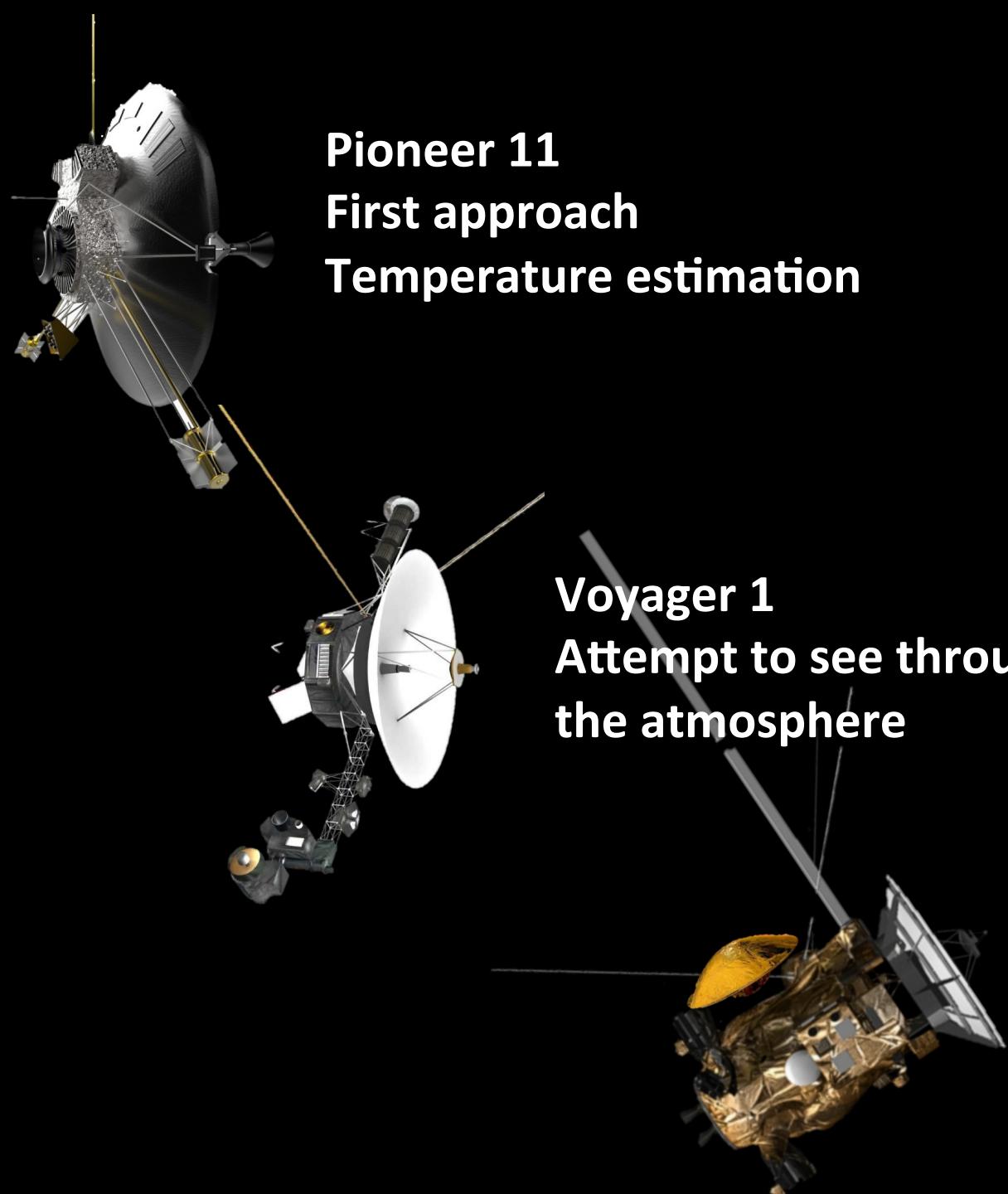




Egeus

The organics components searcher
