John Adams Institute

Philip Burrows, Director

Imperial College London

ROYAL HOLLOWAY UNIVERSITY OF LONDON

UNIVERSITY OF OXFORD

Director's Report to Advisory Board

16/4/26

Mark Rayner (1983-2026)

The development of a novel technique for characterizing the MICE muon beam and demonstrating its suitability for a muon cooling measurement

DPhil JAI, Oxford: 2007—2011:

Key contribution:

Technique to measure muon beam phase space

Critical to demonstration of ionization cooling

Subsequent career:

Lecturer/researcher:

T2K at Geneva University

Educator:

Ecole International de Geneve

Word Economic Forum

Researcher and communicator

Editor, CERN Courier

JAI Advisory Board

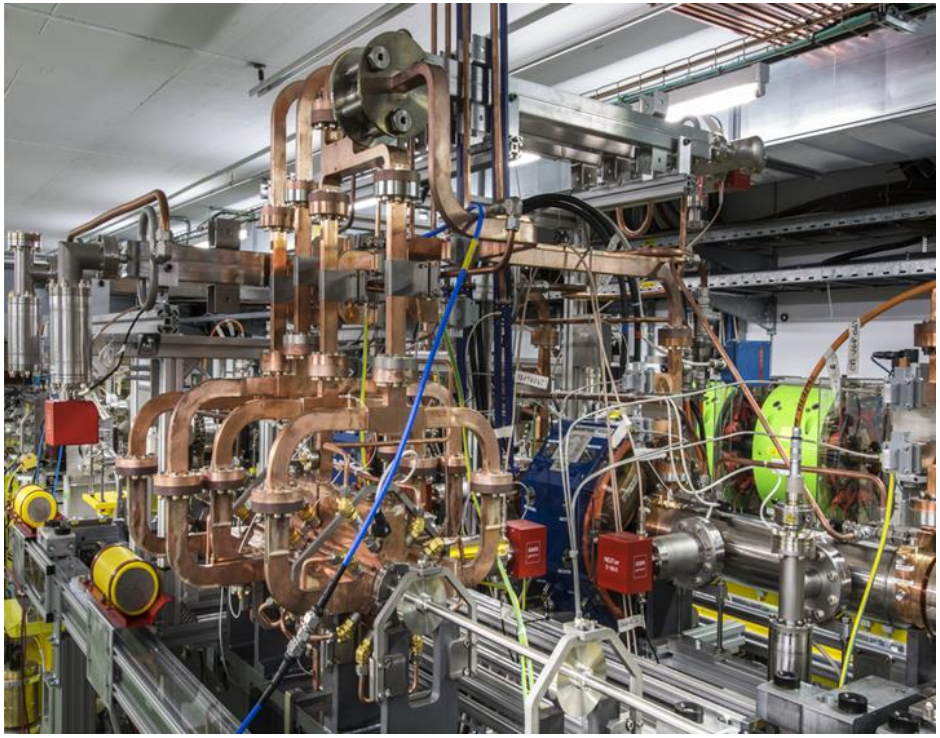
from 2026

- Deepa Angal-Kalinin (ASTeC)
- Mei Bai (SLAC)
- Mike Lamont (CERN)
- Ritchie Patterson (Cornell)
- Eckhard Elsen, Chair (ex-CERN, DESY)
- Christoph Quitmann (ex-MAXIV, Research Instruments)
- Akira Yamamoto (KEK, CERN)

Outline

- JAI mission + overview
- Strategy
- Funding
- Student + staff news
- Programme covered by the following speakers!

JAI Mission



A centre of excellence for advanced and novel accelerator technology:

provide expertise, research, development and training in accelerator techniques, and

promote advanced accelerator applications in science and society

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JAI Overview

One of two UK national academic centres of excellence in accelerator science & technology, set up in 2004

Oxford University, Royal Holloway, Imperial College

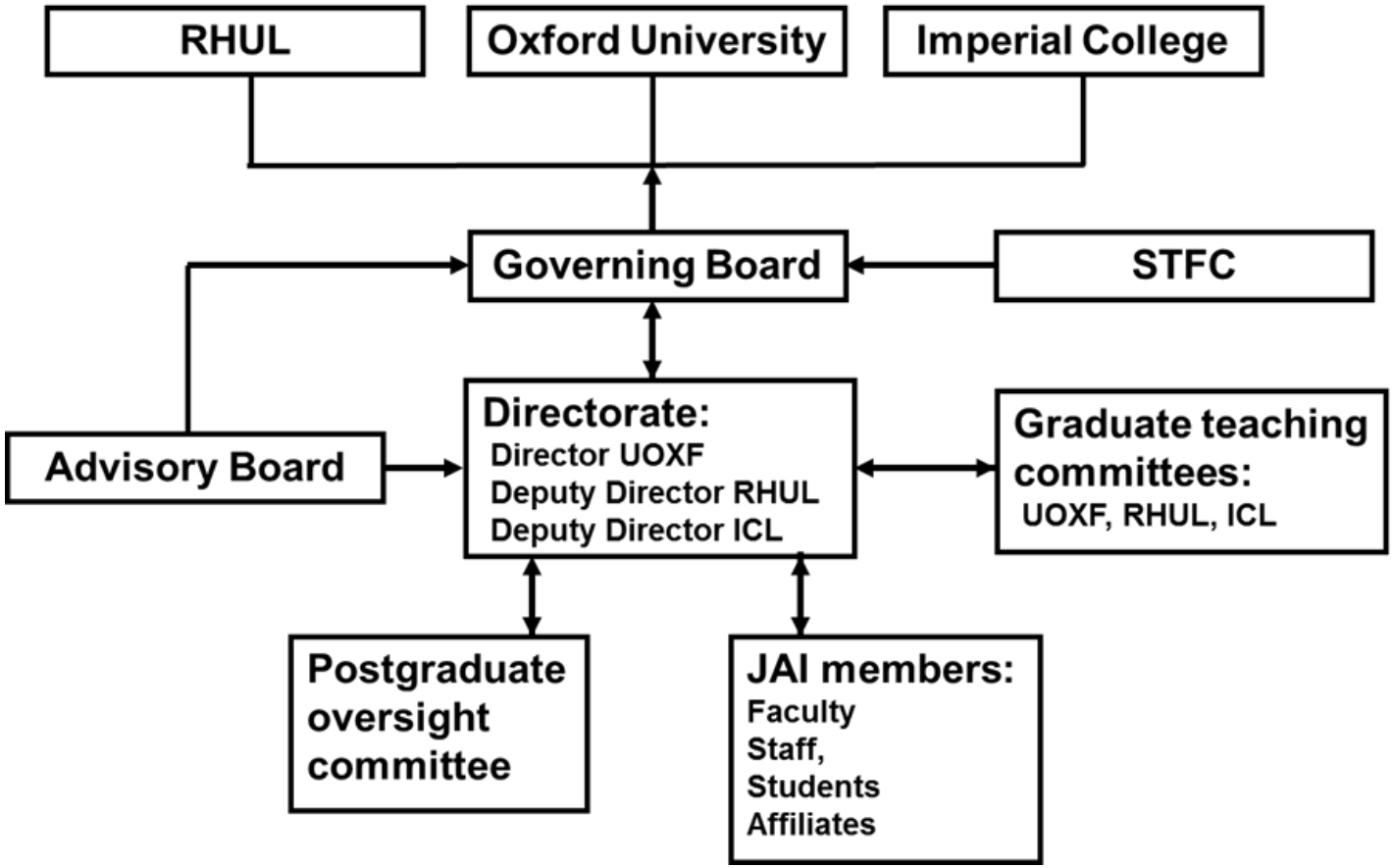
- **Research & development**
- **Education & training**
- **Knowledge exchange, impact, public engagement**

