From Broglio’s “Sistema Quadrifoglio” to the Necklace Problem on Flower Constellation

Thursday, March 24, 2016
4:00 p.m. | 202 Reed McDonald Building

Abstract
The Flower Constellations theory evolution has a very interesting story that will be summarized in this talk. Broglio’s “Sistema quadrifoglio” was an initial 4-satellite configuration that has generated the original theory of Flower Constellations. This new way to design satellite constellations has then generated interesting subsets such as, the “shape-preserving” constellations, the “rock around orbits,” and the “two-way orbits”. Thanks to number theory mathematical properties, the theory has been generalized to the 2-D and 3-D Lattice versions and, finally, to the Necklace problem. The mathematics behind will be minimized and various examples and animations for potential current and futuristic applications will be shown.

Daniele Mortari is professor in the Department of Aerospace Engineering at Texas A&M University, working on the field of attitude and position estimation, satellite constellation design, and sensor data processing. In addition, he has taught at the School of Aerospace Engineering of Rome’s University, and at Electronic Engineering of Perugia’s University. He received his dottore degree in Nuclear Engineering from University of Rome “La Sapienza,” in 1981. He is IEEE and AAS Fellow, AIAA Associate Fellow, Honorary Member of IEEE-AESS Space System Technical Panel, and former IEEE Distinguish Speaker. He has published about 280 papers and he has been widely recognized for his work, including receiving best paper Award from AAS/AIAA, two NASA’s Group Achievement Awards, 2003 Spacecraft Technology Center Award, the prestigious 2007 IEEE Judith A. Resnik Award and, recently, the 2016 AAS Dirk Brouwer Award.

Refreshments will be served at 3:45 p.m.