



The Cockcroft Institute
of Accelerator Science and Technology

Introduction to the Cockcroft Institute Education and Training Program

2023/24

Outline

- The CI lecture programme
 - Goals
 - Scope
 - Organisation
- Other education and training opportunities
- Maintaining a Portfolio of Activity

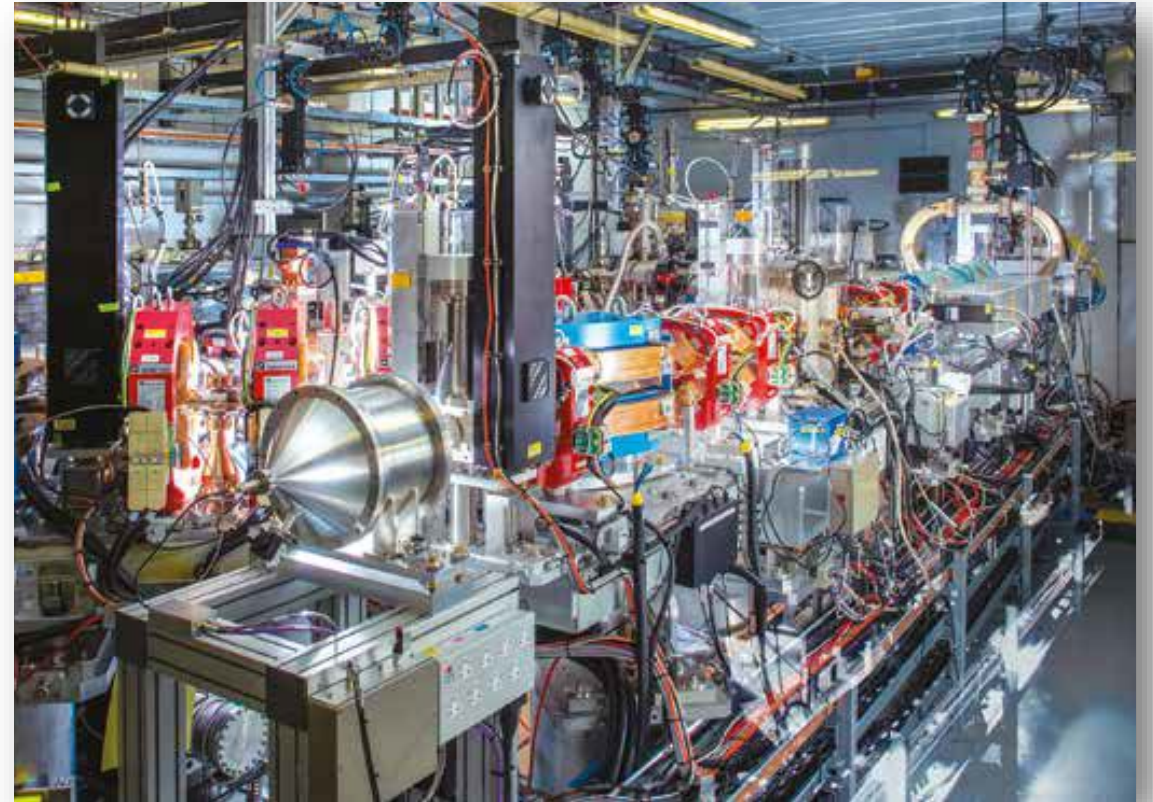
For further details and information, see the *CI Postgraduate Handbook*.

If you have any questions, please ask (your supervisor, Laura, or me).

Goals of the CI Lecture Programme

The goal of the CI lecture programme is to support the development of a **broad range** of knowledge and skills to enable you to attain a high level of achievement in the accelerator research that you carry out while studying for your PhD and in your subsequent career.

The lectures focus on technical aspects, but also cover complementary skills (communication, outreach, project planning, organisation and management).



Education and Training

Education:

The act or process of imparting or acquiring general knowledge, developing the powers of reasoning and judgment, and generally of preparing oneself or others intellectually for mature life.

Dictionary.com

An enlightening experience.

Oxford English Dictionary

Training:

The action of teaching a person or animal a particular skill or type of behaviour.