100 members:

- **22 faculty**
- **35 staff**
- **43 PhD students**

+ 46 affiliates (STFC labs, CERN …)

Governance


RHUL
Oxford University
Imperial College
Governing Board
STFC
Advisory Board
Directorate:
Director UOXF
Deputy Director RHUL
Deputy Director ICL
Graduate teaching committees:
UOXF, RHUL, ICL
Postgraduate oversight committee
JAI members:
Faculty
Staff,
Students
Affiliates

JAI Research Strategy

- **World-class R&D at the cutting edge of accelerator science and technology**
  - **In collaboration with our UK and international partners**
- **Lead and support UK's strategic accelerator interests**
  - **Domestic and overseas accelerator facilities/programmes**
- **Capitalise on our strengths to make an impact**
- **Train next generation of accelerator scientists + engineers**
  - **Provide outstanding R&D opportunities on forefront projects**

Proactive and nimble in securing resources to support these ambitions

→ see later

Faculty Update

Oxford:

- **Richard D'Arcy appointed Associate Professor (2023)**

- **Adrian Oeftiger appointed Associate Professor (2024)**

- **Ian Martin appointed Visiting Professor (2024)**

- **2024 faculty searches @ Oxford and RHUL**

William Shields (RHUL)

John Adams Institute for Accelerator Science

Lecturer in Accelerator Physics

BDSIM

LhARA

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Alex Gerbershagen (Oxford)

Associate Professor

Head of Particle Therapy Research Center at the University Medical Center Groningen in the Netherlands

Particle therapy accelerators, diagnostics and isotope production

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Key expertise (faculty + core staff)

John Adams Institute for Accelerator Science

Beam dynamics

Burrows, Gerbershagen, Martin, Oeftiger, Pasternak, Sheehy, Shields, Tsesmelis

Beam instrumentation, feedback & control

Bett, Boorman, Burrows, Gibson, Karataev, Reichold

RF systems

Bett, Foster, Lyapin, Zhang

Laser + plasma systems

D'Arcy, Foster, Hooker, Mangles, Najmudin, Norreys, Rose, Walczak

Medical beamlines

Dosanjh, Gerbershagen, Long, Pasternak, Sheehy, Shields

Metrology & alignment systems

Reichold

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Accelerator R&D themes

John Adams Institute for Accelerator Science

Particle physics colliders and beamlines

Bett, Boorman, Burrows, Foster, Gibson, Karataev, Oeftiger, Reichold, Tsesmelis, Zhang

Light sources

Burrows, Karataev, Martin

Intense hadron beams

Boorman, Gibson, Long, Oeftiger, Pasternak, Sheehy

Advanced acceleration techniques

Burrows, D'Arcy, Foster, Hooker, Mangles, Norreys, Najmudin, Rose, Walczak

Societal applications

Dosanjh, Gerbershagen, Long, Najmudin, Pasternak, Reichold, Sheehy

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Strategic partnerships

- STFC national laboratories:
  - Diamond Light Source
  - ISIS
  - Central Laser Facility + Extreme Photonics Applications Centre
  - ASTeC, Daresbury Laboratory
- Cockcroft Institute
- CERN
- DESY
- KEK
- BNL, JLab, SLAC

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Diamond Light Source

Strong links with Accelerator Physics, Diagnostics + Controls

Martin + Bobb are JAI PhD graduates

joint support of students/PDRAs




PhD students (* = joint JAI/DLS):

Ji Li*	(2021)	(Oxford)	integrated optics design
Dan Harryman	(2021)	(RHUL)	CDR transverse position
Niki Vitoratu*	(2020)	(RHUL)	e- energy measurements
Seb Wilkes*	(2021)	(Oxford)	timing mode for users
Alec Clapp*	(2021)	(RHUL)	optical CDR BPM
Corey Lehman*	(2023)	(Oxford)	beam loss monitors (AI/ML)
Shaun Preston*	(2023)	(Oxford)	AI/ML tools / injection




