

John Adams Institute

Philip Burrows, Director

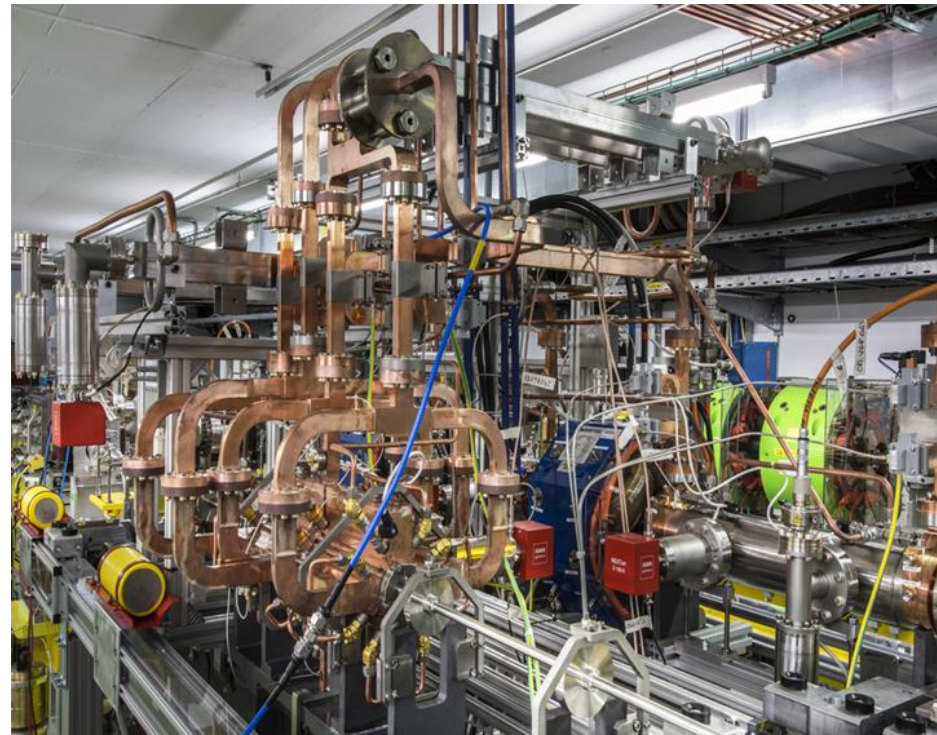


Outline

- **JAI mission + overview**
- **Faculty/staff updates**
- **Funding**
- **Strategy**
- **Programme covered by the following speakers!**

Mission

A centre of excellence for advanced and novel accelerator technology, providing expertise, research, development and training in accelerator techniques, and promoting advanced accelerator applications in science and society



JAI Overview

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

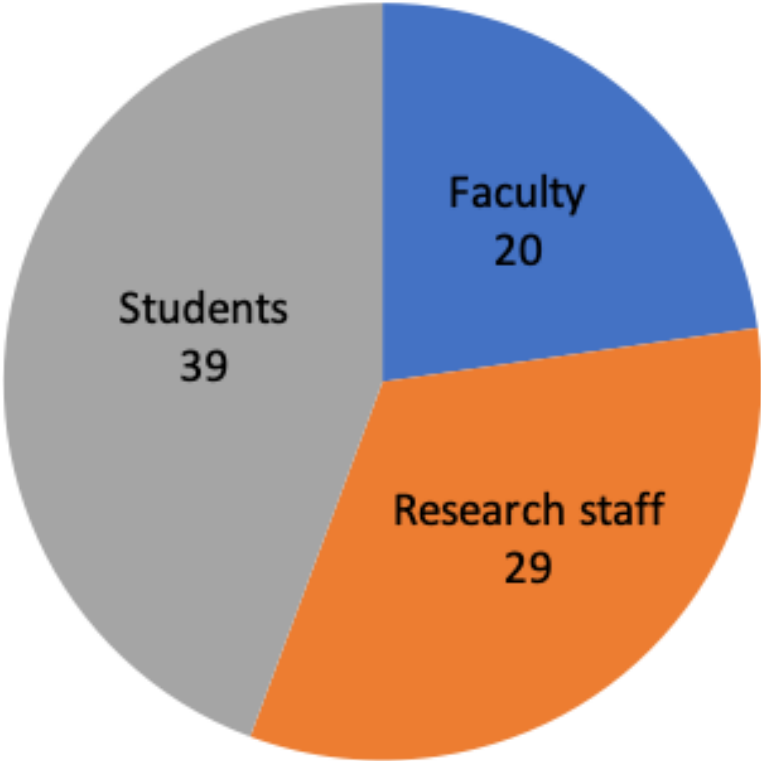
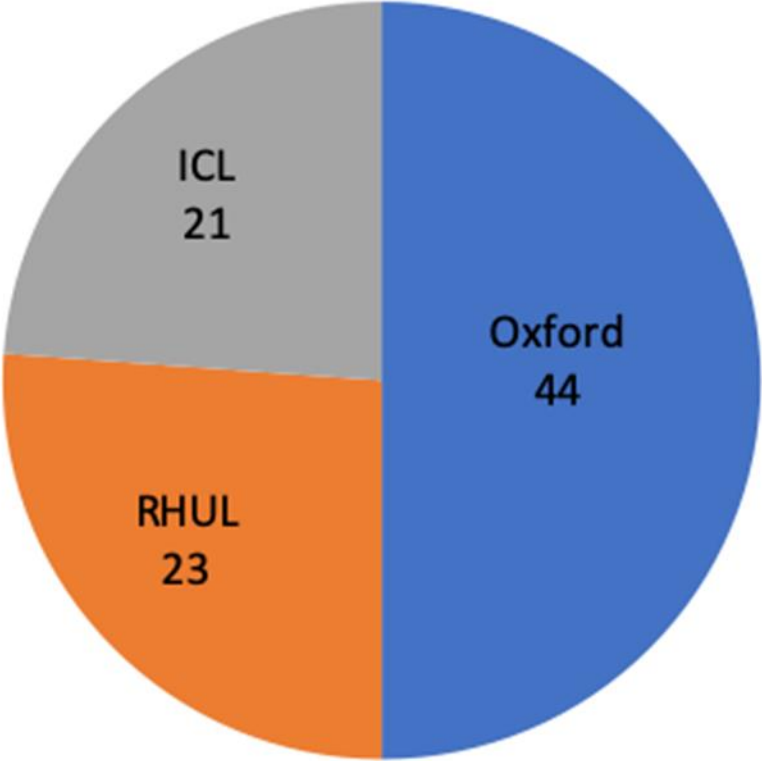
Oxford University, Royal Holloway, Imperial College

