

# John Adams Institute

Philip Burrows, Director





# John Adams Institute

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**Oxford University, Royal Holloway, Imperial College**

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

**22 faculty**

**32 staff**

**48 PhD students**

**Research projects at: CERN, DESY, KEK, Daresbury,  
Diamond, ISIS, CLF ...**

# JAI grant proposal 2021-25



Science and  
Technology  
Facilities Council

A proposal for the programme of the  
John Adams Institute for Accelerator Science  
2021-2025

Imperial College London  
Royal Holloway University of London  
University of Oxford

Submitted 19 March 2020

Imperial College  
London



**115 pages total,  
including  
13 appendices**

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

**THANK-YOU!**

# STFC grant award 15/1/21

April 2021 – March 2025



**£6.5M 'resource' + £0.6M equipment**

**Research staff support as requested**

**Capital equipment as requested**

**+ £172k announced 9/2/21 for spend by 30/9/21 (!)**

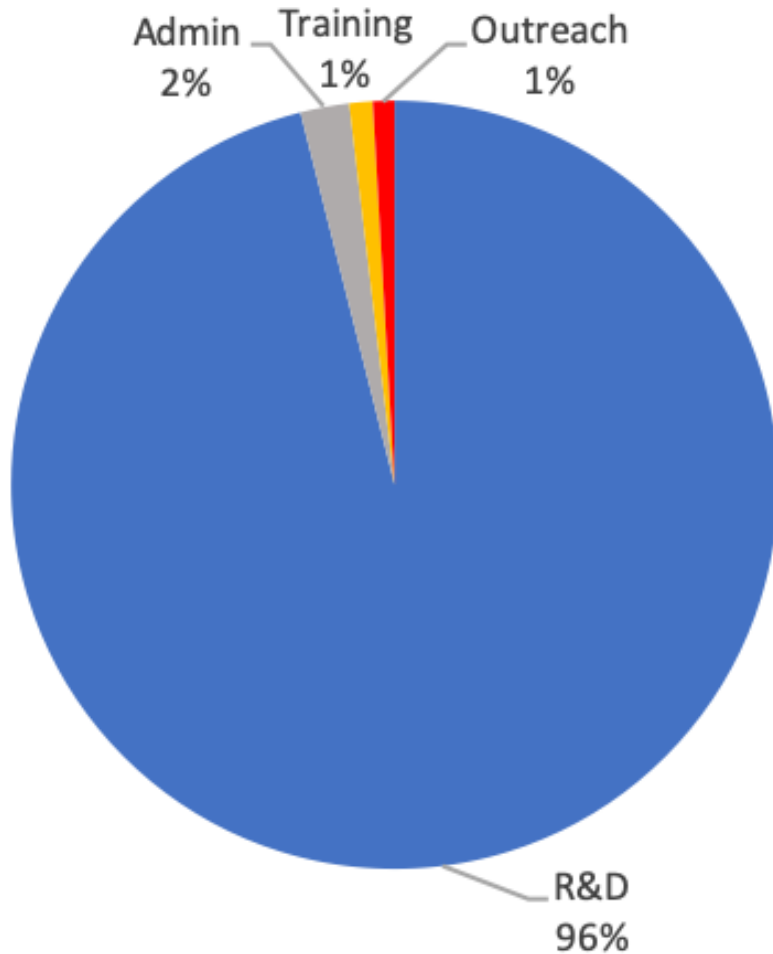
**Lower travel, consumables, admin + faculty time support**

