

Dr. Elijah Petersen

Bio: Elijah graduated from Case Western Reserve University in 2003 with BS and MS degrees in Civil Engineering and a BA in Psychology. He then received a PhD at the University of Michigan studying the ecological uptake and elimination behaviors of carbon nanotubes. He then received a Fulbright scholarship to do postdoctoral research at the University of Joensuu in Finland. Elijah joined NIST as a National Research Council postdoctoral research fellow from 2009-2010 and then became a staff research scientist in 2010.

Talk Title: Metrology for decreasing uncertainty in ecotoxicity measurements of carbon nanomaterials

After studying the potential environmental effects of carbon nanomaterials for the past decade, some consistent findings have been obtained and the capacity to design more accurate ecotoxicology tests has also been developed. One significant improvement is the identification of artifacts in nanoecotoxicology testing that could lead to erroneous “positive” or “negative” results. For example, after identification of the artifact from THF-dispersed fullerene particles, subsequent studies have typically shown minimal effects to fish with water dispersed fullerenes agglomerates. Additional artifacts in nanoecotoxicology testing will be highlighted and strategies to minimize such artifacts will be discussed. Significant progress has also been made with analytical methods to quantify concentrations of carbon nanomaterials in organisms. One example of a finding that has been thoroughly established is that bioaccumulation experiments with carbon nanotubes have consistently shown a lack of adsorption across the gut tract of multicellular organisms. Critical knowledge gaps will also be discussed.