



## Mario José Molina



**Date of Birth** 19 March 1943

**Place** Mexico City (Mexico)

**Nomination** 24 July 2000

**Field** Atmospheric Chemistry

**Title** Professor, Nobel laureate in Chemistry, 1995

### Most important awards, prizes and academies

**Awards:** Tyler Ecology and Energy Prize (1983); UNEP-Sasakawa Prize (1999); Esselen Award (1987); Newcomb-Cleveland Prize (AAAS) (1988); Nobel Prize in Chemistry (1995). **Academies:** National Academy of Sciences; Institute of Medicine, USA; American Chemical Society; American Physical Society; Fellow, American Geophysical Union; National College of Mexico.

### Summary of scientific research

Prof. Molina predicted in 1974 (together with F.S. Rowland) that CFC gases being used in spray cans, as refrigerants and solvents, etc., would eventually deplete the ozone layer. This laid the ground for the discovery of the 'ozone hole' over the Antarctic. Subsequent work in large measure explained the mechanism by which ozone depletion over the poles comes about.

### Main publications

Author or joint author of over a hundred articles and essays, including: Molina, M.J. and Rowland, F.S., Stratospheric sink chlorofluoromethanes-chlorine atom catalysed destruction of ozone, *Nature*, 249, p. 810 (1974); Molina, M.J., Tso, T.L., Molina, L.T. and Wang, F.C.-Y., Antarctic Stratospheric chemistry of chlorine nitrate, hydrogen chloride, and ice: release of active chlorine, *Science*, 238, p. 1253 (1987); Molina, M.J., Lipson, J.B., Elrod, M.J., Beiderhase, T.W. and Molina, L.T., Temperature dependance of the rate constant and branching ration for the OH+C1O reaction, *J. Chem. Soc. Farady Trans.*, 93, p. 2665 (1997); Molina, M.J., Zhang, R. and Molina, L.T., Development of an electrostatic ion guide in chemical ionisation mass spectrometry, *Rev. Sci. Instrum.*, 69, p. 4002 (1998); Molina, M.J., Koop, T., Ng, H.P. and Molina, L.T., A new optical technique to study aerosol phase transitions: The nucleation of ice from H<sub>2</sub>SO<sub>4</sub> aerosols, *J. Phys. Chem.*, 102, p. 8924 (1998); Molina, M.J., Zhang, R., Broekhuizen, R., Lei, W., Navarro, R. and Molina, L.T., Experimental Study of intermediates from OH initiated reactions of toluene, *J. Am. Chem. Soc.*, 121, pp. 10225-6 (1999); Molina, M.J., Lipson, J.B., Beiderhase, T.W., Molina, L.T. and Olzmann, M., Production of HC1 in the OH+C1O: Laboratory measurements and statistical rate theory calculations, *J. Phys. Chem.*, 103, p. 6540 (1999); Molina, M.J., Koop, T., Bertram, A.K. and Molina, L.T., Phase transitions in aqueous NH<sub>4</sub>HSO<sub>4</sub> solutions, *J. Phys. Chem*, 103, pp. 9042-8 (1999); Molina, M.J., Lee, S.H., Leard, D.C., Zhang, R. and Molina, L.T., The HC1+C1ONO2 reaction rate on various water ice surfaces, *Chem Phys. Lett.*, 315, pp. 7-11 (1999); Molina, M.J., Salcedo, D. and Molina, L.T., Nucleation rates of nitric acid dihydrate in 1:2 HNO<sub>3</sub>/H<sub>2</sub>O solutions at stratospheric temperatures, *Geophys. Res. Lett.*, 27, p. 193 (2000).