**No funding for project students**

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



# Resource allocation



**96%**

**R&D:**

**91%**  
**5%**

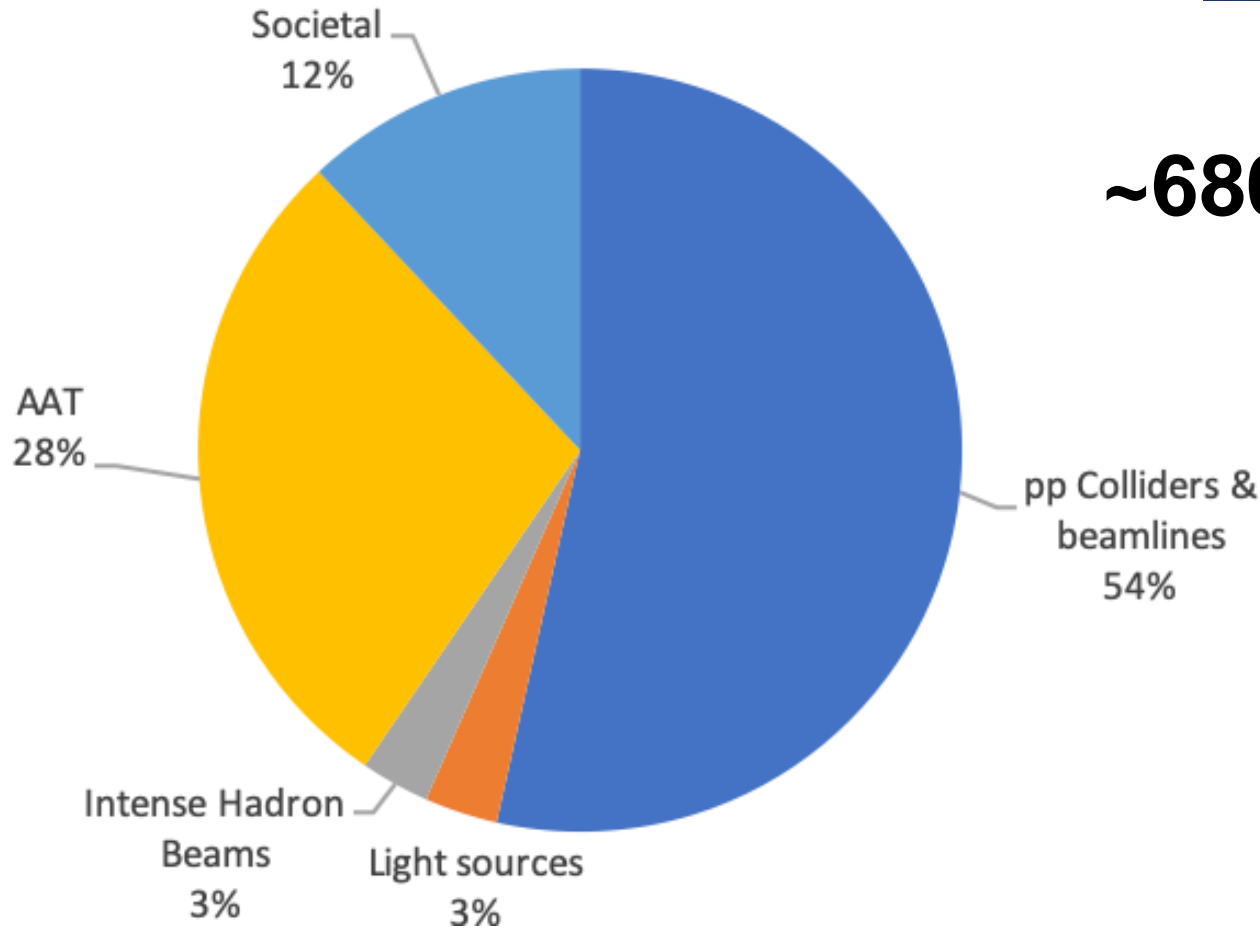
**staff**  
**T&C**

# Staff distribution

(STFC core grant request)

