Professor Jacek Banasiak
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Educational Curriculum	1981, MSc (Engineering), Technical University of Łódź, Poland 1989, PhD, Strathclyde University, Glasgow, Scotland 1999, Habilitation (DSc), University of Warsaw, Poland
Professional Experience	1981-1992, junior lecturer to senior lecturer, Technical University of Łódź, Poland 1992-2015, University of Natal (later University of KwaZulu-Natal), lecturer to senior professor, Head of School of Mathematical Sciences 2005-2007, research professor 2011-2015, Academic Leader: Research in 2015; 2008-, Technical University of Łódź, extraordinary professor 2016-, DST/NRF SARChI Chair in Mathematical Models and Methods in Biosciences and Bioengineering, University of Pretoria, South Africa
Current research interest	- nonlocal, integro-differential models in kinetic theory, mathematical biology and fragmentation-coagulation theory, - asymptotic analysis of multiple scale problems
Research methods	- functional analysis
Publications	1. *Generalized network transport and Euler-Hille formula,* Discrete and Continuous Dynamical Systems-A, 2018, in print, (with A. Puchalska). 2. *Asymptotic state lumping in transport and diffusion problems on networks,* Mathematical Models and Methods in Applied Sciences, 26, No. 2 (2016) 215-247 (jointly with A. Falkiewicz and P. Namayanja 3. *Semigroup approach to diffusion and transport problems on networks*, Semigroup Forum, 93(3) (2016) 427 - 443 (jointly with A. Falkiewicz and P. Namayanja),

Structured populations with fast dynamics – patches and networks

We consider structured population models in which the population is subdivided into states according to certain feature of the individuals. We consider various rules allowing individuals to move between the states – it may be physical migration between geographical patches or the change of the genotype by mutations during mitosis. We shall see that depending on the type of the migration rule the models can vary from a system of coupled McKendrick equations to a system of transport equations on a graph. We address the well-posedness of such problems, classical in the first case and more challenging in the second. The main interest, however, will be asymptotic state aggregation that, in the presence of different time scales, allows for a significant simplification of the equations. Interestingly enough, the aggregated equations vary widely, from scalar transport equations to systems of ordinary differential equations. Some aspects of long term dynamics also will be discussed.