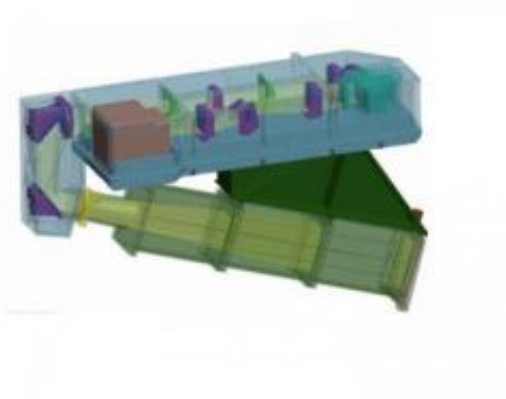


# NRL's MIGHTI selected by NASA for potential space flight

November 10 2011

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This is a conceptual design of one of the two identical MIGHTI units. Credit: Naval Research Laboratory

A Naval Research Laboratory instrument designed to study the Earth's thermosphere is part of a future science mission that has been selected by NASA for evaluation for flight.

The NRL-developed Michelson Interferometer for Global High-resolution Thermospheric Imaging (MIGHTI) [satellite instrument](#) is part of the Ionospheric Connection Explorer (ICON) mission, led by Thomas Immel at the University of California, Berkeley. The ICON mission will fly instruments designed to understand the extreme variability in our Earth's ionosphere, which can interfere with communications and ge-positioning signals.

Ionospheres act as a boundary between planetary atmospheres and space, containing weakly ionized plasmas that are strongly coupled to their neutral atmospheres, but also influenced by the conditions in the [space environment](#). They experience a constant tug-of-war between these external and internal influences, and exhibit a remarkable set of non-linear behaviors. The unpredictable variability of the Earth's ionosphere interferes with communications and geo-positioning signals and is a national concern. ICON makes a complete set of measurements of the state of the ionosphere and all of the critical drivers that affect it to understand this variability.

NRL's MIGHTI instrument will contribute to reaching the mission goals by measuring the neutral winds and temperatures in the Earth's low latitude [thermosphere](#). The MIGHTI instrument uses the DASH (Doppler Asymmetric Spatial Heterodyne spectroscopy) technique, which was co-invented and pioneered by NRL. The payload consists of two identical units that will observe the Earth's thermosphere with perpendicular viewing directions. As ICON travels eastward and continuously images the thermosphere and [ionosphere](#), MIGHTI will measure the vector components of the vertical wind profile.

NRL's MIGHTI is named for Albert Michelson, a physicist known for his research on the measurement of the speed of light using a related interferometer type. More directly, MIGHTI builds on technology previously used in NRL's SHIMMER (Spatial Heterodyne Imager for Mesospheric Radicals), a payload aboard STPSat-1.

The ICON mission proposal, that NRL's MIGHTI is a part of, is one of five proposals selected for Explorer Missions. With its selection for further evaluation, the NRL MIGHTI team, led by Dr. Christoph R. Englert, NRL's Space Science Division (<http://www.nrl.navy.mil/spacescience/>), will receive NASA funding and work for 11 months to further develop the MIGHTI concept.

Subsequently, NASA will select up to two of the Explorer Mission proposals to proceed toward flight, with launches expected as early as 2016.

Provided by Naval Research Laboratory

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