ASTRA

Technology Solutions for Earth, Space, & In Between

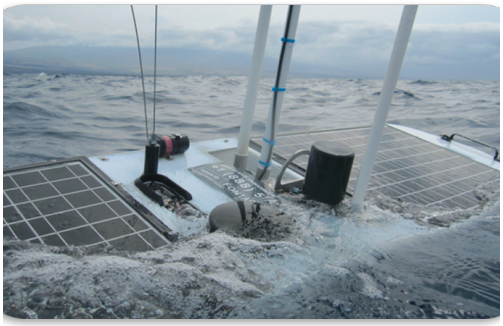
ASTRA™ turns science into data, & data into knowledge.

Atmospheric & Space Technology Research Associates (ASTRA) was born from the vision to apply fundamental space physics knowledge to real- world problems.

Founded in 2005, ASTRA is a leader in the “New Space” small- satellite industry. We leverage our scientific and engineering expertise to develop unique solutions, addressing complex space physics disciplines, instrumentation, modeling capabilities, and data analytics.

As scientists and engineers, we understand what it takes to collect quality data and how to use it. We use that understanding to provide innovative solutions in the form of:

- **Space Systems**
- **Instrumentation Design & Development**
- **Modeling Services**
- **Data Analytics**
- **LiDAR**



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ASTRA

Science + Technology + Applications

Bringing it all together

Space Systems

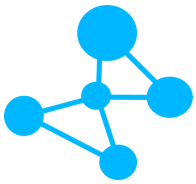
ASTRA™ helps our customers utilize low cost access to space by providing innovative CubeSat sensors and subsystems, engineering robust CubeSat system-designs based on your measurement and scientific needs, and providing in-depth mission analysis to ensure mission success and scientific closure.

Instrumentation Design

ASTRA provides state-of-the-art programmable instrumentation for small satellites and ground operations, specializing in deployment of assets in remote regions and oceanic environments.

Data Analytics

ASTRA produces customized data solutions in a variety of different forms to help people and organizations reach their desired goals. Our scientific team utilizes deep understanding and expertise in many aspects of space physics to produce new interpretations of data and model output, providing new insights and discoveries for our customers.



Modeling

ASTRA develops software tools to quantify the impact of various measurements for both Earth-based and space-based systems. We provide the tools to help governments and organization understand and mitigate the impacts that space weather has on the systems we rely on to live, work, and play.

LiDAR

ASTRA's ability to miniaturize sensors and subsystems is unmatched. This led to the development of the ASTRALiTe EDGE™, a topographic and bathymetric LiDAR system that is flown from a UAV. The EDGE is designed for shallow water surveying and infrastructure inspection. Learn more at astralite.net

Innovative solutions built to your specifications.

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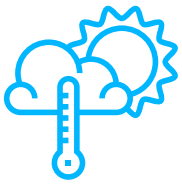
ASTRA

INTELLIGENT DATA FOR A SMARTER PLANET

WEATHER

Atmospheric data collection and modeling for weather forecasting, managing economic impact and business interruption, as well as long-term climate change insight.

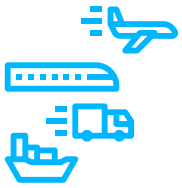


CLIMATE CHANGE

Collecting and analyzing actionable intelligence for governments and businesses to operate more efficiently, more profitably, and with greater social responsibility when it comes to our resources, our environment, and the sustainability of our planet's ecosystem.

COMMUNICATIONS

From GPS to the various communication methods we use, our atmospheres have an effect on their ability to function when needed.



TRANSPORTATION

From changing upper atmospheric winds and temperature to ocean vector wind and wave models, ASTRA focuses on data to help industry operate more efficiently, safely, and with greater environmentally responsiblity.

RISK MANAGEMENT

Using data to help government and business manage climate and weather change risks to humans, property, and the environment.

AGRICULTURE

Water, food, and oxygen are the most critical elements to human existence on earth. Collecting and analyzing atmospheric and terrestrial data to produce, sustain, and protect these resources is a priority.

Data to help us live, work & play better on Earth & in space.

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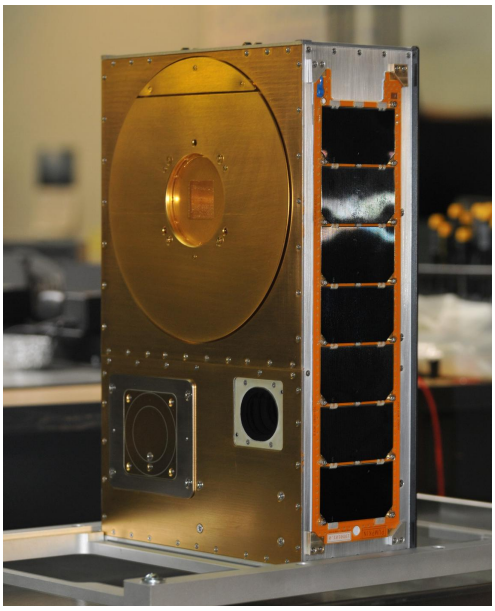
ASTRA

SORTIE

Scintillation Observations & Response of The Ionosphere to Electrodynamics (SORTIE)

At low and middle latitudes, wave-like plasma perturbations are thought to seed larger perturbations that may evolve into irregularities, which in turn have negative effects on high frequency communications and global positioning systems. Currently, no comprehensive atlas of measurements describing the global spatial or temporal distribution of wave-like perturbations in the ionosphere exists.

