

# News Release



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**Goddard Space Flight Center**  
Office of Public Affairs  
Greenbelt, Maryland 20771  
(301) 286-8955

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**For Release**

Cynthia M. O'Carroll  
Goddard Space Flight Center, Greenbelt, Md.  
(Phone: 301-614-5563)  
[Cynthia.m.ocarroll@nasa.gov](mailto:Cynthia.m.ocarroll@nasa.gov)

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## **NASA SCIENTIST AWARDED DISTINCTION OF AGU 2003 FELLOW**

Dr. Michael Mishchenko, an atmospheric scientist at NASA's Goddard Institute for Space Studies (GISS) in New York City, N.Y., has been awarded the distinction of Fellow of the American Geophysical Union (AGU).

New Fellows will be presented with an official certificate during the Honors Ceremony at the Joint EGS-EUG-AGU Meeting in Nice, France, on Wednesday, April 10.

Mishchenko is one of 41 new AGU Fellows elected by scientific peers in recognition of their acknowledged eminence in one or more branches of geophysics. The number of Fellows elected each year is limited to no more than 0.1% of the total membership of AGU.

A senior researcher at GISS, Mishchenko was cited for his pioneering work in electromagnetic scattering and radiative transfer and their applications to remote sensing and climate research.

Mishchenko was born and raised in Simferopol, a small town located in the center of the Crimean peninsula in the southern Ukraine. He received an MS degree in physics from the renowned Moscow Institute of Science and Technology (generally considered to be the Soviet counterpart of MIT) and a PhD degree in astrophysics from the National Academy of Sciences of Ukraine in Kyiv. This was followed by five productive years as a research scientist at the Main Astronomical Observatory in Kyiv. Since 1992 Mishchenko has been

affiliated with GISS, and has been a senior member of the research staff since 1997.

Mishchenko is a distinguished scientist working in the areas of light scattering by aerosol and cloud particles, radiative transfer in planetary atmospheres and surfaces, and terrestrial and planetary remote sensing. His most significant scientific achievement has been the development of a highly efficient so-called T-matrix method for computing radiative and scattering properties of nonspherical particulates such as dust-like aerosols and crystals forming cirrus and polar stratospheric clouds and aircraft condensation trails. The computer programs that he developed are publicly available and have been used worldwide by many dozens of research groups.

Through his solution of the equation describing the transport of electromagnetic radiation in particulate surfaces, Mishchenko developed a physical theory accurately explaining the phenomenon of coherent backscattering. This phenomenon manifests itself in the form of a narrow peak of intensity scattered by a surface towards the source of light and plays an important role in remote-sensing studies of ice, snow, and regolith surfaces of many solar system objects including the Earth. Based on his theory, Mishchenko predicted the existence of the so-called polarization opposition effect in the form of a sharp polarization feature accompanying the backward intensity peak. He then demonstrated that this effect can explain unusual polarization of sunlight scattered by Saturn's rings, Galilean satellites of Jupiter, and E-type asteroids. Also, his theory quantitatively explained peculiar radar returns from ice-covered surfaces of Mercury and the Jovian satellites Europa, Ganymede, and Callisto.

Mishchenko has made pioneering contributions as both scientist and Project Manager in the implementation of the Global Aerosol Climatology Project established jointly by the NASA Radiation Sciences Program and the Global Energy and Water Cycle Experiment. The GISS research group headed by Mishchenko developed advanced algorithms for retrieving aerosol properties from space and generated a global climatology of aerosol optical thickness and size for the full period of existing satellite observations. Among other products of this endeavor were three GACP science team meetings, two special GACP sessions at the meetings of the American Meteorological Society (AMS) and the American Geophysical Union, and a comprehensive special issue of the *Journal of the Atmospheric Sciences* published by AMS and edited by Mishchenko jointly with Prof. Joyce Penner of the University of Michigan and Dr. Donald Anderson of NASA Headquarters.

Mishchenko's professional honors and awards include the AMS Henry Houghton Award, four NASA GSFC awards, and the NASU Barabashov Award. Mishchenko is a Topical Editor of the journal *Applied Optics* published by the Optical Society of America and has been an Editorial Board Member of three other leading scientific journals. Mishchenko has authored two books, 12 book chapters, and more than 100 articles published in peer-reviewed scientific journals. Also he edited three topical issues in leading scientific journals.

Mishchenko lives in Manhattan's Upper West Side with his wife Nadia and their three children, Andrew, Natasha, and Sergei. In addition to his work at GISS, Mishchenko enjoys various family activities, reading, and music.