



# The Influence of Salts on the Detection of Organics from Ocean Worlds via Laser Desorption Mass Spectrometry

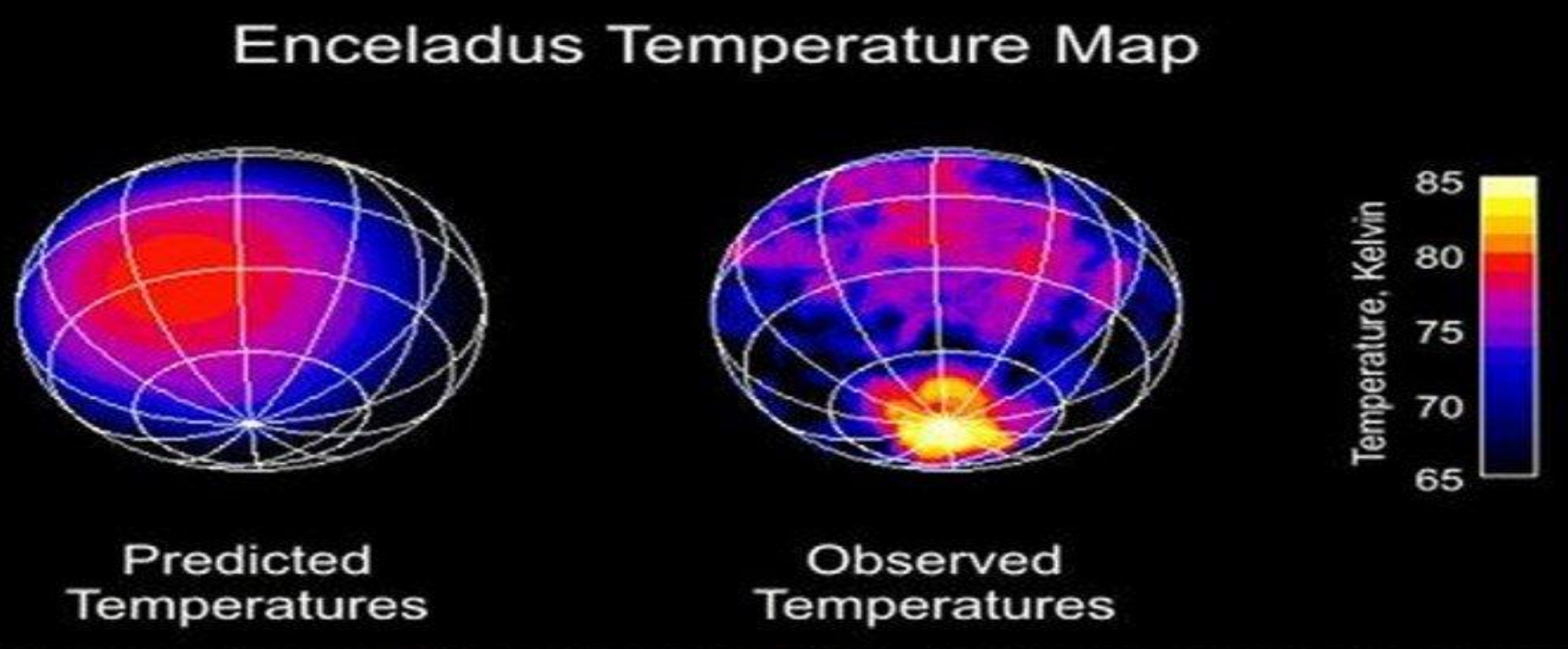
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## Why Enceladus?

