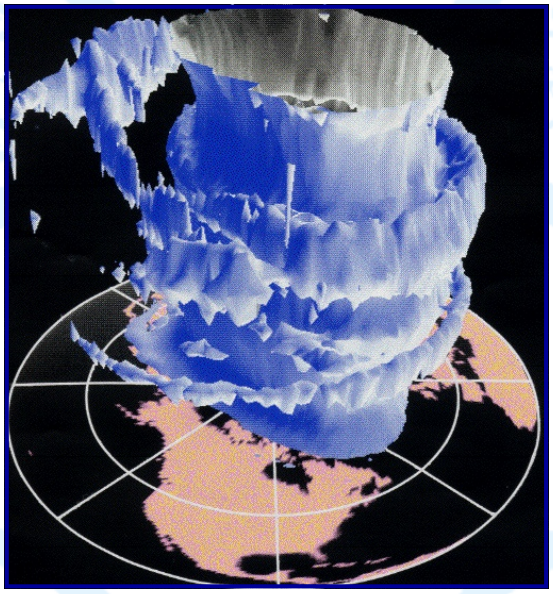
Featured Commission: The International Commission on the Middle Atmosphere (ICMA)

The International Commission on the Middle Atmosphere (ICMA) is one of the ten Commissions making up IAMAS. ICMA exists to foster research into the science of the middle atmosphere, a region defined loosely as stretching from the tropopause into the lowermost thermosphere. ICMA sponsors and co-sponsors several symposia at each IUGG General Assembly and at the IAMAS Scientific Assemblies. The ICMA-sponsored "Middle Atmosphere Science" symposium at the IUGG Assembly in Perugia provided an opportunity for discussion of the most recent observational and modelling advances related to the middle atmosphere.

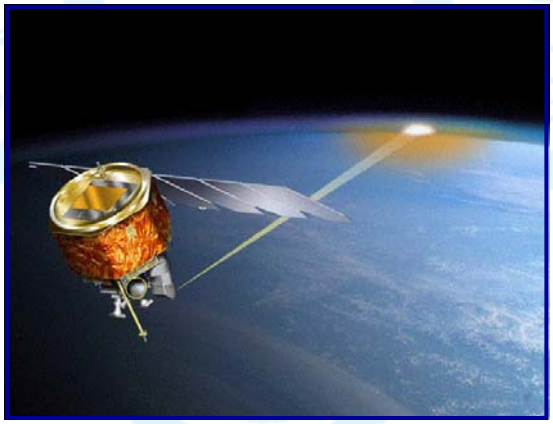
The interests of ICMA at the upper altitudes of the middle atmosphere overlap with those of Division II of IAGA, and ICMA maintains a close relationship with IAGA as well, notably by sponsoring and co-sponsoring symposia at the IAGA Scientific Assemblies. ICMA and IAGA have also cosponsored numerous workshops over the last few years including an ongoing series on "Vertical Coupling in the Atmosphere-Ionosphere System", with the third in the series being held last September in Varna, Bulgaria.

ICMA's interests also overlap with those of the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP). ICMA, IAGA and SCOSTEP jointly cosponsor a working group on "Trends in the Mesosphere, Thermosphere and Ionosphere". A paper assessing observed mesospheric temperature trends produced by this working group won the prestigious Gerbier-Mumm International Award of the World Meteorological Organization in 2005.

Understanding the dynamics, chemistry and physics of the middle atmosphere continues to present an exciting range of challenges. Work on understanding the anthropogenic contributions to stratospheric ozone chemistry made great strides in the 1970's and 80's and led to worldwide adoption of regulations strictly controlling the manufacture of ozone-depleting chemicals. This basic work has been followed up with ever more detailed and comprehensive observational and modelling research on the coupled dynamical-chemical system of the middle atmosphere. Recently deployed satellites such as ENVISAT, TIMED and AURA are providing remote-sensing observations of temperatures, winds and atmospheric constituents at unprecedented resolution and accuracy. On April 25 of this year another exciting space-based mission began with the launching of the NASA AIM satellite, which is the first dedicated to exploring noctillucent clouds located near the summer mesopause.



Visualization of the stratospheric winter polar vortex as simulated in a fine-resolution General Circulation Model. Specifically, an instantaneous picture of a surface that surrounds the air with low nitrous oxide concentration relative to the mean value at each horizontal level. The altitude extent of the surface shown is roughly 16-40 km. The main vase-like sheath outlines the polar vortex, while the ribbons wrapping around the vortex represent air that has recently eroded from the vortex..



Artist's conception of the recently-launched AIM satellite in the process of measuring properties of noctillucent clouds by a solar occultation method (NASA).

Advances in computer power in recent years have enabled more complete and much higher resolution General Circulation Models (GCMs) to be run that simulate the atmosphere from the ground to the lower thermosphere. Notably, a number of global GCMs have now been developed that include a sophisticated treatment of ozone chemistry that runs interactively with the dynamical component of the model.

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