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

95 personnel + 33 affiliates (STFC labs, CERN)

JAI Personnel

(March 2020)



**Healthy balance,
maximises
scientific output**



Key expertise (faculty + core staff)

Beam dynamics

Boogert, Burrows, Pasternak, Pozimski, Sheehy, Tsesmelis

Beam instrumentation, feedback & control

Bett, Boogert, Boorman, Burrows, Gibson, Karataev, Lyapin, Reichold

RF systems

Bett, Foster, Lyapin, Zhang

Metrology & alignment systems

Reichold

Laser + plasma systems

Foster, Hooker, Mangles, Najmudin, Norreys, Rose, Walczak

Medical beamlines

Dosanjh, Long, Pasternak, Pozimski, Sheehy

Accelerator R&D projects

2.1 Particle physics colliders and beamlines:

Bett, Boogert, Boorman, Burrows, Foster, Gibson, Karataev, Lyapin, Reichold, Zhang

2.2 Light sources

Boogert, Burrows, Karataev, Lyapin

2.3 Intense hadron beams

Boorman, Gibson, Long, Pasternak, Pozimski, Sheehy

2.4 Advanced acceleration techniques

Burrows, Foster, Hooker, Mangles, Norreys, Najmudin, Rose, Walczak

2.6 Societal applications

Dosanjh, Long, Najmudin, Pasternak, Pozimski, Reichold, Sheehy

Faculty/staff updates

JAI: **PNB** appointed Director for 5 years from 1/6/20

Oxford: Particle Physics strategic hiring plan includes 3 JAI appointments:

UOXF-faculty-1: hadron beams (approved by PMC)

UOXF-faculty-2: advanced acceleration (presented to PMC)

UOXF-faculty-3: particle-beam therapy

Strong links with **Diamond Light Source Head of Accelerator Physics**

Senior staff appointments in RF systems (**Zhang**) and DAQ/controls (**Bett**)

Dosanjh appointed as senior researcher (medical beamlines)

Imperial: Addition to JAI faculty (**Long, Pasternak, Pozimski**): major strengthening on intense hadron beams, muons, medical beamline applications

RHUL: No change

STFC core funding

STFC funds JAI core grant: April '17 – March '21 ~ £5.7M

Faculty time almost entirely paid by universities ~ £2M/an

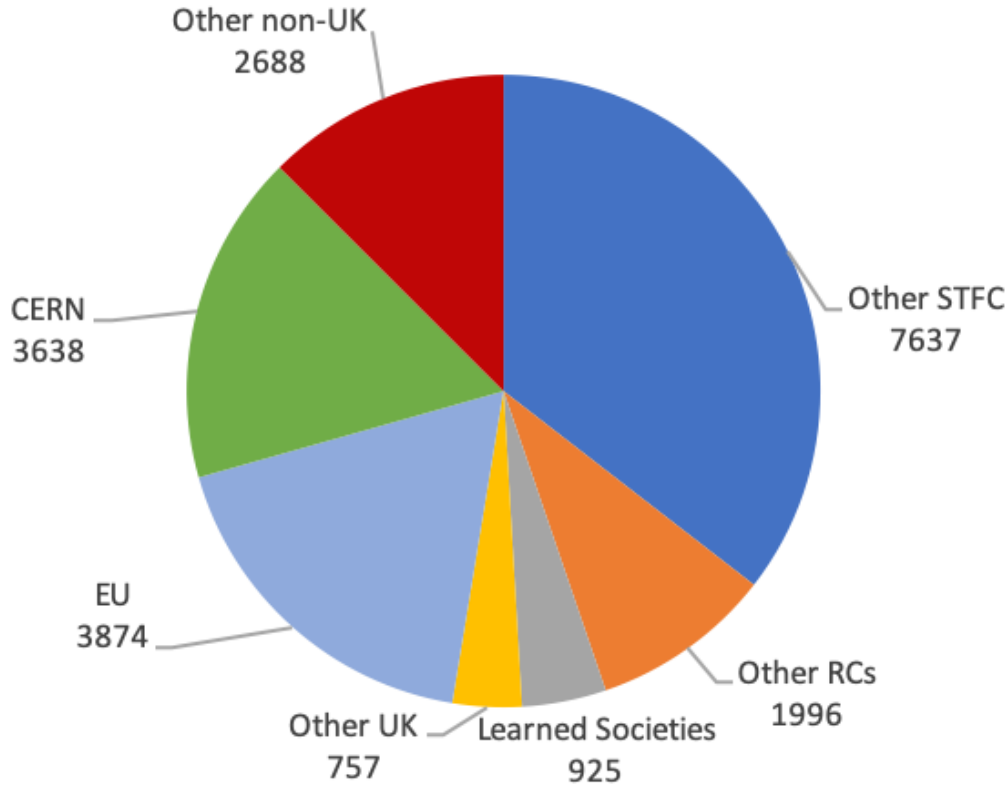
Additional grants for students, equipment + projects (eg. HL-LHC)

