Abstract of my present research work: R. Piacentini

(done as Director of research of Ph D students and researchers and in collaboration with researchers of different institutions: Jay Herman's Group at GSFC/NASA; Sophie Godin's Group at IPSL/Univ Paris VI, France; Jan van der Leun, ECOFYS/The Netherlands and UNEP Advisor; Eduardo Quel's Group at CEILAP/Bs Aires, Argentina; Naum Fraidenraich's Group at University of Pernambuco, Recife/Brazil; Edgar Crinó's Group at National University of San Luis/Argentina, Alejandro Paladini at INGEBI/Bs Aires, Argentina; Luis Saravia's Group at INENCO/Salta, Argentina; Fernando Stengel at Skin Cancer Foundation of Argentina)

Subjects

a) **Solar global (290-4000 nm) irradiance:** After the measurement we have done of the largest solar global irradiance in the world, registered in the Puna of Atacama high altitude desert (ref. 10), at present we are analyzing this irradiance at ground level in Recife, Brazil, were extreme values are registered in particular days. Also, we are planing to measure and model this global irradiance and its UV component incident over inclined surfaces (ref. 14), during the 2007 International Polar Year, at the Belgrano Argentina Antarctic Base. On a horizontal plane, in some days near the Southern Hemisphere summer solstice, the integrated value (or irradiation) could be even higher that that measured at low intertropical latitudes at the Andes plateau in the North-West of Argentina. So, it is expected that this irradiance will be extremely high, due to the contribuition of the reflection in the ice/snow of the surroundings. The results will be of basic importance and for applications in the use of Solar Energy near the Summer solstice in this region and in the protection of persons working outdoor.

b) Solar UV biological irradiances: Following the works we made in relation to solar UV and their associated biological irradiances (mainly erythemal, ADN and plant damages, see ref. 5,6, 8,9, 11,12, 15), we are determining now the incidence of the erythemal irradiance on the human body exposed to the Sun. This work, done in collaboration with dermatologists, will determine the most sensible areas of the body of persons exposed to the Sun in different positions, in order to suggest specific protection measures. There are millions of outdoor workers in Argentina (and many more in subtropical and tropical regions of the world), that need to be protected against the deletereous effect of intense Sun.

c) Skin cancer and climate change: We are developing a statistical analysis of the Third US Skin Cancer Survey data, in order to try to determine the possible influence of temperature increase on the developement of skin cancer, as was demonstrated in cells and in animals. The study will be extended to data obtained at different places of South America (Ecuador and Argentina).

Also, we will undertake a detailed study of the excess number of skin cancers that it is expected to develop in Argentina in the present century, due to the ozone depletion and temperature increase due to global warming. Results obtained for the North-Western of Europe (UNEP report: "Environmental effects of ozone depletion and its interaction with climate change: 2002 Assessment" http://www.gcrio.org/UNEP2002/7unep2002Health.pdf, see the icon *Health Effects, figure 6*), show a large augmentation of this number if Earth's temperature is assumed to increase in the 21 century. Due to the particular situation of the Patagonian Argentina region, largely affected by the ozone depletion, combined with the over-passage of the ozone hole or its extension (filament-like low ozone events that propagates outside the ozone hole), it is expected that the excess number of skin cancers in this region will increase in the following decades, even more than was determined for De Bilt in the Northern Hemisphere.

d) UVB (290-320 nm) radiation during ozone hole events and its proyection to the Patagonian Argentina southern region, including climate change: In the past, we studied this significant event and the behavior of the ozone total column and solar ultraviolet irradiance, mainly over the Southern Hemisphere, Argentina and Antarctica (ref 3, 13, 16). In the framework of the 2007 International Polar Year, we will study the evolution of the ozone hole that it is expected to pass by its maximum depletion (minimum annual mean depth) in the current years and the related UVB radiation that consequently will pass by its maximum mean annual intensity. Temperature increase will be included in the analysis, due to the coupling of UVB, ozone and global warming, as described in the UNEP Report, cited below.