The basis of the field has been developed through intense study of several model systems including charge transfer salts such as tetrathiofulvalene-tetracyanoquiodimethane and polyenes such as polyacetylene and its various isomers and doped forms. New synthetic procedures were developed during the study of the chemistry of these systems, and tools were developed for measuring the electrical, magnetic, spectroscopic and other properties of these highly anisotropic systems. New theoretical concepts such as strong electron-phonon interaction, Peierls transition, solitons, bipolarons, etc. were developed to understand these materials and research initiated into application of these novel systems as electrostatic eliminators and battery materials.

It is our assessment that these studies into chemistry, physics, application and theory are together forming a new conductive materials science. Several developments are already visable which point to a rapidly evolving materials base and an understanding of conductive materials. Presentations at this Workshop point to many opportunities in new formulations of polyenes such as polyphenylene and polythiophene, and the development of environmentally stable and processable materials based on polycrystalline inhomogenous and/or composite systems. The development and understanding of the nonlinear optical response of these solids opens up new opportunities for nonlinear signal processing based on the strong electron-phonon coupling of polyene chains. As the science of conductive materials is extremely broad, it is necessary to bring to bare a very wide variety of tools including, but not limited to measurement of the electronic structure of monomers, oligomers and polymers; measurements of the three-dimensional ordering of polymers and molecules and solids; measurement of the role of the counterions in effecting the reactivity of conducting polymers and its effects on the structural order of conducting polymers; and direct measure of the charge transport, magnetic, optical, and rhealogical properties of these materials and their composites. Theory has made a great deal of progress in the field, but many opportunities for new science remain. These include application of quantum chemistry to small and medium sized molecules and oligomers and to development of more sophisticated phenomenological models of the electronic structure and defects of polyenes, and to understanding the macroscopic properties of real samples of conductive materials and their polycrystalline or composite