



# Mathematisches Kolloquium

## A general multilevel estimation framework: Multivariate joint models and more

**Sprecher: Dr. Michael J. Crowther**

Eingeladen von Prof. Jan Beyersmann

**05.05.2017 | 14:30 Uhr | R142 HeHo 22**

A tremendous amount of work has been conducted in the area of joint models in recent years, with new extensions constantly being developed as the methods become more widely accepted and utilised, especially as the availability of software increases. In this talk I will introduce work focused on developing an over-arching general framework, and usable software implementation, for estimating many different types of joint models. This will allow the user to fit a model with any number of outcomes, each of which can be of various types (continuous, binary, count, ordinal, survival, even user-defined distributions), with any number of levels, and with any number of random effects at each level. Random effects can then be linked between outcomes in a number of ways, such as directly, or including the expected value (or a function of it) of an outcome in the linear predictor of another, and more. Utilities are also provided to allow the user to extend to non-standard distributions in an extremely simple way. I'll focus on a special case of the general framework, joint modelling of multivariate longitudinal outcomes and survival, and in particular discuss some of the challenges faced in estimating such complex models. The methods will be illustrated with a commonly used joint model dataset in primary biliary cirrhosis.