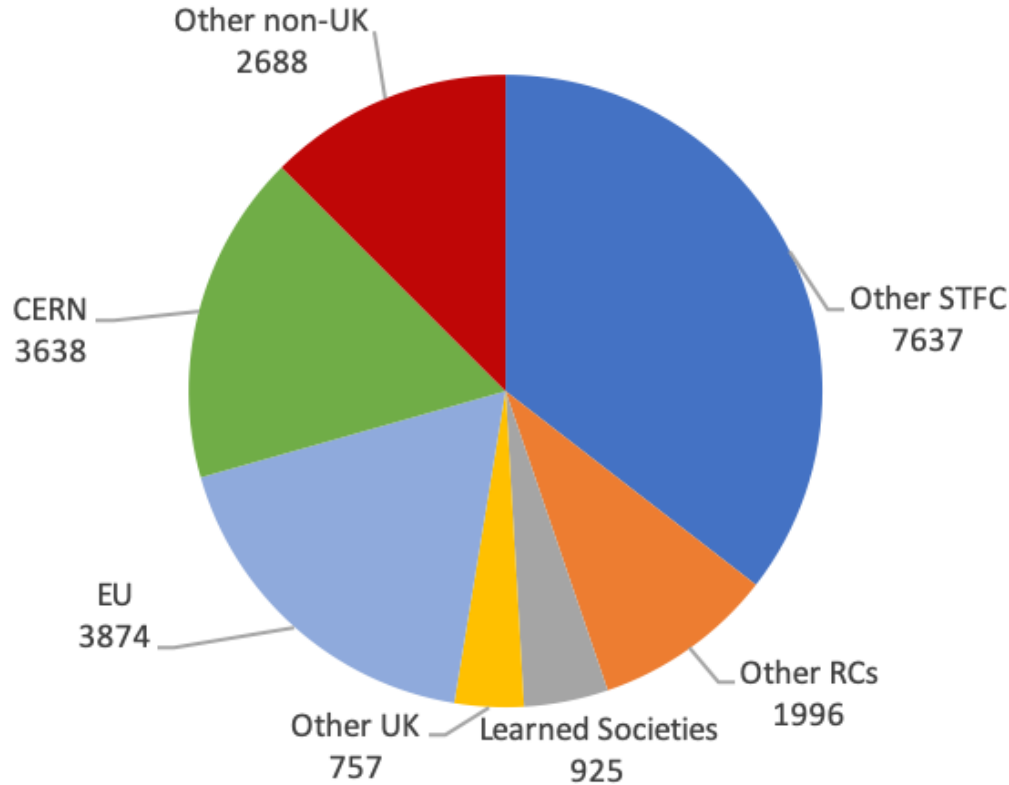


**~680 staff months**  
(39 people)



# Leveraged resources

(March 2020)



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

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



# Covid19 response



- During lockdown, JAI has been functioning very effectively, largely via virtual interactions
- 4 PDRAs + 5 doctoral students on LTA at CERN worked safely and effectively
- Laboratory work proceeded at universities subject to Covid safety measures
- During lockdown 10 PhD students graduated and secured excellent positions
- Admitted 9 PhD students in October 2020 – completed JAI graduate course
- Recruited + admitted 9 PhD students who started in October 2021

## Concerns:

- Some student LTAs delayed due to STFC travel restrictions
- Hands-on project work has been impacted
- Facility access reduced → delays in experimental programmes
- Delays in hiring
- Monitor and support all our personnel who are unable to work 'on site'

# JAI faculty

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## **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**

# Congratulations!

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**Suzie Sheehy**

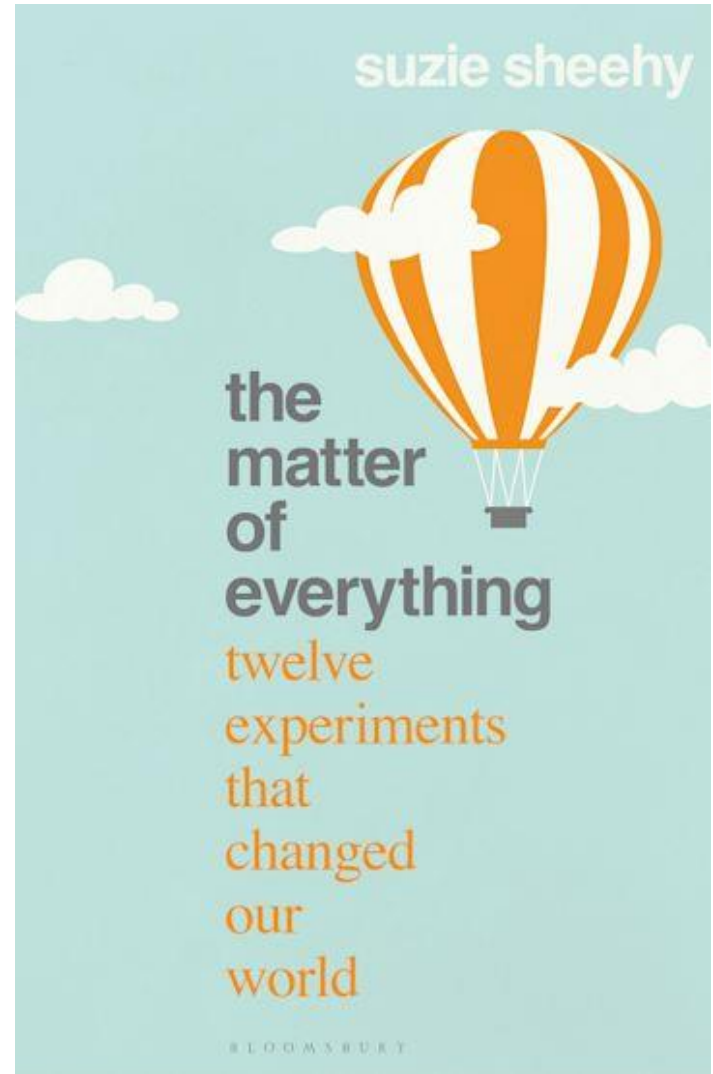
**Taking up senior  
lectureship at  
Melbourne University**



