

Raymond G. Roble

Raymond G. Roble received the Ph.D. from the University of Michigan and currently is a senior scientist at the National Center for Atmospheric Research (NCAR) in Boulder, Colorado. His research concentrates on the chemistry, physics, and dynamics of the upper atmosphere and on global atmospheric electricity. He has constructed a hierarchy of general circulation models of the coupled thermosphere/ionosphere/mesosphere system and his most recent model is called a thermosphere/ionosphere/mesosphere/electrodynamics general circulation model (TIME-GCM) that extends from 30 to 500 km altitude range. These general circulation models have been used to analyze data from the NSF CEDAR and GEM programs as well as several NASA space flight programs. He has served on numerous national and international committees and has authored or co-authored over 400 publications. He is a fellow of the American Geophysical Union and has received the Arctowski medal from the National Academy of Sciences.

Education

University of Michigan	Engineering Physics	BSE	1957
University of Michigan	Engineering Mathematics	BSE	1957
University of Michigan	Mechanical Engineering	MSE	1961
University of Michigan	Aeronomy	PhD	1969

Appointments

1984–Present	Senior Scientist, High Altitude Observatory (HAO), NCAR
1986–2001	Head, Terrestrial Impact of Solar Output Section, HAO, NCAR
1993–1995	Deputy Director, HAO, NCAR
1978–1984	Senior Scientist, Atmospheric Chemistry and Aeronomy Division, NCAR
1977–1981	Project Leader, Thermospheric Dynamics and Aeronomy Project, NCAR
1973–1977	Scientist, Atmospheric Quality and Modification Division, NCAR
1970–1973	Scientist, Laboratory for Atmospheric Sciences, NCAR
1969–1970	Postdoctoral Fellow, Advanced Study Program, NCAR
1964–1969	Research Scientist, Space Physics Research Laboratory, U. of Michigan
1961–1964	Engineer, Bendix Research Laboratories, Southfield, MI
1957–1960	Engineer Officer, USS Taussig, DD746, US Navy

Selected Publications

- Roble, R.G., E.C. Ridley, A.D. Richmond, and R.E. Richmond, A coupled thermosphere and ionosphere general circulation model, *Geophys. Res. Lett.*, 15, 1325-1328, 1988.
- Richmond, A.D., E.C. Ridley, and R.G. Roble, A thermosphere/ionosphere general circulation model with coupled electrodynamics, *Geophys. Res. Lett.*, 19, 601-604, 1992.
- Roble, R.G. and E.C. Ridley, A thermosphere-ionosphere-mesosphere-electrodynamics general circulation model (TIME-GCM): Equinox solar cycle minimum simulations (30–500 km), *Geophys. Res. Lett.*, 21, 417-420, 1994.
- Roble, R.G., On the feasibility of developing a global atmospheric model extending from the ground to the exosphere, in “Atmospheric Science Across the Stratopause,” *Geophysical Monograph 123*, American Geophysical Union, 53-67, 2000.

- Roble, R. G., On the feasibility of developing a global atmospheric model extending from the ground to the exosphere, "Atmospheric Science Across the Stratopause," *Geophysical Monograph*, 123, American Geophysical Union, 53-67, 2000.
- Roble, R.G., On forecasting thermospheric and ionospheric disturbances in space weather events, in "Space Weather," *Geophysical Monograph* 125, American Geophysical Union, 369-375, 2001.
- Liu H.-L. and R.G. Roble, A study of a self-generated stratospheric warming and its mesospheric-lower thermospheric impacts using the coupled TIME-GCM/CCM3, *J. Geophys. Res.*, 107, NO.D23, 4695, doi:10.1029/2001JD001533, 2002.