



© private

# MPI-NAT SEMINAR SERIES

## Michael Stumpf

University of Melbourne, Australia

### Distorted Development: noise and the dynamics of cell-fate decision making

We can study developmental processes - from a single fertilised egg cell all the way to a complex multicellular organism - at single cell resolution. Waddington's epigenetic landscape has become an iconic representation of cellular differentiation process, and new types of experimental single cell data allow us to quantify these landscapes and the gene regulatory networks underlying cellular development. While the role of noise in cell biology has been amply documented, the repercussions of stochasticity on the landscape and the differentiation dynamics has received only scant attention. Here I will show that noise shapes the landscape profoundly and is even capable of changing qualitative features of the cell differentiation dynamics. I will illustrate how we can reconstruct and analyse landscapes and the underlying gene regulation dynamics from single cell data. Cellular phylodynamic approaches allow us to these changing landscapes and networks to cell lineage trees in order to understand the cell fate decision making dynamics in complex multicellular organisms.

Tuesday, 30.08.2022, 11:00 am

Host: Dr. Juliane Liepe



Manfred Eigen Hall

MAX-PLANCK-INSTITUT  
FÜR MULTIDISZIPLINÄRE  
NATURWISSENSCHAFTEN