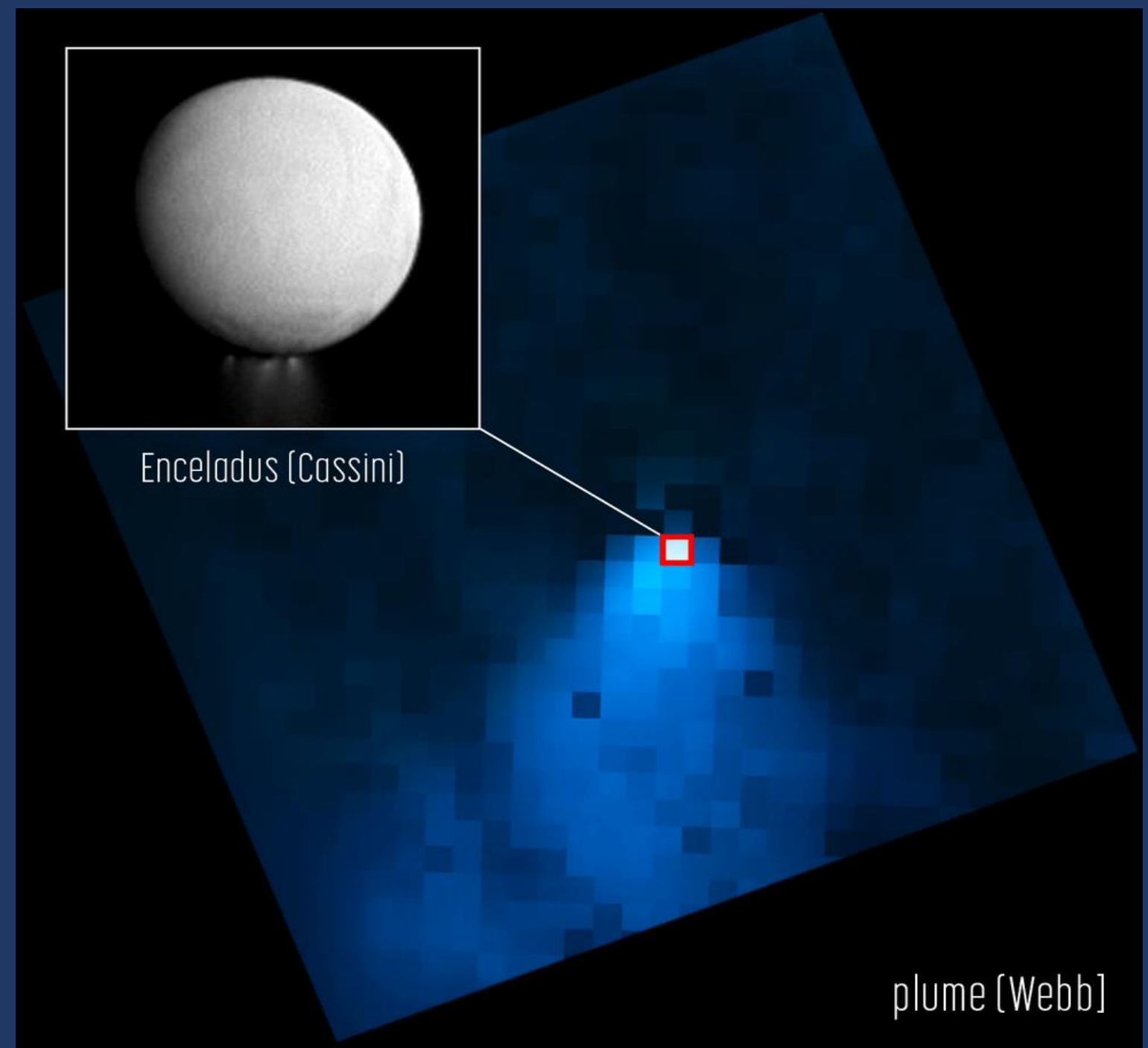
- The long-lived Enceladus plume emits particles consisting of water, salt, and “CHONP” organics
- Salt-rich particles consist majorly of NaCl, NaHCO<sub>3</sub>, and Na<sub>2</sub>CO<sub>3</sub>, and K<sup>+</sup>
- The ingredients needed to polymerize larger molecules like amino acids and nucleobases- (nitrogen, oxygen-bearing amines, carbonyls, aromatic compounds) are available in the Enceladus ocean
- Studying these features can help uncover prevailing and/or the early emergence of biological activity

These features along with an internal heat signature are ingredients for alien life