on TSSM

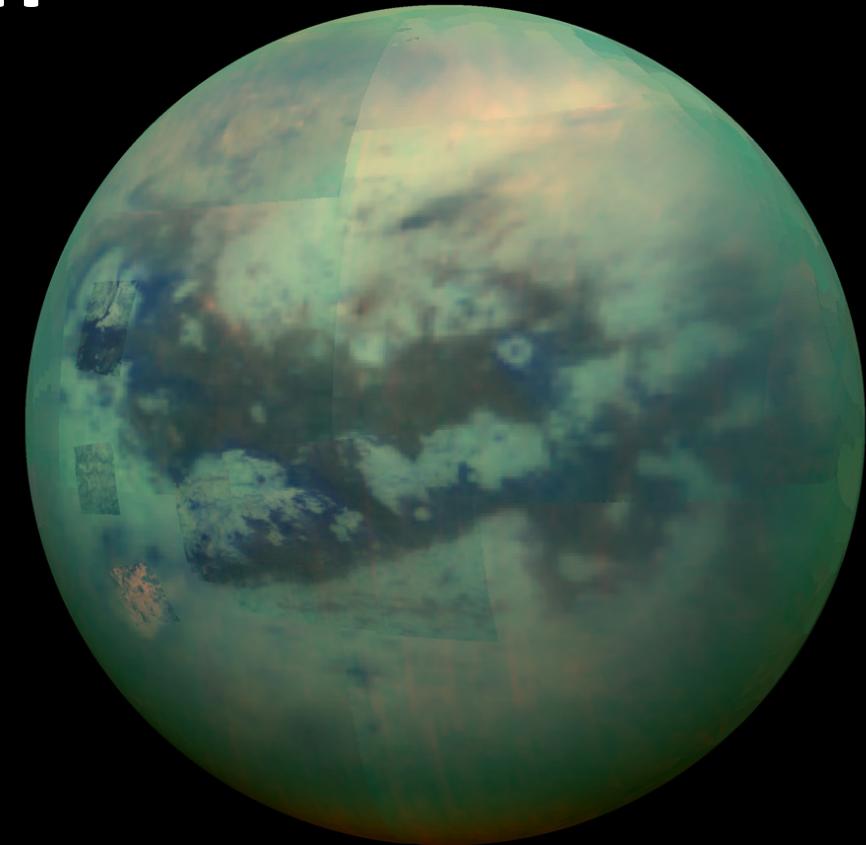
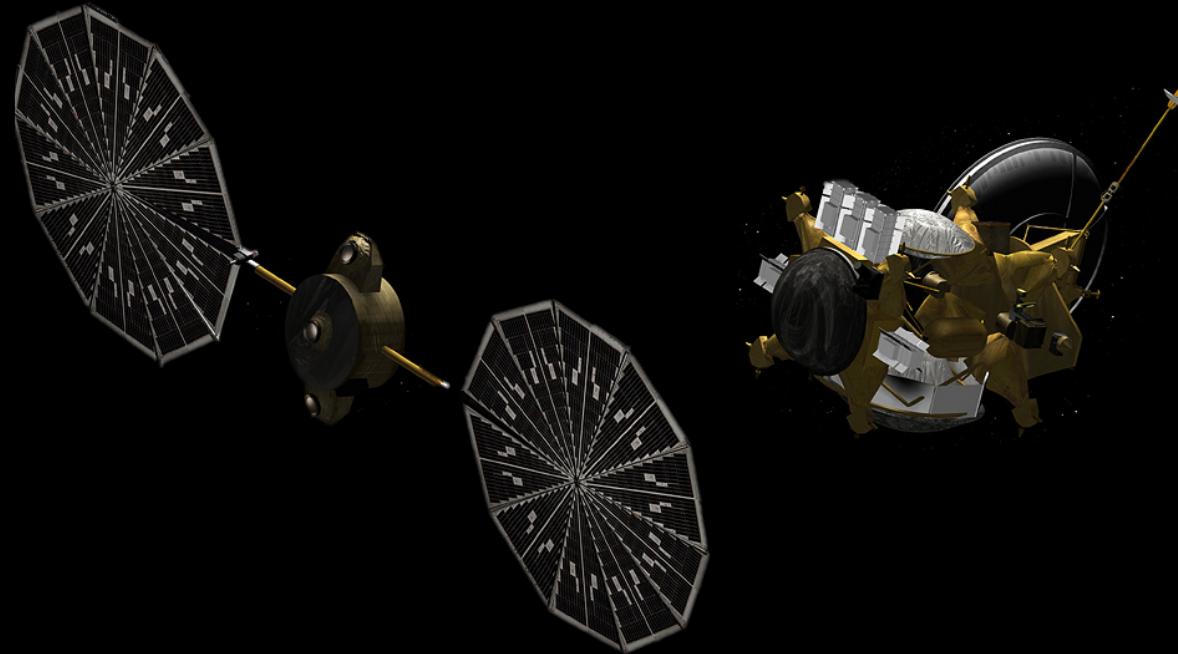


