Scientific Discovery at the Nexus of Information Science and Materials Science

Krishna Rajan
Erich Bloch Chair
Department of Materials Design and Innovation
University at Buffalo: the State University of New York

Abstract

This presentation will provide an overview of how the tools of information science when harnessed with experimental and computational materials science, provides pathways for new discoveries that significantly advance the structure-property paradigm in materials design. The field of ‘Materials Informatics” lies at this intersection between the science of materials and the science of information. In this talk we shall provide a few examples of how we use Materials Informatics to address materials science issues which impact the area of energy related applications, including high temperature alloy design and catalysis chemistry. This presentation will also introduce the vision of the newly established Department of Materials Design and Innovation (MDI) at the University of Buffalo-SUNY. The MDI aims to introduce a new paradigm for materials science education and research that educates individuals to have intellectual fluency in both information science and materials science.

Biography

Krishna Rajan is the inaugural Erich Bloch Endowed Chair of the Department of Materials Design and Innovation (MDI) at University at Buffalo: the State University of New York—a position he assumed in the summer of 2015 for this newly formed department.

Professor Rajan received his doctorate from MIT in 1978 in Materials Science with a minor in science and technology policy and followed his graduation with a postdoctoral appointment at Cambridge University. His undergraduate education was at the University of Toronto where he obtained his bachelor’s degree in metallurgy and materials science in 1974. Prior to joining UB, he was at Iowa State University for a decade serving as the Wilkinson Professor of Interdisciplinary Engineering, holding appointments in materials science and engineering, and the bioinformatics and computational biology program. Before that he was professor of Materials Science and Engineering at Rensselaer Polytechnic Institute and a staff scientist at the National Research Council of Canada. More than 40 doctoral and masters’ students have graduated under his guidance. He has also supervised nearly 50 postdoctoral scientists in materials science, physics, computer science and statistics. With over 300 publications and ~300 invited presentations to his credit, Prof. Rajan is the founding editor-in-chief of the Materials Discovery Journal, published by Elsevier. He has received numerous awards and recognitions, including most recently the Alexander von Humboldt Research Award from Germany for his pioneering work in establishing the field of materials informatics; and was appointed as a member of Science and Technology Experts Group (ISTEG) of the National Academies of Science, Engineering and Medicine.