Physical Research Laboratory
Ahmedabad

Area Seminar

(Space & Atmospheric Sciences Division)

Title: **"Discoloration of the Taj Mahal due to Ambient Particulate Deposition"**

Speaker: **Dr. J. Jaidevi**
Institute of Infrastructure, Technology, Research and Management (IITRAM), Maninagar, Ahmedabad

Date: **07 September 2015**

Venue: **Ground Floor Lecture Hall**

Time: **1600 hrs**

Highlight of the talk:

Aerosols refer to a suspension of solid or liquid particulate matter (size ranging from a couple of nanometers to a few tens of microns) in air. Aerosols perturb Earth's radiative budget directly by interacting with the solar/terrestrial radiation and indirectly by modifying the cloud properties, and thereby impact the climate and hydrological cycle. They also adversely impact human health by affecting the cardio-respiratory and central nervous system of human body via inhalation route. The particulate matter, through deposition or processes like acid rain, affects the monuments, paintings etc. The talk will focus on the regional effects of particulate matter on Taj Mahal. Due to its location in the Indo-Gangetic Plains, the effect of particulate matter on Taj Mahal is visible. Deposition of particulate matter on the white marbles of Taj Mahal is discoloring the white marble into brown color thus affecting its aesthetic view. The size, number and chemistry of the particles deposited onto the marbles were obtained using advanced techniques of microscopy and chemical analysis. The optical properties of these particles were modeled using their physical and chemical properties. The surface reflectance of the particle laden marble was estimated using a radiative transfer model. The daylight illumination, response of eye to color and surface reflectance were used to find the color perceived by the eye. The method adopted was a novel method to find the color of the surface loaded with particles. The method was used to find the contribution of natural dust and anthropogenic aerosol involved in discoloration of Taj Mahal marbles.

All interested are welcome.