

**Thursday, February 18th**

Scaife Hall Auditorium

Room 125

4:30 p.m.

Refreshments at 4:00 p.m.

## **The Smart Grid and Power Engineering Education**



### **Sakis Meliopoulos**

**Georgia Power Distinguished Professor  
Georgia Institute of Technology**

A. P. Meliopoulos was born in Katerini, Greece. He obtained a Diploma in Electrical and Mechanical Engineering from the National Technical University in Athens, Greece in 1972 and a Master in EE (1974) and a Ph.D. degree (1976) from the Georgia Institute of Technology in Atlanta, Georgia, USA. Dr. Meliopoulos' first professional association was with Western Electric (1971) in Atlanta, Georgia. After receiving a PhD degree in 1976, he joined the faculty of the Georgia Institute of Technology as an Assistant Professor (1976), Associate Professor (1982-88) and full professor (1989-present). At this capacity, he is actively involved in education and research for improved safety and electromagnetic compatibility of electric power installations, protection and control of power systems and the application of new technology in these areas. Since 1999 he is the Georgia Tech site Director of PSERC, a power system research consortium of universities and industry. Dr. Meliopoulos has pioneered several new analysis and design techniques for safety, protection and control of electric power systems. He led the effort for the first wide area monitoring system in the eastern interconnection using PMU technology (NYPA 1992-96), the EPRI transmission reliability analysis program (TRELSS-1996), he developed the first fully distributed substation based state estimation using PMU technology (USVI-WAPA, 2008), he invented the Smart Ground Multimeter, and developed a number of power system analysis programs that are currently used in the industry, most notable the WinIGS (Integrated Grounding System analysis and design), and the WinIGS-F (a three phase power flow program). Dr. Meliopoulos is a Fellow of the IEEE. He was named the Georgia Power Distinguished Professor in 2006.

The electric power system has been recognized as one of the critical infrastructures that are paramount to the economic activity of the country. The over \$300 billion dollar per year electric power industry delivers about  $3.5 \times 10^{12}$  kWhr (about 40% of the total energy consumption in the US) and has an installed generating capacity of about 1,000,000 MW. Another quarter to one third of this capacity is estimated to be in the form of standby electrical systems for critical systems, such as control centers, hospitals, etc. The electric power grid is a large heterogeneous system, with many interdependencies on other infrastructures (fuel supply), subject to weather effects (weather related failures and weather sensitive electric load), exhibits complex dynamic interactions and it is controlled with humans in the loop. It is certain renewable (wind, photovoltaics, etc.), distributed generation, PHEVs and other distributed resources will be integrated in larger quantities with the national power grid. All of these technologies interface with power electronic devices (inverters). To fully realize the advantages of these technologies and to make their economics attractive, it will be necessary to invent new ways of monitoring, controlling, optimizing and protecting this integrated system. The term smart grid captures the expectation for the development of these technologies. The talk will discuss key issues of smart grid technologies, the impact on power system engineering curricula and the opportunities that generates for undergraduate and graduate students.

#### **ECE Seminar Hosts**

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