Materials Science & Technology Division FACT SHEET

Mission:
The Materials Science & Technology (MST) Division mission is to conduct basic and applied research and development on materials in order to improve the understanding of physical phenomena and to develop advanced materials and processes to enable energy-efficient, cost-competitive and environmentally acceptable materials technologies for a variety of important national priorities.

Who we are:

MST Division is centered in the Physical Sciences Directorate at Oak Ridge National Laboratory.

- Consists of 18 Research & Development Groups, three Programs, and two User Centers
- Research activities consist of a foundation of modeling and simulation, the three classical pillars of materials science: synthesis, structural characterization, and property evaluation, and a variety of applied materials science and technology topics ranging from materials to extreme environments to use-inspired applications
- Materials research is a major contributor to the development of energy technologies
- Leader in open-source materials research
- World class capabilities for materials synthesis, characterization, and property evaluation

Research:

Research activities consists of eighteen groups can be grouped into six technical themes.

- Theory and modeling at multiple scales,
- designed synthesis of condensed matter physics systems, alloys, structural ceramics, and specialized crystals,
- structural characterization via electron, ion, photon and neutron sciences,
- comprehensive physical and mechanical property characterization,
- interaction with extreme environments (temperature, corrosive media, radiation), and
- applied materials physics (superconductivity, thermoelectrics, hydrogen storage, photovoltaics, catalysis, energy storage)

Point of Contact:

Dr. Gene E. Ice joined the former Metals & Ceramics Division in 1979. His early work on X-ray optics lead to the co-invention of dynamically-bent sagittal-focusing crystal optics, which are now deployed at synchrotron facilities around the world. After ten years of designing and then operating the ORNL materials science beamline at the National Synchrotron Light Source, Dr. Ice began research to develop polychromatic microdiffraction methods for materials characterization. This research ultimately led to construction of the world's first dedicated polychromatic microdiffraction facility with submicron resolution in three dimensions. He became the X-ray Scattering and Microscopy Group Leader in 1995 and an ORNL Corporate Fellow in 2003. In 2008 he became an editor of the Journal of Synchrotron Radiation. He is considered an international expert on X-ray optics and Neutron optics with broad expertise in novel characterization methods to understand the fundamental relationship between structure and properties in materials.

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