Commercialisation & Impact

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Strategy

- JAI approach to Commercialisation

Highlight Projects

- Frequency Scanning Interferometry
- Novel accelerator based cancer therapy systems
- Composite Beampipe
- Precision cavity beam position monitors
- Beam Delivery Simulation

Other

- Spinouts
- Student training
- LinkedIn
- Feedback

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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 to STFC funds inc:
  - STFC Impact Acceleration Account £50k p.a. to each university (*On Hold*)
  - STFC's Early Stage R&D (TRL 1-5) (*On Hold since 2024*)
  - STFC CASE – industry studentship funding (*On hold since 2023*).
  - STFC Proof of Concept (TRL 5-7)

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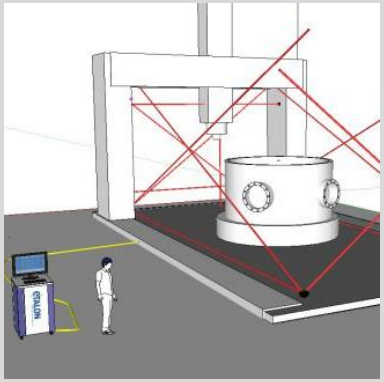
Projects - Frequency Scanning Interferometry

- Developed and patented frequency scanning (FSI) and phase modulation interferometry (PaMIr). Initially for ATLAS detector and ILC.
- Companies use Absolute Multiline for improved machining – knowing where all your machine tools are 0.5 µm per meter uncertainty.
- Commercialised through collaboration with Etalon, who licence, make and sell the *Absolute Multiline* product for industrial and scientific applications with sales ~£4M to customers inc. Siemens, General Electric
- The data acquisition elements further developed in collaboration with VadaTech UK, who now licence and make the MicroTCA – based DAQ system
- Collaboration is ongoing for further improvements (PaMIr)
- Also deployed at national standards laboratories (NPL, PTB, le cnam, INRiM), helping organisations around the world by improved calibration.

HEXAGON



Projects - Novel accelerator based cancer therapy systems

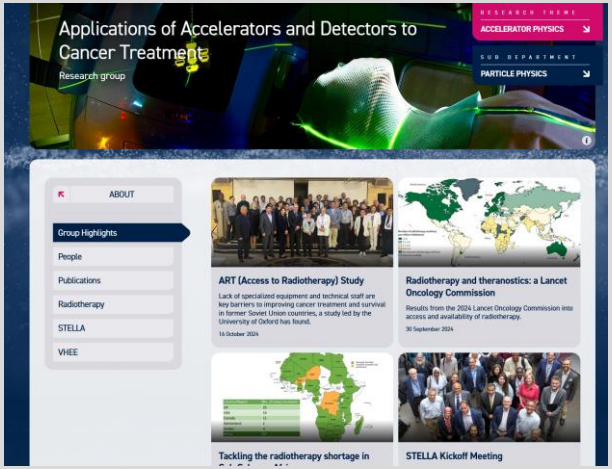

First Radiotherapy linac in Cameroon

STELLA / SAPPHIRE

- Collaboration with Exeter, Cambridge and Oxford Hospitals
  - Designing and prototyping fault-resilient multileaf collimators (MLCs)
  - Early fault prediction in Linac

VHEE

- Collaboration with CERN and Lausanne Hospital
  - Beam Dosimetry
  - Dose delivery



Projects – Composite Beampipe & RF Shield

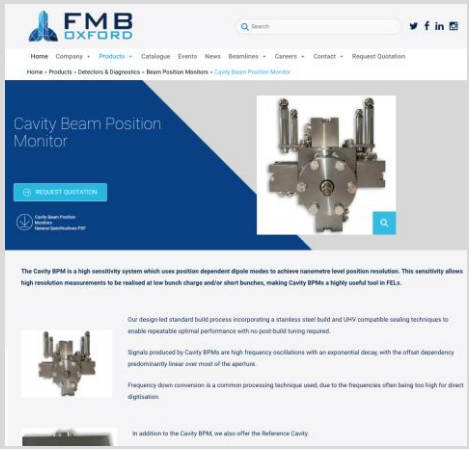
- Originated from work on ultra-lightweight tracking detector structures for the LHCb Upgrade
- Developed novel composite while tackling outgassing and geometric stability
- Used STFC IAA fund to develop prototype demonstrators for industry
- Led to patent application and then a licensing deal with local company Brick Kiln Composites and also consulting contract for lead engineer
- Applications / customers tbc

