Title:

"How do malignant cancers really grow? Mathematical models, biomarkers and implications for therapies"

Abstract:

"Cancers are hundreds of diseases involving uncontrolled cell proliferation and invasion of normal tissues. Cancer is currently the second leading cause of death in industrialized countries. In spite of the huge resources invested, cancer has not been beaten and improvements in overall survival are in the range of 1-2% per year. A key element of cancer making it a 'moving target' for treatments is its underlying evolutionary dynamics. Cancer is not a static disease but one that evolves by the combined action of generation of heterogeneity and Darwinian selection of the fittest clones under the action of different evolutionary forces.
In this talk I will discuss, using a combination of different types of mathematical models, metabolic and growth data, how does evolutionary dynamics influence the way solid human cancers grow as observed in routine macroscopic medical images. I will explain how to use that information, through the lens of simple mathematical models, to obtain key data guiding treatments in different specific scenarios."