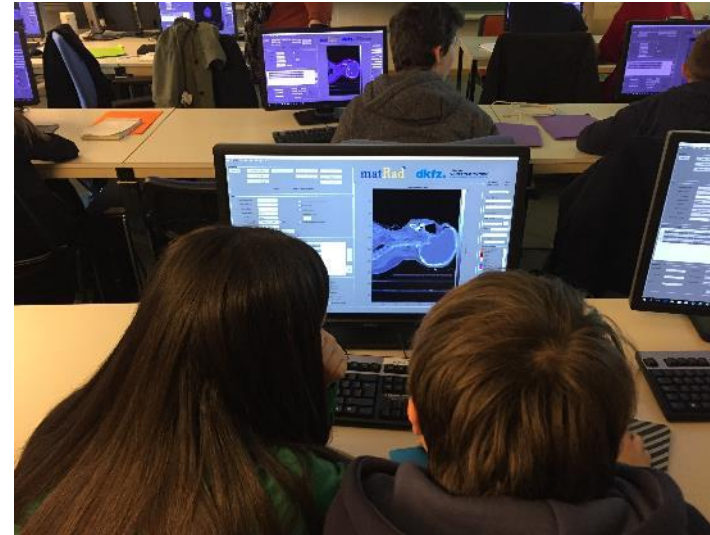


Masterclass Hadronentherapie

- Entwickelt von DKFZ + GSI (+ LMU)
- Tumortherapie (Leber, Kopf) mit Röntgenstrahlung, Protonen oder Kohlenstoffionen
- Bestrahlungsplan mit Open-Source-Forschungs-Toolkit matRad3
- <https://indico.cern.ch/event/840212/page/17999-presentations>
- Wird über IPPOG nächstes Jahr bei den International Masterclasses integriert

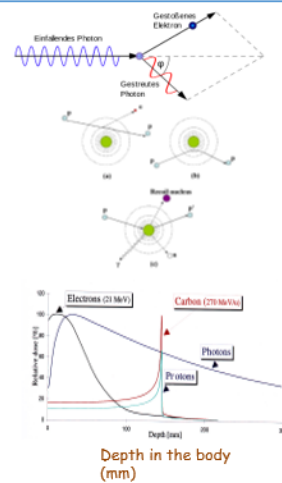


Masterclass Hadronentherapie

Introductory Lectures

1st lecture – From particle physics to radiation dose

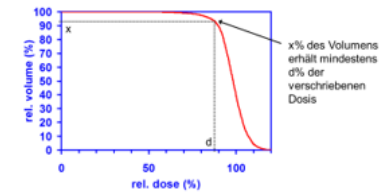
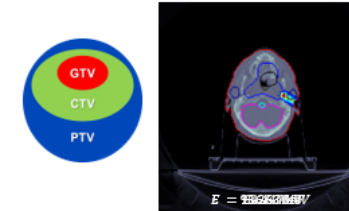
- What is cancer? How can we treat it? Why radiation therapy?
- What is radiation dose?
 - Interactions of particles with matter
 - different types of radiation (photons vs. charged particles)
- How do we produce radiation dose clinically?
 - accelerators (LINACs, synchrotrons, cyclotrons?)



Introductory Lectures

2nd lecture – Treatment Planning

- How do we see inside the body? → Imaging (CT)
- How do we find the tumor? → Segmentation
- How do we plan the treatment?
 - How do we calculate dose?
 - How do we optimize dose?
 - How do we evaluate the treatment plan?



Measurement: Hands-On Treatment Planning

- Based on our Matlab open source toolkit **matRad**
 - simplified MasterClass version compiled as standalone software
- 1. Treatment planning with photons
- 2. Treatment planning with protons & carbon ions
 - show advantage of particle treatment plans
- 3. Difficulties of particle therapy planning
 - biological treatment planning
 - impact of uncertainties

