ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

INVITATION TO THE DOCTORAL SEMINAR

Dr. Evelyn Buckwar

JKU Linz

"A stochastic hierarchical model for low grade glioma evolution"

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Abstract

A stochastic hierarchical model for the evolution of low grade gliomas is proposed. Starting with the description of cell motion using piecewise diffusion Markov processes (PDifMPs) at the cellular level, we derive an equation for the density of the transition probability of this Markov process using the generalised Fokker-Planck equation. Then a macroscopic model is derived via parabolic limit and Hilbert expansions in the moment equations. After setting up the model, we perform several numerical tests to study the role of the local characteristics and the extended generator of the PDifMP in the process of tumour progression. The main aim focuses on understanding how the variations of the jump rate function of this process at the microscopic scale and the diffusion coefficient at the macroscopic scale are related to the diffusive behaviour of the glioma cells. This is joint work with Amira Meddah, JKU, and Martina Conte, Politecnico di Torino

Michaela Szölgyenyi and the Department of Statistics look forward to seeing you at the talk!