How will INCUS change weather forecasting capabilities and what impact will it have?
Our goal is to have INCUS launched by August 27, the observations of which will help to better predict extreme weather events. The majority of the intense storms that we experience, like hail-storms, tornadoes, heavy rainfall-producing storms, or hurricanes like Helene and Milton that devastated the southeast in October, depend heavily on the vertical motions within these storm systems. INCUS will measure these vertical storm motions.

Wind moves upward in storms very rapidly and the rate at which those winds travel upward is a measure of storm intensity. Currently our models used to provide the daily weather forecast, often underestimate these upward wind velocities. If we're going to address those model issues, we need global observations of storm updraft velocities. We have to make measurements all around the tropics to understand what drives those strong updrafts in different regions around the world. For the first time ever, INCUS gives us the capability to measure these intense updrafts on a global scale. With this database of global observations, we'll evaluate our models to better understand where they fall short and why they do so. Without such observations, it's challenging to evaluate and enhance our forecast models.

INCUS will allow us to refine these models to better predict storm intensity, especially for extreme weather events. This is critical, as communities rely on these forecasts to make decisions and prepare. The hope is that INCUS will provide a foundational database for tropical storm dynamics, improving not only forecasting but our overall understanding of storm processes.

How does INCUS change the way data is traditionally collected?
Current data collection often relies on ground-based radar which, while locally useful, is limited in coverage and only available over land. With INCUS, we'll be gathering information from space, providing a continuous global view of the tropics. This approach lets us observe storm systems in regions that currently lack detailed observational data, like the open oceans, which are home to many of the strongest hurricanes.

Beyond weather forecasting, are there other applications in which INCUS can be used?
Definitely. Beyond improving daily storm forecasts, the data from INCUS will support climate research by enhancing our knowledge of how storms contribute to global energy and water cycles, as well as how storms drive the large-scale atmospheric circulation.

These data could help researchers model future climate scenarios with greater accuracy, which is essential as extreme weather events become more frequent and intense due to climate change.