

# PhD Defence

PhD Student  
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Probabilistic Forecasting for On-line Operation of  
Urban Drainage Systems

**Friday, 4 July, at 13:15**

The Technical University of Denmark  
DTU Compute  
Building 101, room S09

**Abstract:** This thesis deals with the generation of probabilistic forecasts in urban hydrology. In particular, we focus on the case of runoff forecasting for real-time control (RTC) on horizons of up to two hours.

For the generation of probabilistic on-line runoff forecasts, we apply the stochastic grey-box model approach. Building on previous work concerning the development of conceptual stochastic rainfall-runoff model structures, we

- investigate approaches for the calibration of model parameters that tune the models for multistep predictions,
- develop an approach for generating probabilistic multistep predictions of runoff volume in an on-line setting,
- develop a new approach for dynamically modelling runoff forecast uncertainty.

We investigate how rainfall inputs can be optimally combined for runoff forecasting with stochastic grey-box models and what effect different types of radar rainfall measurements and forecasts have on on-line runoff forecast quality.

Finally, we implement the stochastic grey-box model approach in a real-world real-time control (RTC) setup and study how RTC can benefit from a dynamic quantification of runoff forecast uncertainty.

**Supervisors:**

Principal supervisor: Professor Henrik Madsen, DTU Compute

Co supervisor: Professor Peter Steen Mikkelsen, DTU Environment

**Examiners:**

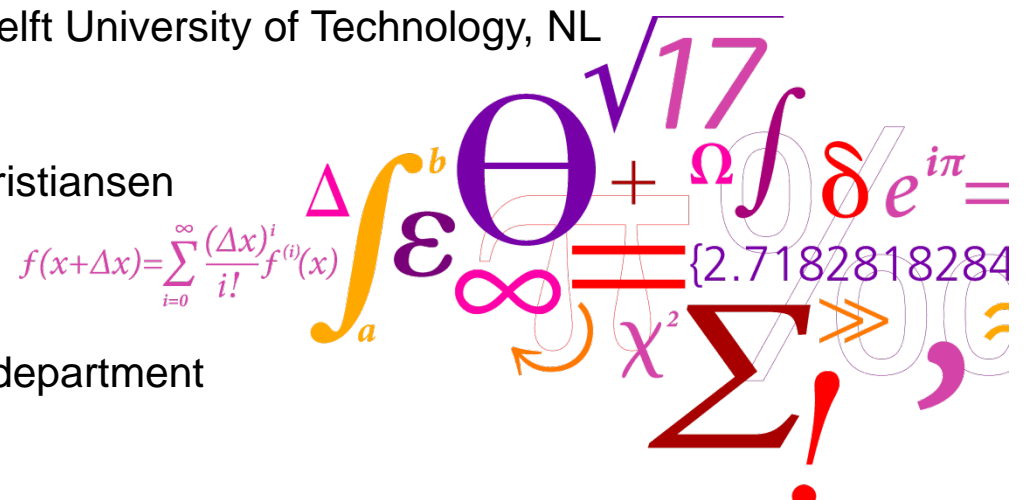
Associate Professor Peter Bauer-Gottwein, DTU Environment (Chair)

Univ.-Prof. Dr. Ing. Dirk Muschalla, Graz University of Technology, Austria

Professor dr. ir. Arnold W. Heemink, Delft University of Technology, NL

**Chairman at the defence:**

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A copy of the PhD thesis is available for reading at the department

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