Joint PDRA (Oxford):

Maxim Korostelev	2018-21	Diamond 2 lattice design
Riyasat Husain	2023-24	booster synchrotron upgrade
Milica Rakic	2026-28	collective effects in Diamond 2

ISIS Neutron + Muon source

John Adams Institute for Accelerator Science

Strong links with Intense Beams, Accelerator Physics and Operations groups

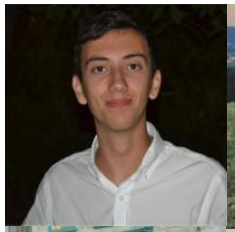
Offer part-time PhD opportunity to ISIS staff (5 completed, 2 in progress)

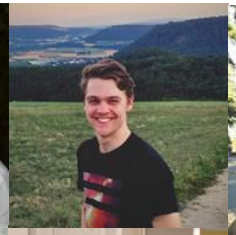
PhD students (Oxford):

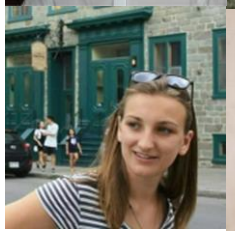
Jake Flowerdew	(2023)	IBEX Paul trap
Max Topp Mugglestone	(2024)	FFA beam dynamics
Rob Williamson	(2023)	beam instabilities in the ISIS synchrotron
David Posthuma de Boer	(2018)	beam coupling impedances on the ISIS synchrotron
Carl Jolly	(2023)	beam dynamics / ISIS2 design
Joshua Appleby	(2024)	transverse tune
Francesco Straniero	(2025)	beam dynamics / collective effects

Joint PDRA (Oxford):

Emi Yamakawa	(2021)	beam instrumentation
Hannah Wakeling	(2022)	sustainability for ISIS2







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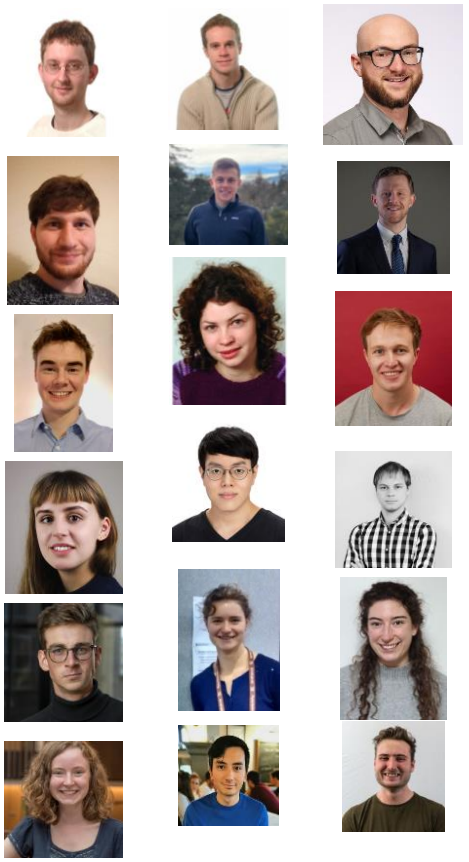
Central Laser Facility

Strong links with Astra-Gemini and Vulcan laser facilities;

Major users of CLF facilities; contributed significantly to the design and specification of new EPAC (Hooker on EPAC project board, Mangles on ISTAC) and Vulcan20-20 facilities (Mangles on Science Case Update);



Co-funded PhD students

Aimee Ross	2021	Resonant excitation of plasma wakefields
Emily Archer	2020	Spatiotemporal optical injection
Sebastian Kalos	2022	Plasma-modulated plasma accelerators
Laurence Bradley	2023	X-rays from wakefield accelerators

+ > 30 other students have used CLF facilities

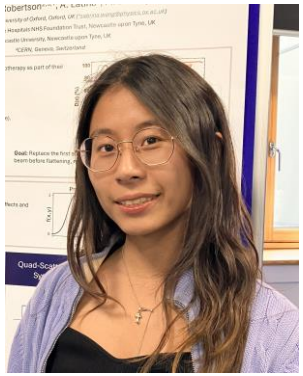
CLARA

JAI sees CLARA as a key opportunity for the UK

- HALHF@CLARA
  - Staging demonstrator & high-average-power R&D
  - Collaboration between JAI (Oxford), CI, and Oslo
  - Large international (growing) team with 4 PhDs and 5 PDRAs

- VHEE therapy
  - Collaboration with ASTeC and CI to develop VHEE FLASH concepts at CLARA
  - Sabrina Wang (PhD, Oxford) implementing double-scatter flat-beam generation in to CLARA sims (BDSIM, RF-Track)

'Excellent news is that CLARA reached its full energy of 250 MeV at the beginning of April 2025 and will be a most valuable addition, for example, providing beams for research and in-vivo experiments that are not possible at CLEAR.' [AB2025]



ASTeC + Cockcroft Institute

Strong collaborations on UK projects + programmes:

- **High-Lumi LHC-UK2**
- **AWAKE-UK2**
- **ILC, CLIC, EIC**
- **MuHIG**
- **CLARA (H3Beams, VHEE/FLASH …)**
- **ITRF/LHARA, STELLA**
- **Centre of Excellence for Sustainable Accelerators (CESA)**
- **UK-FEL**
- **Training: joint seminars + lectures**
- **Burrows on ASTeC AB + CLARA Beam Allocation Panel, Gibson on Cockcroft SAB**

International

CERN

LHC, HL-LHC, AWAKE, FCCee, CLIC/ILC, CLEAR

'Physics Beyond Colliders'

DESY

FLASHForward

KEK

Accelerator Test Facility (ATF), ILC Technology Network

BNL + JLab

Accelerator Test Facility, EIC

SLAC

FACET2

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JAI→ CERN fellows/staff

2011:

