



DEPARTMENT OF MATERIALS SCIENCE & ENGINEERING, IIT KANPUR

PROF. E. C. SUBBARAO DISTINGUISHED LECTURE SERIES

Fascinating Challenges of Health Care for Engineering

Prof. Akshaya Kumar Jena

Former Professor and Head
Materials Science and Engineering IIT Kanpur



10th MARCH, 2023



04:00 PM



LECTURE HALL COMPLEX L-17

About the Speaker



Prof. Akshaya Kumar Jena is a distinguished teacher cum professor and researcher in the field of materials science and engineering. He received his B.Sc. Degree from BHU, India and D.I.C. from Imperial College of Science and Technology, UK. He obtained his PhD degree from University of London, U.K.

Prof. Jena during his teaching and research career served as a faculty member in the Massachusetts Institute of Technology, USA, Indian Institute of Technology Kanpur, India, Imperial college of Science and Technology, UK, The University of Manitoba, Canada, and Technical University of Berlin, Germany. Prof. Jena has over 120 peer reviewed publications in international journals and 110 invited and peer reviewed publication in conference proceedings. He also has ten approved patents granted in USA and Europe. He also authored two well recognized books in the field of materials science and engineering: Phase Transformations in Materials, A. K. Jena and M. C. Chaturvedi, Prentice-Hall, USA, (1992) and Structure and Properties of Engineering Materials, V.S.R. Murthy, A.K. Jena, K.P. Gupta and G. S. Murty, Tata McGraw-Hill, India (2003). His scientific accomplishments have been recognized by several national and international awards and fellowships. He was also a AOC Scholar from Imperial College of Science and Technology, U.K. Prof. Jena received distinguished alumnus award from Banaras Hindu University, India and Khosla national award from University of Roorkee, India. He was a Canadian commonwealth fellow, Canada and senior Humboldt fellow, Germany. He served as invited distinguished lecturer at Ontario Center for Materials Research, Canada, Alcan International R & D Center, Canada, University of Toronto, Canada, Queen's University, Canada and McMaster University, Canada. He also served as a visiting professor at University of Manitoba, Canada and Technical University of Berlin, Germany. He was the former professor and Head of the department of Metallurgical Engineering, IIT Kanpur. Now it is Materials Science and Engineering.

Abstract

Research and development related to biomedical applications are becoming integral parts of all branches of engineering and science. The Materials Engineering discipline is no exception. With expanding health care industry and our greater understanding of the science behind the root causes of diseases, have resulted in many challenges for all of us. We will consider examples of very simple to very complex issues. We will discuss how some basic and well-known ideas can be used to design critical implants for organs, and how similar concepts have been used to create products currently being extensively used in healthcare industry. A more difficult problem is the elimination of toxic heavy metal ion contaminants from drinking water. We will discuss a new recently proposed technique, which can be very effective. Finding cure for nonbacterial and nonviral diseases like cancer is a formidable challenge, because such diseases are caused by defects within our body. We will discuss how billions of instructions are stored in the body. Genes contain some of these instructions for specific processes like creation of organs and functioning of organs. If the instruction code in the gene is incorrect for the function for which the instruction is intended, we end up in a disease. If the defective disease is identified, a cure can be found. Identifying the defective gene or genes amongst almost billions of possibilities is formidable.

About Professor E. C. Subbarao



Prof. Eleswarapu Chinna Subbarao received BSc (Glass Technology) (1949) from Banaras Hindu University (BHU), B.S. (1952) and M.S. (1954) degrees in Ceramic Engineering from the University of Washington, Seattle; and PhD (Ceramic Technology) (1957) from the Pennsylvania State University. His doctoral thesis pioneered work on domain effects in ferroelectric ceramic barium titanate. He worked at Westinghouse Research Laboratories, Pittsburgh, PA (1956-63). In 1963, he joined IIT Kanpur, worked there as first Head of Metallurgical Engineering Department.; then as Founder-Director, Tata Research Development and Design Centre, Tata Consultancy Services, Pune.

Dr. Subbarao organized the first conference on Materials Science Education in India (1966) and established an interdisciplinary postgraduate programme in materials science at IIT Kanpur, also an Advanced Center of Materials Science, thus ushering in material science education and research in India. He was the first Dean of Faculty at IIT Kanpur and played a pivotal role in assembling world-class faculty at the IIT. He served on the Editorial boards of many national and international journals. He also served as Member, INSA Council (1982-84). Professor Subbarao received the INSA Prize for Materials Science (1995), National Metallurgists' Award (1970), Homi Bhabha Award in Applied Science (1978), ID Varshnei Memorial Lecture Award (1987), Distinguished Materials Scientist of the Year by MRSI (1991), NP Gandhi Memorial Lecture Award (1995), Distinguished Alumnus of the Institute of Technology, Banaras Hindu University (1998), and Honorary Fellow of IIT Kanpur (2006). He was elected Fellow of the Indian Academy of Sciences, Bangalore, Indian National Academy of Engineering and the International Academy of Ceramics. Dr. Subbarao currently staying with his son, who's an alumnus of IITK in M.E. in 1979, in Los Angeles.

About the Donor



Mr. Ramamritham Ramkumar born in 1951 did his B.Tech. in Metallurgical Engineering from IIT Kanpur in 1972. Then he moved to Canada to pursue MBA from the university of Toronto. Mr. Ramkumar is a businessperson who has been at the head of 6 different companies.

Presently, he occupies the position of Chairman at ASL Print FX Ltd., Independent Chairman of Meta Materials, Inc., and Chairman of Process Research ORTECH, Inc. Mr. Ramkumar is also on the board of Metamaterial Technologies, Inc.

In the past he held the position of Director at Snipp Interactive, Inc., Chief Executive Officer of INSCAPE Corp., Chief Financial Officer, VP-Operations & GM at Reff, Inc. and Charter Member at The Indus Entrepreneurs. Mr. Ramkumar has also served on the boards of numerous other public companies listed on the TSX and NASDAQ. Over the last 10 years Mr. Ramkumar has been an investor in a number of business ventures ranging from flexographic printing to technology development in the area of extracting metals from minerals.