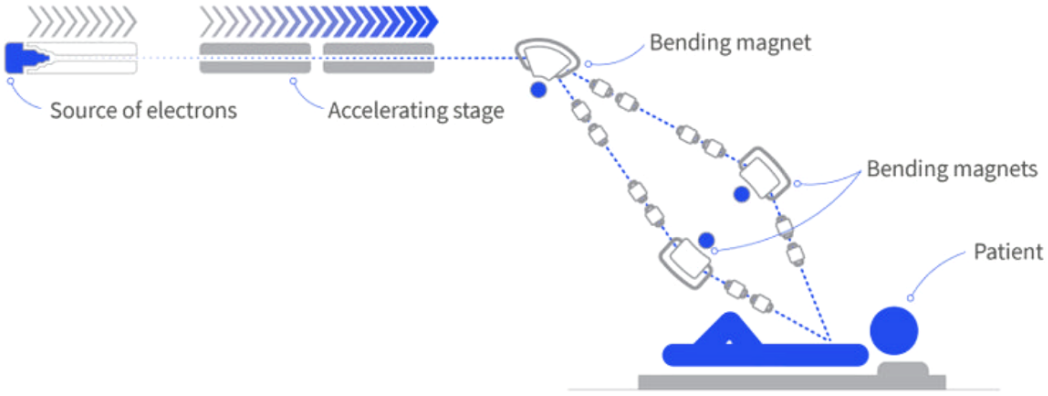
John Adams Institute for Accelerator Science

UNIVERSITY OF OXFORD

Physics vs Cancer: What are the Hot Topics in Particle Therapy Accelerator Development?



Abstract:

The presentation provides an overview over the recent developments in the field of accelerators and beamlines for proton, ion and high-energy electron therapy. It describes the rising use of the superconducting technology, in particular to its application to the gantry magnets. The advantages and disadvantages of the superconducting technology use are discussed in regards to both proton and ion beam therapy systems. This includes the delineation of the new treatment modalities enabled by the use of superconducting magnets. Furthermore, the principle of FLASH therapy with electron and proton beams is introduced and its challenges in regards to dose distribution, beam stability and dosimetry are discussed. As a conclusion, the outlook for the potential solutions is presented.

Dr. Gerbershagen is no stranger to the JAI, having started his career there, completing a DPhil at the University of Oxford in 2013. Following this, he spent four years at the Paul Scherrer institute in Switzerland, working on proton radiotherapy. His current position with CERN's Experimental Areas Group began in 2017, where he sets up, adapts, and develops particle beams for many different experiments, as well as contributing to many other projects.