Robert Apsimon

Ben Constance

2015:

Ewen Maclean (now staff)

2016:

Davide Gamba (now staff)

2017:

Neven Blaskovic

Alex Gerbershagen (staff)

2019:

Michele Bergemaschi

Swann Levasseur

Leon van Riesenhaupt

2020:

Jan Paszkiewicz

Eugenio Senes

2021:

Andrey Abramov

Rebecca Ramjiawan

2022:

Daniele Butti

Luke Dyks

Lawrence Wroe

2023:

Jake Flowerdew

Helen Guerin

Collette Pakuza

Pablo Arutia Sota (staff)

2024:

Max Topp Mugglestone

Laurence Nevay (staff)

Rebecca Taylor

2025:

Florian Stummer

Daniel Harryman (staff)

2026:

Jack Salvesen

Bjoern Lindstrom (staff)

22 fellows +5 staff in ATS

2 fellows now staff

JAI→ CERN doctoral students

2010:

Alex Gerbershagen

2012:

Davide Gamba

Jack Roberts

2015:

Swann Levasseur

2016:

Chetan Gohil

Pierre Korysko

Jan Paszkiewicz

2017:

Eugenio Senes

2018:

Gian Luigi D'Alessandro

Luke Dyks

2019:

Daniele Butti

Helene Guerin

Carlo Mussolini

2020:

Robert Murphy

Pablo Arutia Sota

Rebecca Taylor

2021:

Florian Stummer

2022:

Sasha Horney

Emily Howling

Vlad Musat

Jack Salvesen

2024:

Lewis Kennedy

Giusy Passarelli

2026:

Francesca Murgia

24 Doctoral students

Graduate destinations

- **Since JAI foundation in 2004: > 130 PhD graduates (+ 48 in progress)**
- **Graduates secured positions at: CERN, DESY, ESS, SLAC, FNAL, BNL, LBNL, STFC, universities**

- **CLF:** Nicolas Bourgeois, Steven Dann, Kirill Fedorov, Benjamin Spiers, Christopher Thornton
- **Diamond:** Ian Martin, Lorraine Bobb, Neven Blaskovic
- **ISIS:** Ben Pine, Rob Williamson, Steven Brooks, Scott Laurie, *Ciprian Plostinar*
- **DESY:** Andreas Walker, Rob Shalloo, Emily Archer, John Dale, Tony Hartin, Jon Wood, Kristjan Poder
- **MAX IV:** Steve Molloy, Francis Cullinan, *Neven Blaskovic*
- **ESS:** *Neven Blaskovic*, Ciprian Plostinar
- **PSI:** Alex Gerbershagen
- **SLAC:** Christine Clarke, Glen White, Robbie Watt, Elias Gerstmayr, Savio Rozario
- **Fermilab:** Rob Ainsworth
- **BNL:** Christina Swinson
- **LBNL:** Tony Gonsalves, Alex Picksley
- **LLNL:** Johannes Van de Wetering

Recent graduates→commerce/industry

Michael Davis	UBS
Alex Savin	Patent lawyer
Peter Tudor	Metaboards Oxford
Alex Lyapin	Oxford Quantum Circuits
Talitha Bromwich	Wild Business
Rebecca Ramjiawan	Luffy AI
Gavin Cheung	Sports analyst
Theodorus Christodoulou	Lab4Crypto (startup)
Gian Luigi D'Alessandro	Unakin (AI startup)
Dan Harryman	Tokamak Energy
Carlo Mussolini	Fractile (startup)
Alexander von Boetticher	Cogram (AI startup)
Muhammad Kasim	Living Optics (startup)
Aimee Ross	ASML
Cary Colgan	Tokamak Energy
Jan-Nicolas Gruse	D-Fine
Jan Paszkiewicz	Infleqtion UK
Kristian Poeder	Mu-ray.tech

University faculty

UCL HEP Group
https://www.hep.ucl.ac.uk › ~jolly › SimonJollyCV

Prof. Simon Jolly – Curriculum Vitae

Leader of the UCL High Energy Physics Proton Beam Therapy group investigating novel detectors and diagnostics for quality assurance and imaging.

Charlotte Palmer 2011
Dr
Lecturer, **School of Mathematics and Physics**
Centre for Light-Matter Interaction (CLMI)

A/Prof
Suzie Sheehy 2010
Associate Professor in Medical Accelerator Physics
School of Physics

Dr Robert Apsimon Lancaster University
Senior Lecturer in Electronic Engineering

Matthew Streeter 2013
Dr
Royal Society Univ Research Fellow, **School of Mathematics and Physics**
for Light-Matter Interaction (CLMI)
://orcid.org/0000-0001-9086-9831
Email

prof. A. (Alexander) Gerbershagen 2013
university of groningen
Head of Particle Therapy Research Center (PARTREC),
Team Leader for Accelerator and Radiation Physics

William Shields
- Centre for Particle Physics and Astronomy
- Lecturer in Accelerator Physics, Department of Physics

Dr Christopher Arran Lancaster University
Lecturer in Ultrafast Beams and Phenomena 2018

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Group + team Leaders

John Adams Institute for Accelerator Science

Rob Williamson 2023

Accelerator Physicist Group Leader at ISIS, STFC

Ian P. S. Martin 2011

Head of Accelerator Physics Group, Diamond

prof. A. (Alexander) Gerbershagen 2013

Head of Particle Therapy Research Center (PARTREC), Team Leader for Accelerator and Radiation Physics

university of groningen

Lorraine Bobb
Head of Diagnostics, DLS

Ciprian Plostinar
Head of Accelerator, ESS

Stephen Molloy 2006

Head of Accelerator Operations at MAX IV Laboratory

Lund, Skåne län, Sverige · Kontaktinformation

703 följare · Fler än 500 kontakter

Jonathan Wood 2016

Deutsches Elektronen-Synchrotron DESY: Hamburg, DE

2024-01 to present | Teamleader for beam-driven plasma acceleration (MPL)
Employment

Rob Shalloo

Emmy Noether Group Leader | Plasma Accelerator Physicist

Hamburg, Hamburg, Tyskland · Kontaktinformation

DESY

University of Oxford

Kristjan Põder 2016

Lead of Plasma Accelerator Application development at DESY

UCL HEP Group
https://www.hep.ucl.ac.uk › ~jolly › SimonJollyCV

Prof. Simon Jolly – Curriculum Vitae

Leader of the UCL High Energy Physics Proton Beam Therapy group investigating novel detectors and diagnostics for quality assurance and imaging.

