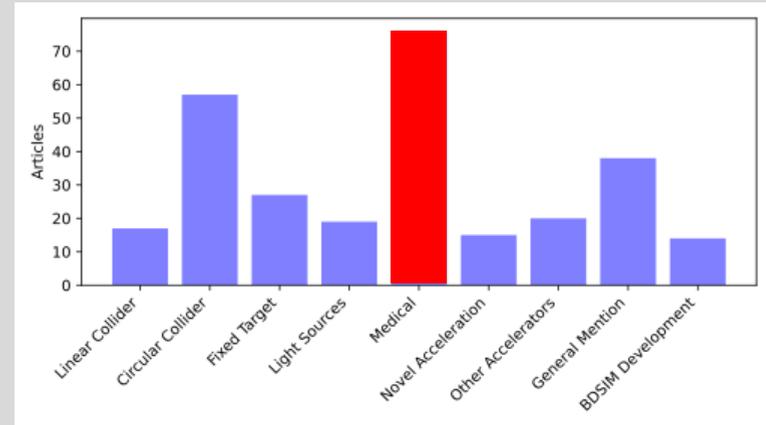
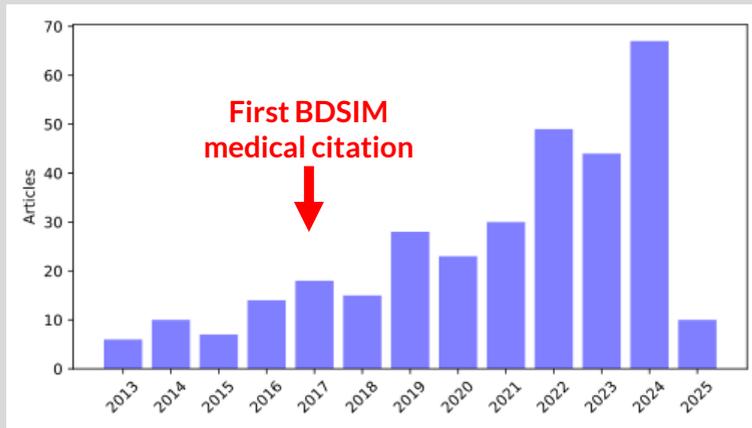
## Strategy

- The John Adams Institute for Accelerator Science is a centre of excellence in the UK for advanced and novel accelerator technology. The Institute provides expertise and training in accelerator techniques, participates in research and development, and **promotes advanced accelerator applications in science and society at large**.
- Seeking applications of accelerators in industry – developing new technology – engaging with industry / users when relevant
- No direct funding for commercialisation activity in JAI budget.
- JAI staff encouraged to apply for dedicated funds inc:
  - STFC Impact Acceleration Accounts held by universities - **£50k p.a.**
  - STFC Early Stage Research and Development scheme (on-hold)
  - STFC Late stage commercialisation (on-hold)
  - UKRI Proof of Concept fund (new)

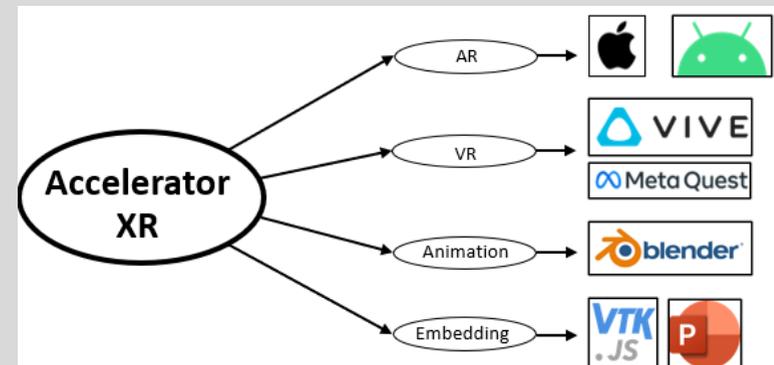
## RHUL Projects

### Beam Delivery Simulation (BDSIM)

- Internationally recognized & adopted accelerator physics tracking code
- 323+ citations of BDSIM since 2013 (collated from Google Scholar up to 23/04/25)



