
Management Board meeting #6

Director's report

Centre development

Administration:

- Bimonthly progress reports since the MB last met:
 - 2019: September.
- Annual reports:
 - 2019: November

Collaboration:

- **CCAP:**
 - **OIRO:**
 - * KL met F. van den Heuvel in August 2019. We discussed areas of common interest and agreed to follow up.
 - * Important now to organise a second follow-up discussion.
- **External-existing:**
 - **MedAustron:**
 - * Graduate student, H.T. Lau, who was in residence at MedAustron, is now back at Imperial engaged in preparation of instrumentation for radiobiological experiments (the 'SmartPhantom'). The SmartPhantom is designed to be employed in the proton and carbon-ion exposures in collaboration with the Medical University of Vienna (MUW).
 - * The SmartPhantom is now late and there is a significant risk that the deadline of 19Jan20 for deployment at MedAustron will not be met.
 - * I am concerned that the delay will damage our good relationship with MUW (though not with MedAustron).
 - * Work continues to maintain a good relationship with MUW so that we can exploit the carbon-ion beam at MedAustron going forward.
 - **CERN:**
 - * The PIMMS2 and NIMMS projects at CERN have progressed but external participation has been limited. This is a disappointment.
 - * A PhD student was recruited into the CCAP programme in November 2019 as part of the development of our joint programme with CERN. An offer was made to the candidate 'subject to funding'. In the event CERN was unable to identify funding to support the PhD position.
 - * Work continues to establish a basis for collaboration. An MoU between CCAP and CERN may be an appropriate way forward.
 - * C. Hunt (Physics) has now finished his 6-month associate contract.
 - **CERN/STFC: Development of medical-linac based X-ray treatment facility for challenging environments:**
 - * No update this meeting. Status remains unclear.

- **Under development:**

- International Biophysics Collaboration (IBC):
 - * Established on the 22nd May 2019 at the collaborations first meeting which was held at GSI, Darmstadt, Germany. The CCAP is a founder member.
 - * Using resources secured through STFC Opportunities 2019 award we can now develop collaboration with/within IBC.
- STFC ISIS and Particle Physics Departments:
 - * Case for joint PhD student with PPD submitted.
 - * Discussion of joint PhD student with ISIS underway.
 - * In both cases the issue is the ‘matching funds’; i.e. 50% of the cost of the position.
- John Adams Institute:
 - * Discussions of the IC-HEP accelerator group joining the JAI continue. The JAI proposal for the continuation of their consolidated grant must be submitted next spring. Discussion of the details of the request for additional funds for Imperial (HEP) will begin in earnest 18Dec19.

Staff:

- Discussions continue regarding two complementary lecturer positions:
 - Lecturer in novel particle radiobiology (FoM/Dept. of Surgery and Cancer) with an interest in the development of a fundamental understanding of the radiobiology of novel particle beams and the application of this knowledge to improve clinical practice; and
 - Lecturer in biophysics (FoNS/Physics) with an interest in the measurement, characterisation and modelling of the biological impact of particle beams.

50% funding for both posts remains on the table from the Gunnar Nielsson Trust;

- Posts mentioned in Physics and Surgery and Cancer strategic plans.
- Imperial’s new Academic strategy emphasises the importance of cross-cutting, multidisciplinary research that leverages core scientific competences. There are, in principle, 13–16 posts that could be appointed in such cross-cutting, multi-disciplinary initiatives. The CCAP mission matches the Academic Strategy and we need to ensure that we make the case for the CCAP programme within the context of the new academic strategy.

Outreach:

Since the MB last met:

- Conference presentations:
 - J. Pasternak: 20Nov19; FFA 19, PSI, Zurich, “*Design of LhARA facility*”
 - K. Long: 28Aug19; 19th Lomonosov Conference, Moscow, “*Novel accelerators for innovation, science, and society*”
- Seminars:
 - 27Nov19, Blackett: R. Radogna (UCL); “*A calorimeter for particle therapy range verification*”
 - 13Nov19, Blackett: Y. Prezado (Inst. Curie), “*New approaches in Radiation Therapy*”
- External seminars:
 - K. Long: 18Nov19; Presentation to the RFI’s Imaging with sound and light theme meeting; RS, London; “*Particle Beam Therapy*”
 - A. Kurup: 24Oct19; University of Sussex; Moscow, “*Medical applications of particle accelerator and detector technologies*”

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

- Manjit Dosanjh (CERN): radiotherapy and related research;