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Funding

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Funding 2021-25

- **STFC core grant April 2021 – March 2025:** **£7M**
- **University contribution:** **+ £2M**
- **Additional grants, awards and facilities access:** **+ £26M**

  STFC project + studentship grants, EPSRC, CERN, DESY, Diamond, ISIS, CLF, US Air Force, European Commission …

- **Total** **£35M**

  → STFC leverages an additional £4 for every £1 invested via core grant

Funding 2025-28

- **STFC core grant April 2025 – Sept 2028 (42 months):** **£6.6M**
- **University contribution:** **+ £2M**

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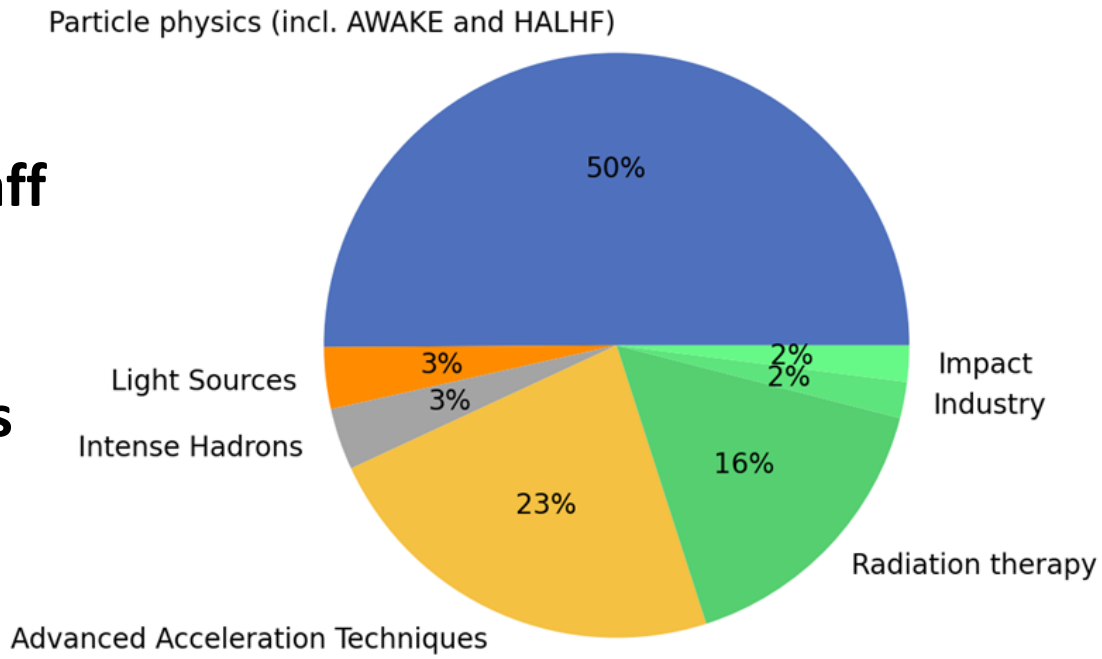
New core grant from 1/4/25

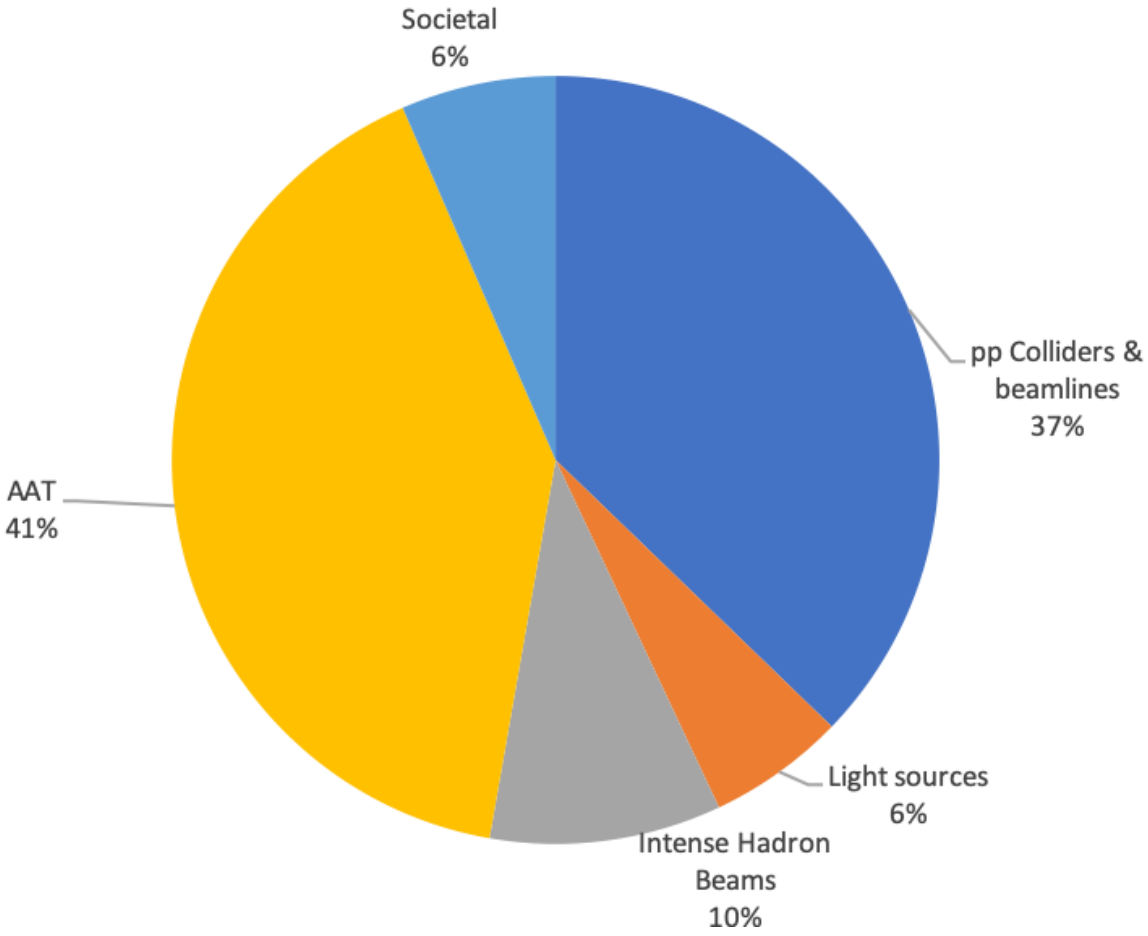
- 95% on research staff
- ~500 staff months / 25 staff
- ~ zero capital
- £200k travel/consumables
- Academic time funded

