

# FIM

# Nachdiplomvorlesung

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## Gerber-Shiu Risk Theory through Lévy Processes

September 26 - December 19, 2012  
Wednesdays 10.15 - 12.00h  
HG G 43, ETH Zürich, Rämistrasse 101

### Abstract

I will give a complete review of classical and modern insurance risk theory through the eyes of excursion theory for Lévy processes. To keep the technical requirements to a minimum, the course will deal largely with the case of the classical Cramér-Lundberg process, developing in detail the Poissonian structure of sojourns from the maximum, moving towards the end of the course into a more general Lévy set-up. The objective is to go far beyond the classical ruin problems, into the realms of dividend strategies which correspond to refracted, reflected and super- and sub-reflected Lévy processes, as well as focusing on the importance of the modern theory of scale functions for spectrally negative Lévy processes in the analysis. Much of what will be presented will cover, at the appropriate level, the main developments that have occurred in the last 5-10 years in the research literature. If there is time, I would also like to deal with some completely new Monte-Carlo simulation methods. The course will assume core basic knowledge of Markov processes, knowledge of measure theoretic probability as well as core facts from analysis.

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