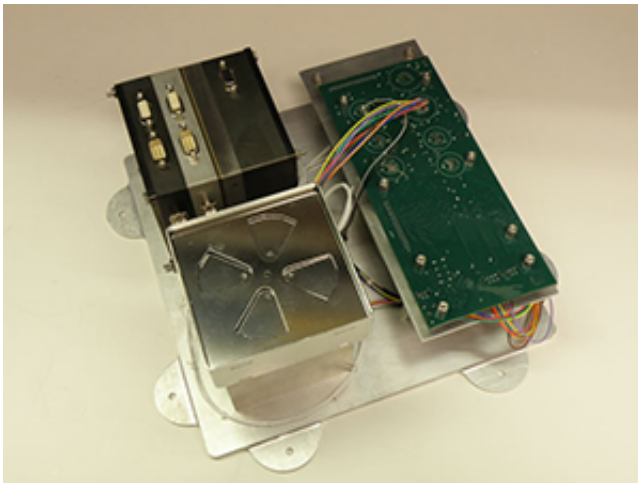


APL instrument to fly on first NASA-funded Virgin Galactic spaceflight

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Components of APL's Electromagnetic Fields Measurement instrument. For scale, the device measures about 10 by 10 inches. Credit: Johns Hopkins University Applied Physics Laboratory

While Earth's upper atmosphere may soon be a destination for space tourists, scientists from the Johns Hopkins University Applied Physics Laboratory (APL) have set their sights on being among the first to blaze a research trail in this "suborbital" region, with the launch of an instrument to study magnetic activity 50 miles aboveground.

APL's Electromagnetic Field Measurements instrument is one of 12 experiments set to fly on Virgin Galactic's SpaceShipTwo, as part of the first NASA-funded science mission on a suborbital [space](#) plane. During

a 90-minute flight—on a launch date to be announced—the instrument will characterize the [electromagnetic field](#) inside the spacecraft, to help scientists understand the potential effects of strong external and internally generated fields on the spacecraft and what they carry.

"This data will enable future payloads designed to make scientific observations of Earth's magnetic field to cancel out interference from the spacecraft," says APL's H. Todd Smith, the Electromagnetic Field Measurements principal investigator. "Ultimately, our payload will serve as an integration platform for future [scientific research](#) and instrument development activities."

Scientists hope commercial spacecraft designed for tourism may also provide low-cost access to space for research, instrument development, technology demonstrations and education. These new manned and unmanned vehicles will initially travel to altitudes up to 50 miles—just about 80 kilometers—at costs much lower and with higher frequency than current research rockets.



Virgin Galactic's SpaceShipTwo — pictured here during a supersonic flight test earlier this year — will carry a dozen NASA-sponsored scientific payloads. Credit: MarsScientific.com and Clay Center Observatory via Virgin Galactic

Researchers refer to this region as the "ignorosphere" because it's been so difficult to study directly. "It's too high for balloons and aircraft to reach, yet too low for satellites," Smith said. "Yet, this is a critical transition region for our atmosphere—approaching the gateway between Earth and outer space—so these new vehicles may afford an unprecedented research opportunity."

APL is establishing a foothold in the burgeoning field of suborbital space research; the Lab hosted a meeting last summer for scientists to discuss the latest commercial space developments and determine the utility, challenges and interest for aeronomy investigations—studies of the [upper atmosphere](#)—enabled by the rapidly emerging commercial suborbital spacecraft industry. APL is also set to launch three more instruments under NASA's Flight Opportunities program, which leverages commercially available vehicles and platforms to enable technology discoveries.

The flights will allow researchers to demonstrate the viability of their technologies while taking advantage of American commercial access to near-space. "We are at the beginning of a revolutionary new age in which the average person can have access to space," Smith said. "The sky is literally the limit for the scientific possibilities."

Provided by Applied Physics Laboratory

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