  @ 4% (18 investigators)



Personnel distribution

(All funding sources)



Complete JAI personnel deployment
including students

Funding 2025-28

- **STFC core grant April 2025 – Sept 2028 (42 months):** **£6.6M**
- **University contribution:** **+ £2M**
- **Additional grants, awards and facilities access already secured:**

  STFC studentships, CERN Doctoral Studentships, Diamond, ISIS, EPSRC, European Commission (EPITA, COORDINA-INNOV, TwinRise)

  Further application pending to European Commission (GEAR-NG, RI-SPOND)

New EPSRC grant

Nov 2024 submitted an outline proposal to EPSRC call:

Healthcare Technology Translation Partnership Scheme

JAI/Oxford Physics and Oxford Oncology Department:

Kristoffer Petersson	Project lead	University of Oxford
Boris Vojnovic	Specialist	University of Oxford
Catriona Gilmour-Hamilton	Professional enabling staff	University of Oxford
Geoff Higgins	Project co-lead (UK)	University of Oxford
Iain Tullis	Research and innovation associate	University of Oxford
[redacted]	Grant manager	University of Oxford
Manjit Dosanjh	Project co-lead (UK)	University of Oxford
Philip Burrows	Project co-lead (UK)	University of Oxford
[redacted]	Researcher co-lead	Oxford University Hospitals NHS Foundation Trust
David Rowlands	Specialist	Teledyne e2v (UK) Ltd

'Linear accelerator for Mega Voltage Photon FLASH radiotherapy'

Grant has been awarded: £2M **(12 awarded, 221 submissions)**

Inflation 2012-26

- **We have been in receipt of ‘flat cash’ core funding from STFC since 2012**
- **During this period cumulative UK inflation was 53%**
- **Our volume of research effort funded from our core grant today is 2/3 what it was in 2012**

STFC funding situation

- **STFC has announced that it will need to reduce its annual budget by £162M by 2030**
- **The need for a global cut to its budget at the level of 30% has been announced by STFC Executive Chair – prioritisation exercise ongoing**
- **JAI and Cockcroft grants appear to be secure thru September 2028**
- **No accelerator R&D *PROJECTS* have been funded since 2022**

STFC statement 9/4/26

(Grahame Blair)

John Adams Institute for Accelerator Science

Accelerator science programme

- **Accelerator Institute Grants**: The Cockcroft and John Adams accelerator institute grants run to September 2028
  - STFC (with advice from SB PPAN) have prioritised the accelerator institutes to maintain the university involvement in the field in a highly constrained financial environment
- **Accelerator Projects**: It has not been possible to fund further phases of the existing **HL-LHC** or **AWAKE** projects. A minimum viable HL-LHC project around integration and commissioning is being considered as part of the Science Board (PPAN) prioritisation process

We recognise that funding opportunities are limited in the short term

- STFC's **International Review of Accelerator Science** is complete, the details of which will be communicated in due course
  - The high-level outcome of the review found that STFC should continue to invest, and identified strengths for a world class programme and what it would likely to take to fund it
- **Future aspiration:** This is subject to the outcome of the prioritisation process and will be viewed in the light of the wider organisation's transformation workstreams.

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Welcome class of 2025!

John Adams Institute for Accelerator Science

Oxford: Meg Savage

Francesco Straniero

Theodore Madden



Imperial: Ayham Yousif

George Weis


RHUL: Tiago Fernandes de Nobrega

UCL: Lucy Bishop

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Class of 2024 visit to CERN

(July 2025)

