

Dr R. S. Pandey Distinguished Lecture 2017
Indian Institute of Technology Kanpur

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PRINCIPLES OF DOING MEANINGFUL RESEARCH

Assuming that the audience will principally consist of research students of diverse interest, this lecture will present my synthesis of the principles of doing meaningful research. The content is drawn from personal research experience, interactions with many great people, reflections on great people's thought processes and anecdotes. The question is how Indian institutes and universities can, within a reasonable time, approach the position of the great universities like Stanford or Cambridge. The key lies not in merely increasing the resources but in a transformation of the attitude. As a part of the interweaved story, I'll present some results and methodologies used in my own research on various topics such as transport and deposition of particles in turbulent flow, nucleation of droplets in power-plant steam turbines, bio-inspired heat exchanger, optimisation of aero gas turbine engines, thermo-fluid-dynamics of natural convection, fluid dynamics in rotating microchannels, fluid dynamics in three-dimensional branching networks (e.g. human lung), design optimization of the emerging Tesla disc turbines. I do not expect that everyone will accept my views on the principles of research but hope that the resulting discussion will lead to helpful reflections in the student community who will build the future of Indian research.