

MSE SEMINAR

October 27, 2017

113 McBryde Hall

3:30 – 4:30 PM

Refreshments at 3:00 PM

Jerry Contreras

Graduate Student

Materials Science and Engineering, Virginia Tech

“Fabrication of ultrasound sensitive polymer-glass composites”

ABSTRACT

Recent work has shown that Ultrasound imaging has significant potential to replace X-ray imaging for medical device implantation and long-term monitoring in patients. To develop and fabricate composite catheters, which improve the contrast achieved with the safer Ultrasound modality and so aid in replacing x-rays. The data presented demonstrates that adding varying amounts of biocompatible glass beads (size range 50-200 μm) to a polymeric device results in unique patterns being produced when it is exposed to ultrasound. Three compositions were fabricated (i.e. 0, 1, and 5 wt% beads) and characterized for glass-polymer distribution and ultrasound response. The addition of 5 wt% beads resulted in a 16-fold increase in contrast enhancement when compared to polymer alone. However, the initial extruded catheters exhibited rough surfaces, due to poor dispersion of the microbeads throughout the polymer, thus compatibilizer coatings for the microbeads were synthesized and deposited by collaborators at the University of Nottingham. Use of coated beads resulted in samples with uniform distribution throughout composite and diminished surface roughness.

BIOSKETCH

Jerry Contreras is a graduate student in Dr. Whittington's Additive Materials Group. He graduated from the University of Texas Pan-American with a bachelors of science in Physics in 2014. His research interests include biomedical materials and medical devices.