

Dear Mr. McBride,            CC: Pat Price, Claire Garland,

My name is Ken Long, I am Professor of Physics at Imperial and a long-time member of the Institute of Physics.

My attention was caught by your recent letter to the Times in which you argued that a visionary ten-year plan for the physical sciences is required to go alongside the Government's Industrial Strategy to ensure that the UK can make the most of the opportunities created by "... *discovery science and innovation ... to completely transform our lives and economies.*"

I echo these sentiments and support the IoP's push to seed the creation of such a plan for the physical sciences.

Advances in the physical sciences have the potential to unlock Nobel-prize-winning break-throughs in other fields and to provide new technologies and capabilities that improve wellbeing, enhance lifestyle and drive economic growth. I believe the ten-year plan for the physical sciences should recognise the opportunities presented by "natural science leadership" in multidisciplinary research and innovation and address how best to foster transformative "convergence science and innovation".

The [LhARA initiative](#), which seeks to harness the potential of laser-driven beams to transform radiotherapy for cancer treatment, is an exemplar of such a multidisciplinary collaboration. The LhARA initiative has been funded to date through the UKRI, its importance having been established through peer review within the STFC and the MRC. The international collaboration is now working to complete the interim Conceptual Design Report, the principal deliverable of the UKRI Infrastructure Fund "Ion Therapy Research Facility" Preliminary Activity.

We now need to take the LhARA initiative to the next level. Our ambition is to create a self-sustaining, multidisciplinary R&D programme alongside science-delivery and impact-generation programmes that maximise the benefits of our initiative. Our strategy is to secure the resources for our programme through co-investment and co-creation with research councils, entrepreneurs and industrialists

The ambitious, multidisciplinary nature of the initiative makes it essential to consult widely to define the next steps. Therefore, the collaboration is planning a series of meetings with key expert peer groups. The first four meetings in the series have been identified:

- "Particle therapy international meeting", targeting the pre-clinical/clinical researcher and clinical communities;
- "Cylindrically-symmetric strong focusing of ion beams", targeting the laser-plasma and novel accelerator communities;
- "Novel time-resolved and high-resolution imaging", targeting the developers of instrumentation and diagnostics necessary to understand the biology of radiation therapy; and
- "Biology, measurement, simulation and interpretation of radiation biology", targeting the radiobiology community and the community developing conventional and AI-based biological simulation tools.

Further meetings addressing, for example, automated cell/animal model and patient positioning, automated co-registration of treatment plan with patient/animal-model and organ position, real-time in-situ dose measurement and fast feedback to accelerator, are being discussed.

The multidisciplinary nature of the LhARA initiative must be reflected in the agendas of the proposed meetings and in the target audience. We shall therefore need to reach out to the learned societies that represent the relevant communities. Partnering as a collaboration with the IoP in making these connections will be of substantial benefit in raising the profile of the meeting series and making it a success.

Before the summer break, I contacted Claire Garland (in CC) to propose that we work together to organise the first meeting in the series as a “pilot”. Claire was enthusiastic and noted that the proposed meeting would build on the very successful ["Advancing Radiobiology Technology"](#) meeting that we organised in October 2023.

Claire also pointed out that a series of meetings such as we propose “usually works well” and encouraged me to write to you to “pitch” the idea that the LhARA collaboration and the IoP work together to organise the peer-group consultation meetings as a series

Returning to your letter to the Times; the 10-year strategy for the physical sciences for which the IoP is advocating must be broad and encompass the wealth of opportunity that discovery science and innovation provides. The LhARA initiative is an exemplar, the multi-disciplinarity and high-risk/high-return approach making a strategic 10-year vision an important component in making the case for investment. It would be wonderful to find a mechanism by which the meeting series we propose might support the case you are making for, more general, 10-year plan for the physical sciences.

It would be great if we could meet to discuss the development of the meeting series and how it might resonate with the IoP’s championing of the strategic 10-year plan. I hope this will be of interest and propose that Pat Price (in CC), LhARA clinical lead, and Claire be included in the invitation.

With best wishes ...

Ken