
Management Board meeting #5

Director's report

Centre development

Administration:

- Bimonthly progress reports (see <https://ccap.hep.ph.ic.ac.uk/trac/wiki/Governance/ManagementBoard/Reports/Bimonthly>):
 - 2018: December;
 - 2019: January, March, May — next due 17Sep19.
- Annual report: (see <https://ccap.hep.ph.ic.ac.uk/trac/wiki/Governance/ManagementBoard/Reports/Annual>).
 - Anticipate that 2019 Annual Report will be required early in November 2019.

Collaboration:

- **CCAP:**
 - OIRO:
 - * Last MB (06Nov18) we agreed to continue contacts with OIRO with a view to continued collaboration.
 - * Intermittent discussion with Frank van den Heuvel looking for a good time to re-initiate discussion.
 - * Most recent discussion with FvdH at PTCOG where we agreed to meet to discuss the next steps.
 - * We are looking for a date to meet in Aug19.
- **External-existing:**
 - MedAustron:
 - * Graduate student, H.T. Lau, has been in residence at MedAustron. Contributions to carbon-ion beam-line commissioning, 800 MeV proton-beam commissioning, and evaluation of beam-line optics (BDSim, MADX).
 - * Now engaged in preparation of instrumentation of water phantom to be employed in proton and carbon-ion radiobiology programme in collaboration with the Medical University of Vienna (MUW).
- **External-new:**
 - CERN: PIMMS2:
 - * Last MB noted the opportunity of the putative PIMMS2 study of a compact/less expensive linac or synchrotron for delivery of proton and ion beams.
 - * Kurup, Long, Pasternak, Pozimski visited CERN on 13/14 November 2018 to discuss collaboration with A. Lombardi (PIMMS2 co-lead).
 - * Agreed potential areas of collaboration and goal to secure student through the CERN Doctoral Student programme.
 - * M. Vretenar (study leader) gave a seminar in CCAP seminar series on 12Dec18 and re-iterated informal agreement that he would like CCAP to look at the front-end of the beam, up to ~ 10 MeV.

- CERN: progress:
 - * C. Hunt (Physics) now at CERN on a 6-month associate contract. Working with Lombardi on issues related to proton beam-line commissioning.
 - * T-S Dascalu recruited into HEP/Physics PhD programme to work on LhARA and PIMMS2 in context of CERN Doctoral Programme.
- CERN/STFC: Development of medical-linac based X-ray treatment facility for challenging environments:
 - * Presented as an opportunity at the last MB.
 - * Status now unclear. No recent correspondence; the situation is at present unclear, at least to me.
- GSI: Radiobiology and related instrumentation development:
 - * KL visited GSI on 13Dec18; seminar and discussion of collaboration.
 - * Agreed to seek a student through Physics/HEP for student to be seconded to GSI to contribute to radiobiology programme. Funding at GSI through Visiting Scientist Programme.
 - * Student identified, but, funding uncertainty caused candidate to withdraw her application.
- **Under discussion:**
 - International Biophysics Collaboration (IBC):
 - * Established on the 22nd May 2019 at the collaborations first meeting which was held at GSI, Darmstadt, Germany.
 - * At this meeting KL presented CCAP’s plans and LhARA in particular.
 - * While the full scope of the IBC is yet to be determined, the vision for the IBC programme encompasses CCAP’s ambitions.
 - * In view of the excellent peer-group network, opportunities or collaboration, and potential to secure EU/ERC funding, CCAP is a founder member.
 - * Application to STFC for resources to support engagement with IBC submitted (further details under “Funding” below).
 - STFC ISIS and Particle Physics Departments:
 - * Previously reported preparation of MoU with STFC ISIS to support collaboration on accelerator-science aspects of CCAP programme.
 - * MoU now signed and provides for a broad collaborative programme that includes accelerator-science but also includes instrumentation, computing etc.
 - * MoU underpins collaborative work on LhARA and SmartPhantom. Ideally it will be leveraged in the Autumn to secure a joint PhD student.
 - John Adams Institute:
 - * Discussions of the development of a closer relationship between JAI and IC-HEP continue.

