

Industrial & Systems Engineering Seminar

Energy Prices & Dynamic Games with Stochastic Demand

Wednesday, April 5

3:15 PM – Refreshment, 3:30 – Graduate Seminar

Lind Hall Room 305



Professor Ronnie Sircar

Operations Research and Financial Engineering

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The dramatic decline in oil prices, from around \$110 per barrel in June 2014 to around \$30 in January 2016 highlights the importance of competition between different energy producers. Indeed, the price drop has been primarily attributed to OPEC's strategic decision (until very recently) not to curb its oil production in the face of increased supply of shale gas and oil in the US, which was spurred by the development of fracking technology. Most dynamic Cournot models focus on supply-side factors, such as increased shale oil, and random discoveries. However declining and uncertain demand from China is a major factor driving oil price volatility. We study Cournot games in a stochastic demand environment, and present asymptotic and numerical results, as well as a modified Hotelling's rule for games with stochastic demand.

BIO:

Ronnie Sircar is a Professor of Operations Research and Financial Engineering at Princeton University, and is affiliated with the Bendheim Center for Finance, the Program in Applied and Computational Mathematics and the Andlinger Center for Energy and the Environment. He received his doctorate from Stanford University, and taught for three years at the University of Michigan in the Department of Mathematics. He has received continuing National Science Foundation research grants since 1998. He was a recipient of the E-Council Excellence in Teaching Award for his teaching in 2002, 2005 and 2006, and the Howard B. Wentz Jr. Junior Faculty Award in 2003. His research interests center on Financial Mathematics, stochastic volatility models, energy markets and exhaustible resources, credit risk, asymptotic and computational methods, portfolio optimization and stochastic control problems, and stochastic differential games. He is a co-author of the book "Multiscale Stochastic Volatility for Equity, Interest-Rate and Credit Derivatives", published by Cambridge University Press in 2011, and was founding co-editor-in-chief of the SIAM Journal on Financial Mathematics, from 2009-2015.