Undergraduate and Graduate Chemistry Research Symposium

Sponsored by the Northern New York Local Section of the ACS

Saturday, April 4th from 9:00 am – 2:00 pm at SUNY Potsdam

FINE PARTICLES: THE GOOD, THE BAD, AND THE UGLY

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Small particles ranging in size from a few nanometers to a few micrometers represent some of the essential parts of the material world. Such dispersed matter is ubiquitous: from interstellar dust to everywhere on our planet. They affect both our environment and our lives for the good and for the bad, which is the topic of this talk.

The main reason for this dual influence is due to the fact that many essential properties of particles depend not only on the chemical composition, but also on their size and shape. It is, therefore, essential that we should be able to prepare uniform particles of different morphologies to evaluate their characteristics as a function of the physical parameters, and to produce such materials of predicable properties for various uses. On the other hand, we must find effective ways to eliminate finely dispersed matter when undesirable, i.e. detrimental to our well being and harmful to the ecology. Despite the fact that the science of particles is an old one, many of the problems remain unresolved, because the tasks to explain and quantify the observed phenomena are not trivial. This presentation will deal with several aspects of such materials, and describe some of the achievements and challenges.