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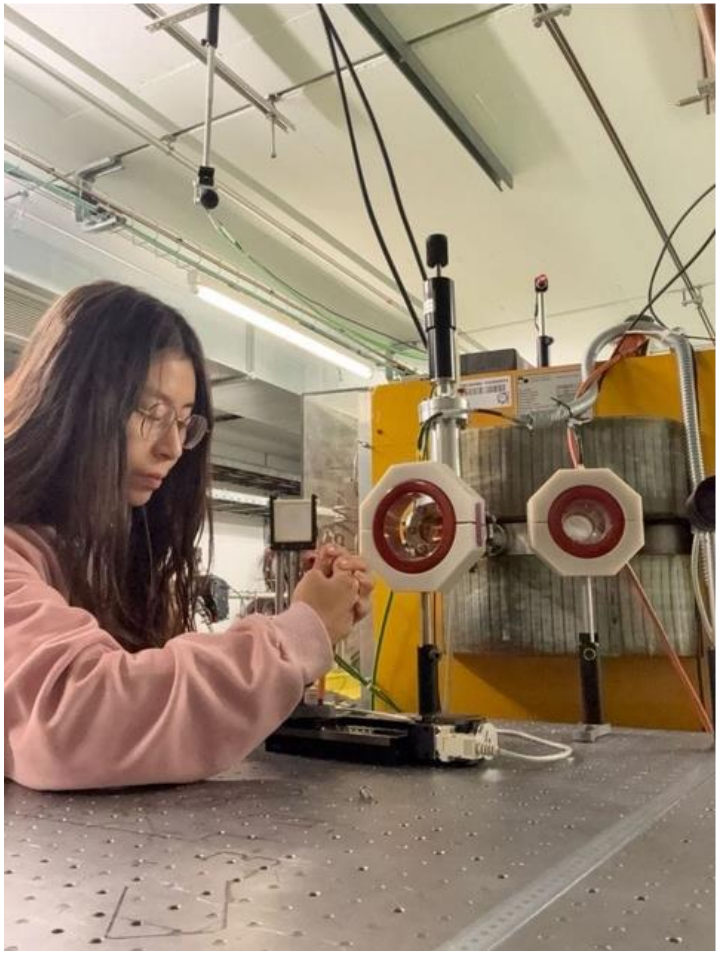
Congratulations!

Sabrina Wang

Awarded the John Adams Prize for outstanding performance in the first year

Now at CERN for her LTA working at the CLEAR Facility on Development of Scattering Systems for Tumour Conformality with VHEE Beams



Congratulations!

John Adams Institute for Accelerator Science

Joe Bateman

Awarded the IoP Medical Physics Group PhD Prize

'for his work on developing new dosimetry measurement techniques by creating a novel detector using silica fibres that can monitor the radiation beam pulse-by-pulse, at dose rates needed for FLASH'

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Congratulations!

John Adams Institute for Accelerator Science

Alex Picksley

Awarded the 2025 Simon van der Meer Early Career Award in Novel Accelerators

'for pioneering contributions to high-energy laser-plasma accelerators suitable for future applications, including the development of metre-scale plasma channels, novel injection techniques, and single-stage generation of high-quality 10 GeV electron beams'

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Congratulations!

John Adams Institute for Accelerator Science

Eva Los

Awarded the IoP Plasma Physics Group Malcolm Haines Prize for Early Career Researchers

‘for her work on experimental tests of strong field QED’

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Congratulations!

Hannah Wakeling

IUPAP Accelerator Ambassador 2026

supports young scientists in promoting engagement and education in the field of particle accelerators

Congratulations!

John Adams Institute for Accelerator Science

Robin Timmis

Awarded the IoP Plasma Physics Group Culham Thesis Prize 2026

Presented at Group Annual Conference in Aberdeen last week

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Congratulations!

John Adams Institute for Accelerator Science

Peter Norreys

2025 Institute of Physics / Société Française de Physique Fernand Holweck Medal and Prize

"For his outstanding contributions to fundamental studies of high energy density plasmas using high power and petawatt-class lasers, including fast ignition inertial fusion, particle beam acceleration and ultra-bright X-ray sources."

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Congratulations?!

John Adams Institute for Accelerator Science

Philip Burrows

From 2026:

Chair, CERN Scientific Policy Committee

+

European Strategy Group

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Congratulations!

Manjit Dosanjh

John Adams Institute for Accelerator Science

For being invited to speak at the Pontifical Academy of Sciences in Vatican

STELLA: An initiative to overcome global inequalities in access to curative radiotherapy

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Congratulations!

LhARA team

On Wednesday 9th July, the LhARA team had the pleasure of presenting to a variety of VIPs, including President Macron, as part of his state visit to the UK. The President and his team were "in town" to sign into existence a collaboration on AI between CNRS, Cambridge, Imperial, and Oxford. A new International Research Lab "ABEL" focussing on functionalised materials was also signed into existence.

LhARA was represented by Chloe Hooper, Josie, Calvin, Pat and me and Leo Cancer Care by Sophie Towe and Lisa James. Between us we presented the project/vision to many who were not aware of our mission — people from the UK, overseas, and even from Imperial. We were able to shake the President's hand and Pat, Josie, Lisa and Sophie explained our mission with enthusiasm! Lots of contacts made; both within Imperial, with civil service, embassy, and within CNRS.

LhARA has a stand at the 2026 Royal Society Summer Science Exhibition

30 June – 5 July 2026

JAI programme today's presentations

Particle physics colliders and beamlines	Adrian Oeftiger/Stephen Gibson
Intense hadron beams	David Kelliher
Diamond Light Source	Ian Martin
Medical beamline applications:	
VHEE/FLASH/STELLA	Manjit Dosanjh
LHARA	Will Shields
Advanced acceleration: beam driven	Richard D'Arcy
Advanced acceleration: laser driven	Simon Hooker
Facility sustainability	Hannah Wakeling
Commercialisation and impact	Phillip Tait
Training and public engagagement	Emmanuel Tsesmelis
Design study: RCS muon collider	1st year students

Extra material

John Adams Institute for Accelerator Science

For reference if needed

Imperial College London

ROYAL HOLLOWAY UNIVERSITY OF LONDON

UNIVERSITY OF OXFORD

JAI faculty

Royal Holloway:

Stephen Gibson, Pavel Karataev, Will Shields

Imperial College:

Ken Long, Stuart Mangles, Zulfikar Najmudin, Jaroslav Pasternak

Emeritus: Steven Rose

Oxford:

Philip Burrows, Richard d'Arcy, Alexander Gerbershagen, Simon Hooker, Peter Norreys, Adrian Oeftiger, Armin Reichold