Secured additional direct funding > £26M

→ STFC core grant generates substantial output multiplier

Leveraged resources

(March 2020)



Breakdown of leveraged funding overlapping with grant period 2017-21 (£K)

**Total: £26M
(includes £4.6M facilities access not shown)**

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April 17 – March 20 delivered:

320 scientific papers

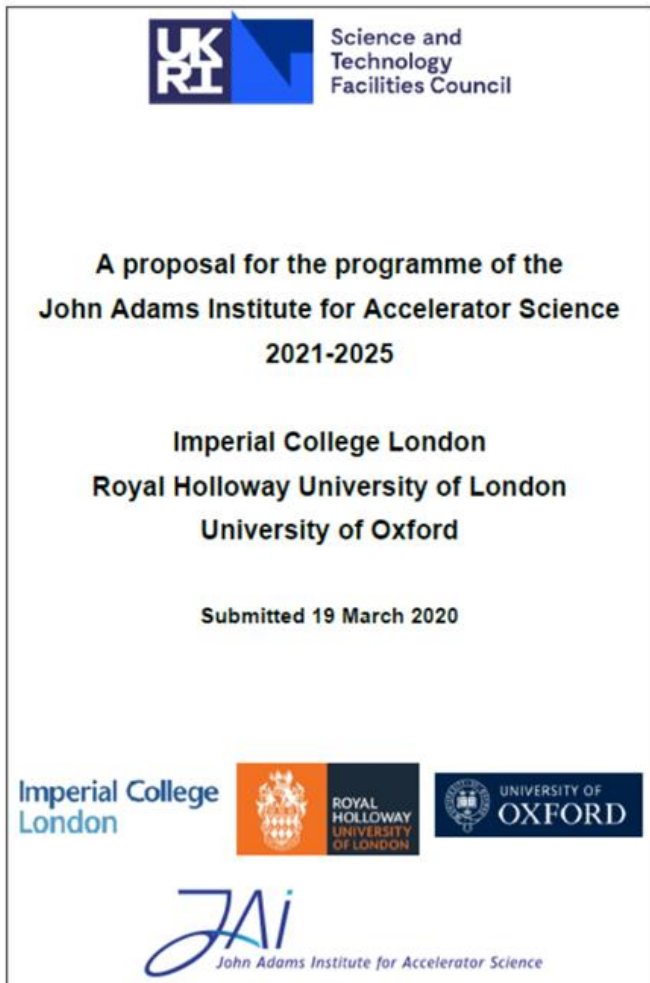
27 PhD graduates (all employed!), 39 PhDs in progress

82 public engagement events reaching 34,000 live

STFC grant renewal



11/12/19 STFC called for bids from JAI and CI for the next grant period 1/4/21 -31/3/25



Proposal submitted 19/3/20

115 pages total, including 13 appendices

**monumental effort from faculty, staff
+ university grants teams**

THANKS TO JAI TEAM!

