

**More Precise Diagnosis, Improved Radiation Therapy:
The German Cancer Research Center at the World Congress on Medical Physics**

Physicists, computer scientists, doctors and engineers from the German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) will present 37 projects from the areas of imaging and radiation therapy at the World Congress on Medical Physics in Munich. Professor Dr. Wolfgang Schlegel from DKFZ is president of this conference, which starts on 7 September 2009.

The world's most important specialist meeting of medical physicists and medical engineers will take place in Munich from 7th to 12th September 2009. The "World Congress on Medical Physics and Biomedical Engineering" is organized by the Association for Electrical, Electronic & Information Technologies, VDE. Medical focus areas of this year's conference will be oncology, radiology, neurology and cardiology.

Scientists of the German Cancer Research Center (DKFZ) are well represented this year with projects from the areas of imaging and radiotherapy. "Radiology and radiation therapy are among the strongest and most successful research areas of DKFZ," says congress president Wolfgang Schlegel. In the area of radiation therapy, the primary goal of research efforts at DKFZ is to direct the radiation beam ever more precisely onto the tumor while increasingly sparing surrounding tissue. The DKFZ scientists present optimized systems of positioning the patient as well as more precise methods for determining the exact tumor position prior to each individual radiation treatment.

The precision of radiotherapy is often restricted by the fact that tumors shift their position in the body. Thus, it may depend on the filling of the stomach or bowel, or, particularly in lung tumors, on respiratory motion. Physicists from the department headed by Wolfgang Schlegel at DKFZ present two approaches of how to aim the radiation beam more precisely onto the tumor in such cases. First, they are studying ways of activating the beam only at the exact moment when the tumor assumes a particular position. Another technical approach is to use a computer-controlled multileaf screen to direct the radiation beams in real time to the exact present tumor position.

To make work easier for radiologists and radiotherapists, a group of computer scientists headed by Dr. Oliver Nix at DKFZ together with their partners at Fraunhofer MeVis have developed "DIROlab". DIROlab is a user-friendly software that makes all diagnostic data of a patient available for doctors at the same time. DIROlab translates data from different diagnostic instruments (CT, MRI, or PET scanners) into a common language. In addition, the software is able to communicate with other systems such as image archiving and programs for radiotherapy planning. Thus, it is ideally suited to improve processes in the treatment of cancer patients.

Medical computer scientists from the department of Dr. Hans-Peter Meinzer have developed navigation systems which will support surgeons in the future when performing minimally-invasive interventions, e.g. on the liver or prostate. The software provides real-time three-dimensional presentations of the surgical instruments and the surrounding anatomy and, thus, facilitates "blind" orientation for surgeons in the body.

Scientists from the DKFZ, Heidelberg University Hospitals and the Pädagogische Hochschule Heidelberg have developed the first international E-learning Master Program for Medical Physics. Seventy percent of contents are transmitted via Internet; students have to

be present at the Heidelberg institutes only for short stays. The curriculum of this innovative program will be presented for the first time at the congress.

A picture for this press release is available at:

<http://www.dkfz.de/de/presse/pressemitteilungen/2009/images/Lamellenkollimator.jpg>

(Computer-controlled leaves of a multi-leaf-collimator)

The German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) is the largest biomedical research institute in Germany and is a member of the Helmholtz Association of National Research Centers. More than 2,000 staff members, including 850 scientists, are investigating the mechanisms of cancer and are working to identify cancer risk factors. They provide the foundations for developing novel approaches in the prevention, diagnosis, and treatment of cancer. In addition, the staff of the Cancer Information Service (KID) offers information about the widespread disease of cancer for patients, their families, and the general public. The Center is funded by the German Federal Ministry of Education and Research (90%) and the State of Baden-Württemberg (10%).

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