- Paul Beard (UCL): Photo-acoustic imaging;
 - Ross Gray (Strathclyde): Laser-plasma interactions and ion sources;
 - Suzy Sheehy (JAI, Oxford and Melbourne): Medical accelerators;
 - Graeme Burt (CI/Lancaster): Novel RF structures; and
 - Marco Borghesi (Queens, Belfast): Laser-plasma interactions and ion sources for bio/medical applications.
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LhARA; the Laser-hybrid Accelerator for Radiobiological Applications

Development of pre-CDR:

- Timetable is set out on the pre-CDR page of CCAP wiki:
 - **29 Nov 2019:** first issue of the baseline, including initial parameter list, updates to the existing floor layout, WBS and interfaces document.
 - **31 Dec 2019:** First end-to-end simulation.
 - **31 Jan 2020:** Design of the facility will be frozen. The R&D programme needed to take the programme forward will be defined. First view of the costs.
 - **28 Feb 2020:** Complete write-up of the pre-CDR.
 - Mar 2020: External review of pre-CDR in advance of publication.
- A ‘LhARA Steering Group’ has been formed from the PIs of the institutes that make up the LhARA consortium:
 - Academic institutions:
 - * *Imperial:* CCAP, Departments of Physics and Computing;
 - * *Liverpool:* Department of Physics, Institute of Translational Medicine (Department of Molecular and Clinical Cancer Medicine);
 - * *Manchester:* Division of Cancer Sciences;
 - * *Belfast:* Centre for Plasma Physics (Department of Physics), Centre for Cancer Research and Cell Biology;
 - * *Strathclyde:* Department of Physics; and
 - * *Royal Holloway University of London:* Department of Physics.
 - Accelerator centres:
 - * Accelerator Science and Technology Centre and STFC Daresbury Laboratory, Warrington;
 - * John Adams Institute; and
 - * Cockcroft Institute.
 - Laboratories:
 - * Accelerator Science and Technology Centre and STFC Daresbury Laboratory, Warrington;
 - * Central Laser Facility, STFC Rutherford Appleton Laboratory, Harwell;
 - * ISIS Department, STFC Rutherford Laboratory, Harwell; and
 - * Particle Physics Department, STFC Rutherford Laboratory, Harwell.
 - Clinical departments:
 - * Department of Oncology, Imperial College Healthcare NHS Trust, Charing Cross Hospital, London;
 - * Radiotherapy Department, Imperial College Healthcare NHS Trust, Charing Cross Hospital, London; and
 - * Division of Cancer Sciences, The Christie Hospital, Manchester.
 - Industrial partners:

- * Leo Cancer Care;
- * Maxeler Technologies, Ltd.; and
- * Corerain Technologies.

The SG is conceived as the 'institute board' and will provide oversight of the pre-CDR team and will play a crucial role in the development of the R&D programme.

- It has been agreed that the pre-CDR will be reviewed by an external expert panel before it is submitted for publication. The LhARA team and SG have nominated persons to serve on this panel. Invitations are now being made.
- The preparation and subsequent publication of the pre-CDR will be used as a springboard to launch the proposals necessary to secure the resources for the next stage in the project.

Rosalind Franklin Institute:

- “The Rosalind Franklin Institute is dedicated to transforming life science through interdisciplinary research and technology development”.
- Discussions with the RFI were initiated by P. French (Imperial, Physics and FONS Vice Dean for Research). The goals of the LhARA consortium (and those of the CCAP) are well aligned with those of the RFI.
- KL presented the LhARA initiative in the context of the development and ambitions of the CCAP to the RFI at a meeting of its “Imaging with Sound and Light” theme on the 18th November 2019.
- The LhARA concept and its resonance with the goals of the RFI were well received.
- Discussions continue; KL will meet the Director of the RFI (J. Naismith) on 19Dec19.

Funding

Record of applications:

