

Annexure - 2 - Summary of selected five Eminent Scientist Lectures

Lecture 1 – Importance of Early Questions

by Prof. Eluvathingal D. Jemmis, Indian Institute of Science, Bangalore.

The session was one of the most inspiring talks that I have ever had the privilege of attending. The main theme of the talk revolved around the importance of asking questions especially in the field of science. Prof. Jemmis said in the talk,

“Success of nations depends on the ability of its citizens to ask original questions.”

He also focused on the idea that one need not be a genius to ask questions but asks intriguing questions and as the experience and academic knowledge of an individual increases, the quality of questions also improves and questions become less generalised. But generalised questions are not bad, instead they are fundamental and quite more important as well as interesting.

Another major aspect of the talk was to understand the importance of interdisciplinary sciences and Prof. Jemmis gave us example of Edward Witter who was studying history and instead went on to do a PhD in Theoretical Physics and went on to become one of the pioneers of String Theory. Similar cases have happened where students have found their interests in subjects and fields other than the ones they were studying during their undergraduate or high school years. He also gave us insight into his PhD thesis on the study of Borophene and it was quite engaging and informative.

Lecture 2 – Igniting Minds: Spurring Innovations

by Dr. Renu Swarup, Secretary to the Govt. Of India, Dept. Of Biotechnology, Ministry of Science and Technology

The talk was centred around the provisions and steps taken by senior scientists and the government of India has taken to help ignite young minds in the country and push forward the envelop of innovation in the near future and what steps we can take in the future as students in doing the same. Some of the main focuses are team work, hard work as well as focused and targeted outcome. Dr. Swarup also focused on the importance of international collaboration.

One of the major aspects of the talk was the concept if translating our ideas into research and then into a tangible product or service and make it widely available to the end-user. The talk focused on how knowledge driven enterprises, academia as well R&D departments in both public and private sector along with Start-Ups can help take science and innovation ahead.

Lecture-3 – Investing in Science, Technology, and Innovation: A way towards an Atmanirbhar Bharat

by Prof. Alok Dhawan, CSIR-IITR, Lucknow

The lecture was centered on the importance of investments in scientific innovation and research for the formation of a self-reliant nation and it is even more important for a nation as big as ours. The key, as Prof. Dhawan stated is for students to be Critical, Creative and Innovative. The lecture also focused on the role played by CSIR as a pan India research institution to foster as a link between entrepreneurs, industry and academia and thus increase the development of Science and Technology (S&T) in India. One major aspect of the lecture was also on how CSIR-IITR and other institutions are using drug development and other methods to combat COVID-19 and eliminate SARS-CoV-2 virus in India. Prof. Dhawan talked about the use of Digital and Molecular Surveillance to study the sequencing of the corona virus and development of rapid and economical diagnosis for at various facilities and also on the repurposing of drugs and development of new drugs and vaccines.

Lecture-4 - Science of Climate Change

by Dr. Madhavan Nair Rajeevan, Secretary at the Ministry of Earth Sciences, Govt. Of India and Chairman at ESSO and Earth Commission

The lecture was focused on the understanding of all the factors responsible for climate changes and the study of the earth system for understanding as to how we can model and quantitatively understand how the different factors lead to climate change and to what extent.

Climate change mainly occurs due to

- Internal causes and
- External Causes

External Causes are generally comprise of changes of solar irradiance incident on the upper atmosphere, changes in the orbital parameters of the earth such as eccentricity of the orbit or obliquity of the ecliptic and other reasons might be a change in the rate of rotation of the earth about its own axis.

Internal causes are further classified into 2 categories mainly, natural variability such as volcanic eruptions or changes in atmospheric composition or continental drift, etc., and second due to anthropogenic (human) activity such as deforestation, desertification, etc. The lecture further focused on data and using qualitative as well as quantitative data to study how these different factors and causes can effect mean climate in different regions on the planet. Dr. Madhavan focused on both global as well as Indian trends of Surface air temperatures and how it has evolved.

Lecture 5 – Manage your Career Journey

by Dr. Julie Franklin, MSc CChem MRSC MCMI, Career Management Specialist.

This lecture was one of the most productive, informative and interesting lectures till now as Dr. Franklin focused on very important topics such as finding career opportunities and also what skills are employers looking for in today's demanding enterprise sector as well as the marketable skills needed in Industry. Further she emphasised on techniques to make one's CV and application stand out, perform in interviews and develop as a professional.

Dr. Franklin emphasised that a career is a lifelong learning journey and it is not linear. It is flexible and dynamic and will change as we evolve as professionals and individuals. She focused on the importance

of choosing a profession in a field which we enjoy to study and work on as individuals to create a proper work-life balance.

One major aspect of the lecture was on the important choice that every young scientist needs to make - "Industry or Academia?" Dr. Franklin suggested that one must make this choice on the basis of the skills that one has and the goals that one wishes to achieve. She also introduced the difference between an Academic CV and Industrial CV as well as the difference between Academic and Industrial interviews and also gave a brief introduction to the STAR Model for competency based interview questions -

- Situation (setting the context)
- Task (what was required of us?)
- Action (what did we do?)
- Result (what was the outcome?)
- and most importantly what did we learn

Another major aspect of this lecture was the development of a professional network and how networking can allow individuals from the same field can help one another. Dr. Franklin focused on the use of social sites such as LinkedIn and ResearchGate to network with individuals from academia and industry.