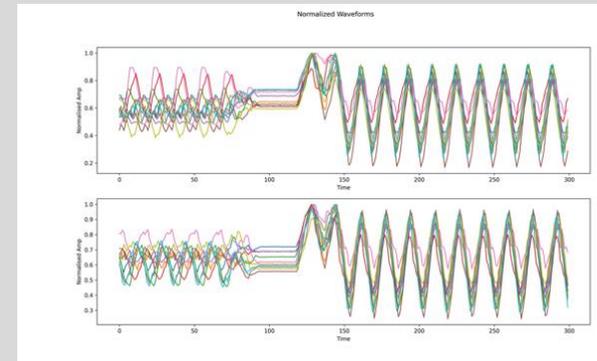
- Impact activity: Accelerator Extended Reality Showcasing accelerator technology to the general public through augmented and virtual reality
- Public Engagement opportunities:  
LhARA exhibition at the Great Exhibition Road Festival, June 2025 – VR video



## RHUL Projects

### Precision Cavity BPMs

- Project started by Alexey Lyapin and a PhD student
- Impact money from RHUL used to develop the required triggered phase-synchronised RF sources
- This RF source is of great interest to quantum computing researchers
  - Conversations had with RHUL condensed matter group
  - Discussion with researchers from Oxford Quantum Circuits
  - Survey of RF manufacturers and resellers at ARMMS conference and elsewhere – nothing like it on the market (Nov 2024)
- *Intention to submit* for UKRI funding to further develop and commercialise the RF source
  - Only one application from RHUL is permitted (UKRI rules) so entered internal competition against 13 other entries – results awaited
- Possible partnership with ANGARA Technology to develop control system



## RHUL Projects

### ANGARA Technology Sàrl

- Geneva-based consultancy created in May 2019 by two former CERN employees and RHUL project associate (PJAS)
- Primary focus is developing high-performance control and automation systems for
  - Big Physics labs
  - Universities
  - Hadron Therapy
  - Energy Distribution
  - Chemical and Mechanical Engineering
- Independent of JAI, but has close ties with both RHUL and JAI
- Six years of applying engineering/physics experience to commercial activities
- RHUL PhD student to work for us for a few months starting soon

## Oxford Projects

### Plasma-Modulated Plasma Accelerators (P-MoPA)

- Funded by STFC IAA to write a Pre-Conceptual Design Report for a 600MeV P-MoPA accelerator (patented) with estimates of size, cost, components, performance etc. and scaling to 300 MeV and 1 GeV energies
- P-MoPA driven by current, commercially available technology (1 Joule thin-disk laser with repetition rate of 1kHz)
- Comparison of toy-model P-MoPA with X-band EuPRAXIA accelerator and also P-MoPA-driven Compton source comparison with current Compton sources (STAR, SMART\* LIGHT)
- P-MoPA Commercialisation paper produced January 2025 with expert industry input by Christoph Quitmann identifying next steps
- A water window FEL based on P-MoPA would be the long term goal but an inverse Compton scattering source at 100-300 keV is the next step
- Further support and collaboration with STFC CLF is being explored

## Advisory Board Recommendations 2024

### Novel accelerator based cancer therapy systems

*“JAI staff should be encouraged to claim “inventorship” by publishing or patenting the results, even if “ownership” cannot be claimed for the JAI due to IP regulations at CERN and other collaboration partners”*

- Oxford Physics have devoted an area of their website to “Applications of Accelerators and Detectors to Cancer Treatment”, which includes all projects, people and publications from the Manjit Dosanjh Research Group.
- <https://www.physics.ox.ac.uk/research/group/applications-accelerators-and-detectors-cancer-treatment>

### Marketing for Cavity BPMs for FELs

*“JAI and FMB-Oxford could approach the smaller FEL projects, which do not have the resources to develop their own solutions for diagnostics e.g. TARLA (Turkey), PoFEL (Poland), Smart\*Light (The Netherlands), STAR (Italy), Thom-X (France), etc.”*

- Cavity BPMs are now available from FMB-Oxford

## Advisory Board Recommendations 2024

### **BDSIM as an example of a success story**

*“BDSIM is already a success as an open-source tool and should be used as an example of a success story in the STFC applications that benefits the community far beyond JAI.”*

- Survey of user community; user meeting

### **Spinout promotion**

*“The spin-outs Mach42 and Living Optics are positive signs and should be promoted internally to encourage other researchers to follow their example.”*

- These spinouts are discussed in the Graduate Course lecture ‘Commercialisation of Accelerator Technology’ and will feature in future JAI website updates and JAI LinkedIn news stories as they grow.

### **Grow JAI presence on LinkedIn**

*“Grow the channel membership and increase the content to keep in touch with alumni”*

- Followers have increased from 125 to 357 and new posts ~every 2 weeks.