

# CENTRUM ZASTOSOWAŃ MATEMATYKI

INSTYTUT MATEMATYCZNY

POLSKIEJ AKADEMII NAUK

Warszawa, ul. Śniadeckich 8, IV piętro, sala 403

Seminarium

## BIOLOGIA OBLICZENIOWA

Poniedziałek, 11 lutego 2013

**14.15 Thomas Hillen (University of Alberta, Canada; member of the Editorial Board of J. Math. Biol. oraz SIAM J. Appl. Anal.): Mathematical Modelling with Fully Anisotropic Diffusion**

With “fully anisotropic” I describe diffusion models of the form  $u_t = \nabla \nabla (D(x)u)$ , where the diffusion tensor appears inside both derivatives. This model arises naturally in the modeling of brain tumor spread and wolf movement and other applications. Since this model does not satisfy a maximum principle, it can lead to interesting spatial pattern formation, even in the linear case. I will present a detailed derivation of this model and discuss its application to brain tumors and wolf movement. Furthermore, I will present an example where, in the linear case, the solution blows-up in infinite time; a quite surprising result for a linear parabolic equation. (Joint work with K. J. Painter and M. Winkler).

**15.15 przerwa**

**15.45 Marcin Małogrosz (Uniwersytet Warszawski, Wydział MIM): How to iron a wing of the fruit fly? — dimension reduction in a model of morphogen transport**