Oxford English Dictionary

Structure of the CI Lecture Programme

- Each set of lectures has a code: *CI-theme-level*
- There are five *themes*:
 - ACC: general accelerators
 - BEAM: beam dynamics
 - MAG: magnets and insertion devices
 - RF: radiofrequency systems
 - SWA: short-wavelength accelerators
- There are four *levels*:
 - 100: Introductory (annual programme)
 - 200: Advanced (biennial, codes 21X and 22X)
 - 300: Options/specialist (biennial, 31X and 32X)
 - 400: Complementary skills

The CI Lecture Programme: Autumn 2021 Schedule

indico.stfc.ac.uk

Departments > ASTeC > Cockcroft Lectures



Cockcroft Institute Lecture Programme
October 2023 – January 2024

- CI-ACC-101: Introduction to Accelerators**
Hywel Owen (HO) CI/ASTeC
- CI-ACC-102: Relativity and Elements of Electromagnetism**
Jonathan Gratus (JG) CI/Lancaster University
- CI-RF-103: Introduction to Radio Frequency Systems**
Graeme Burt (GB) CI/Lancaster University, Louise Cowie (LC) CI/ASTeC
- CI-BEAM-104: Introduction to Beam Dynamics**
Ian Bailey (IB) CI/Lancaster University
- CI-BEAM-105: Lattice Design and Computational Dynamics**
Rob Apsimon (RA) CI/Lancaster University, Oznur Apsimon (OA) CI/University of Manchester
- CI-Mag-106: Conventional Magnets for Accelerators**
Alex Bainbridge (AB) CI/ASTeC
- CI-SWA-107: Introduction to Short Wave Accelerators**
Guoxing Xia (GX) CI/University of Manchester

Date/time	10:30	11:45	14.00
09 Oct 2023	CI-ACC-102 (JG)	CI-ACC-102 (JG)	No Lecture
16 Oct 2023	CI-ACC-101 (HO)	CI-ACC-101 (HO)	No Lecture
23 Oct 2023	CI-ACC-102 (JG)	CI-ACC-102 (JG)	CI-ACC-102 (JG)
30 Oct 2023	CI-MAG-106 (AB)	CI-BEAM-104 (IB)	CI-BEAM-104 (IB)
6 Nov 2023	CI-MAG-106 (AB)	CI-BEAM-104 (IB)	CI-BEAM-104 (IB)
13 Nov 2023	CI-MAG-106 (AB)	CI-RF-103 (GB)	CI-RF-103 (GB)
20 Nov 2023	CI-MAG-106 (AB)	CI-BEAM-104 (IB)	CI-BEAM-104 (IB)
27 Nov 2023	No Lecture	CI-RF-103 (GB)	CI-RF-103 (GB)
4 Dec 2023	CI-BEAM-105 (RA/OA)	CI-BEAM-105 (RA/OA)	CI-BEAM-105 (RA/OA)
11 Dec 2023	CI-BEAM-105 (RA/OA)	CI-BEAM-105 (RA/OA)	CI-BEAM-105 (RA/OA)
8 Jan 2024	CI-BEAM-105 (RA/OA)	CI-BEAM-105 (RA/OA)	CI-SWA-107 (GX)
15 Jan 2024	CI-BEAM-105 (RA/OA)	CI-BEAM-105 (RA/OA)	CI-SWA-107 (GX)
22 Jan 2024	CI-SWA-107 (GX)	CI-SWA-107 (GX)	CI-SWA-107 (GX)

Lectures will be given in the Walton Room (unless otherwise announced) and via Zoom, and are open to all students and staff.
For connection details and further information, please see: <https://indico.stfc.ac.uk/category/88/>
For queries, contact: r.apsimon@lancaster.ac.uk, laura.corner@liverpool.ac.uk or emily.grundill@stfc.ac.uk



The CI Lecture Programme: Autumn 2021 Schedule

indico.stfc.ac.uk

Departments > ASTeC > Cockcroft Lectures

Lectures are generally on Mondays: 10:30, 11:45, 14:00.

Lectures will take place in the Merrison Lecture Theatre (10 October) or the CI Walton Room (A53, after 10 October).

- CI-Acc-101 Introduction to Accelerators (*Hywel Owen*)
- CI-Acc-102 Relativity and Electromagnetism (*Jonathan Gratus*)
- CI-RF-103 Introduction to RF Systems (*Graeme Burt/Louise Cowie*)
- CI-Beam-104 Introduction to Beam Dynamics (*Ian Bailey*)
- CI-Beam-105 Lattice Design and Computational Dynamics (*Oznur Apsimon and Robert Apsimon*)
- CI-Mag-106 Conventional Magnets (*Alex Bainbridge*)
- CI-SWA-107 Intro. to Short-Wavelength Accelerators (*Guoxing Xia*)



Cockcroft Institute Lecture Programme
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CI-Mag-106: Conventional Magnets for Accelerators Alex Bainbridge (AB) CI/ASTeC
CI-SWA-107: Introduction to Short Wave Accelerators Guoxing Xia (GX) CI/University of Manchester