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.
- Financial situation in Physics has led to a hiring freeze. The Department is making 2- and 5-year plans to bring the finances into line with the Faculty’s requirements.

- This pressure has slowed progress on the recruitment.

Outreach:

<https://ccap.hep.ph.ic.ac.uk/trac/wiki/Communication>

Since the MB last met:

- Publications:
 - A. Kurup et al.: “*Simulation of a radiobiology facility for the Centre for the Clinical Application of Particles*”, arXiv:1907.10157, to be published in *Physica Medica*, *European Journal of Medical Physics*.
- Conference presentations:
 - C. Hunt: 20May19; IPAC, Melbourne, “*The LhARA Radiobiology Facility for the Centre for the Clinical Application of Particles*”
 - K. Long: 21May19; 1st meeting of the IBC, “*Laser-hybrid Accelerator for Radiobiological Applications*”
- Seminars:
 - 20Feb19, Blackett: K. Kirkby; “*Proton Therapy the myths and the magic*”
 - 27Feb19, Blackett: V. Patera (Sapienza), “*The FOOT (FragmentatiOn Of Target) experiment*”
 - 01May19, Blackett: G. Burt (Lancaster/CI): “*Side coupled Medical Linac development at Lancaster University*” (cancelled/postponed through speakers personal circumstances)
 - 10May19, ICR Fulham Rd: J. Parsons; “*The importance of DNA damage complexity in the radiobiology of proton beam therapy*”
 - 19May19, Blackett: P. Cerello (Torino): “*The importance of DNA damage complexity in the radiobiology of proton beam therapy*”
- Workshops:
 - 19Mar19: Diagnostics workshop 2019:
Presentations of diagnostics development activity within CCAP. Presentations from potential customers and partners in the development of the technologies. Successful event, new contacts with TUM, CLF, and UCL made.

Future:

- Seminars:
 - 13Nov19, Blackett: Y. Prezado (IMNC, Paris), topic: radiobiology using proton beams
 - 27Nov19, Blackett: Ross Gray (Strathclyde), topic: laser-driven accelerator R&D at Strathclyde
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Funding

Record of applications:

Id	Title	Funder	Lead	Value (£k)	Submission Date	Interview Date	Decision Date	Allocation			Notes	
								(£k)	Start	End		
22	Opportunities 2019	STFC	KL	139.35	13-Jun-19	N/A	Aug-19				£170k in kind contribution from project partners.	
21	Clinical Academic Research Partnerships March 2019	MRC	DG	188.78	17-Jun-19	N/A						
20	STFC IAA (SmartPhantom)	STFC/IAA	AK/KL	37.66	09-May-19	N/A	Y	05-Jun-19	37.66	01-Jun-19	31-Mar-20	
19	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
18	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
17	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	Oct-19	
16	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
15	Clinical Academic Research Partnerships March 2019	MRC	DG	142.91	09-Mar-19	N/A	N					Request from note in email from Dorothy.
14	Sol to ASB	STFC	KL	302.35	25-Feb-19	N/A	N					
13	STFC Exploration award	STFC	KL	20.00	24-Jan-19	N/A						
12	STFC CG capital award	STFC	KL	18.73	Aug-18	N/A	Y	23-Oct-18	18.73			
11	STFC CASE studentship CCAP/Maxeler	Imperial	DG/IRM/C/KL	80.77	04-Oct-18	N/A	N	20-Dec-18				Impact too narrow.
10	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.
9	STFC IAA	STFC/IAA	AK	20.00	29-Jun-18	N/A	Y	Jan-18	52.14	Sep-18	Jan-19	£20k requested;
8	STFC quota studentship via IC HEP	STFC	KL	70.00	Nov-17	N/A	Y	Dec-18	70.00	01-Oct-18	Jun-22	
7	Laser-driven ion beams for radiobiology and treatment	CRUK	KL, MW	498.35	24-Jan-18	N/A	X	25-Apr-18				
6	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	
5	Laser-driven ion beams for radiobiology	RoseTrees Trust	KL, MW	251.46	01-Dec-17	N/A	X					
4	Ultra-fast prompt photon imaging for proton beam therapy	Imperial	KL, AK, DC, DG	250.00	24-Nov-17	21-Feb-18	X					
3	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
2	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.
1	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				
				Total	9,213.61	Success rate: 1.58%		Total	145.87			

