

## **New Developments in Option Pricing**

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Option pricing is one of the main research areas of modern Mathematical Finance. Hence, new valuable developments in this area remain well-motivated and highly desirable. The aim of the talk is to present some comprehensive issues that can be interesting for a wider audience besides those experts who primarily work in Mathematical Finance. Moreover, the developments in option pricing can be considered as a reasonable source of new problems and studies in related mathematical disciplines. In the talk we discuss the essence of the notion “financial contract” and formulate the main problem for study in this context. It will be basically shown in the classical Black-Scholes environment. A dual theory of option pricing will be developed by means of market completions as an alternative of the well-known option price characterization via martingale measures. We also present another approach in approximate option pricing which is based on comparison theorems for solutions of stochastic differential equations. It will be shown that this method brings very satisfactory bounds for option prices. Finally, we will pay our attention to extensions of probability distributions of stock returns using orthogonal polynomials techniques. Going in this way we get a possibility to see what happens beyond the Black-Scholes model.