ASTRA's SORTIE mission was designed to help map and further understand the wave-like plasma perturbation distributions throughout the ionosphere. The SORTIE 6U CubeSat sensor package measures key in-situ plasma parameters, and includes an ion velocity meter and a planar Langmuir probe.



Main Objectives

The SORTIE 6U Cubesat provides:

1. Determination of the initial spectrum of wave perturbations which are the starting point for plasma instabilities;
2. Measurements of electric fields determining the magnitude of the instability growth rate near the region where plasma bubbles are generated;
3. Initial observations of irregularities in plasma density resulting from plasma instability growth.

Launch & Deployment

The SORTIE mission launched aboard CRS-19 on December 5th, 2019, and was deployed from the International Space Station of February 19th, 2020.

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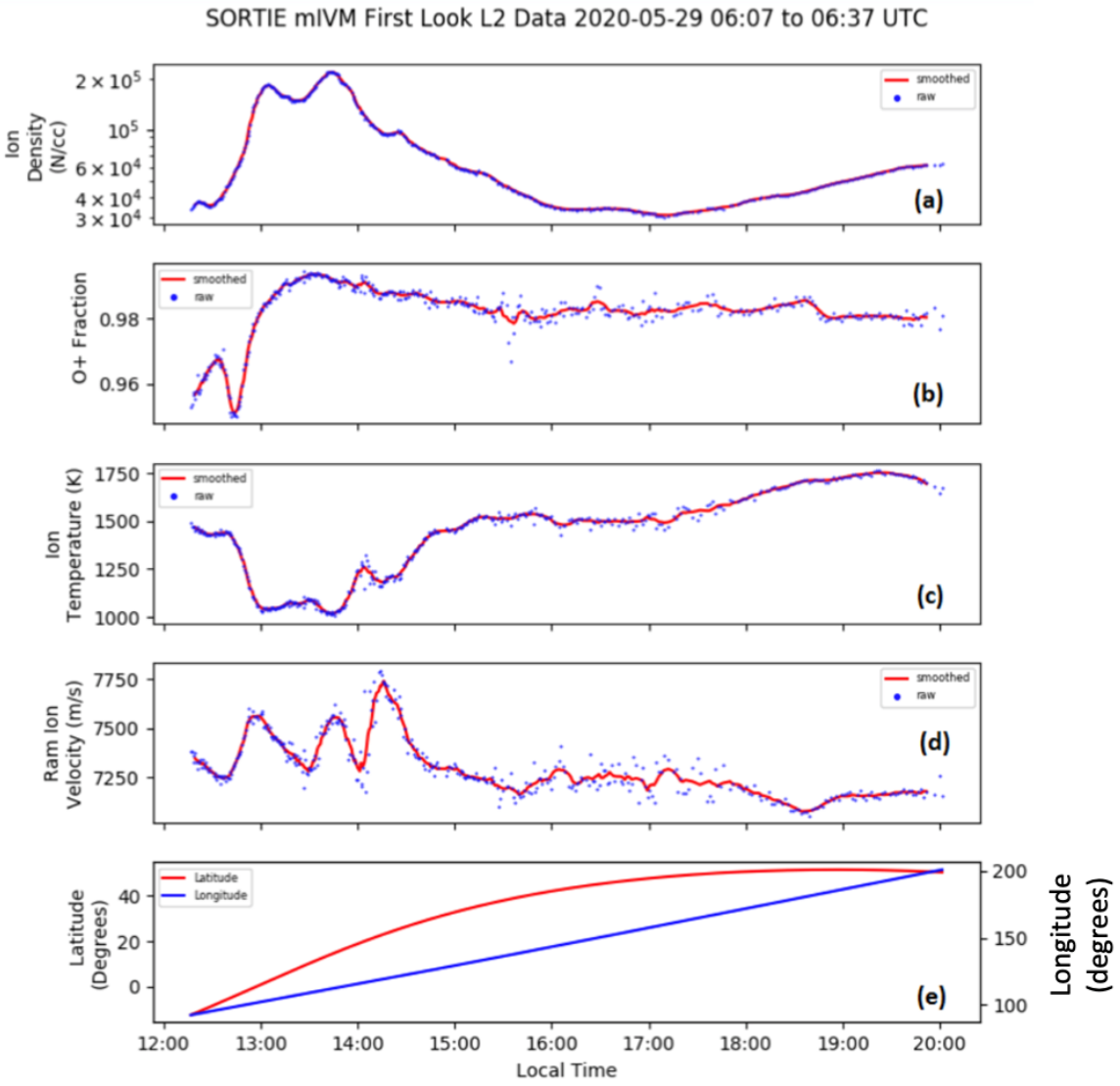
First Light Data

The SORTIE mission is currently conducting nominal CONOPS, collecting science data regularly (see figure of example May 2020 on-orbit SORTIE IVM data), with on-orbit measurements expected to continue into early 2021. The on-orbit measurements are supplemented by ground based measurements of traveling ionospheric disturbances (TIDs) from ASTRA's network of TIDDBIT HF mappers and GPS receivers.

On-orbit SORTIE data has demonstrated the first successful integration, ground calibration, and flight of a single-aperture IVM instrument package for ionospheric measurements from a CubeSat. As a pathfinder mission, SORTIE opens the door to a "constellation of SORTIEs" that would then help provide an instantaneous global view of the Earth's ionospheric structure and activity.



ASTRA provides innovative solutions to difficult problems.