

Management Board meeting #8

Director's report

Centre development

Administration:

- [Bimonthly progress reports](#) since the MB last met:
 - [August](#)
- [Annual reports](#):

Reporting framework has been revised. Annual reports are no longer required, the arrangements going forward are:

- **Frequency:** Multi-faculty networks and centres will now be reviewed once every two years.
- **Format:** Centre progress will be discussed at a biannual review meeting with up to 5 Networks or Centres, respectively, working in the same or complementary topics. Centre activity will be reviewed at the meeting by a panel of two Vice-Deans (Research) chaired by the faculty host Vice-Dean. To facilitate the discussion, Centre leads will be asked to prepare a short progress report on a Power-Point template to present at their review meeting.

Collaboration:

CCAP:

- Updates from the CCAP members (Faculty of Medicine, the Imperial Academic Health Science Centre, the Imperial College NHS Healthcare Trust, the Department of Physics, the Imperial CRUK Cancer Centre, the Institute of Cancer Research, the John Adams Institute and the Oxford Institute for Radiation Oncology):
 - Imperial College NHS Healthcare Trust:
 - * R. McLauchlan (Consultant Medical Physicist) has been appointed a visiting professor in the Physics Department strengthening the collaboration between the two departments.
 - Institute for Cancer Research:
 - * Discussion continues with K. Harrington and U. Oelfke to identify J. Yarnold's successor.
 - * Conscious of the need for ICR to be represented in today's discussion of the IAC, I have invited G. Bamber to today's meeting.
 - John Adams Institute:
 - * The HEP Group at Imperial joined the Imperial Physics Laser/Plasma group in the recent JAI proposal for continuation of the Consolidated Grant that supports the work of the Institute. The bid, which contained support for elements of the Centre's programme, is understood to have been successful.

External-existing:

- CERN:
 - A graduate student (R. Taylor) has been recruited into the CCAP programme through the CERN Doctoral Student programme (Oct20 start). The student will contribute to the study of slow extraction from the synchrotron ring proposed for the South Eastern European International Institute for Sustainable Technologies ([SEEIIST](#)).

- CERN/STFC: Development of “Smart Technologies to Extend Lives with a Linear Accelerator (STELLA)”:
 - Development continues in the context of the JAI.

New since last time:

- Institut Curie, Paris:
 - Two students have been recruited through the Imperial-CNRS doctoral student scheme. One student in Paris started in October 2020. The Imperial Student (J. McGarrigle) has been recruited, her start has been delayed due to illness. The collaboration will be developed around the biological impact of charged-particle beams.

Under development:

- International Biophysics Collaboration (IBC):
 - Resources requested through a COST proposal (AUSPICE) to support networking activities.
- STFC ISIS and Particle Physics Departments:
 - A joint PhD student (Physics/PPD) has been secured to be recruited for an October 2021 start.

Staff:

- At previous MB meetings the ongoing discussion of two complementary lecturer positions:
 - Lecturer in novel particle radiobiology (FoM/Dept. of Surgery and Cancer); and
 - Lecturer in biophysics (FoNS/Physics);
- were discussed. Discussion of these posts has stalled. The 50% support from the Gunnar Nielsson Trust seems no longer to be available. It may be possible to restart the discussion when the strategic planning activities restart.
- I. McNeish and KL continue to make the case for recognition and support for the LhARA (Laser-hybrid Accelerator for Radiobiological Applications) initiative through the Faculties of Natural Science and Medicine.

Outreach:

Since the MB last met:

- Sep20: PTCOG 2020 Online (PTCOG20), 13 September 2020, **H.T. Lau** on behalf of the LhARA consortium: ”The Laser-hybrid Accelerator for Radiobiological Applications (LhARA)”;
- Jul/Aug20: 40th International Conference on High Energy Physics (ICHEP20), 30 July-5 August 2020, Prague, Czech Republic, **K. Long** on behalf of the LhARA consortium: ”The Laser-hybrid Accelerator for Radiobiological Applications (LhARA)”;
- Jun20: Beam Line and INstrumentation: Fourth Workshop (BLIN4), 29 June 2020, online, Ludwig-Maximilians-Universitat, Munchen, Germany **K. Long** on behalf of the LhARA consortium: ”The Laser-hybrid Accelerator for Radiobiological Applications (LhARA)”;
- **Seminars:**
 - 16 Dec (postponed): Francesco Romano (INFN): ”Dosimetry at FLASH instensities”
 - 25 Nov: Michael Merchant (Manchester): ”Mechanistic modelling of DNA damage and repair for Proton Therapy”
- **External seminars and other presentations:**
 - 30Nov: T. Dascalu, ”Numerical study of proton beam transport through space-charge lens”; poster submitted for the Data Science Virtual Poster Competition, Faculty of Natural Sciences, Imperial College London

Possible speakers to be contacted by A. Kurup to fill seminar slots in the coming terms include:

- Anna Barnett (Sussex): novel technology development;
- Paul Beard (UCL): Photo-acoustic imaging;

- Marco Borghesi (Queens, Belfast): Laser-plasma interactions and ion sources for bio/medical applications.
 - Manjit Dosanjh (CERN): radiotherapy and related research;
 - Ross Gray (Strathclyde): Laser-plasma interactions and ion sources;
 - Amy Chadwick (Manchester): Radiobiology of proton and ion beams (possibility for presentation at ICR, Fulham Road);
 - Giuseppe Schettino (NPL/Surrey): novel dosimetry; and
 - Suzy Sheehy (JAI, Oxford and Melbourne): Medical accelerators.
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LhARA; the Laser-hybrid Accelerator for Radiobiological Applications

pre-CDR:

