



האוניברסיטה העברית בירושלים
The Hebrew University of Jerusalem

American Physical Society
Racah Institute of Physics

Workshop

What physics can say about climate changes

December 25, Danciger B building, seminar room, 4.00 pm
(25.12.13 at 16.00)

1. 16.00 – 16.10 Prof. M. Ya. Amusia **Introductory remarks**
2. 16.10 – 17.10 Prof. N. Shaviv **The Role of the Solar Forcing in the 20th century climate change,**
3. 17.10 – 17.40 Prof. Daniel Rosenfeld **The dominant role of aerosol cloud-mediated forcing in the uncertainty of anthropogenic climate forcing and climate sensitivity.**
4. 17.40 -18.00 - General discussion

All interested, including students, are welcomed.

Refreshments will be served in the lobby of Danciger B building, from 15.45

M. Ya. Amusia and R. Herber, APS Fellows

Prof. Nir Shaviv

The Role of the Solar Forcing in the 20th century climate change

Abstract:

A long list of empirical results strongly suggests that solar variations play an important role in climate change. We will begin by trying to understand why such variations are crucial if we are to understand 20th century climate change, and how it is related to the value of the climate sensitivity. The latter is of course necessary if we are to predict future climate change. We then review some of the aforementioned evidence, and in particular, the data which can be used to quantify the size of the solar climate link. We will then discuss the mechanism responsible for the large link - cosmic ray ionization and its effect on climate. We will end by building a more consistent picture for 20th century global warming, while mentioning a few words on the expected 21 st century climate change.

Prof. Daniel Rosenfeld

The dominant role of aerosol cloud-mediated forcing in the uncertainty of anthropogenic climate forcing and climate sensitivity

Abstract:

Anthropogenic emissions of aerosols and their precursors counteract the positive (warming) radiative forcing due to the emitted greenhouse gases, by reflecting more solar energy back to space directly and through their impacts on cloud properties. While the positive radiative forcing due to Green House Gases (GHG) is relatively well known, the cloud-mediated aerosol radiative forcing is a result of very complex processes which are difficult to document and quantify. Therefore the uncertainty in the cloud-mediated aerosol radiative forcing dominates the overall uncertainty of anthropogenic climate forcing. The climate sensitivity is the extent of global warming for a given amount radiative forcing. The aerosols negative (cooling) radiative forcing hides part of the warming due to GHG to an unknown extent and thus renders the climate sensitivity quite uncertain. In the presentation the main mechanisms that are responsible for the uncertainty in the aerosol radiative forcing and the implications to the global picture will be reviewed.