Joint Physics Department / Oncology Department Seminar

10:00 – 11:00 Wednesday 10th July 2013
Richard Doll Building Lecture Theatre
Old Road Campus

Advances in Particle-beam therapy accelerators and imaging technologies

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Cancer is the second-largest cause of death in the U.S. About half of all cancer patients receive definitive radiation therapy either as their primary treatment or in combination with chemotherapy or surgery; overall approximately two-thirds of all cancer patients will receive radiation therapy. The majority of radiation treatments are still performed with x-rays generated by electron linacs, however, in recent decades particle beam therapy using proton and carbon ion beams has rapidly evolved into a state-of-the-art therapy. Protons and ions offer advantageous physical-dose distributions and, for particles heavier than protons, a potential biological advantage. Clinical experience with protons and ions has produced remarkable local tumor control rates in single-institution studies, but despite recognition of these potential advantages, particle beam therapy has lagged technically far behind conventional radiotherapy, particularly in regard to hardware and software advances that improve the precision and efficiency of delivery and a lack of on-board imaging. Further the size and complexity of the ion accelerators and beam delivery have limited widespread adoption. This talk will report on recent technical leaps in both compact accelerator design and delivery, and advances in imaging technology for particle beam therapy.

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