MASTER ONLINE
ADVANCED PHYSICAL METHODS IN RADIOTHERAPY

Postgraduate, distance learning European Masters Program "Advanced Physical Methods in Radiotherapy" at Heidelberg University, Germany

At the University of Heidelberg a new MSc program in Medical Physics delivered in English was started. The focus of the new Master Online "Advanced Physical Methods in Radiotherapy" (APMR) is on medical physics in radiation therapy – a vibrant field in which innovations and ongoing developments over the last few years have contributed significantly to the improvement of cancer therapies. In particular, three areas stand out with respect to these advancements:

- Intensity Modulated Radiotherapy (IMRT),
- Image Guided Radiotherapy (IGRT), and
- Heavy Ion Therapy.

We are often reminded by our colleagues in institutions working in radiation therapy that it is difficult to keep up with all areas of modern radiation therapy, medical physics and medical technology, and to incorporate these into daily practice. Currently there is no place in the world that offers an exhaustive academic training that fully integrates the modern methods of both medical physics and radiation therapy fully aligned to emerging scientific research issues and technological developments. The Master program APMR has been established to address this deficit in order to best prepare medical physicists for their increasing, new responsibilities.

APMR is an accredited postgraduate study program on the cusp of relevant therapeutic developments. Designed to provide work based training on location in Heidelberg it contributes directly to the improvement of patient care. A large part of the program is delivered predominantly online (80%). Practical training will take place in Heidelberg, a very renowned and scientifically acclaimed center in the field of medical physics and radiation therapy. The German Cancer Research Center (DKFZ) is home to the largest research department for medical physics in Germany.

German Cancer Research Center, dkfz

Here major progress was made in the 1980s in the development of IMRT, and in 1997 the DKFZ also was one of the first centers to implement IMRT in clinical practice. In that same year under the auspices of the Radiologic University Hospital, a scanned ion beam consisting of carbon ions was employed for the very first time in a clinical setting. This was performed in close collaboration with the DKFZ and the Gesellschaft für Schwerionenforschung (GSI) in Darmstadt.

This pilot project ultimately culminated in the unique ion therapy facility "HIT" at the University Hospital of Heidelberg opened for clinical operation in 2009. Many of the scientists at the DKZF, the hospital and the GSI who have pioneered this field have been enlisted to teach on our Master's program. This in turn presents the unique opportunity for the Master students to academically engage with 60+ very experienced experts and thus to deepen the understanding of current research in this area.

In addition to the facilities in Heidelberg already mentioned above, the National Centre for Tumour Diseases (NCT) is seen to strengthen Heidelberg campus' extraordinarily strong oncological research network even further.

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The program participants are instructed online in the theoretical underpinnings of modern radiation therapy from the convenience of their home. During the attendance phases they supplement their knowledge through work-based activities and hands-on training in imaging and image analysis, therapy planning, radiation, dosimetry, quality assurance and verification with special focus on the above mentioned fields IMRT, IGRT and ion therapy. The practical exercises are supported by equipment and accelerators at the participating institutes. The spectrum of facilities in Heidelberg ranges from modern linear accelerators with IMRT and IGRT capabilities, to tomotherapy and ion therapy.

Heidelberg Ion-Beam Therapy Center (HIT)

The student support provision on the APMR ensures that students new to online learning have the time and assistance necessary to feel comfortable using online technologies for studying. In using these new technologies the participants experience the benefits of an "anytime, anywhere" program. There is an effective balance between individual self-study elements and collaborative activities online that foster lively discourse and critical discussion between the students, their peers and esteemed subject experts from around the world. The flexible format of the APMR program meets the needs of Medical Physicists already working in the field.

Online guest lecture with Prof. Bortfeld, Boston, USA

All Medical Physicists who are interested in the new Master program are referred to our website http://www.apmr.uni-hd.de.

For a hands-on experience as an online learner they are also invited to sign up for a week-long cost free APMR Taster course anytime between June and September 2011.

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