

The Spring 2022 Seminar Series in Chemical Engineering Presents:  
**The Scientific Basis of Climate Change:  
Understanding the Past to Present and Implications  
for the Future**

March 24, 2022, 12:45-1:45 pm Chafee Hall, Room 273

Zoom Simulcast: <https://uri-edu.zoom.us/j/93044052368>



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**Abstract:** We will discuss the current state of the science of climate, its variations and change especially since preindustrial times (part of "Anthropocene" era). Developing mathematical models of the Earth's climate system and utilizing observations, we investigate the forcing of the climate system which includes natural and human causes; processes and interactions that govern the sensitivity of the system; and impacts ranging from globe-wide to regional spatial scales. The use of model simulations and observational evidence of the past-to-present changes leads to attribution and identification of the mechanisms, including traceability to human-induced activities. The climate system perturbations extend across Earth's physical, biogeochemical and ecosystem domains. Understanding of the past climate and scenarios of mankind's development leads to numerical projections of future climate states, including expectations of changes in extremes of societal concern. Challenges on the science side include improving confidence measures in the outcomes which can then provide improved guidance to technical solutions for adaptation and mitigation. The steady progress in the understanding of the nonstationary climate system has led to reliable science-based inputs for policy decision-making.

**Bio:** **Ram Ramaswamy** is Director of NOAA Oceanic and Atmospheric Research's Geophysical Fluid Dynamics Laboratory (GFDL), located in Princeton, NJ. Ram received his undergraduate degree in Physics from Delhi University (India), and Ph. D. in Atmospheric Sciences from the State University of New York at Albany. He was a postdoctoral Fellow in the Advanced Study Program at the National Center for Atmospheric Research in Boulder (CO). Ram joined GFDL in 1985 and was a Senior Scientist (2000-2008) before becoming Director of GFDL and joining the Senior Executive Service. He is also a Lecturer with the rank of Professor in the Atmospheric and Oceanic Sciences Program at Princeton University. Ram directs one of the world's premier climate modeling centers, addressing the NOAA mission to develop and apply numerical models for predicting and projecting global-to-regional climate. Applications with GFDL models touch upon a wide range of climate extremes and impacts of policy and societal concerns e.g., hurricanes, storms, droughts, floods, snowpack, ice melt, sea-level rise, heat waves, land, and marine ecosystems.

Ram is a Fellow of the American Meteorological Society (AMS), American Geophysical Union (AGU), American Association for the Advancement of Science, and American Physical Society. He was a member of the IPCC team that was co-awarded the 2007 Nobel Peace Prize with Al Gore. He is a recipient of AGU's Charney Lecture, AMS' Houghton, Roberts, and Rossby honors, Distinguished Executive Presidential Rank award, and three-time recipient of the WMO Norbert Gerbier MUMM International award for original scientific papers.