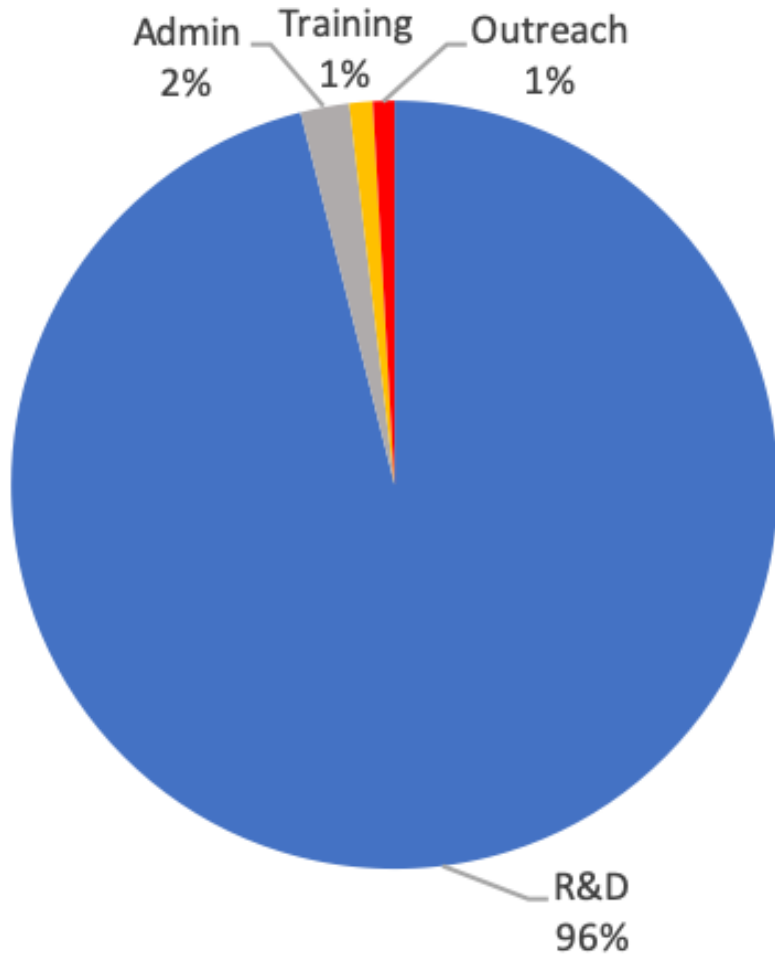
**Thanks to AB for your feedback
+ support!**

STFC grant renewal

11/12/19 STFC called for bids from JAI and CI for the next grant period

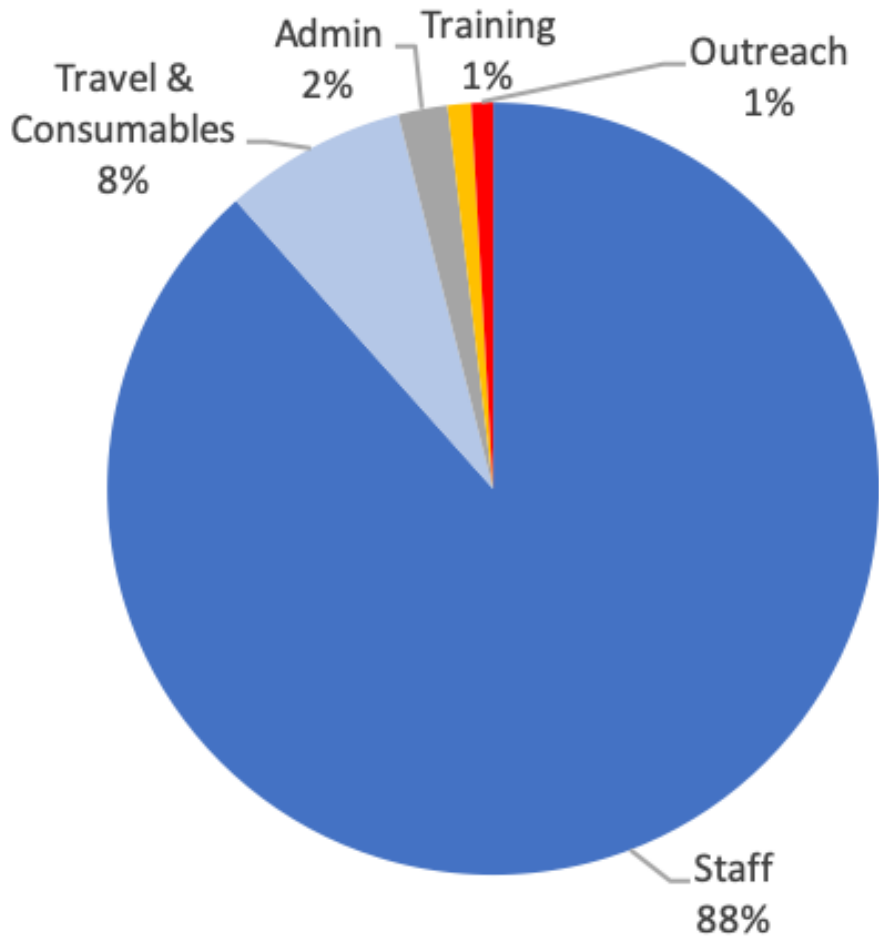
19/3/20 JAI grant proposal submitted
requested £6.95M 'resource' + £0.6M 'capital'