Title	Funder	Lead	Value (£k)	Submission Date	Interview Date	Decision Date	(£k)	Allocation Start	End	Notes
STFC Eames Rutherford Fellowship	STFC	CH	622.01	26-Jun-19						Under review
Opportunities 2019	STFC	KL	139.35	13-Jun-19	N/A	Aug-19	139.35	01-Oct-19	30-Sep-21	£170k in kind contribution from project partners.
Clinical Academic Research Partnerships March 2019	MRC	DG	188.78	17-Jun-19	N/A					
Contribution from HEP group for a high-spec server	HEP	AK	7.00			Y	7.00			HEP group agreed to pay for a high-spec server to replace the decommissioned machine (hepac232).
Distributed, precise and personalised, particle-beam therapy for 2050	EPSRC	KL	6,983.30	02-May-19	N	15-Jun-19				Outline: £1375k in kind and £325k in case from project partners (total £1700k). EPSRC contribution: £6,983.30k
The SmartPhantom – A beam profile and dose measuring device	STFC/IAA	AK	35.00	09-May-19	N/A	Y 05-Jun-19	37.66	Jul-19	31-Mar-20	
Class of 64 Scholarship	Imperial	KL	63.81	04-Mar-19	N/A	Y 03-Apr-19	63.81	Oct-19	Sep-22	Titus-Stefan DASCALU
Clinical Academic Research Partnerships March 2019	MRC	DG	142.91	09-Mar-19	N/A	N				Request from note in email from Dorothy.
Sol to ASB	STFC	KL	302.35	25-Feb-19	N/A	N				
STFC Exploration award	STFC	KL	20.00	24-Jan-19	N/A					
STFC CG capital award	STFC	KL	18.73	Aug-18	N/A	Y 23-Oct-18	18.73			
STFC CASE studentship CCAP/Maxeler	Imperial	DG/RMcC/IKL	80.77	04-Oct-18	N/A	N 20-Dec-18				Impact too narrow.
Imperial College Research Fellowship	Imperial	CH	302.10	28-Aug-18	N/A	N Oct-18				Nominal £70k/yr for 4 years + £22.1k non-staff.
STFC IAA	STFC/IAA	AK	20.00	29-Jun-18	N/A	Y Jan-18	52.14	Sep-18	Jan-19	£20k requested;
STFC quota studentship via IC HEP	STFC	KL	70.00	Nov-17	N/A	Y Dec-18	70.00	01-Oct-18	Jun-22	
Laser-driven ion beams for radiobiology and treatment	CRUK	KL, MW	498.35	24-Jan-18	N/A	X 25-Apr-18				
Building a European Network for the development of novel techniques for radiobiology and particle therapy	Imperial	VB	5.00	23-Jan-18	N/A	Y 22-Feb-18	5.00	01-Mar-18	29-Feb-20	
Laser-driven ion beams for radiobiology	RoseTrees Trust	KL, MW	251.46	01-Dec-17	N/A	X				
Ultra-fast prompt photon imaging for proton beam therapy	Imperial	KL, AK, DC, DG	250.00	24-Nov-17	21-Feb-18	X				
Opportunity: recruitment of PhD student to carry out research in accelerator-based radiobiology in collaboration with MedAustron	Imperial	KL	70.00	21-Nov-17	N/A					Submitted to Faculty via K.Wier as Physics HoD
Development of a programme for the measurement of the radio-biological effectiveness of charged particle beams	CRUK IC	KL/MW	70.00	19-Mar-17	N/A	X				Studentship. Value nominal.
Development of a programme to investigate the biological foundations of charged-particle therapy	CRCE	KL/MW	29.83	31-Mar-17	N/A	X 05-May-17				

Period	Value (£k)	Award (£k)	Success rate	Corrected success rate
Oct16-Sep17:	99.83	0.00	0.00%	0.00%
Oct17-Sep18:	1,406.91	127.14	8.67%	8.67%
Oct18-Sep19:	8,504.51	247.81	2.91%	16.29%
All:	10,170.75	393.69	3.87%	12.35%

Comments:

- STFC Opportunities 2019: successful:
 - Provides resources to:
 1. Deliver an outline CDR for the ‘Laser-hybrid Accelerator for Radiobiological Applications’, LhARA;
 2. Establish a test-bed for advanced technologies for radiobiology and clinical radiotherapy at the Clatterbridge Cancer Centre (CCC); and
 3. Create a broad, multi-disciplinary UK coalition, working within the IBC to place the UK in pole position to contribute to and to benefit from this exciting new biomedical science-and-innovation initiative.
 - C. Hunt (CERN) will apply for an STFC Ernest Rutherford Fellowship to contribute to LhARA and PIMMS2.
 - EPSRC Healthcare Call development of cone-beam-CT image processing and automation.
 - Small group met in September 2019. Need to pick up the preparation of the proposal.
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Undergraduate teaching

Development of undergraduate teaching related to CCAP programme:

- A meeting with relevant teaching staff in Physics was held in September 2019. It was agreed to develop a proposal for bio/medical-physics option as part of a new curriculum that will be rolled out to years 3 and 4 in 2-years time.
 - Seek to exploit expertise from across the CCAP.
 - Initiative will be taken forward once the autumn 2019 term has finished (13Dec19).
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Business plan

Agenda item:

- Seek complete draft by March 2020.
 - Use completed Business Plan to trigger establishment and first meetings/activity of:
 - Governing Board;
 - International Advisory Board;
 - Perhaps also consider ‘consortium agreement’ when Business Plan is complete.
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