Director's Note

SSEC scientists have made significant contributions to the study of Earth and our neighboring planets. This edition of *Through the Atmosphere* includes articles that reflect these continued traditions.

The first article summarizes a recent field campaign conducted in a Nevada desert that collected data to calibrate the GOSAT (Greenhouse gases Observing SATellite) sensors. SSEC contributed to this joint Japan/U.S. program by providing observations from the AERIBago, ground-launched balloons and from the Scanning HIS on board the NASA ER-2 aircraft. The field program included the participation of AOS undergraduate students. GOSAT is a young satellite launched in 2009. SSEC's role in new satellites is also demonstrated in the next article which provides a highlight of the new NPP satellite mission launched in 2011. SSEC-produced images from the VIIRS were some of the first to hit the presses!

SSEC's Office of Space Science Education (OSSE) has long provided outstanding education programs about our neighbor Venus. Here we highlight some of OSSE's recent education activities for the European Space Agency's Venus Express (VEX) Mission. This model education program covers informal and formal education venues.

The next six featured articles summarize some recent research of SSEC scientists about our neighbors:

Venus: Scientists at SSEC are studying vortex structures in Venus' atmosphere, using models to simulate observed vortices. The approach seeks new insights into the physical connections between vortex instabilities and the Venusian global circulation.

Mars: McIDAS is a valuable tool to track clouds and estimate winds from satellite images. It is now being applied to images from the Mars Reconnaissance Orbiter (or MRO) to track the winds over the polar regions of Mars.

Jupiter: Observations of the largest planet in our solar system from Visual and Infrared Mapping Spectrometer (VIMS) are enabling a new evaluation of the chemistry of Jupiter's clouds.

Saturn: Images from the Cassini VIMS are also being used to study recent storms on Saturn. These images are providing evidence for devising the circulation patterns of our neighbor.

Uranus: The first planet discovered with a telescope, SSEC scientists continue to explore this planet using more modern image sequences. Observed methane anomalies are being used to develop models of the planet's circulation patterns.

Neptune: Named for the Roman god of the sea, this planet was "discovered" by prediction rather than observations. The statistics of our eighth planet are extreme in many ways.

The final article returns to a view of Earth and its tropical storms. As devastating as these storms can be, we still lack a good capability to predict their intensity and in many cases their paths. SSEC and NOAA scientists are collaborating to find a means to improve model forecasts of these storms using hyperspectral infrared observations from satellite sounders, such as AIRS, IASI and the new CrIS (Atmospheric InfraRed Sounder, Infrared Atmospheric Sounding Interferometer and Cross-track Infrared Sounder).

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