

To: N. Jennings (Vice Provost, Research and Enterprise)
From: K. Long (Director, Centre for the Clinical Application of Particles)

May 22, 2019

Centre for the Clinical Application of Partices; activity report March 2019

This report covers the period from 22nd March 2019. As usual the report includes two key aspects of the Centre's activities over the reporting period.

1 Proposals

Formal feedback from the STFC was received on the 'Statement of Interest' (SoI) submitted to the STFC Accelerator Strategy Board in February 2019. The SoI outlined a two-year programme by which a Conceptual Design Report for LhARA, the Laser-hybrid Accelerator for Radiobiological Applications [1], would be delivered. Though the resources requested were modest, the SoI provided a vehicle by which to bring together a significant 'proto-coalition' of institutes with an interest in the programme¹. In its feedback letter the STFC encouraged the submission of an application to the STFC 'Opportunities' call which has recently been announced.

Centre personnel have made several applications for resources and one new grant (Class of 64 PhD scholarship) has been awarded:

Class of 64 Scholarship: Our last report summarised the outcome of the Centre's graduate-student recruitment activity. Two offers were made. The first, to Titus-Stefan DASCALU, was accepted subject to funding. The second was declined as the student held funded offers from other institutes.

Supported by the Centre, Dascalu made an application for a 'Class of 64' Scholarship and for a President's Scholarship. The candidate's proposals were supported by the Department of Physics. The candidate withdrew his application for the President's Scholarship when he was awarded full funding through the Class of 64 scheme. Dascalu will join the Centre in October 2019 and contribute to the development of LhARA and take part in the Centre's nascent collaboration with CERN.

Transformative Healthcare Technologies 2050: an outline proposal was submitted to the EPSRC for the resources necessary to deliver the first part of the LhARA programme [2].

The proposal is led from the Department of Physics at Imperial and Co-Is on the proposal are drawn from:

- Imperial's Departments of Physics and Computing;
- The Imperial College Healthcare NHS Trust (clinical oncology and Radiation Physics and Radiobiology);
- The University of Liverpool's Institute of Translational Medicine; and
- The Physics Department of RHUL.

The application included the following 'project partners':

- The John Adam's Institute for Accelerator Science;
- The STFC's Central Laser and ISIS Facilities;
- The Imperial College Healthcare NHS Trust;
- The Department of Physics, University of Liverpool;
- The School of Medical Sciences, University of Manchester;

¹Centre for Plasma Physics, Centre for Advanced and Interdisciplinary Radiation Research, School of Mathematics and Physics, Queen's University, Belfast; Department of Physics, University of Strathclyde, Glasgow; Central Laser Facility, STFC Rutherford Appleton Laboratory, Harwell; John Adams Institute, Department of Physics, the University of Oxford, Oxford; Department of Physics, University of Liverpool, Liverpool; Christian Doppler Laboratory for Medical Radiation Research for Radiation Oncology, Medical University of Vienna; Department of Oncology, Imperial College Healthcare NHS Trust, Charing Cross Hospital, London; Radiotherapy Department, Imperial College Healthcare NHS Trust, Charing Cross Hospital, London; Division of Cancer Sciences, University of Manchester and The Christie Hospital, Manchester; Institute of Translational Medicine, University of Liverpool, Liverpool; Centre for Cancer Research and Cell Biology, Institute for Health Sciences, School of Medicine, Dentistry and Biomedical Sciences, Queen's University, Belfast; Cockcroft Institute, SciTech Daresbury, Daresbury; Accelerator Science and Technology Centre and STFC Daresbury Laboratory, Warrington; and ISIS Department, STFC Rutherford Laboratory, Harwell.

- The School of Physics and Astronomy, University of Birmingham;
- Leo Cancer Care;
- Maxeler Technologies, Ltd.; and
- Corerain Technologies.

The full-economic cost of the proposed five-year programme is £8.30M, of which the requested contribution from EPSRC is £6.98M. The project partners have together pledged £1.38M in kind and £0.33M in cash. The EPSRC will decide whether to invite a full proposal in June 2019. Should a full proposal be requested, the deadline for submission is the 27th August 2019.

The Department of Physics allowed the outline proposal to be submitted on the understanding that the financial and other risks associated with the full proposal be discussed at an early stage. The ground-work for these discussions is being laid, the discussions themselves will be initiated when the summer examination season is drawing to a close.

STFC Impact Acceleration Account (IAA): building on the work carried out under the STFC IAA award that was reported in our March 2019 report, a request for £35k of follow-on funding to construct a production prototype detector for deployment in the radiobiology programme at MedAustron was submitted. If successful this award will prove the principle of the detector in a production environment and cement the Centre’s emerging collaboration with the Medical University of Vienna.

2 The importance of DNA damage complexity in the radiobiology of proton beam therapy, J. Parsons (Liverpool); CCAP seminar

On the 10th May 2019, as part of the CCAP seminar series, J. Parsons (Institute of Translational Medicine, Liverpool) presented the programme of radiobiology being carried out at the University of Liverpool². The seminar was held at the Institute of Cancer Research, Fulham Road, thereby being the first of the CCAP seminars to be held outside the South Kensington Campus.

Outcomes:

- A full programme of discussions with CCAP-affiliated personnel at the ICR identified a number of areas of joint interest in which future collaborations could be developed.

References

- [1] CCAP Collaboration, “Laser-hybrid Accelerator for Radiobiological Applications.”
<https://ccap.hep.ph.ic.ac.uk/trac/wiki/Research/DesignStudy/Proposals/2019/STFC-ASB-SoI,2019>.
- [2] CCAP Collaboration, “Distributed, precise and personalised, particle-beam therapy for 2050.”
<https://ccap.hep.ph.ic.ac.uk/trac/wiki/Research/DesignStudy/Proposals/2019/EPSRC-Transformative-Healthcare-Technologies-2050,2019>.

²<https://ccap.hep.ph.ic.ac.uk/trac/wiki/Communication/Seminars/2019/05-10-PARSONS-Jason>