



# Michigan Mathematics Alexander Ziwet Lectures

## Professor Ioannis Karatzas

*Eugene Higgins Professor of Applied Probability  
Columbia University*

*Fellow, Institute of Mathematical Statistics*

*IMS/Bernoulli Society Lecturer*

*André Aisenstadt Lecturer*

*Doctorate Honoris Causa, Athens University Faculty for  
Economics and Commerce*



### ***Some Stochastic Control Problems in Mathematical Finance***

Tuesday, November 18 • 4:10 p.m. • Room 1360 East Hall

We formulate and review a class of stochastic control problems, collectively known under the rubric of “portfolio optimization”, that arise in the mathematics of finance. Ideas from convex duality play a prominent role in the resolution of these problems; so does the theory of parabolic partial differential equations, under certain strong conditions on the financial market structure. Under less stringent conditions, stochastic analogues of the classical Hamilton-Jacobi-Bellman equation emerge as particularly relevant in this context, in connection with ideas and results from ‘backwards’ stochastic equations and the Ito-Wentzell formula for random fields. Using such tools, feedback formulae become available for the investor’s optimal strategies, based on his current level of wealth. Recent progress on these issues will be surveyed, and some open questions will be mentioned.

### ***Volatility Stabilization, Diversity and Arbitrage***

Wednesday, November 19 • 3:10 p.m. • Room 3088 East Hall

### ***Optimal Arbitrage***

Thursday, November 20 • 3:10 p.m. • Room 3088 East Hall

*A reception for Professor Karatzas will be held at 5:00 p.m.  
Tuesday, November 18, in the Mathematics Upper Atrium, East Hall*

*The Ziwet Lectures were established in 1934 through a bequest from Professor Alexander Ziwet, a faculty member and Chair of the UM Department of Mathematics from 1888-1925. He stipulated that his estate “should be used for the promotion of scientific work.”  
The Ziwet lectures are one of the most prestigious lectures series in the Department.*