1145-92-21 **Suncica Canic*** (canics@berkeley.edu). *Development of Mathematical Methods for Next Generation Stent Design.*

Over the past 30 years, non-surgical, percutaneous coronary interventions with stent implantation transformed the practice of cardiology. Before the introduction of drug eluting stents (DES), bare metal stents (BMS) were the only choice. DES have led to a significant reduction in in-stent restenosis rates, one of the major limitations of BMS. There is an on-going effort to continue to improve the current generation stents with thinner struts, lesion-dependent geometric designs for complicated lesions, better biocompatible polymer use for coating, biodegradable polymer, or polymer-free stents with porous-metal coating or nanoparticle-mediated drug delivery systems. In this talk we will review the stateof-the-art mathematical methods and models that are being developed to guide the next generation stent design. The methodology includes nonlinear movingboundary problems to study fluid-structure interaction between implanted stents, blood flow, and coronary artery elastodynamics, novel poroelastic, composite structural models to study drug diffusion and chemical reaction with vascular tissue, hyperbolic PDE models defined on graphs to study optimal geometric stent design, and Smoothed-Particle Hydrodynamics approaches to study nanoparticle-mediated drug delivery systems. (Received August 17, 2018)