BRICK KILN COMPOSITES

Projects - Cavity Beam Position Monitors for FELs

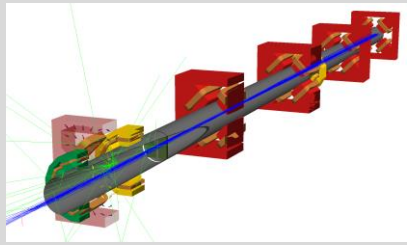
- Cavity BPMs originally developed for linear colliders, now designed for FELs.
- Sensitivity allows high resolution measurements to be realised at low bunch charge and/or short bunches
- Offer complete off-the-shelf system in partnerships with XDS-Oxford (FMB-Oxford) and iTech. Deployed at ELI-BL
- Looking for further potential partners and new applications
  - Not widely taken up
- Lead researcher moved to quantum computing industry

CBPM triplet at CLARA, Daresbury Laboratory



Projects - Beam Delivery Simulation

- BDSIM program simulates movement of particles in a particle accelerator – create a computation model (Geant4)
- Growing worldwide adoption, applied to many machines & experiments: CERN, CLIC, XFEL, Diamond, LhARA, PSI …
- Applications of BDSIM: Detector backgrounds, Beam transport in vacuum/air/gas, Beamline design, Collimation system efficiency, Secondary radiation transport, Beam losses and energy deposition, Laserwire diagnostics, Shielding activation, Beam shaping, Permanent magnet degradation, and many more …..
- Attempts to encourage commercial application is ongoing – medical citations growing quickly



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- **LinkedIn**
- **Feedback**

Spinouts

- Started with development of a 3D laser spectrometer as a plasma wakefield diagnostic tool

Mach42

- Founded by Sam Vinko, Muhamad Kasim, Gianluca Gregori & Brett Larder (2019)

- Secured £4.5M. Using ML optimisation, the company aims to cut analogue semiconductor development time in half. Offices in Oxford and USA.

Living Optics

- Founded by Robin Wang, Peter Norreys, Muhammad Kasim (2020)

- Launched first product – portable hyperspectral camera (VIS-NIR video-rate spectral imaging camera) for applications inc. agriculture, security, healthcare

- Raised £20M in series A funding round and moved into new premises to house growing team of 30 employees based in Abingdon and office in Taiwan.

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JAI John Adams Institute for Accelerator Science

University Spinout Policy

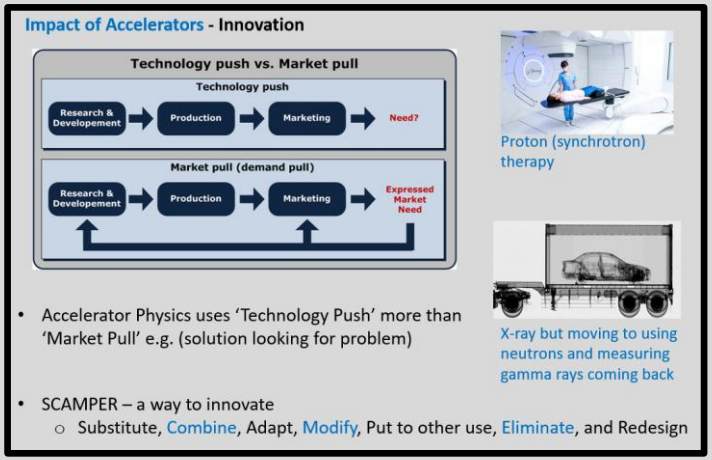
Academic Founders of a spinout receive:

- 80% founding shares in spinout, 20% to the university
- Opportunity to convert equity to cash early
- Opportunity for Academic Consulting to spinout (30 days+)
- Opportunity for Joint Appointment
- Royalty returns on IP licensed to spinout

