



# PHYSICS AND ASTRONOMY

## COLLOQUIUM

### (Online)

**Dr. Emily Heath**

Carleton University

## **“Modeling and compensating for patient anatomical changes in radiation therapy”**

### Abstract

“Radiation therapy is used in approximately half of all cancer treatments in Canada. In a radiation therapy treatment, ionizing radiation sources, placed internally or externally to the patient, are used to irradiate and destroy cancer cells. These treatments are typically planned based on an image of the patient’s anatomy acquired prior to treatment. Due to physiological processes such as respiration, as well as treatment response, we know that the patient’s anatomy can vary over the course of the treatment delivery. A potential impact is that the delivered treatment differs from what was planned which may compromise the treatment outcome. Therefore, accurate methods to assess the impact of anatomical changes and to compensate for them are needed.

In this talk I will present the development of dose accumulation methods to model the impact of anatomical changes on the delivered radiation dose distribution. Application to modeling respiratory motion in external beam radiotherapy as well as prostate swelling in permanent implant brachytherapy will be discussed. Incorporation of dose accumulation methods with robust optimization to develop novel motion-adaptive radiation therapy treatments will also be presented.”

Wednesday, November 3, 2021

3:30 p.m. PDT

via Zoom: <https://uvic.zoom.us/j/81377096640>