FP7 "Marie Curie Initial Training Networks"

ENTERVISION

Research Training in 3D Digital Imaging for Cancer Radiation Therapy

Job Opening:

Design and test of physical phantoms in the context of hadron therapy

In the framework of the Marie Curie Research Training Network ENTERVISION (Research Training in 3D Digital Imaging for Cancer Radiation Therapy), CERN will host an Experienced Researcher (ER) for the duration of 2 years.

ER candidates must have at least 4 but less than 5 years experience or a doctoral degree; the total research experience, including the time taken for doctoral studies, cannot be more than 5 years.

Hadron therapy is a highly advanced technique of cancer radiotherapy that uses beams of ions to destroy tumour cells. As ions deliver most of their energy in a given point, accurate positioning is a crucial challenge for targeting moving organs, as in lung cancer, and for adapting the irradiation as the tumour shrinks with treatment. Therefore, quality assurance becomes one of the most relevant issues for an effective outcome of the cancer treatment.

ENTERVISION is connected to the FP7 research project ENVISION, aimed at developing novel imaging modalities for quality assurance in hadron therapy. These include the verification of dose simulation and of in-vivo dosimetry using physical phantoms for the measurement of dose.

The recruited ER will participate in all stages of the design, construction and testing of physical phantoms for ion beam measurement. The goal of the project will be to build phantoms of increasing complexity, and to study the Bragg peak positioning and dose distribution at different therapeutic particle energies. The ER will also work on comparing the measured distributions with those predicted by the most advanced simulation packages. This work will complement another ENTERVISION project aimed at designing and testing biological phantoms, and will allow collecting of robust data for use in clinical treatment protocols.

The ER will be based at CERN, but the project will be developed jointly with INFN (Italy), where the phantoms will be built, and Cambridge (UK), which will provide the environment for clinical validation. There is the possibility of taking measurements in the particle therapy facilities that are operating in Europe (as CNAO, HIT or equivalent).

During the training period, the ER will be given the opportunity to work in a multidisciplinary environment, and to profit from the comprehensive training programme developed for ENTERVISION, starting with the core principles of image guided radiotherapy and then extending the training curriculum to the specific hardware and software technologies needed for image guided hadron therapy. . ENTERVISION will also provide the opportunity to perform hands-on work in different and complementary fields, such as adaptive treatment planning, optical imaging, cell irradiation, biological phantom design, Monte Carlo simulation of in-

vivo dosimetry, in-beam Positron Emission Tomography monitoring techniques. CERN also has an extensive training catalogue, and the ER will be able to attend the courses which are most fitting to his/her needs.

The ER will also be given appropriate networking opportunities, both within the ENTERVISION network and outside, for example through the participation to international conferences.

The successful candidate is graduated in medical physics, and has experience in dosimetry. Experience in treatment planning and in development and testing of physical phantoms for radiation therapy are highly desirable.

All applications should be done electronically on CERN e-recruitment system:

https://ert.cern.ch/browse_www/wd_pds?p_web_site_id=1&p_web_page_id=9515&p_no_apply=&p_show=N

Contact:

Prof. Manjit Dosanjh

CERN Life Sciences Advisor

Manjit.Dosanjh@cern.ch