Visiting: Manjit Dosanjh, Ian Martin, Suzie Sheehy, Emmanuel Tsesmelis

Emeritus: Brian Foster, Ken Peach, Roman Walczak

JAI staff

Imperial College:

Sanjit Chandran, Nicholas Dover, Adam Hughes, Paul Jurj, Brendan Kettle, Ajit Kurup

Oxford:

Eleonora Belli, Douglas Bett, Vera Cilento, James Cowley, Linus Feder, Ben Greenwood, Pierre Korysko, Mark Jones, Armanc Karakoyun, Ronan Lahaye, Eva Los, Mariana Moreira, Fern Panell, Milica Rakic, Phill Tait, Max Topp-Mugglestone, Robin Timmis, Hannah Wakeling, Weida Zhang

Royal Holloway:

Siobhan Alden, Majid Ali, Paul Bamford, Gary Boorman, Alessio Bosco, Richard Elsom, Vice Harryman, Vice Lindstrom, Mark McCallum, Matthew Pereira

JAI students

Oxford:

Joshua Appleby, Darren Chan, Sasha Horney, Emily Howling, Abigail James, Carl Jolly, Sebastian Kalos, Corey Lehmann, David McMahon, Theodore Madden, Vlad Musat, Ibrahim Najmudin, David Posthuma de Boer, Shaun Preston, Jack Salvesen, Robert Simpson, Meg Savage, Francesco Straniero, Sabrina Wang, Seb Wilkes

Imperial College:

Meriame Berboucha, Laurence Bradley, Ginevra Casati, Yihao Chen, Jasmin Hills, Adam Hughes, Rohan Kamath, Runfeng Luo, Rehanah Razak, George Weis, Ayham Yousif

Royal Holloway:

Majid Ali, Max Bosman, Alec Clapp, Diya Dipac, Luke Eddowes, Tiago Fernandes de Nobrega, Thomas Hyatt, Alex Keyken, Mark McCallum, Natsune Nishi, Giusy Passarelli, Matt Pereira

EU Projects

Faculty provide scientific leadership + coordination in many EU projects

Previous:	**EUCARD 1 + 2**
	TIARA
	HiGRADE
	EJADE
	EuPRAXIA → on ESFRI roadmap
	EuroCirCOL
	ARIES (2018-22)
	I.FAST (2021-25)
Ongoing:	**EAJADE**
About to start:	**EPITA, TwinRISE, COORDINA-INNOV**
In preparation:	**GEAR-NG, RI-SPOND**

5 - 10 year JAI vision

Particle physics vision

Leading contributions to highest-priority projects:

- **HL-LHC commissioning and operations:**

  beam dynamics, performance optimisation, upgrades in LS4 + LS5

- **Flagship contribution to TDR for next collider @ CERN:**

  beam dynamics, feedback/control, instrumentation, BDS, MDI

  preparation for in-kind contributions

- **AWAKE Run 2:**

  new electron injector line commissioning/operation + Run 2c,d exploitation

- **Subject to resources:**

  'Physics Beyond Colliders' beamlines

  Electron-Ion Collider (RCS BPM design, beam orbit feedback)

- **Subject to European Strategy:**

  R&D towards a muon collider demonstrator

Beam-Driven PWFA Vision

- Continue to lead and grow HALHF (*a hybrid RF/plasma linear-collider concept*)
  - Publication of a pre-CDR in the first half of 2026
  - Full CDR ~2 yrs later (*depending on available resources*)
- Realise full potential of HALHF@CLARA:
  - Staging of wakefield-accelerated beams (*incl. R&D in to novel interstage optics*)
  - Plasma acceleration of bunch trains with HALHF properties (*~10 ns separation, 100 Hz*)
  - Energy-mapping studies and high-average-power plasma sources
- Continue to leverage the FLASHForward facility
  - High-repetition-rate studies and plasma sources (*synergy with JAI laser-driven goals*)
  - High beam quality and high overall efficiency
- Develop nascent collaboration with FACET-II
  - Implementation of discharge-capillary tech (*originated at Oxford by Hooker group*)
  - Experimentation with HALHF-like electron beams and plasma sources

Laser-driven WFA Vision

- Grow areas in which we are world-leading:
  - Single-stage multi-GeV electron acceleration
  - High-repetition rate plasma channels
  - Novel high-repetition rate drivers
  - Radiation generation from laser-accelerated beams
  - High-quality ion laser-driven ion sources
  - Novel science driven by laser-accelerated beams, e.g. plasma QED
- Opportunities offered by EPAC:
  - Expand technical capabilities of beamlines (energy and brighter electron beams, brighter and harder betatron beams, more energetic and collimated ion beams)
  - Staged acceleration of laser accelerated beams
  - Development of novel radiation sources (XFEL, Compton…)
- Contribute to worldwide plasma accelerator development initiatives:
  - ELI, DESY, LBNL, Zeus
  - ALEGRO working group on plasma-driven colliders, ESPP
  - Plasma-accelerator-driven FELs (EuPRAXIA)

Medical applications vision

John Adams Institute for Accelerator Science

STELLA and LhARA are:

- National & international collaborations led from the UK & JAI
- Active in clinical, multi-disciplinary and industrial engagement

Going forward:

- Work with funders (STFC, MRC; UKRI) to create "eco-system" in which to:
  - Co-create with industrial partners, e.g. Leo Cancer Care; through
  - Co-investment in the TRL pipeline

JAI ideal environment: through co-creation contribute science for growth!

Imperial College London

ROYAL HOLLOWAY UNIVERSITY OF LONDON

UNIVERSITY OF OXFORD

Mei Bai (SLAC)

- **Distinguished Scientist**
- **Deputy Director for Science, Accelerator Directorate**

Ritchie Patterson (Cornell)

- **Helen T. Edwards**
  Professor of Physics

- **Director,**
  Center for Bright Beams

Mike Lamont (CERN)

- **Former Director,**
  Accelerator and Technology

Imperial College London

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