

Junior Trimester Program “Stochastic Modelling in the life sciences: From evolution to medicine

Group: AC | DC

Group Members: Fredrik Alberti, Martina Favero, Hannah Götsch, Anastasia Ignatieva, Adrian Martini, Sophia-Marie Mellis, Jaromir Sant, Terence Tsui, Bastian Wiederhold.

The whole group are very grateful for the opportunity to partake in the Junior Trimester Program, which allowed for a stimulating and exciting environment within which to explore new projects and areas of research. We would like to thank the HIM administration for their help throughout the three months, particularly Mrs. Silke Steinert-Berndt.

As a group we organised the following events:

- The summer school “Stochastic Modelling in the Life Sciences” held over the week 9-13 May 2022. Short courses by Prof. Alison Etheridge (Oxford), Prof. Nina Gantert (TUM), Prof. Kevin Painter (Polito), Dr. Jere Koskela (Warwick) and Dr. Federico Sau (ISTA).
- The workshop “Interacting Particle Systems in Mathematical Biology”, held over the period 25-28 July 2022.
- A short course on lockdown constructions by Terence Tsui

Apart from this, we also invited the following researchers

- Jere Koskela (Warwick)
- Kseniia Khudiakova (ISTA)
- Julian Kern (WIAS)
- Dario Spanò (Warwick)
- Raphael Forien (INRAE)

The program lead to a large number of collaborations, some of which lead to the following publications:

- A. M. Etheridge, T. G. Kurtz, I. Letter, P. L. Ralph, T. H. L. Tsui. *Looking forwards and backwards: dynamics and genealogies of locally regulated populations*. arXiv:2305.14488
- T. H. L. Tsui, P. F. Xie, S. Chulián, V. M. Pérez-García. *Breaking Down Cell-Free DNA Fragmentation: A Markov Model Approach*. biorXiv:10.1101/2023.07.06.547953
- A. Martini, A. Mayorcas. *An Additive Noise Approximation to Keller-Segel-Dean-Kawasaki Dynamics Part I: Local Well-Posedness of Paracontrolled Solutions*. arXiv:2207.10711
- A. Ignatieva, M. Favero, J. Koskela, J. Sant, S. Myers. *The distribution of branch duration and detection of inversions in ancestral recombination graphs*. biorXiv:2023.07.11.548567