Resource allocation



96% R&D

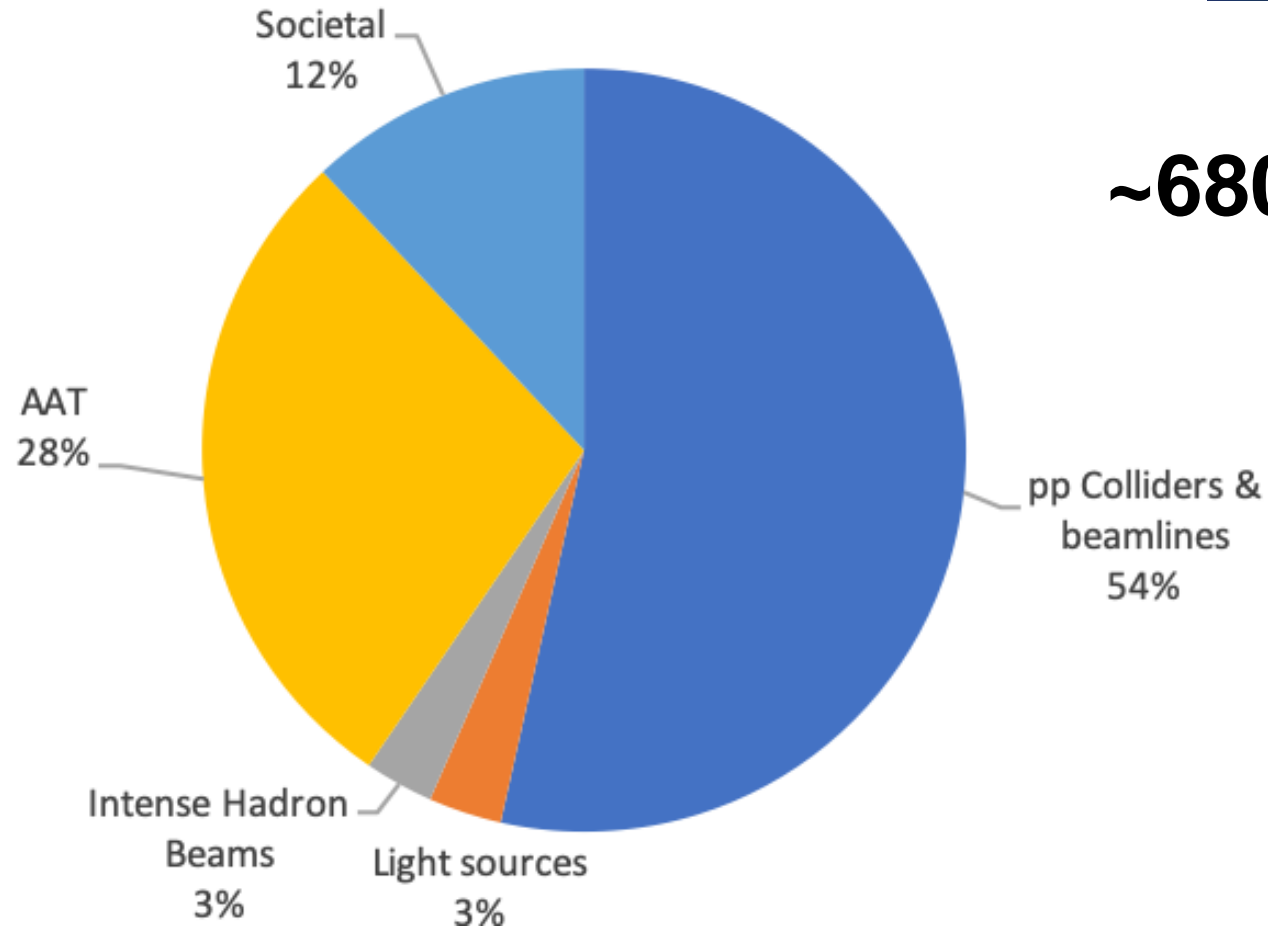
Resource allocation



88% **staff**
8% **T&C**

Staff distribution

(STFC core grant request)



~680 staff months
(39 people)

Key features of STFC request

Focus (~2/3 of total) on 'PP accelerators' (including AWAKE)

- anchored in CERN programme (HL-LHC, AWAKE, CLIC, PBC)
- capitalises on UK investment in CERN ('our lab!')
- directly supports STFC high-priority projects + UK PP programme

