



The IEEE AESS Tunisia Chapter
 is inviting all interested IEEE members and researchers
 to assist to a seminar presented by



Daniele Mortari, Professor of Aerospace Engineering at Texas A&M University.

December 11, 2009 at 3:00 P.m.: *Flower Constellations: Toward a New Theory*

Flower Constellations have been discovered in 2004 at Texas A&M University. These constellations constitute novel space objects with time-invariant shapes. Recently, the mathematical theory has been extended by recognizing Flower Constellations as Lattice on Torus. Under this new theory the equivalency and similarity problems have been completely solved. This talk will introduce the theory of compatible orbits, the previous Flower Constellation theory, and the new theory by showing many examples and potential applications.

December 12, 2009 at 9:00 A.m.: *Recent Surprises: Attitude Rate Estimation using n-Dimension Rotations and the Multiplicative Measurement Model*

An adaptive filtering technique to estimate the angular velocity is presented. The idea relies on the fact that, if the angular velocity does not change direction, the dynamics of the quaternion describing the attitude evolution, constraints the quaternion on a 3-D hyper-plane. This talk, using properties of Ortho-skew matrices and decomposition of orientation into rotations in 4-D space, shows how to identify this hyper-plane and how to estimate the angular velocity using subsequent quaternions. Motivation comes from the possibility to estimate attitude rate during fast maneuvers using star trackers and/or to provide Kalman filters with good initial angular velocity estimates.

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**Distinguished
Lecturer**

Place: National School of Engineers of Sfax, Tunisia.

You are welcome