# Congratulations!

**Suzie Sheehy**

**New book about to be  
published**



# Congratulations!

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## **Bucker Dangor**

### **2021 IoP Michael Faraday Medal and Prize**

for outstanding contributions  
to experimental plasma  
physics, and in particular for  
his role in the development  
of the field of laser-plasma  
acceleration



# Congratulations!

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**Steve Rose**

**Fellow of the American  
Physical Society**





# Congratulations!

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**Philip Burrows**

**Council of the  
Institute of Physics**



# JAI staff

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## **Imperial College:**

**Saleh Alatabi, Rory Baggott, Ben Chen, Ollie Ettlinger, George Hicks,  
Brendan Kettle, Rakesh Kumar Yembadi, Ajit Kurup**

## **Oxford:**

**Vittorio Bencini, Douglas Bett, James Chappell, James Cowley,  
Linus Feder, Johan Fopma, Hector Garcia Morales, Pierre Korysko,  
Mark Jones, Jubin Mitra, Peter Qiu, Phill Tait, Emi Yamakawa, Weida Zhang**

## **Royal Holloway:**

**Alberto Arteche, Paul Bamford, Gary Boorman, Alessio Bosco,  
Richard Elsom, Alexey Lyapin, Mark McCallum, Laurie Nevay,  
William Shields**

# Welcome!

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## **Ben Chen**

Discharge development and modeling for AWAKE (IC)



## **Rakesh Kumar Yembadi**

High rep-rate laser wakefield accelerators (IC)



# Welcome!

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## James Chappell

Laser-plasma accelerators (OX)



## Linus Feder

Laser-plasma accelerators (OX)



# Welcome!

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**Vittorio Bencini**

PDRA – AWAKE (OX)



# Welcome!

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**Mark McCallum**

RA – industrialisation in  
accelerator electronics (RHUL)





# Congratulations!

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**Emma Jane Ditter**

→ PDRA Cambridge



**Andrey Abramov**

→ CERN Fellowship



# Congratulations!

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**Rebecca Ramjiawan**

→ CERN Fellowship



**Emi Yamakawa**

→ Staff position, ISIS



# JAI students

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## **Oxford:**

**Emily Archer, Pablo Arrutia Sota, Joe Bateman, Luke Dyks, Jake Flowerdew, Peter Griffin-Hicks, Oscar Jakobsson, David McMahon, Carlo Mussolini, Collette Pakuza, David Posthuma de Boer, Cameron Robertson, Aimee Ross, Bethany Spear, Max Topp-Mugglestone, Johannes Van de Wetering, Seb Wilkes, Robert Williamson, Wei Ting Wang, Laurence Wroe**

## **Imperial College:**

**Michael Backhouse, Meriam Berboucha, Cary Colgan, Titus-Stefan Dascalu, Elias Gertschmayer, Jan-Niclas Gruse, Anna Gunn, Adam Hughes, Paul Jurg, Hin Tung Lau, Eva Los, Maria Maxouti, Rohan Prasad, Rebecca Taylor, Robbie Watt, Wei Wu, Nuo Xu**

## **Royal Holloway:**

**Siobhan Alden, Majid Ali, Daniele Butti, Theodoros Christodoulou, Alec Clapp, Gian Luigi D'Alessandro, Helen Guerin, Daniel Harryman, Helena Lefebvre, Robert Murphy, Florian Stummer**

# Welcome class of 2021!

**Alec Clapp**  
**Florian Stummer**  
David McMahon  
Bethany Spear  
Johannes van de Wetering  
Seb Wilkes  
Annabel Gunn  
Maria Maxouti  
Josie McGarrigle



**Guests:**  
**Fern Pannell**  
**Namra Aftab**  
**Sandeep Mohantray**

(UCL)  
(HU-B)  
(HU-B)