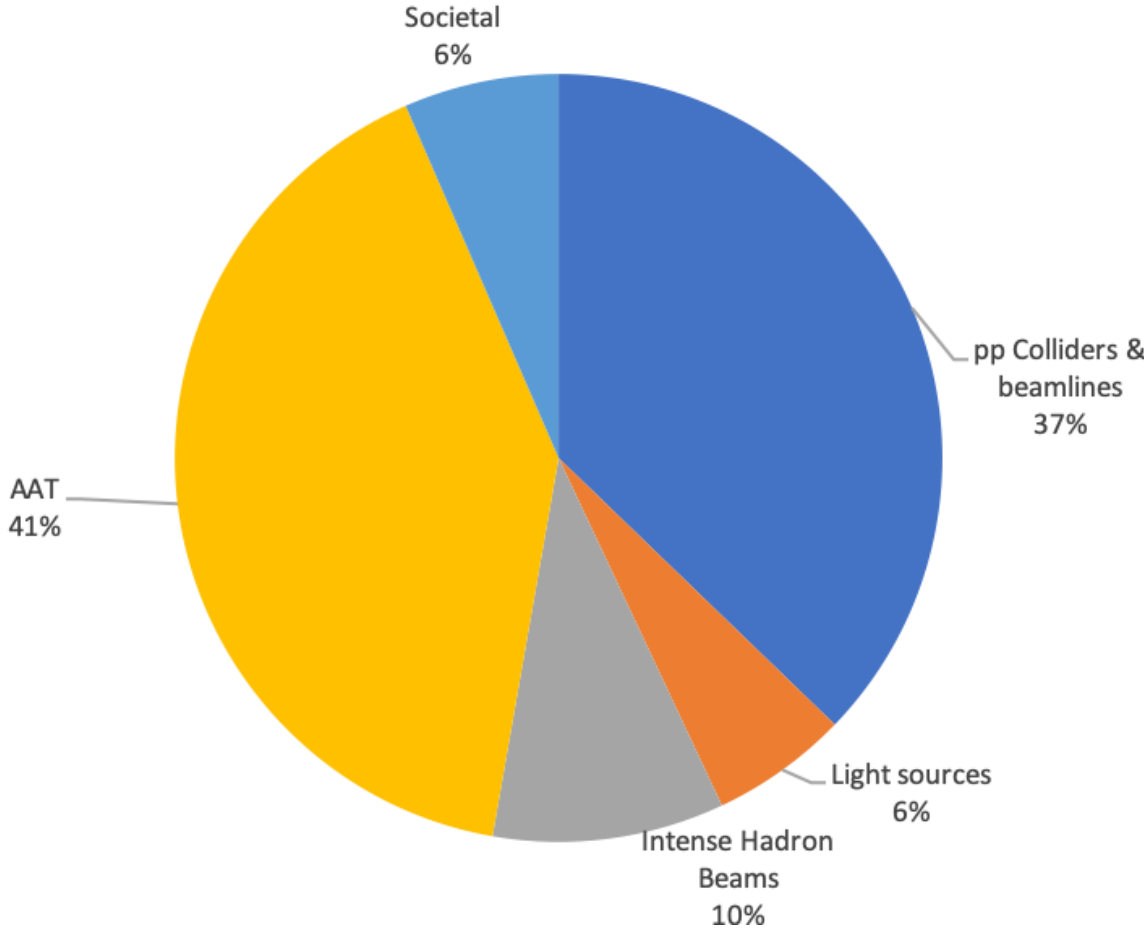
Platform for advanced accelerator R&D

+ for supporting national laboratories: EPAC, DLS(II) + ISIS(II)

Increasing emphasis on societal (medical) applications

Personnel distribution

(All funding sources, March 2020)



**Complete
JAI personnel
deployment
including students**



STFC grant renewal

11/12/19 STFC called for bids from JAI and CI for the next grant period

19/3/20 JAI grant proposal submitted

Peer review by dedicated committee:

8/6/20 Future science/technical programmes

11/6/20 Broader institute strategy + management

7/7/20 Affordability and potential funding scenarios

20/10/20 Recommendation to STFC Science Board

15/1/21 Grants announced

STFC grant award

April 2021 – March 2025



£6.5M 'resource' + £0.6M equipment

Research staff effort as requested

Capital equipment as requested

Reduced travel, consumables, admin + faculty time support

No funding for project students

(Also receiving £0.3M/yr for PhD students via STFC 'quota')

JAI programme

today's presentations

Particle physics colliders and beamlines

Stephen Gibson

Light sources

Ian Martin

Intense hadron beams

Jaroslav Pasternak

Advanced acceleration techniques

Zulfikar Najmudin

Medical beamline applications

Manjit Dosanjh

Industrial applications and connections

Laurie Nevay

Training and public engagement

Emmanuel Tsesmelis

JAI and UK Strategy

- **STFC Accelerator Strategic Review (2018):**
Roadmap coordinators:
 - PP machines:
 - Light sources:
 - Novel accelerators:
 - Industrial, medical:
 - Neutron sources:
- **STFC Accelerator Programme Evaluation Panel**
- **STFC Particle Physics Technology Advisory Panel**
- **STFC Science Board**
- **STFC Projects Peer Review Panel**
- **UKRI Infrastructure Advisory Committee**
- **UK Research Excellence Framework Physics Panel**

Boogert, Boulding

Burrows, Long

Bartolini

Najmudin

Van den Heuvel

Thomason

Gibson, Hooker

Burrows

Najmudin

Gibson

Foster

Burrows

JAI and European Strategy

- European Strategy for Particle Physics Update (2020)
Burrows Scientific Secretary for accelerators
- European Committee for Future Accelerators
Boogert, Burrows UK delegates
- European Lab Directors' Group accelerator R&D roadmap:
Tsesmelis (Scientific Secretary)
Hooker (high-grad accel, plasma), Long (muon beams)
- European project coordination: TIARA, EuPRAXIA, ARIES, I.FAST, EuroCircol, FCCIS, EJADE ...
Bartolini, Boogert, Burrows, Foster, Hooker, Long, Najmudin, Walczak

Extra material

For reference if needed

Engagement with STFC + international laboratories



Close research and training engagement with DLS, ISIS, CLF:

- Diamond + ISIS upgrades, FETS, IBEX, EPAC, UK-XFEL
- 2 joint PDRAs (Oxford) with DLS + ISIS
- 7 DLS + ISIS staff part-time PhDs (Oxford)



Strong collaboration with Daresbury/ASTeC + CI:

- Bring complementary skills to UK collaborations on major projects (CLIC, HL-LHC, AWAKE, EuPRAXIA, STELLA, ITAR ...) + support CLARA

Major partnership with CERN: HL-LHC, CLIC, AWAKE, PBC ...

