



Institut für Mathematik

Seminar zur Stochastik

Donnerstag, 9. Juli 2026

14:15 Uhr

SR 1086, Inselplatz 5

Prof. Dr. Christophette Blanchet-Scalliet

(École Centrale de Lyon)

“Optimal production management under ecological concern”

Abstract: In the context of carbon abatement, we study the optimal production problem of a firm subject to a constraint on its cumulative carbon emissions. The firm's objective is to maximize its expected profit under a convex penalty if its total emissions over a fixed period exceed a regulatory threshold. We model the production and emission processes as a system of controlled stochastic differential equations. The resulting optimization problem leads to a Hamilton-Jacobi-Bellman (HJB) equation, which we solve numerically using a novel Deep Galerkin Method coupled with a Policy Iteration Approximation (DGM-PIA). This approach outperforms traditional finite difference and semi-Lagrangian schemes in our tests. Our numerical analysis reveals how the optimal production control and the resulting economic value are critically sensitive to the stringency of the emission threshold. The results provide insights into the effectiveness of climate policies and suggest the potential benefit of differentiated regulatory mechanisms.

Alle Interessierte sind herzlich eingeladen!

Kontakt:

Stephan Ankirchner
Professur Stochastische Analysis
Institut für Mathematik
Inselplatz 5
07743 Jena