

## **Institute Lecture**

### **Chemistry, Carbon and Climate Science to Meet the 21st Century Energy Challenge**

**Dr. Manvendra K. Dubey, Senior Scientist, Earth Systems Observations, Los Alamos National Laboratory, USA**

**Tuesday, 12<sup>th</sup> February 2013, Time: 5.00 PM, Venue: L-16, Lecture Hall Complex**

#### **Abstract**

Mankind has engineered and harnessed resources at unprecedented scales and rates that has altered the local, regional and global environment in the 20th century and the pace is accelerating in the 21st century. Technology has improved our quality of life and is driven by market forces. However, technology has had inadvertent consequences on the environment and these externalities are being included in regulatory frameworks. Scientists need to establish a causal relation between anthropogenic emissions and the problem for society to enact laws and treaties. This attribution is challenging given the complexities and natural variability of our earth system. The talk will highlight the following three environmental problems of the human epoch:

- (1) Air pollution and acid rain from power and transportation emissions
- (2) Stratospheric ozone depletion from halocarbons
- (3) Climate change from energy production and land-use change

The talk will rely on the speaker's research to trace the trajectory of atmospheric science that led to the clean air laws and the Montreal Protocol to protect air quality and stratospheric ozone respectively. The talk will show that air-pollution, stratospheric ozone and climate-change problems are coupled and interact non-linearly. Policies controlling one will affect the other, positively and/or negatively. A proactive and science and technology driven approach to address environmental issues with effective international agreements will be key in the 21st century.

#### **About the speaker**

Dr. Manvendra Krishna Dubey is the winner of the President's Gold Medal of IIT Kanpur of the 1979 graduating class. He did his research with Prof. P. T. Narasimhan (5 year M. Sc 1979) as a National Science Talent Scholar. Subsequently, Dr. Dubey received a Ph.D. in chemical physics from Harvard University where he assisted Prof. James Anderson's group with establishing the causal link between the chlorofluorocarbons and the Antarctic ozone hole. For 16 years, he has been at Los Alamos National Laboratory as a Climate Observations Program Manager and the Climate Focus Lead. His project "Indo-US Science Collaboration to Guide Air Quality and Climate Policy," in which I. I. T. Kanpur is a leading player will expand state-of-the-art climate and air-quality observational networks in India.

Dr. Dubey is an editor of Atmospheric Chemistry and Physics. He was an editor for Geophysical Research Letters and helped the U. S. National Academies review the U.S. climate research plan. He is an active AGU and AAAS member and has convened special sessions on timely topics at the nexus of energy and the environment.

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**Tea at 4.45 PM**

**All interested are welcome.**

A. K. Chaturvedi  
Dean of Research and Development  
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