

## **Radiotherapy Treatment Planning: A Mathematician's Perspective**

Jenny Power

Radiotherapy is among the most common methods for treating cancer. Treatment planning is a crucial step of the treatment process. Clinicians carefully create treatment plans to ensure the radiation is directed at the tumour and not at the healthy tissue, which if damaged could result in further health complications. Mathematically, this problem can be formulated as a PDE constrained optimisation problem, where the goal is to find the optimal radiation source to irradiate the tumour, while minimising radiation damage to surrounding organs. This talk will focus on the mathematical formulation of the treatment planning problem, with a specific emphasis on brachytherapy, a type of radiation treatment where radioactive seeds are surgically implanted directly onto the tumour.