- Currently: 9 doctoral students + 4 PDRAs @ CERN

Strong relationships with many overseas labs:

- KEK (ATF2), DESY (FLASHForward), BNL (ATF), SLAC (FACET), PSI ...



JAI faculty

Royal Holloway:

Stewart Boogert, Stephen Gibson, Pavel Karataev

Imperial College:

Ken Long, Stuart Mangles, Zulfikar Najmudin, Jaroslav Pasternak,

Juergen Pozimski, Steven Rose

Emeritus: Bucker Dangor

Oxford:

Philip Burrows, Brian Foster, Simon Hooker, Peter Norreys,

Armin Reichold, Suzie Sheehy, Roman Walczak

Visiting: Manjit Dosanjh, Emmanuel Tsesmelis, Richard Walker

Emeritus: George Doucas, Ken Peach

Welcome to IC (HEP) colleagues!

Ken Long

Jaroslav Pasternak

Juergen Pozimski

Ajit Kurup

Paul Jurg

Hin Tung Lau

Titus-Stefan Dascalu

Rebecca Taylor

Congratulations!

Riccardo Bartolini

**Project Leader:
PETRA IV, DESY**



Congratulations!

Simon Hooker

IoP

Cecilia Payne-Gaposchkin

Medal and Prize

(plasma physics)



Congratulations!

Brian Foster

**Institute of Physics
Honorary Fellow**



JAI staff

Imperial College:

**Saleh Alatabi, Rory Baggott, Emma-Jane Ditter, Ollie Ettliger,
George Hicks, Brendan Kettle, Ajit Kurup**

Oxford:

**Douglas Bett, James Cowley, Johan Fopma, Hector Garcia Morales,
Mark Jones, Jubin Mitra, Peter Qiu, Rebecca Ramjiawan, Phill Tait,
Emi Yamakawa, Weida Zhang**

Royal Holloway:

**Andrey Abramov, Alberto Arteche, Paul Bamford, Gary Boorman,
Alessio Bosco, Richard Elsom, Alexey Lyapin, Laurie Nevay,
William Shields, Stuart Walker**

Welcome!

Weida Zhang

**Senior electronic
engineer (OX)**



Welcome!

Douglas Bett

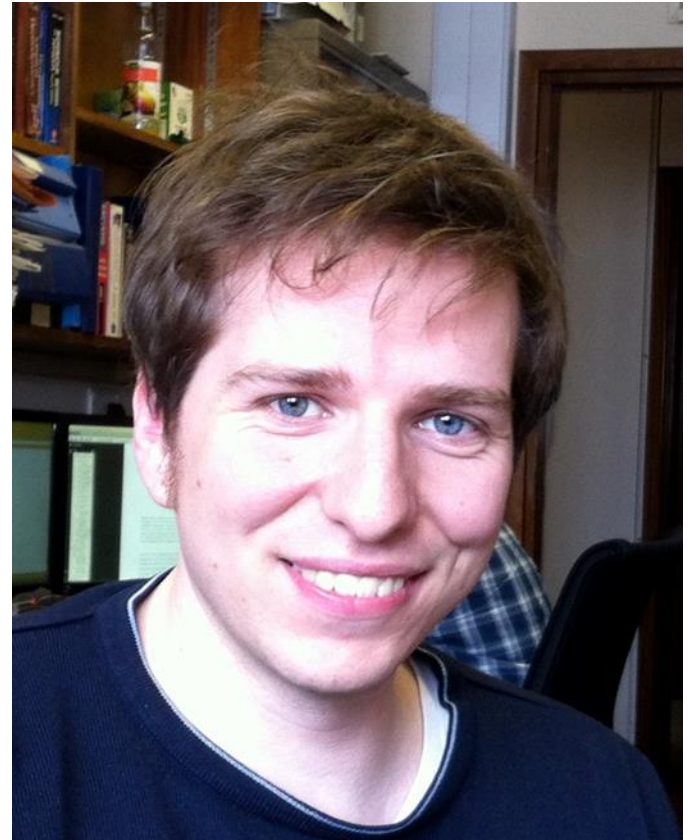
**Data acquisition
engineer (OX)**



Welcome!

Nick Dover

Marie Curie Fellow (IC)



Welcome!

Pierre Korysko

PDRA, CLIC + CLEAR (OX)



Welcome!

Marko Mayr

PGRA, AWAKE-2 (OX)



Farewell!

