$$\gamma \longrightarrow \Sigma\mu(l,E)dl \longrightarrow$$

HST 533 - Medical Imaging in Radiation Therapy

Tuesdays 4-5:30pm (E25-119)

Medical imaging is important for radiation therapy from diagnosis, staging, target definition, and treatment planning to delivery and outcome assessment. This course will introduce imaging concepts and applications used throughout radiation therapy workflows, including Magnetic Resonance Imaging (MRI), Positron Emission Tomography (PET), and Computed Tomography (CT). Advanced topics will include proton imaging modalities such as prompt gamma imaging and proton radiography/CT. The course will also include lectures regarding image reconstruction and image registration. Students will be introduced to open source medical image computing software (3D Slicer and Plastimatch). The course includes optional imaging demonstrations at Massachusetts General Hospital.

The lectures will be held by a team of experts covering the following lecture units:

- Introduction to RT Workflow- voxels to cancer cells to survivors
- Usage / Programming of 3D Slicer
- Image segmentation
- Image Registration
- Image Reconstruction/ CT /CBCT
- MRI
- PET/SPECT
- Prompt Gamma
- Proton Radiography and proton CT
- What are the potential future developments, ideas and visions?