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Predator-prey interactions and morphogenesis — classical biomath problems and new challenges

The talk concerns two distinct classical problems of mathematical biology. Modelling predator-prey interactions refers to the famous model of Lotka-Volterra (1920–1926) and the modelling of morphogenesis dates back to the work of Turing (1952) where the concept of morphogene was introduced for the first time. We shall present problems in freshwater ecology and developmental biology in which classical modelling approaches are not suitable and some new models have been proposed. We shall also discuss new research directions. The talk will partially refer to the following articles:

References

[1] Z. M. Gliwicz, D. Wrzosek, *Predation-mediated coexistence of large- and small-bodied Daphnia at different food levels*, American Naturalist 172 (2008), 358–374.
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[3] P. Krzyżanowski, Ph. Laurençot, D. Wrzosek, *Well-posedness and convergence to the steady state for a model of morphogen transport*, SIAM J. Math. Anal. 40 (2008), 1725–1749.
[4] P. Krzyżanowski, Ph. Laurençot, D. Wrzosek, *Mathematical models of receptor-mediated transport of morphogens*, Math. Models and Meth. Appl. Sci. 20 (2010), 2021–2052.