Andrey Abramov

→ CERN Fellow (FCCee)

Aaron Alejo

→ La Caixa Junior Leader Fellow, Spain

Stuart Walker

→ PDRA on E-XFEL (DESY)

Rob Shalloo

→ PDRA, DESY

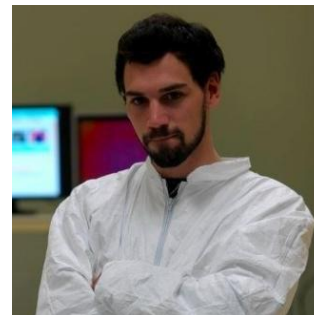
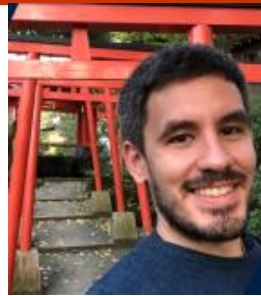
Matthew Streeter

→ Research Fellow, CPP Queen's Belfast

Robert Kieffer

→ Swiss industry

James Holloway



JAI students

Oxford:

Emily Archer, Pablo Arrutia Sota, Joe Bateman, Luke Dyks, Jake Flowerdew, Peter Griffin-Hicks, Oscar Jakobsson, Jakob Jonnerby, Ji Li, Carlo Mussolini, Collette Pakuza, Alexander Picksley, David Posthuma de Boer, Cameron Robertson, Aimee Ross, Max Topp-Mugglestone, Robert Williamson, Wei Ting Wang, Laurence Wroe

Imperial College:

Michael Backhouse, Meriam Berboucha, Cary Colgan, Titus-Stefan Dascalu, Adam Hughes, Paul Jurg, Hin Tung Lau, Eva Loss, Rohan Prasad, Rebecca Taylor, Robbie Watt, Wei Wu, Nuo Xu

Royal Holloway:

Siobhan Alden, Majid Ali, Daniele Butti, Theodoros Christodoulou, Gian Luigi D'Alessandro, Kirill Fedorov, Helen Guerin, Daniel Harryman, Helena Lefebvre, Robert Murphy, Andrei Olenik

Welcome class of 2020!

Majid Ali

Robert Murphy

Emily Archer

Pablo Arrutia Sota

Joe Bateman

Rory Edwards

Cameron Robertson

Meriam Berboucha

Rohan Prasad

Rebecca Taylor

(Pyroelectric accel)

(CERN beamlines)

(LWFA)

(CERN SPS)

(beam therapy)

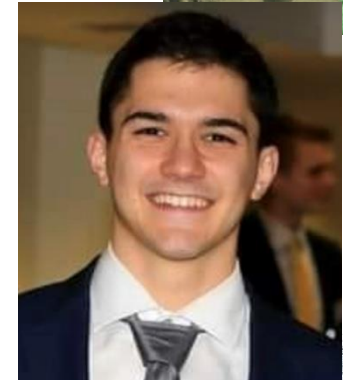
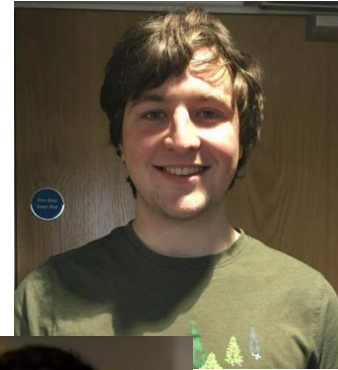
(MPhys)

(beam therapy)

(LWFA)

(laser ion sources)

(beam therapy)



Congratulations on completing PhD!

Andrey Abramov

Elias Gerstmayr

Chetan Gohil

Jan-Niclas Gruse

Pierre Korysko

Lucy Martin

Jan Paszkiewicz

Eugenio Senes

Niki Vitoratu

Stuart Walker

Congratulations on new positions!

Andrey Abramov



→ CERN Fellow (FCCee)

Elias Gerstmayr

→ PDRA, Photon Sciences, SLAC

Chetan Gohil

→ PDRA, Oxford Psychiatry

Jan-Niclas Gruse

→ Consultancy, Berlin

Pierre Korysko



→ PDRA, JAI Oxford (CLEAR)

Lucy Martin

→ Fellow, Edinburgh Genetics

Jan Paszkiewicz

→ CERN Fellow (RF)

Eugenio Senes



→ CERN Fellow (AWAKE)

Niki Vitoratu

→ PDRA, CI (AWAKE)

Stuart Walker



→ PDRA RHUL → DESY (E-XFEL)

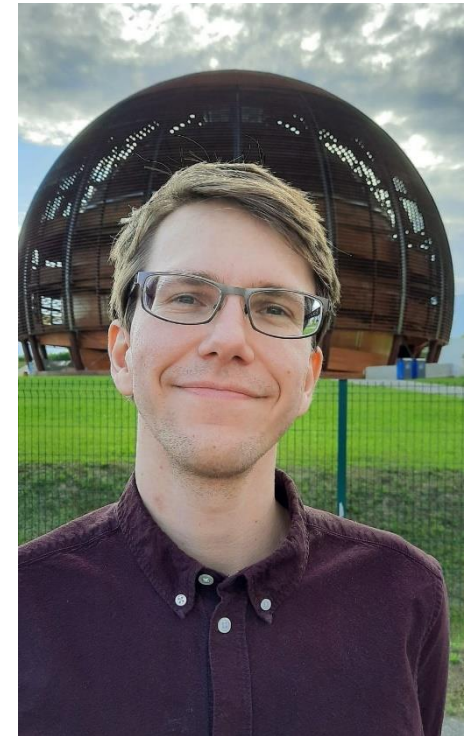


Congratulations on CERN Fellowships!

Eugenio Senes



Jan Paszkiewicz



Andrey Abramov



Congratulations!

**Lawrence Wroe:
IET PAEN poster prize**



**Collette Pakuza:
John Adams Prize**



**Charles Sillett:
MPhys project prize**

