

**Seminarium Zakładu Energetyki Jądrowej i Analiz Środowiska,
Departament Układów Złożonych,
Narodowe Centrum Badań Jądrowych**

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Sala 223 – Neutron
Park Naukowo-Technologiczny, Otwock-Świerk

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**Forward and Inverse Uncertainty Quantification of Thermal-
Hydraulics Physical Model Parameters**

Abstrakt:

The statistical uncertainty methodologies, such as the ones used by DAKOTA and RAVEN code, are well developed and commonly used in research and industry. The initial step of such uncertainty methodology is selection of the uncertain input parameters and their probability distribution functions (PDFs). The uncertainty assigned to each input parameter is typically done through expert judgement. Since most of the physical models use correlations with best-fit coefficients, it is vital that uncertainty quantification on these physical model coefficients is carried out to represent uncertainty of the simulation results. Bayesian-based inverse methods are proposed to estimate input uncertainty and reduce reliance on expert judgement. The seminar will demonstrate inverse uncertainty quantification of input models identified and ranked as highly sensitive to the figure of merit (e.g., peak clad temperature) and forward uncertainty quantification for prediction of safety-significant event (e.g., post-dryout).

[1] - Info o prelegencie:

Tomasz Kozłowski has been an Assistant Professor of Nuclear, Plasma, and Radiological Engineering at the University of Illinois at Urbana-Champaign since 2011. He received his Ph.D. in Nuclear Engineering from Purdue University in 2005, where he worked on spatial homogenization methods for transport calculation and PARCS code development. He received his Docent in Nuclear Power Safety at the Royal Institute of Technology in Stockholm, Sweden in 2011, where he worked on BWR stability, BWR safety and multi-physics coupling. His current research concentrates on nuclear reactor analysis, forward and inverse uncertainty, reactor physics and reactor thermal-hydraulics.