

2-SESSION SEMINAR:

1.- DESIGNING FOR POWER INTEGRITY: STATUS, CHALLENGES AND OPPORTUNITIES

by **Madhavan Swaminathan**

from Georgia Tech., Joseph M. Pettit School of Electrical and Computer Engineering. Georgia, USA.



SEMINAR DESCRIPTION:

Since the mid-1990s, designers have been developing sophisticated methods for managing power integrity in packages and printed circuit boards which has had a direct impact on the signal integrity of systems. These have included items such as developing design parameters such as target impedance, developing repeatable frequency domain characterization methods, pushing the EDA vendors to improve the capability of the design tools, developing new devices such as EBGs to improve isolation, developing embedded capacitance layers to name a few. However, the designers are continuing to face challenges where the noise on the power distribution is beginning to over shadow the signals in fast switching environments arising in high speed computing systems. These challenges are often times opportunities for university research that can lead to interesting and often times innovative solutions.

This talk will cover a review of the past developments in this area and will focus on the present challenges and potential solutions in the area of power delivery.

SHORT BIO:

Madhavan Swaminathan is the Joseph M. Pettit Professor in Electronics in the School of Electrical and Computer Engineering, Georgia Tech, Director of the Interconnect and Packaging

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Center, Georgia Tech and the Founder and CTO of E-System Design, a company focusing on the development of CAD tools for achieving signal and power integrity in integrated 3D micro and nano-systems. He is also the co-founder of Jacket Micro Devices, a company that specialized in integrated RF modules and substrates for wireless applications that was acquired by AVX Corporation. He was formerly the Deputy Director of the Microsystems Packaging Center at Georgia Tech. Prior to joining Georgia Tech, he was with IBM working on packaging for supercomputers. He is the author of more than 350 journal and conference publications, holds 25 patents, is the author of 3 book chapters, primary author and co-editor of 2 books - "Power Integrity Modeling and Design for Semiconductors and Systems", Prentice Hall, Nov 2007 and "Introduction to System on Package", McGraw Hill, Mar. 2008 in the field of packaging and has won several awards including the Technical Excellence Award from Semiconductor Research Corporation. He is an IEEE Fellow. He received his B.E. degree from Regional Engineering College, Tiruchirapalli (now NITT) in 1985 and M.S and PhD degrees in Electrical Engineering from Syracuse University, USA in 1989 and 1991, respectively.

2.- WHO IS THE FATHER OF ELECTRICAL ENGINEERING?

by Tapan K. Sarkar

**from Department of Electrical Engineering and Computer Science
Syracuse University; Syracuse, New York, USA.**



SEMINAR DESCRIPTION:

According to Sir James Jeans: /In his hands electricity first became a mathematically exact science and the same might be said of other larger parts of Physics/. He did develop almost all aspects of Electrical Engineering. To start with, as Sir Ambrose Fleming pointed out he provided a general methodology for the solution of Kirchoff's laws as a ratio of two determinants. He showed how a circuit containing both capacitance and inductance would respond when connected to generators containing alternating currents of different frequencies. He developed the phenomenon of electrical resonance. He showed that between any four colors an equation can be found, and this was confirmed by experiments. Secondly, from two equations containing different colors a third may be obtained. A graphical method can be described, by which after

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fixing arbitrarily the position of three standard colors that of any other color can be obtained by experiments. Finally, the effect of red and green glasses on the color-blind was presented, and a pair of spectacles having one eye red and the other green was proposed by him as assistance to detect doubtful colors. He was the first to show that in color blind people, their eyes are sensitive only to two colors and not to three as in normal eyes. Typically, they are not sensitive to red. He perfected the ophthalmoscope to look into the retina. At the point of the retina where it is intersected by the axis of the eye there is a yellow spot, called the macula. The macular degeneration of the eye affects the quality of vision and is the leading cause of blindness in people over 55 years old. Today, the extent of macular degeneration of the retina is characterized by his yellow spot test. He also developed the fish eye lens to look into the retina with little trauma. He provided a methodology for generating any color represented by a point inside a triangle whose vertices represented the three primary colors that he chose as red, green and blue. He took the first color photograph. The experimental set up was to take three pictures separately using different colors and then project the superposed pictures to generate the world's first color photograph. Today, color television works on this principle, but his name is rarely mentioned. He wrote the first paper on control theory showed for the first time that for stability the characteristic equation of the linear differential equation has to have all its roots with negative real parts. He not only introduced the first statistical law into physics but also introduced the concept of ensemble averaging which is an indispensable tool in communication theory and signal processing. He also did other significant works including introducing the concept of relativity which made Albert Einstein remark:/One scientific epoch ended and another began with him –/, and, /From a long view of the history of mankind – seen from, say, ten thousand years from now – there can be little doubt that the most significant event of the nineteenth century will be judged as his discovery of the – /Richard Feynman/. He always delivered scientific lectures for the common people using models. He also was very prolific in writing limericks, as we will see. Can you guess who this person is???

SHORT BIO:

Tapan K. Sarkar is Professor in the Department of Electrical and Computer Engineering, Syracuse University. His current research interests deal with numerical solutions of operator equations arising in electromagnetics and signal processing with application to system design. He has authored or coauthored more than 300 journal articles and numerous conference papers and 32 chapters in books and fifteen books, including his most recent ones, /Iterative and Self Adaptive Finite-Elements in Electromagnetic Modeling / (Boston, MA: Artech House, 1998), /Wavelet Applications in Electromagnetics and Signal Processing/ (Boston, MA: Artech House, 2002), /Smart Antennas / (IEEE Press and John Wiley & Sons, 2003), /History of Wireless/ (IEEE Press and John Wiley & Sons, 2005), and /Physics of Multiantenna Systems and Broadband Adaptive Processing/ (John Wiley & Sons, 2007), /Parallel Solution of Integral Equation-Based EM Problems in the Frequency Domain / (IEEE Press and John Wiley & Sons, 2009), and /Time and

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Frequency Domain Solutions of EM Problems using Integral Equations and a Hybrid Methodology /(IEEE Press and John Wiley & Sons, 2010) . He received Docteur Honoris Causa from Universite Blaise Pascal, Clermont Ferrand, France in 1998, from Politechnic University of Madrid, Madrid, Spain in 2004, and from Aalto University, Helsinki, Finland in 2012. He received the medal of the /friend of the city of Clermont Ferrand/, France, in 2000.

AGENDA:

Monday 11th June, 2012, Sala de Conferències de la ETSEIAT, Terrassa
(<http://maps.upc.edu/>)

9:00	Welcome Presentation
9:15 to 10:45	Conference 1st part
10:45	Coffee break
11:15 to 12:45	Conference 2nd part

LIMITED PLACES AVAILABLE

Courses registration: eel.doctorat@upc.edu

ATTENDANCE CERTIFICATE WILL BE PROVIDED.

FREE REGISTRATION FOR MASTER AND Ph.D. STUDENTS

Please, indicate your Master or Doctoral Program in the registration e-mail.

Prof Swaminathan course is possible thanks to the Spanish Chapter of the IEEE EMC Society.

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