



KATHOLIEKE UNIVERSITEIT LEUVEN

## Statistics Seminar

Joint organization by  
ORSTAT, Faculty of Business and Economics and the statistics research group,  
Faculty of Science  
Leuven Statistics Research Center

**Prof. Dr. Peter Grünwald**

Centrum Wiskunde en Informatica (CWI), Amsterdam

### **“The catch-up phenomenon in model selection and model averaging”**

**Thursday March 11, 2010  
12:00—13:00**

**Location:** Room HOG 03.101, Naamsestraat 69, Leuven.  
Supporting research project: GOA-project 2007/04

#### **Abstract:**

We partially resolve a long-standing debate in statistics, known as the AIC-BIC dilemma: model selection/averaging methods like BIC, the Bayes factor, and MDL are consistent (they eventually infer the correct model) but, when used for prediction, the rate at which predictions improve can be suboptimal. Methods like AIC and leave-one-out cross-validation are inconsistent but typically converge at the optimal rate. We give a novel analysis of the slow convergence of the Bayesian-type methods. Based on this analysis, we propose the switching method, a modification of Bayesian model averaging that achieves both consistency and minimax optimal convergence rates. Experiments with nonparametric density estimation confirm that our large-sample theoretical results also hold in practice in small samples. We also discuss how our results can coexist with those of Yang (2005), who proved that the strengths of AIC and BIC cannot always be shared.

Joint work with T. van Erven and S. de Rooij.