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Materials and Interactions- Characterization to Reconstruction of Events

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Short Communication

Materials play an important role in our lives, from our living, nourishment, health and wellbeing to technological and scientific advancements. Our world is basically defined in three dimensions that is dictated by interactions between materials. The importance of materials in our lives is well illustrated by the fact that stages of civilization are named after the predominant material usage of the era such as stone age, bronze age, iron age etc [1]. Our perceptions are also primarily dictated by interaction of stimuli with materials. Any stimulus that does not interact with materials, while theoretically proven, remains hypothetical such as the concept of dark energy and dark matter [2,3]. Materials have been studied by scientists to investigate the relationship between the structure and properties of materials. Where enhanced properties are desired, materials are engineered by altering their structure and as a result their properties are improved.

In both material science as well as material engineering, characterization is required for investigation and engineering. Material characterization involves the study of physical structure of the material, its chemical composition and the effect of various interactions the material may have been subjected to in terms of physical, chemical and even atomic/subatomic levels. In the process, properties are probed and quantified against given standards, for example hardness scale, material strength, grain size etc. Common characterization techniques include microscopy, spectroscopy and testing of materials. Materials interact with other materials as well as other external stimuli such as energy, quantum forces and subatomic particles. The impact of these interactions can be studied at various levels in order to assess their effects of material structure and properties.

These interactions are spread across different fields of study. In the field of engineering, these interactions may be studied with respect to their effects of mechanical properties, strength of materials, electrical conductivity, photovoltaic properties. Interactions, such as subjecting a material to heat energy for example would alter its properties. In biosciences, these interactions may be viewed and studied with respect to their effects of structural alterations, biochemical processes and tier impact on life and health. A disease for example may be defines as physical and chemical interaction of external agents, both biological (pathogens) and non-biological (chemicals, carcinogens) and their effects on biological functions. In the field of manufacturing, metal cutting can be characterized in terms of physical and chemical interactions between toll and work materials [4,5].

On a larger scale, these interactions may be spread over interplanetary interactions, interstellar and even intergalactic interactions. Detection of black holes is one such example where the only way to identify on is through its interaction with nearby material objects [6]. Given advanced technology and equipment, it would theoretically and hypothetically be possible to reconstruct historical events by studying the interaction of particles as one interacting particle leaves its signature on the other. This would be possible if we can characterize these inter-particle signatures at atomic and subatomic level. In this way it would be possible to reconstruct the historical existence of particles over the dimensional matrix. We are material beings and as such confined into a material world that is defined by interaction of materials with other material and non-material stimuli. Study of materials is therefore one of the most critical

field of study that has a great impact on our lives and perception of reality.

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