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23 Oct 2023	CI-ACC-102 (JG)	CI-ACC-102 (JG)	CI-ACC-102 (JG)
30 Oct 2023	CI-MAG-106 (AB)	CI-BEAM-104 (IB)	CI-BEAM-104 (IB)
6 Nov 2023	CI-MAG-106 (AB)	CI-BEAM-104 (IB)	CI-BEAM-104 (IB)
13 Nov 2023	CI-MAG-106 (AB)	CI-RF-103 (GB)	CI-RF-103 (GB)
20 Nov 2023	CI-MAG-106 (AB)	CI-BEAM-104 (IB)	CI-BEAM-104 (IB)
27 Nov 2023	No Lecture	CI-RF-103 (GB)	CI-RF-103 (GB)
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11 Dec 2023	CI-BEAM-105 (RA/OA)	CI-BEAM-105 (RA/OA)	CI-BEAM-105 (RA/OA)
8 Jan 2024	CI-BEAM-105 (RA/OA)	CI-BEAM-105 (RA/OA)	CI-SWA-107 (GX)
15 Jan 2024	CI-BEAM-105 (RA/OA)	CI-BEAM-105 (RA/OA)	CI-SWA-107 (GX)
22 Jan 2024	CI-SWA-107 (GX)	CI-SWA-107 (GX)	CI-SWA-107 (GX)

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The CI Lecture Programme

Some lectures will set homework assignments:

- CI-RF-103 Introduction to RF Systems (Graeme Burt/Louise Cowie)
- CI-Beam-104 Introduction to Beam Dynamics (Ian Bailey)
- CI-Mag-106 Conventional Magnets for Accelerators (Alex Bainbridge)

I hear and I forget.

I see and I remember.

I do and I understand.

Confucius

$$\nabla \times \vec{H} = \vec{J} + \frac{\partial \vec{D}}{\partial t}$$



Other Education and Training Opportunities

- Accelerator Schools
 - CERN Accelerator School
 - US Particle Accelerator School
- Seminars at the Cockcroft Institute and at universities
- Group meetings
- Webinars and other on-line resources
- Collaboration meetings, workshops and conferences
- Outreach events
- CI Postgraduate Conference

Portfolio of Activity

Universities generally require students to maintain a portfolio of activity or personal training record.

Talk to your supervisor about the arrangements for your university.

<i>Name: Ms. Joanne Bloggs</i>							
<i>Training Event</i>	<i>Date Completed</i>	<i>Number of Hours</i>				<i>Number of Events</i>	
		100	200	300	TS	Outreach	Other
CI Lectures: CI-ACC-101	Oct 2018	2					
CI Lectures: CI-BEAM-105	Dec 2018	10					
CI Lectures: CI-ACC-221	Feb 2019		7				
CI Lectures: CI-BEAM-223	Mar 2019		8				
CI Seminars	July 2019						3
Blue Dot Festival	June 2019					1	
Daresbury Open Day	July 2019					1	
Totals		12	15			2	
Required Totals		32	50	40	80	4	

Record of Lecture Attendance

Please complete the attendance record on Google Sheets for each lecture!

Accurate records are needed for:

- completing your portfolio of activity;
- evaluation of the lecture programme;
- reporting our activities to CI stakeholders.

The screenshot shows a Google Sheet with the following data:

	A	B	C	D	E	F	G
1	First Name	Surname	Affiliation	Date	Time		
2				05/07/21	11:45		
3				05/07/21	11:45		
4				05/07/21	11:45		
5				05/07/21	11:45		
6				05/07/21	11:45		
7							
8				12/07/21	10:30		
9				12/07/21	10:30		
10				12/07/21	10:30		
11				12/07/21	10:30		
12				12/07/21	10:30		
13				12/07/21	10:30		
14				12/07/21	10:30		
15							
16							
17							

Feedback and Evaluation of the Lecture Programme

We would like to try to improve the lecture programme in terms of:

- delivery,
- topics covered.

Your feedback on the lectures will be essential.



Cockcroft Institute Lecture Programme

Student Feedback Questionnaire

Autumn 2021

We would greatly appreciate your feedback on CI lectures: this will help us improve the lecture programme for future years. Please complete a copy of this questionnaire after each module, to let us know how the module may be improved. Any specific comments you can make will be especially helpful. Many thanks!

Module:	<i>e.g. CI-Acc-101</i>
Number of lectures attended:	
Your role:	PGR Student / PostDoc / Staff / Other (please specify)
Years of study/work in accelerators:	
Area of interest/specialism:	<i>e.g. RF, diagnostics, laser-plasma acceleration etc.</i>

Please put a cross (X) in the appropriate box to show the extent to which you agree with each of the statements in the table below, on a scale from 1 (disagree strongly) to 5 (agree strongly). You may also add any brief comments, as appropriate.

	1	2	3	4	5	Comments
The aim of each lecture was made clear						
The material was at the right level						<i>e.g. too easy, or too hard</i>
The material was well organised and structured						
The lectures were well-prepared						
The material was explained clearly						
The lectures were delivered at the right pace						<i>e.g. too slow, or too fast</i>
The lecturer was easy to understand						
There were good opportunities for questions						
The lectures helped develop my knowledge of accelerators						

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Departments > ASTeC > Cockcroft Lectures

Thank you!

Any questions?