



Dogus Üniversitesi  
İstanbul

## Açılış Konuşmaları

### Solution of Extremely Large Integral Equations in Computational Electromagnetics

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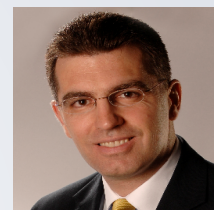
lgurel@ee.bilkent.edu.tr

H-Block Theater Saloon

Sep 3, 2012 12:20-13:00am

#### Abstract:

Accurate simulations of real-life electromagnetics problems with integral equations require solution of dense matrix equations involving millions of unknowns. Solutions of these extremely large problems cannot be achieved easily, even when using the most powerful computers with state-of-the-art technology. Some of the world's largest integral-equation problems in computational electromagnetics have been solved at Bilkent University Computational Electromagnetics Research Center (BiLCEM). In this talk, fast and accurate solutions of large-scale electromagnetic modeling problems involving three-dimensional geometries with arbitrary shapes using the multilevel fast multipole algorithm (MLFMA) and parallel MLFMA will be presented. Solutions of extremely large canonical benchmark problems involving sphere and NASA Almond geometries and of complicated real-life problems such as, scattering from realistic aircrafts longer than 1000 wavelengths will be presented.



### 50 Year Anniversary of PTD\*



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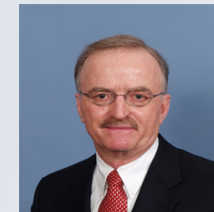
Sep 3, 2012 11:00-11:40am

#### Abstract:

50 years ago this author published his first book on the Physical Theory of Diffraction (PTD). In the present talk he shares his comments on the origination and development of PTD. They relate to such topics as the initial and subsequent forms of PTD, black bodies and shadow radiation, engineering applications, concept of elementary edge waves, asymptotic accuracy of PTD, its relationship with GTD, and prospective of PTD.

\*This talk illustrates some topics of the author's paper submitted to IEEE Antennas & Propagation Magazine.

### (GTD/UTD)\* and Its Applications



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H-Block Theater Saloon

Sep 3, 2012 11:40-12:20am

#### Abstract:

The diffraction phenomenon, Practical applications of diffraction, Formulation of diffraction problems, Place occupied by GTD in the general theory of diffraction, Geometric Optics (PO) as a starting point of GTD, GO/GTD application onto complex 3-D problems, Comparisons against PO/PTD and Ray and caustic asymptotics for 3-D problems, Real potential and deficiencies of GO/GTD, Alternative HF techniques: UAT, UTD.

\* GTD:Geometric Theory of Diffraction, UTD: Uniform Theory of Diffraction