06-Aug-19

06-Aug-19

Period	Value (£k)	Award (£k)	Success rate	Corrected
Oct16-Sep17:	99.83	0.00	0.00%	0.00%
Oct17-Sep18:	1,466.91	127.14	8.67%	8.67%
Oct18-Sep19:	7,920.15	146.12	1.84%	15.60%

Comments:

- Business Plan (agenda item) now a priority.
- EPSRC Transformative Healthcare Technologies for 2050:
 - Outline proposal “Distributed, precise and personalised, particle-beam therapy for 2050” submitted. Case for Support, which had to be anonymised, only was reviewed.
 - Strong consortium (see figure 1; letters of support from all partners).
 - EPSRC contribution £6.98M; promised contributions from project partners of £1.38m in kind and £0.33M in cash.
 - Rejected with feedback:

Engagement with patients, clinicians and industry could have been strengthened.

The CfS clearly did not demonstrate clearly enough the strong engagement of clinicians and industry within the consortium. I believe this could have been clarified if there had been the chance. While individuals and groups within the CCAP have excellent established patient-engagement activities, the CCAP has, to date, not made an effort in this regard.
 - I believe we should carefully consider a patient-engagement activity; I believe it has the potential to enhance the quality of future proposals. The proposal around the development of automation of cone-beam CT image processing (D. Gujral, R. Mclaulhan et al) that is being discussed has the potential to be a vehicle to make initial steps in a CCAP patient-engagement activity.
- STFC Opportunities 2019 call:
 - Would provide funding 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.
 - CoIs from Imperial Physics and Liverpool Biology
 - Consortium summarised in figure 1.
- Near term targets:
 - C. Hunt (CERN) will apply for an STFC Earnest Rutherford Fellowship to contribute to LhARA and PIMMS2. Deadline: 26Sep19.
 - EPSRC Healthcare Call development of cone-beam-CT image processing and automation.
 - STFC CASE studentship for image-processing programme;
 - Graduate students through CERN Doctoral Programme and GSI. Also an opportunity through HEP Group PhD quota awards (less likely this year as we have a student in place);
 - Seeking partner to target CRUK PhD student call. Focus on radiobiology/biophysics to provide continuity in this aspect of our programme when Lau graduates.
- Medium term:
 - EU Design Study call lead by CERN on PIMMS2.



Figure 1: The CCAP's institute, laboratory, and industrial partners. The slide was prepared for the most recent proposal to the Science and Technology Facilities Council. In addition to the partners listed in the figure, the following institutes have expressed their support for, and willingness to collaborate with, the CCAP: the School of Medical Sciences at the University of Manchester, the Cyclotron Facility at the University of Birmingham, and the National Physical Laboratory.

Links with industry:

- Particular project partners shown in figure 1.
 - Hamamatsu keen to work with us on development of prompt-photon imaging. Need to re-initiate contact.
 - Some leads to follow up following successful industrial-engagement w/s organised by A. Kurup.
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Undergraduate teaching

Development of undergraduate teaching related to CCAP programme:

- Opportunity has arisen to develop new curriculum in the option courses for Physics undergraduates in years 3 and 4. Timely as Physics is in the middle of a curriculum review with a revised year 1 curriculum being rolled out next academic year.
 - Goal: over several years to bring forward a coordinated set of option courses.
 - Seek to exploit expertise from across the CCAP; e.g.:
 - U. Oelfke keen to contribute “Physics Foundations and Applications of Hadron Therapy”;
 - C. Hardiman keen to contribute in development of curriculum with medical-physics needs in mind.
 - Meeting of relevant Physics Department staff being arranged. Necessary first step. Seek to bring in expertise and advice from outside Imperial Physics following first meeting.
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Business plan

Agenda item; now urgent.

- Seek complete draft by November 2019.
 - 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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