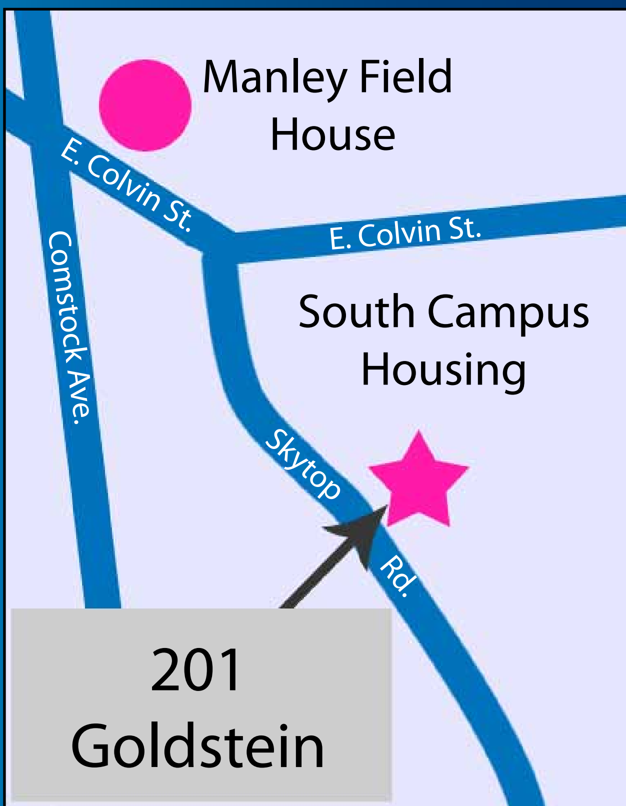
Tuesday, April 30th

6:00 - 7:00 pm

Syracuse University
Goldstein Student Center
Room 201



Walid M. Dyab received the BSc and MSc from University of Alexandria, Egypt, in 2003 and 2007, respectively, both in Electrical Engineering. Currently, he is a doctoral candidate at Syracuse University, Syracuse, NY. From 2003 till 2005, he was a teaching assistant at Alexandria Institute of Technology (AIT), Egypt. From 2005 till 2006, he worked as a Technical Support Engineer in the Radio Network Department at Alcatel. From 2006 till 2009, he was a Teaching and Research Assistant at the German University in Cairo (GUC), Egypt. His research interests include the fields of antennas and electromagnetic wave propagation, antenna measurements, adaptive antenna systems, adaptive signal processing, and the design and analysis of microwave passive circuits.

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Electromagnetic Macro Modeling of Propagation in Mobile Wireless Communication: Theory and Experiment

Presented by Walid M. Dyab, Syracuse University

Cellular systems are one of the fastest growing markets of the 21st century. The competition between service providers is at its most. This is pushing the mobile service providers to continuously reconsider the radio network design issues in order to maximize the usage efficiency of wireless communication resources. Accordingly, a deeper understanding of the physics of propagation of electromagnetic waves in a cellular environment is a must. In this work, some important aspects related to the propagation in mobile wireless environments are studied, both from a theoretical and an experimental point of view. The original Sommerfeld problem is revisited, and many interesting aspects of electromagnetic "Surface Waves" are interrelated to the cellular problem. Detailed analytical solution of the Sommerfeld problem using a modified saddle point method of integration, along with numerical simulations, and experimental results taken from published data, as well as measurements held in live cellular networks, all of these data reveal a consistent path loss exponent of 3 in most of the effective cellular areas. Relating the propagation mechanism in cellular networks to the propagation of light over imperfect ground planes makes it clear that some of the current practices in the field of channel modeling, such as ray tracing, are far from being realistic.

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