**ODR BPMs / Diamond**  
**CERN beamlines**

laser wakefield acceleration  
**AWAKE**

laser wakefield acceleration  
Diamond Light Source upgrade

high-power MIR lasers/accelerators  
LHARA/ion sources



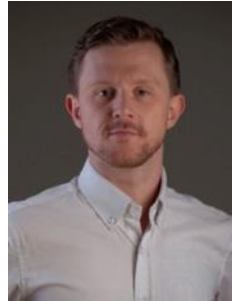
**AWAKE**



# Congratulations on completing PhD!

**Jan-Niclas Gruse**

→ consultant/data science, Berlin



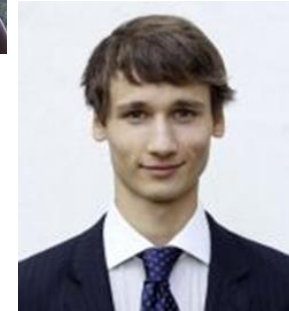
**Jakob Jonnerby**

→ PDRA, IC



**Ji Li**

→ fellow, IoP Beijing



**Marko Mayr**

→ PDRA ALP/Oxford

**Alex Picksley**

→ PDRA, BELLA / LBNL



**Robbie Watt**

→ PDRA, SLAC



**Kirill Fedorov**

→ PDRA RAL/CLF

Kirill Fedorov



Diagnostics

**Andrei Olenik**

→ Russia

Andrei Olenik



Pyroelectrics



# Congratulations!

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**Laurence Wroe:**

**Linacre College**

**Keene Domus Research Prize**

*for excellent research communication skills*

**Oxford Project Engagement with Research  
Seed Fund**

*'Funky-Shaped Drums and Particle Accelerators'  
schools workshop for 11-14 year-olds*





# Congratulations!

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to H  l  ne Guerin



Welcome Oscar!



# Future Leadership?



# JAI seminars

thanks to Emmanuel + Luke

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**Seminar series running for a year via Zoom Thursdays 16:15**

**JAI accelerator seminar → UK accelerator seminar series**

<https://indico.cern.ch/category/13863/>

**Confirmed for next term:**

Mark Boland

Fulvia Pilat

Emilio Nanni

Ralph Assmann

Bruce Carlsten

Sergei Nagaitsev

Canadian Light Source

Spallation Neutron Source

THz for electron diffraction

EuPRAXIA

Space-borne Accelerators

IOTA

# Today's programme (1)

[see more...](#)

09:00	<b>Director's report</b> <i>Philip Nicholas Burrows</i> 09:00 - 09:30
	<b>Status of a beam position monitor for the AWAKE experiment based on Cherenkov diffraction radiation</b> <i>Collette Pakuza</i> 09:30 - 09:50
10:00	<b>Electron beamline design for AWAKE Run 2</b> <i>Rebecca Louise Ramjiawan</i> 09:50 - 10:10
	<b>Synchrotron radiation interferometry for beam size measurement at the LHC</b> <i>Daniele Butti</i> 10:10 - 10:30
	<b>Tea / coffee break</b> 10:30 - 10:50
11:00	<b>Upgrades to the CLEAR facility at CERN</b> <i>Luke Aidan Dyks</i> 10:50 - 11:10
	<b>Machine Learning applied to processing cavity BPM signals</b> <i>Alexey Lyapin</i> 11:10 - 11:30
	<b>Development of laser-particle process for GEANT4 and validation with ATF2</b> <i>Siobhan Alden</i> 11:30 - 11:50
12:00	<b>Instability and Beam-Beam Study for Multi-TeV PWFA e+e- and gamma gamma Linear Colliders</b> <i>Ben Chen</i> 11:50 - 12:10
	<b>Applications of Bayesian Inference in Radiation Reaction Experiments</b> <i>Eva Los</i> 12:10 - 12:30
	<b>Lunch</b>

# Today's programme (2)

		12:30 - 13:30
	RF Cavities: Thinking Outside Circular Boxes	Laurence Matthew Wroe
		13:30 - 13:50
14:00	Gev-Scale Accelerators Driven by Plasma-Modulated Pulses from Kilohertz Lasers	Oscar Jakobsson
		13:50 - 14:10
	kHz electron and ion acceleration exploiting two plasmon decay	Rakesh Kumar Yembadi
		14:10 - 14:30
	Measurements of the effect of density ramps GeV laser-wakefield accelerated beams: implications for staging	Michael Backhouse
15:00	Tea/ coffee break	14:50 - 15:10
	Medical Applications of BDSIM	William Shields
		15:10 - 15:30
	Understanding the instabilities in a plasma lens for ion-beam focusing	Titus Dascalu
		15:30 - 15:50
16:00	Life After JAI: A cross-disciplinary approach to cancer research	Lucy Martin
		15:50 - 16:10
	Virtual / Local Cocktails	

# JAI Fest 2021

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**Let's enjoy the day!**