



**IIChE - Bhubaneswar Regional Centre
Annual Lecture - 2026**

ER. D. P. MISRA DISTINGUISHED ORATION - 2026

INVITED LECTURE

Prosperity through Science and Technology

**Padma Bhushan
Prof. Jyeshtharaj B. Joshi**

Chancellor & Emeritus Professor
Institute of Chemical Technology, Mumbai,
Shanti Swarup Bhatnagar Prize Awardee (Engineering Sciences)
Fellow of U.S. National Academy of Engineering,
Adjunct Professor, Louisiana State University, USA & TIFR, Mumbai,
Distinguished Emeritus Professor, Homi Bhabha National Institute



OCT 12 2026

03:30 PM onwards



(Hybrid Mode)

CSIR-IMMT, Bhubaneswar

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Jointly organized by

**Indian Institute of Chemical Engineers (IIChE)
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**CSIR-Institute of Minerals and Materials Technology
Bhubaneswar - 751013, Odisha, India**

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BIOGRAPHICAL PROFILE OF PROF. J. B. JOSHI



PADMA BHUSHAN PROF. JYESHTHARAJ B. JOSHI

Chancellor & Emeritus Professor
Institute of Chemical Technology, Mumbai,
Shanti Swarup Bhatnagar Prize Awardee (Engineering Sciences)
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Prof. Jyeshthraj Bhalchandra Joshi is a distinguished chemical engineer, scientist, educator and innovator, internationally recognised for his outstanding contributions to chemical engineering research, reactor engineering, process intensification and industrial technology. He has over five decades of experience in research and teaching and has played a significant role in advancing both fundamental and applied aspects of chemical engineering. He obtained his B. Chem. Eng. and Ph.D. (Tech.) from the University Department of Chemical Technology (UDCT), University of Mumbai, and has subsequently built an illustrious academic and research career marked by scientific excellence, technological innovation and academic leadership.

His principal research interests encompass fluid mechanics, multiphase reactor design, computational fluid dynamics, chemical reaction engineering, process intensification, atomic energy, solar energy and bio-energy. His pioneering work on multiphase systems and reactor engineering has contributed significantly to the understanding, modelling, design and scale-up of complex chemical engineering processes. His research combines theoretical analysis, computational modelling and experimental investigations, with a strong emphasis on translating scientific understanding into practical engineering solutions.

Prof. Joshi has an outstanding record of scholarly contributions, with more than 670 research publications, over 34,000 citations, and an h-index exceeding 90, along with more than 110 conference presentations and 30 + papers in conference proceedings. His research has received wide international recognition and has influenced the development of chemical engineering methodologies and practices. He has also made an outstanding contribution to academic mentoring, having guided more than 115 Ph.D. scholars, 60 Master's students and 25 postdoctoral researchers. Through his teaching, research supervision and academic leadership, he has contributed substantially to the development of several generations of chemical engineers and researchers.

A particularly notable dimension of Prof. Joshi's career is his contribution to industrial innovation and technology development. He has around 50 innovations to his credit, covering novel processes, products, reactor designs and engineering solutions that have been implemented in large-, medium- and small-scale industries. He has designed more than 1,000 reactors and has extensively contributed to process intensification, capacity enhancement, quality improvement and process safety. Several of his engineering designs and recommended design procedures have been successfully implemented in commercial operations and have found application beyond India. His work has consistently sought to achieve improved process performance, lower capital and operating costs, enhanced safety and globally competitive standards.

BIOGRAPHICAL PROFILE OF PROF. J. B. JOSHI

His contributions extend beyond research and industrial technology into the broader areas of science education and societal development. Prof. Joshi has actively promoted scientific awareness and scientific temper among young people and the wider community. He has conducted more than 300 science-awareness workshops for school students, encouraging the younger generation to pursue science, engineering and research as careers. Through various science-popularisation initiatives, he has promoted hands-on scientific learning and sought to strengthen the connection between scientific knowledge, education and society.

Prof. Joshi's distinguished career has been recognised with numerous prestigious national and international honours. He was conferred the Padma Bhushan by the Government of India in 2014 in recognition of his distinguished contributions to science and engineering. His notable distinctions include the Science Academy Medal for Young Scientists, Indian National Science Academy; Amar-Dye-Chem Award for Excellence in Research and Development, Indian Institute of Chemical Engineers; Herdillia Award for Excellence in Basic Research in Chemical Engineering (IChE); Maharashtra State National Award for Outstanding Research in Engineering and Technology; Shanti Swarup Bhatnagar Prize for Engineering Sciences; VASVIK Award for Outstanding Contribution to Industrial Research; Dr. K. G. Naik Gold Medal; Goyal Foundation Award for Engineering Sciences; Vishwakarma Medal; Dr. Anji Reddy Innovator of the Year Award; Sayed Husain Zaheer Medal; Lifetime Achievement Award of the Indian Chemical Council; Platinum Jubilee Award; ICT Super Star; Eminent Engineer Award; and Lakshya Distinguished Leader Award. He was also awarded the J. C. Bose Fellowship by the Department of Science and Technology, Government of India.

