**9th February Monday: 12.00-13.00, Room: XXX**

**Speaker: Dr** **Wolfram Wiesemann**

Imperial College Business School

**Systems & Control: “***Scenario-Free Stochastic Programming: Methodology and*

*Applications”*

**Abstract:** Traditional optimisation models only involve deterministic parameterswhose values are assumed to be known precisely. However, many practicaldecision problems involve uncertain parameters such as future prices andresource availabilities. It has been shown that treating these parametersas deterministic quantities can lead to severely suboptimal or eveninfeasible decisions. Stochastic programming overcomes this deficiency byfaithfully treating the uncertain parameters as random variables.

Stochastic programmes are usually solved by approximating the random variables with a finite number of scenarios. Such scenario-based approaches suffer from a curse of dimensionality, that is, the optimisation models scale exponentially with the number of uncertain parameters. In this talk, we present a scenario-free approximation to stochastic programming. Instead of discretising the random variables, we employ a low-dimensional representation of the problem¹s decision variables. The optimisation model scales polynomially with the number of uncertain parameters and is computationally tractable. We illustrate the computational behaviour of this technique in the context of operations management.

**A brief bio:** Wolfram Wiesemann is an Assistant Professor at Imperial College BusinessSchool and a Fellow of the KPMG Centre for Advanced Business Analytics.He has been a visiting researcher at the Institute of Statistics and Mathematics at Vienna University of Economics and Business, the Computer-Aided Systems Laboratory at Princeton University, the Automatic Control Group at ETH Zurich and the Industrial Engineering and Operations Research Department at Columbia University. He holds a Joint Masters Degree in Management and Computing from Darmstadt University ofTechnology and a PhD in Operations Research from Imperial College. His current research focuses on the development of tractable computational methods for the solution of stochastic and robust optimisation problems, as well as applications in energy systems and operations management.