

# Prof. Dr. Wolfgang Schlegel

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## Current Research

Failure of local tumor control is still a problem in about 20% of all cancer patients. Due to this fact, there is an urgent need for the optimization of existing and development of new and more effective treatment techniques for localized tumors.

Research at the department of Medical Physics in Radiotherapy is focused on new conformal radiotherapy techniques with photons, electrons and hadrons. Major achievements of the last two decades were the introduction of 3D treatment planning, Stereotactic Radiosurgery, 3D Conformal Precision Radiotherapy, inverse treatment planning, Intensity Modulated Radiotherapy and Radiotherapy with photons, protons and Carbon-12 ions.

## Future Projects and Goals

Besides the ongoing projects in Hadron-therapy, our future work will be concentrated on establishing mathematical and biological models of tumour and normal tissue response and on the consideration of dynamic changes of target volumes (PTVs) and organs at risk (OARs) under therapy, either caused by therapeutic response, by organ movements or by patient repositioning (Time-adapted Cone Beam Therapy).

## Contact:

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Time adapted therapy will combine conformal dose delivery with on-line imaging of 3D anatomy and on-line monitoring of 3D dose distributions. In a further step we are going to integrate information from molecular imaging into treatment planning and dose delivery with the goal to boost radio resistant tumor sub volumes and to avoid radiosensitive normal tissue structures (Biological adaptive Radiotherapy).

## Selected Publications

Schlegel W; Bortfeld T; Grosu A-L (Hrsg.): New Technologies in Radiation Oncology. Springer Verlag Berlin Heidelberg New York (2006).

Schlegel W; Mahr A: 3D Conformal Radiation Therapy - A multimedia introduction to methods and techniques 2nd revised and enhanced edition. Springer Verlag Berlin Heidelberg New York (2007).



Figure: Prototype of an Multileaf collimator.