Speaker: Rebecca Kuiper (Utrecht University)

Title: "Theory-based hypothesis evaluation using information criteria for one and multiple studies"

Abstract:

The evaluation of hypotheses is a key feature of research in the behavioral, social, and biomedical sciences. For example, researchers might be interested in whether medicine A works better (e.g., leads to more happiness) than medicine B, which works better than a placebo (in an ANOVA model: $\mu_A > \mu_B > \mu_{Placebo}$); or: number of children is a stronger predictor for happiness than income and age (in a regression model with standardized parameters: $\beta_{NoC} > \{\beta_{Inc}, \beta_{age}\}$); or: the cross-lagged effect of stress to anxiety, of rumination to stress, and of rumination to anxiety are higher than the cross-lagged counterparts (in a random-intercept cross-lagged panel model: $\phi_{SA} > \phi_{AS}, \phi_{RS} > \phi_{SR}, \phi_{RA} > \phi_{AR}$). Evidence for such **informative, theory-based hypotheses** can be obtained via (information-theoretical and Bayesian) model selection.

In my presentation, I will focus on information-theoretical model selection, that is, model selection using information criteria. I will introduce the AIC-type criterion GORIC and its approximation the GORICA. I will discuss how the GORIC(A) results can be interpreted and how they do quantify the support for the hypothesis (as opposed to null hypothesis testing). I will address two cases: i) the case when there is one study and ii) the meta-analytic case when there are multiple studies from which we would like to aggregate the results.