NASA/JPL-Caltech & NASA's Goddard Space Flight Center

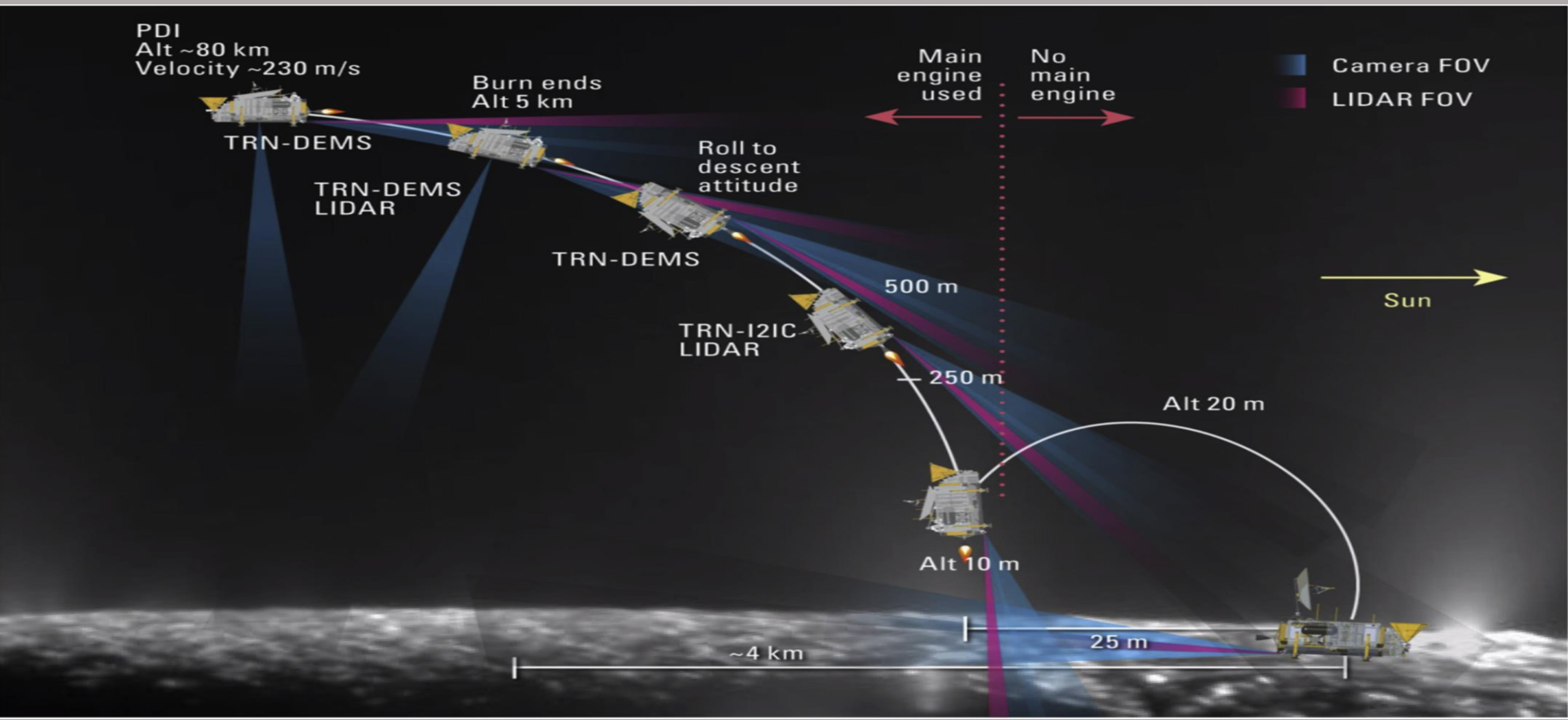
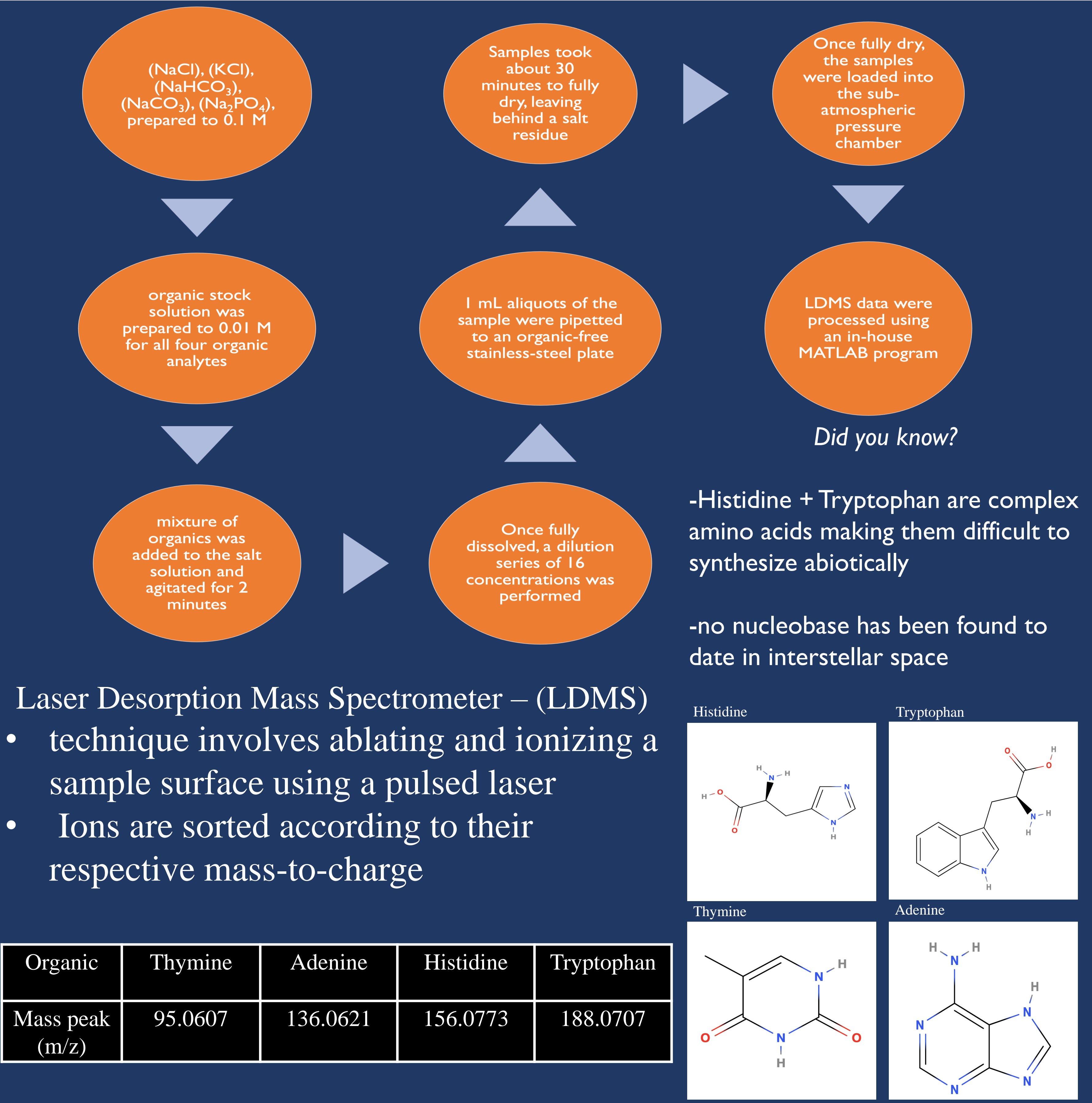
Organics: histidine, tryptophan, essential amino acids that are the building blocks of proteins & adenine and thymine nucleobases, the monomers of genetic material served as putative biosignatures



