

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

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January 17, 2019

## Centre for the Clinical Application of Partices; activity report January 2019

This report covers the period from 3<sup>rd</sup> December 2018.

### 1 Accelerators for medicine; M. Vretenar, CCAP seminar and collaboration with CERN

On the 12<sup>th</sup> December 2018, as part of the CCAP seminar series, M. Vretenar (CERN), Coordinator of the EU Integrating Activity Project “ARIES” (Accelerator Research and Innovation for European Science and Society), presented CERN’s initiative to develop novel, compact accelerator systems for medical applications<sup>1</sup>. M. Vretenar discussed the development of innovative linac- or synchrotron-based options for the next generation of proton- and ion-beam research and therapy facilities. M. Vretenar’s visit gave us the opportunity to take forward the discussion of collaboration on these developments that was initiated in November 2018.

#### Outcomes:

- Collaboration on the development of the critical low-energy (0–15 MeV) section of the accelerator including the ion source, low-energy acceleration, low-energy beam transport, and instrumentation was confirmed.
- We agreed to prioritise the recruitment of a CERN Doctoral Student. Subsequent to the visit, we agreed a form of words to be used in our PhD student-recruitment literature. The search for suitable candidates is now underway.

### 2 Collaboration with the GSI Helmholtzzentrum für Schwerionenforschung (GSI) in Darmstadt

On the 13<sup>th</sup> December 2018, K. Long visited GSI to give a seminar on the work of the CCAP and to discuss possible areas of collaboration with M. Durante, Director of the GSI Department of Biophysics. The Biophysics Department is active in the study of the impact of proton and ion beams on living systems, the development of micro-biological simulations of the effect of ionising radiation, and the development of treatment-planning software. The Department’s multidisciplinary programme is extremely well aligned to the goals of the CCAP.

#### Objectives:

- Discuss areas for the development of collaboration between the CCAP and the Biophysics Department at GSI with a view to developing a significant collaborative activity in the study of the impact of ionizing radiations on tissue, the incremental improvement of micro-biophysical simulations of the underlying processes, and the exploitation of these simulations in improved treatment-planning systems; and
- Discuss mechanisms by which to initiate the recruitment of a student into the biophysics programme as a means of making a concrete start on a collaborative biophysics programme.

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<sup>1</sup><https://ccap.hep.ph.ic.ac.uk/trac/wiki/Communication/Seminars/2018/12-12-VRETENAR-Maurizio>

**Outcomes:**

- A firm basis for collaboration in the radiobiology and software-development programmes within the Biophysics Department at GSI was established. The development of instrumentation for the radiobiology-measurement programme and the development of treatment-planning software were identified as mutually-beneficial areas in which to initiate the collaboration.
- It was agreed to seek to recruit a graduate student and that the GSI Associate Scientist programme would be used as a vehicle by which to secure the resources necessary to support the student during his/her secondment to GSI.

The search for suitable graduate-student candidates is underway.