

# 20-05-10 Workshop Radiotherapy & Mathematics

May 20th, 2010

Salón de Grados, Faculty of Mathematics  
University of Santiago de Compostela

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## Scope

In the last few years, large efforts have been invested in the development of mathematical models which describe radiotherapy treatment. This study can be tackled from several points of view:

- Dose calculation in cancer treatments: Based on Monte Carlo methods or on the solution of the three-dimensional transport equation.
- Treatment optimization: The objective function will have some restrictions provided by the oncologist in each particular case.
- Tumor behavior modeling when treated with radiotherapy: By using image treatment algorithms (image guidance in radiotherapy IGRT) or by using new optimization methods based on biological data (biologically guided radiotherapy BGRT)

The objective of this Workshop is to have an idea-sharing session with relevant research groups in mathematics and members of the hospital community on radiotherapy treatment modeling. The Workshop will consist of presentations of different models used to simulate the tumor behaviour in this type of treatments, numerical techniques used to resolver these models, the most important challenges in this field and possible transference of these results. Organizing Committee

- Óscar López Pouso (Universidade de Santiago de Compostela)
- Andrés Gómez Tato (Centro de Supercomputación de Galicia)
- M<sup>a</sup> Teresa Sánchez Rúa (Centro de Supercomputación de Galicia)Speakers
  
- Iuliana Dasu, Stockholm University and Karolinska Institutet, Sweden.
  
- Martin Frank, RWTH Aachen University, Germany.
  
- Antonio Leal Plaza, Universidad de Sevilla.
- Antonio López Medina, Hospital do Meixoeiro, Vigo.
  
- Juan Pardo Montero, Liverpool University, United Kingdom.
  
- Manuel Salgado Fernández, Hospital do Meixoeiro, Vigo.
- Manuel Sánchez García, Complexo Hospitalario de Ourense.

## Programme

09:00 Workshop Opening

09:15 Computational algorithms in radiotherapy

Manuel Salgado Fernández, Complejo Hospitalario Universitario de Vigo.

10:00 Biological optimization of radiation therapy treatment planning – from modelling to clinical implementation

Iuliana Dasu, Medical Radiation Physics, Stockholm University and Karolinska Institute.

10:45 Multicriteria optimization in radiation therapy

Juan Pardo Montero, School of Cancer Studies, Liverpool University and Department of Physics, Clatterbridge Centre for Oncology.

11:30 Coffee Break

12:00 On the use of transport equations for dose calculation and planning optimization

Martin Frank, Dept. of Mathematics and Center for Computational Engineering Science, RWTH Aachen University.

12:45 Radiotherapy optimization methods for modulated beams in Monte Carlo treatment planning

Antonio Leal Plaza, Medical Physics, Dept. Fisiología Médica y Biofísica - Universidad de Sevilla. Hosp. Univ. Virgen Macarena.

13:30 Round table

Pending speakers.

14:30 Workshop Closing

Registration

Attendance is free of charge, but registration is mandatory. Registration closed.

Registration form.

Travel and accomodation

Reservations may be directly made by the interested persons by contacting the travel agency:

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