Prof. Joshi has been elected Fellow of the Maharashtra Academy of Sciences, Indian Academy of Sciences, Indian National Science Academy, The World Academy of Sciences, Trieste, Italy, and the U.S. National Academy of Engineering. His academic and teaching excellence has been recognised through the Best Teacher Award of the Department of Chemical Technology, University of Mumbai, the Maharashtra State Best Teacher Award, and the Achiever of the Year Award. He was also selected as a Diamond during the Diamond Jubilee function of the Department of Chemical Technology, University of Mumbai, and as a Diamond for Outstanding Contribution to Education, Research and Industry by the Indian Institute of Chemical Engineers. In 2007, he was selected among the top 100 research scientists associated with Industrial & Engineering Chemistry Research of the American Chemical Society, based on high-impact publications.

With an exceptional blend of fundamental research, engineering innovation, industrial application, academic mentorship and science popularisation, Prof. J. B. Joshi represents a distinguished tradition of Indian scientific and engineering excellence. His career exemplifies how advanced research can be transformed into practical technologies and societal value while simultaneously nurturing future generations of scientists and engineers. His contributions have left a lasting impact on chemical engineering research, industrial practice, higher education and the broader scientific community.

ORATION THEME

TOPIC: PROSPERITY THROUGH SCIENCE AND TECHNOLOGY

The well-being of any society strongly depends upon the per capita income (GDP). On this basis India stands 140th among 152 nations of the World. Though the well-being depends upon many other factors (like culture), for a poor country like India, prosperity (enhancement of GDP) is crucial even for cultural development. It is interesting to note that the GDP is also strongly correlated with per capita availability of energy, water, food & nutrition and healthcare.

If we examine the history of developed nations, the prosperity almost entirely hinges on science, technology and innovations. In fact, the prosperity is directly correlated with the innovation index. In this respect, India stands 82nd in 152 nations and appropriately explains why she is poor. This statement though clearly highlights the forward path; the implementation depends upon many factors which are closely interrelated in a complex way. Following is an attempt to present an ecosystem between knowledge creators (universities, research institutions, engineering colleges) and knowledge demonstrators/ distributors [Bhartiya Agro Industries Foundation (BAIF), Krishi Vidnyan Kendra (KVK), Advanced Knowledge based Rural Technology Initiative (AKRUTI) and large number of agencies of the state and central governments].

The important agencies of knowledge creation and innovation are the University and research institutions. It is Science, its methods and what it chooses to analyse and explicate, how it incorporates the aspirations and desires of the people, that decides the well-being of the society. Even more important is the scientific temper, a language of analysis and argumentation. The University is the natural home of scientific temper and must be its strongest proponent. Traditionally, we would expect the University to help us in this and also to answer many other questions, e.g., "What is the analysis and consequent actions that would have prevented the Elphinstone Road tragedy?"

However, centrally founded universities and research institutions are either unable or unwilling to answer such questions, and even worse, they do not even recognize it as a question of Science. The state universities are largely incapable to meet this challenge. There are many possible reasons, viz., (i) a "central" science which is abstract and global but which has little relevance to ground realities and yet soaks up much of the resources and prestige, (ii) poor funding for state colleges, few role-models and very little output which is relevant and rigorous, (iii) absent mechanisms for state universities to engage with regional problems, (iv) an aspirational dysfunction in the conduct of higher education with inordinate attention on competitive exams at the expense of systematic nurture of scientific temper. (v) teachers need to stress that good Science is frequently one which pursues better development outcomes. It is this which may democratize Science and pave the way for a better society for all of us. Experience has shown numerous possibilities to do world class cutting edge research while remaining focused on local problems.

As regards to the demonstrations of technologies, a large number of government agencies are involved with the aim of dissemination of relevant technologies in the society on a large scale. This is achieved through a common platform by bringing together relevant technologies and stakeholders. The expected outputs include higher agricultural productivity, post-harvest processing, improved access to animal biotechnology applications, better access to water, efficient water usage, greater usage of renewable energy resources, food & nutrition, healthcare, etc.

From the foregoing discussion, it is clear that the formal structure in terms of centres of knowledge (together with innovation) creation (universities and research institutions) and technology demonstration is already in place in India. However, both these agencies need to introspect and explore ways to further enhance their effectiveness and impact. In spite of such a bleak picture, there are a number of success stories which show the pathway for achieving prosperity through science, technology, and innovation.