



भौतिक अनुसंधान प्रयोगशाला, अहमदाबाद

Physical Research Laboratory, Ahmedabad

<https://www.prl.res.in/prl-eng/prlat75>

PRL Ka Amrut Vyakhyaan-38

Wednesday, 20 April 2022

@ 05:00 PM (IST)

“The ozone layer, its science, and its policies”

Prof. A.R. Ravishankara

University Distinguished Professor
Departments of Chemistry and Atmospheric Science
Colorado State University, Fort Collins,
Colorado, USA.



<https://youtu.be/ICQKfCbD8xo>



PRL ka Amrut Vyakhyaan-38

Title: “The ozone layer, its science, and its policies”

Speaker: Prof. A.R. Ravishankara

University Distinguished Professor, Departments of Chemistry and Atmospheric Science
Colorado State University, Fort Collins, Colorado, USA.

On Wednesday, 20 April 2022

Abstract

Ozone is arguably one of the essential molecules in the Earth's atmosphere- it protects the surface from the harsh UV solar radiation, is a climate gas, and is an air pollutant at the surface. The ozone layer, a region in the stratosphere where the ozone abundances are the largest in the atmosphere, is affected by human emissions. Since Chapman explained the existence of this layer in the 1930s, the understanding of the science in this layer has grown immensely. The depletion of this layer by ozone-depleting substances, used chiefly for refrigeration and air conditioning, led to the first universally ratified Montreal Protocol.

The story of the ozone layer cannot be separated from either the substances that cause its depletion or the unexpected consequences of our efforts to protect it. The speaker will briefly summarize the story of the ozone layer, the consequences of substitutes for ozone-depleting substances (ODS), and the role of ODS in both ozone and climate. The speaker will show how the ozone layer issue is not a "solved" one, highlight why humanity needs to shepherd it through to its original state, if possible, and the next steps in this overarching issue.

The speaker will finally discuss how the ozone layer science is evaluated and presented to the policy and decision-makers and touch on the considerations by policymakers in making their decisions. ”

The Speaker

Dr. Ravishankara is a University Distinguished Professor in the Departments of Chemistry and Atmospheric Science at Colorado State University. Previously, he was at NOAA as the director of the Chemical Sciences Division (formerly Aeronomy Laboratory) at NOAA's Earth System Laboratories in Boulder. He has worked over the past four decades on the chemistry of the Earth's atmosphere related to stratospheric ozone depletion, climate change, and air quality. His laboratory and Earth's atmosphere measurements have contributed to deciphering the ozone layer depletion, including the ozone hole; quantifying the role of chemically active species on climate; and advancing understanding of air pollutants' formation, removal, and properties.

Dr. Ravishankara is a member of the US National Academy of Sciences, a Foreign Member of the Royal Society (London), and a Foreign Fellow of the Indian National Science Academy. He is also a Fellow of the American Geophysical Union, the Royal Society of Chemistry, the American Association for the Advancement of Science, and the International Union of Pure and Applied Chemistry. His many awards and recognitions include an honorary doctoral degree from the University of York in the UK, Montreal Protocol's Scientific Leadership Award, the Polanyi Medal of the Royal Society of Chemistry, the Stratospheric Ozone Protection award of the US Environmental Protection Agency, the Silver Medal of the US Department of Commerce, NAS Robertson Memorial Lecture and Medal, and the American Chemical Society's award for Creative Advances in Environmental Sciences. He has presented numerous named lectures in many countries. He was the Chair of the Board on Atmospheric Science and Climate of the National Academy of Science from 2014 to 2021 and a co-Chair of the WMO/UNEP Science Assessment Panel on Stratospheric Ozone from 2008 through 2015. He is a member of the Science Advisory Panel of the Climate Clean Air Coalition of UNEP and the Chair of the Advisory Committee for the Vienna Convention Trust Fund. He is on the Editorial Boards of the Proceedings of the National Academy of Sciences (PNAS) and a few other journals. He has previously served on many other Editorial Boards and was the Editor of Geophysical Research Letters. He was a co-Chair of the Air Quality Research Subcommittee (AQRS), an inter-Federal Agencies committee, before leaving NOAA in 2014. He is an author or co-author of nearly 400 peer-reviewed publications and scores of data evaluation and assessment reports.



About PRL

The Physical Research Laboratory (PRL), known as the “cradle of space science” in India, is one



of the premier research institutes founded in 1947 by Prof. Vikram Sarabhai, a renowned Cosmic Ray Scientist, a great visionary and institution builder. PRL played a seminal role in producing a highly motivated cadre of space scientists and the technologists of highest international repute. The first scientific rocket launched from Thumba on 21st November-1963 and many other rockets launched thereafter contained payloads developed at PRL. Dr. Sarabhai initiated many of these scientific and technical activities at PRL which eventually led to the formation of the Indian Space Research Organization (ISRO). Therefore, PRL is known as the “cradle of space science” in India. Further, the research in the area

of Plasma Physics expanded to the formation of the Institute of Plasma Research (IPR).

As an institution PRL is unique in that it conducts fundamental research in a wide range of research areas from the Earth to the cosmos, and comprising Astronomy and Astrophysics; Solar Physics; Space and Atmospheric Sciences; Theoretical Physics; Geosciences; Atomic, Molecular and Optical Physics, Astrochemistry; and Planetary Sciences and Space Exploration. PRL is one of the rare research institutes of international repute wherein research in such diverse fields of sciences is carried out using several state-of-the-art experimental facilities that exist under one umbrella.

Along with the ongoing research, several new initiatives have been taken up during the last few years. The Multi-Application Solar Telescope (MAST) at Udaipur Solar Observatory has been operationalized. PRL initiated scientific programmes in frontier areas of research, which include a search for exo-planets, laboratory studies of interstellar grains, laboratory synthesis of cold astro-molecules and experimental studies in the field of quantum optics. PRL is also developing several scientific payloads as a part of ISRO’s larger vision and contributing to roadmap for competitive scientific exploration of the solar system and beyond. In particular, PRL has been contributing significantly not only in building instruments for space missions, such as Chandrayaan-1, Chandrayaan-2, AstroSat and upcoming Aditya-L1, Chandrayaan-3 and planetary and space missions, but also by bringing out new and insightful science results.

PRL contributes to several national and international research programmes and to human resource development through its Doctoral and Post-Doctoral Programmes, capacity building programmes, such as UN Course on Space Science, and science and engineering internship programmes. PRL contributes significantly to society through its Outreach Programmes by periodically organizing science exhibitions and Open Houses, planned visits of students of various school and college to PRL, and popular talks at various institutions to not only share the excitements of the advancements of contemporary scientific findings but also to encourage students to take up sciences as their research career.