Funded by STFC through an Opportunities 2019 award, the [pre-CDR for LhARA](#) was completed in April 2019. The pre-CDR was [reviewed](#) by an international panel on the 25th and 31st March 2020. LhARA was well received; in their [report](#) the reviewers commented that “*LhARA is clearly an interesting and well motivated proposal.*” A paper summarising the content of the pre-CDR has now been published:

- [Frontiers in Physics: Medical physics and imaging](#): “LhARA: The Laser-hybrid Accelerator for Radio-biological Applications”, Aymar, G. et al, *Front. Phys.*, 29 September 2020;
<https://doi.org/10.3389/fphy.2020.567738>

Continuing momentum:

The collaboration continues to grow; since the MB last met the following institutes have joined the collaboration:

- The Rosalind Franklin Institut; and
- The [Department of Medical Physics and Biomedical Engineering](#) of the Faculty of Engineering Science at [UCL](#).

Proposals submitted:

- [August 2020, ERC Advanced Grant](#): “*CaptureLhARA: Super-efficient ion capture to harness laser-hybrid accelerators for science, innovation, and society*”:
 - Request for 3.49 MEuro to prove the principle of the laser-hybrid technique.
- [October 2020, Outline proposal to the EPSRC Transformative Healthcare Technologies second call](#): “*Transformative, personalised, precision particle-beam therapy for 2050*”:
 - Request for £300k to support a 15-month “Development Phase” activity to develop a full, 5-year “Delivery Phase”, proposal in three work packages:
 1. Outline Conceptual Design Report for the LhARA proof-of-principle biological-assessment facility;
 2. Proton- and ion-acoustic imaging; and
 3. Evaluation of the benefits of the initiative and optimisation of the R&D programme.
 - Work package 3 was led from Imperial by Dr. P. Price (FoM).
 - The industrial partners had committed to provide contributions in kind with a total value of £465k.
 - In addition, STFC promised matching funding of £300k to support the risk-mitigation programme essential to lay the foundations for the 5-year R&D programme of the Delivery Phase.
 - The outline proposal was rejected by EPSRC. No feedback was provided.

- October 2020, COST proposal to the EU: “AUSPICE: Applied nUclear phySics and bioPhysics at ac-Celerators”:
 - Request for 500 kEuro over 4 years to support networking among the 20 institutes, drawn from 20 countries.
 - The goal of the AUSPICE COST Action is to coordinate European activities in radiobiological research at accelerators.

Next steps:

Following the rejection of the EPSRC Transformative Healthcare Technologies outline proposal, the LhARA Steering group agreed the following following fund-raising targets:

- Over two years, the target will be to raise £300k-£500k in each of four work streams:
 1. Outline Conceptual Design Report for the proof-of-principle biological-assessment facility: R. McLauchlan (IC NHS H/c T), T. Price (Birmingham);
 2. Proton- and ion-acoustic imaging: J. Bamber (ICR), P. Beard (UCL);
 3. Evaluation of the benefits of the initiative & optimisation of the R&D programme: S. Green (Birmingham), P. Price (ICL);
 4. Development of next steps in LhARA accelerator R&D programme: C. Whyte (Strathclyde), J. Pasternak (ICL)

In addition, an industrial-engagement “package” is being prepared by KL in collaboration with S. Towe (Leo Cancer Care) and F. Jamieson (ICL, industrial liaison).

Outside Imperial:

STFC:

Following a meeting with the Executive Directors for National Laboratories (N. Geddes) and Science Programmes (G. Blair) a meeting was arranged with the Department Directors of ASTeC, CLF, ISIS, and PPD. The outcome of this meeting was that a document would be prepared describing the opportunities presented by LhARA and identifying the need for a mechanism for the consideration of such initiatives to be created within the STFC. The objective is that the document will be submitted over the names of the Department Directors to the Executive Directors for National Laboratories, Programmes, National Laboratories: Large Scale Facilities, and Strategy, Planning and Communications for transmission to the STFC Executive Board. The present draft of this memo is attached in confidence.

Reaching out to the broader research community:

24Jun21: Future accelerators for biomedical application:

With colleagues from STFC a one-day peer-group meeting to discuss the broad range of topics that impinge on the development of accelerators for biomedical applications will be organised at RAL. The day will culminate in a public lecture on the topic as part of the prestigious RAL Lecture series.

This meeting will be a key opportunity to present the LhARA initiative and its potential benefits in the near-, medium-, and long-terms to the scientific peer group and the community more generally.

Funding

Record of applications:

Proposals submitted since the MB last met:

Title	Funder	Lead	Value (£k)	Submission Date
EU COST	EU	Patera/Long	25.00	Nov-20
STFC IAA	STFC	Long	25.19	Nov-20
Transformative, personalised, precision particle-beam therapy for 2050	EPSRC	KL	375.00	14-Oct-20
CERN Graduate Programme	CERN	Taylor	70.00	-
ERC Advanced Grant	ERC	Long	2,683.50	26-Aug-20

A full summary of funding requests is provided separately.

Comments:

Following the failure of the EPSRC Transformative Healthcare Technology bid, the LhARA Steering Group set itself the goal of raising £300k–£500k in each of the four work streams defined above.

Undergraduate teaching

Development of undergraduate teaching related to CCAP programme:

- A meeting with the Director of Undergraduate Studies in Physics at Imperial and others is scheduled for tomorrow to discuss the curriculum of the third and fourth year option Seek to include expertise at ICR (U/ Oelfke) and CXH (C. Hardiman) in the development this activity.
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