## Hypothesis

Salts derived from the Enceladus subsurface ocean will inhibit the detection of biosignatures using LDMS techniques

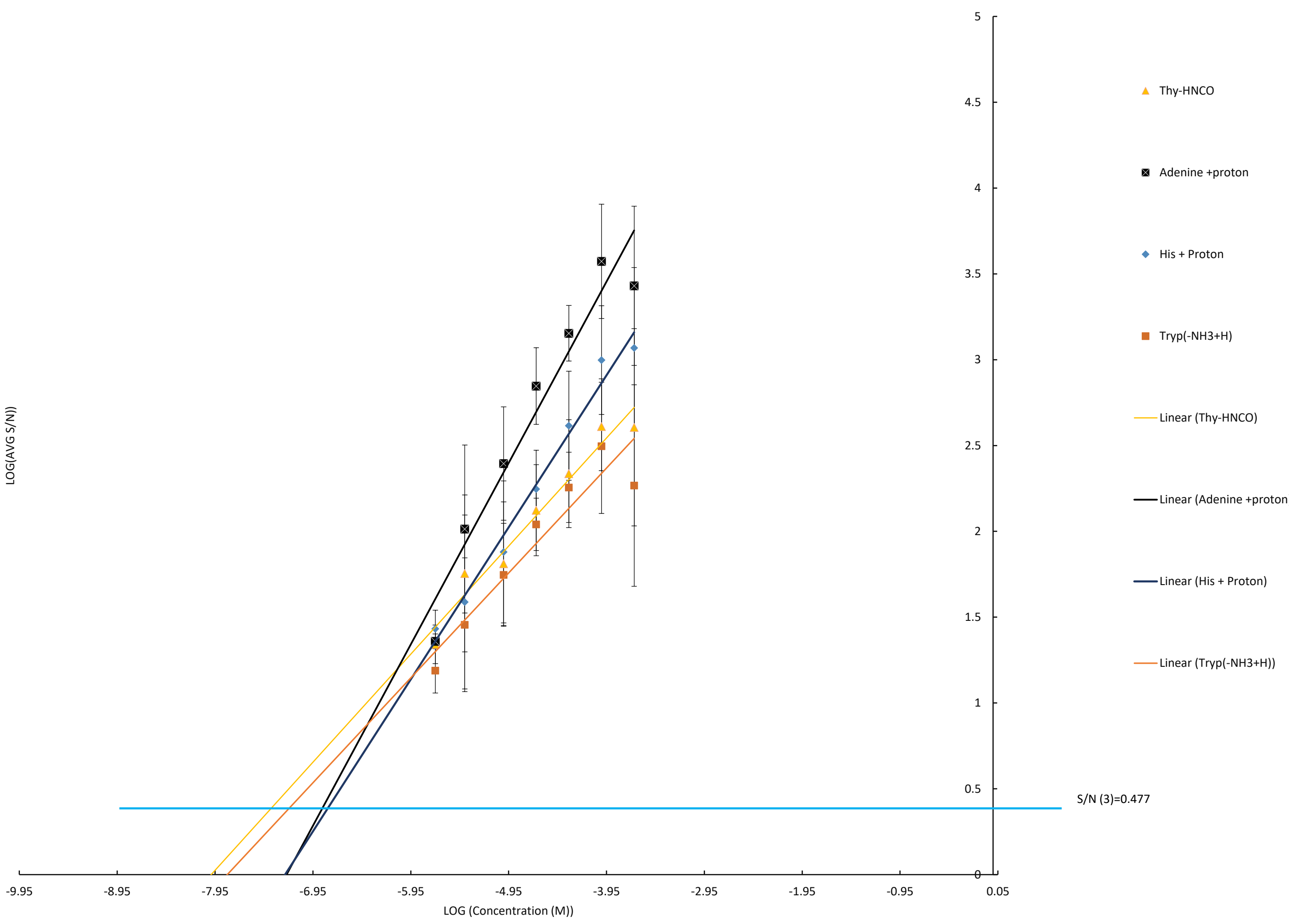
## Methods



## Results

Detection limits: expressed in terms of the minimum concentration of the analyte at S/N = 3

Organic	THY	ADEN	HIS	TRYP
Detection limits (M)	5.85043E-08	1.70745E-07	2.01565E-07	9.03017E-08



## Conclusion + Greater purpose

By simulating similar conditions to Enceladus, we can aim to understand how salt complexes, i.e., Mineralogy affects indicators of life in extraterrestrial environments.

LDMS’s ability to quantify traces of organic compounds can be utilized for future essential missions like the Enceladus Orbilander