Total net revenue	Researcher(s)	University	Department
Up to £50K	85.7%	14.3%	0%
£50K to £500K	45%	30%	25%
Over £500K	22.5%	40%	37.5%

Training Course - Commercialisation of Accelerator Technologies

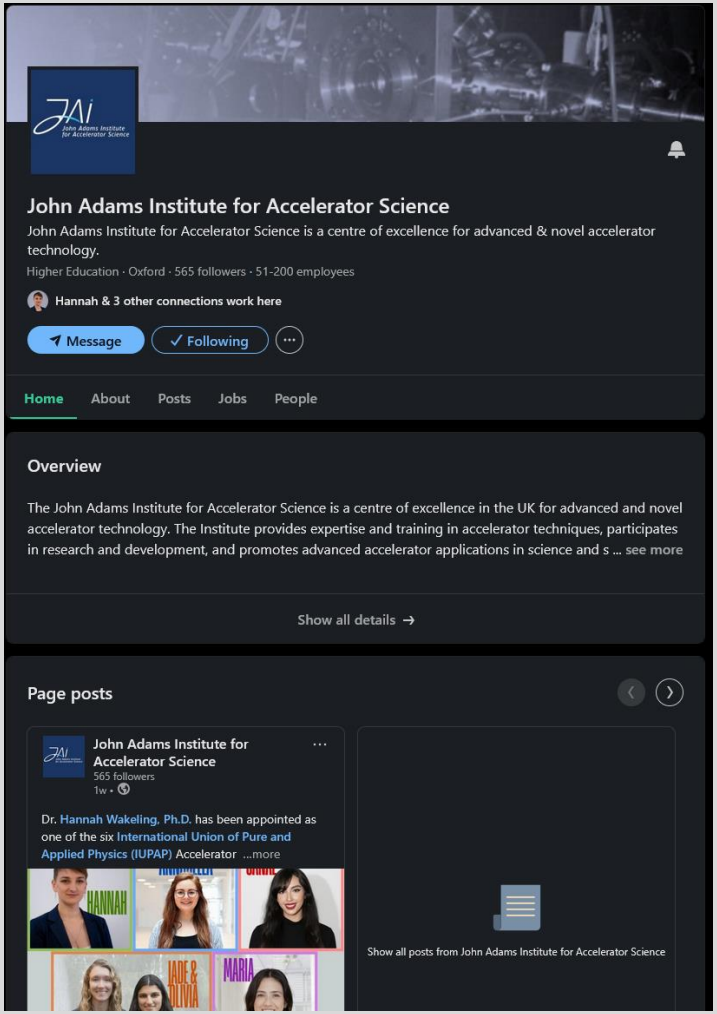
- Recommended by AB members
- Lecture delivered by P Tait to 1st yr JAI students (open to any JAI member)
  - Benefits to Science - Benefits to Society
  - Impact of Accelerators
  - Role of Academia to Innovate
  - Pathways to Commercialisation
  - Future opportunities / Support



- Positive feedback
- Acts as introduction - more support available within universities

JAI now on LinkedIn

- Recommended by AB
  - Help capture career destinations of JAI students to inform potential Applications and Impact of JAI accelerator research
  - Raise awareness of the expertise and impact of JAI
- Currently managed by P Tait
- 559 followers with 20k+ impressions in last year
- New stories every 2 weeks



Feedback

Advisory Board Comments 2025

- *Increase commercialisation benefits to academics to incentivise more activity*

- *Continue to raise awareness of commercialisation externally via LinkedIn and internally via student training*

STFC Accelerator International Review: Report 2025

- *Closer involvement with industry on accelerator programme WITH associated funding uplift*

Agree with all comments

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Questions?

Mach42

Living Optics

BDSIM Beam Delivery Simulation

CERN

NHS Royal Devon University Healthcare NHS Foundation Trust

ICR The Institute of Cancer Research

PSI

CLIC

HEXAGON

UNIVERSITY OF CAMBRIDGE

BRICK KILN COMPOSITES

INSTRUMENTATION TECHNOLOGIES

XDSOXFORD