Pioneer 11
First approach
Temperature estimation

Voyager 1
**Attempt to see through
the atmosphere**

Cassini-Huygens
**Atmosphere and landing
studies.**

Titan Saturn System Mission



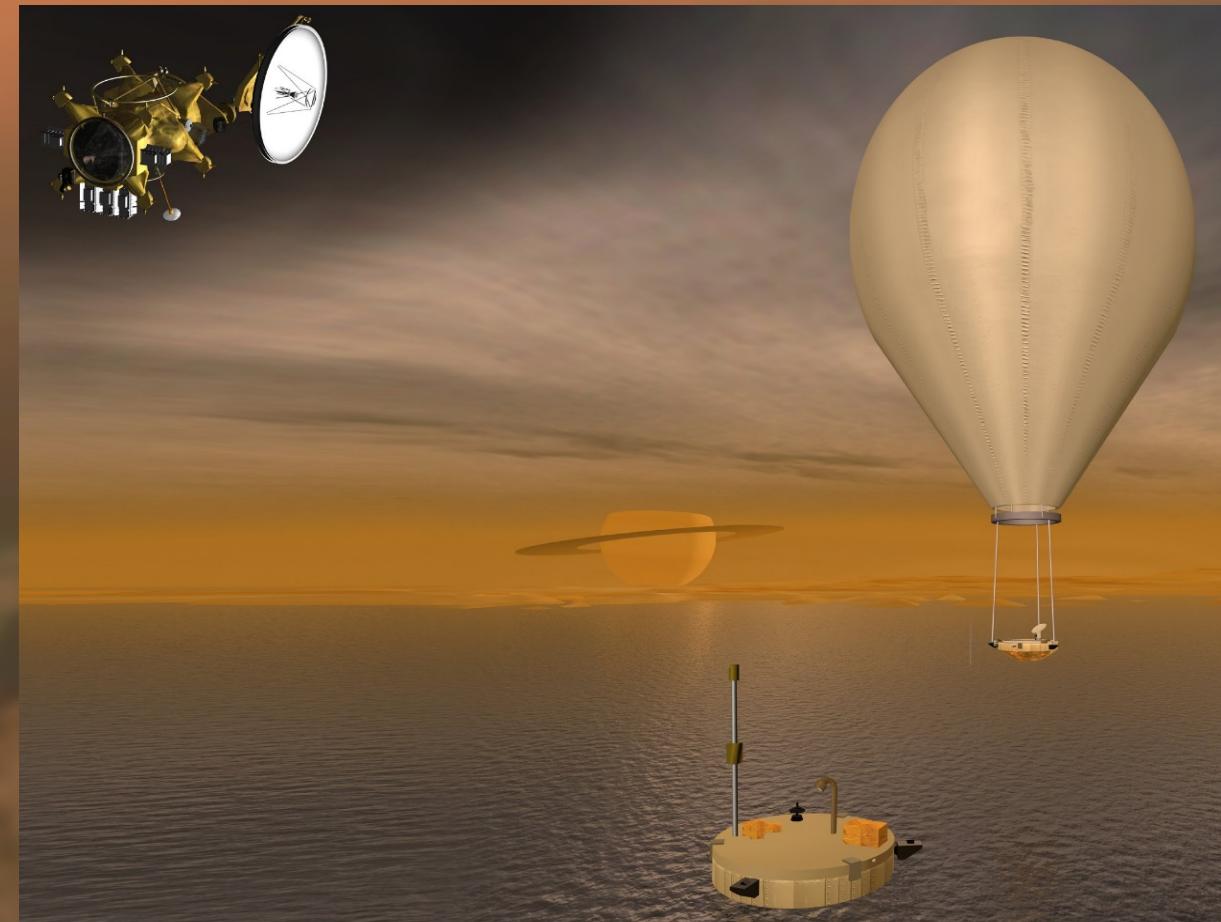
Summary : TSSM's update

1. TSSM's objectives

2. Titan's environment

3. Instrument's modification

4. Consequences



1. TSSM : objectives



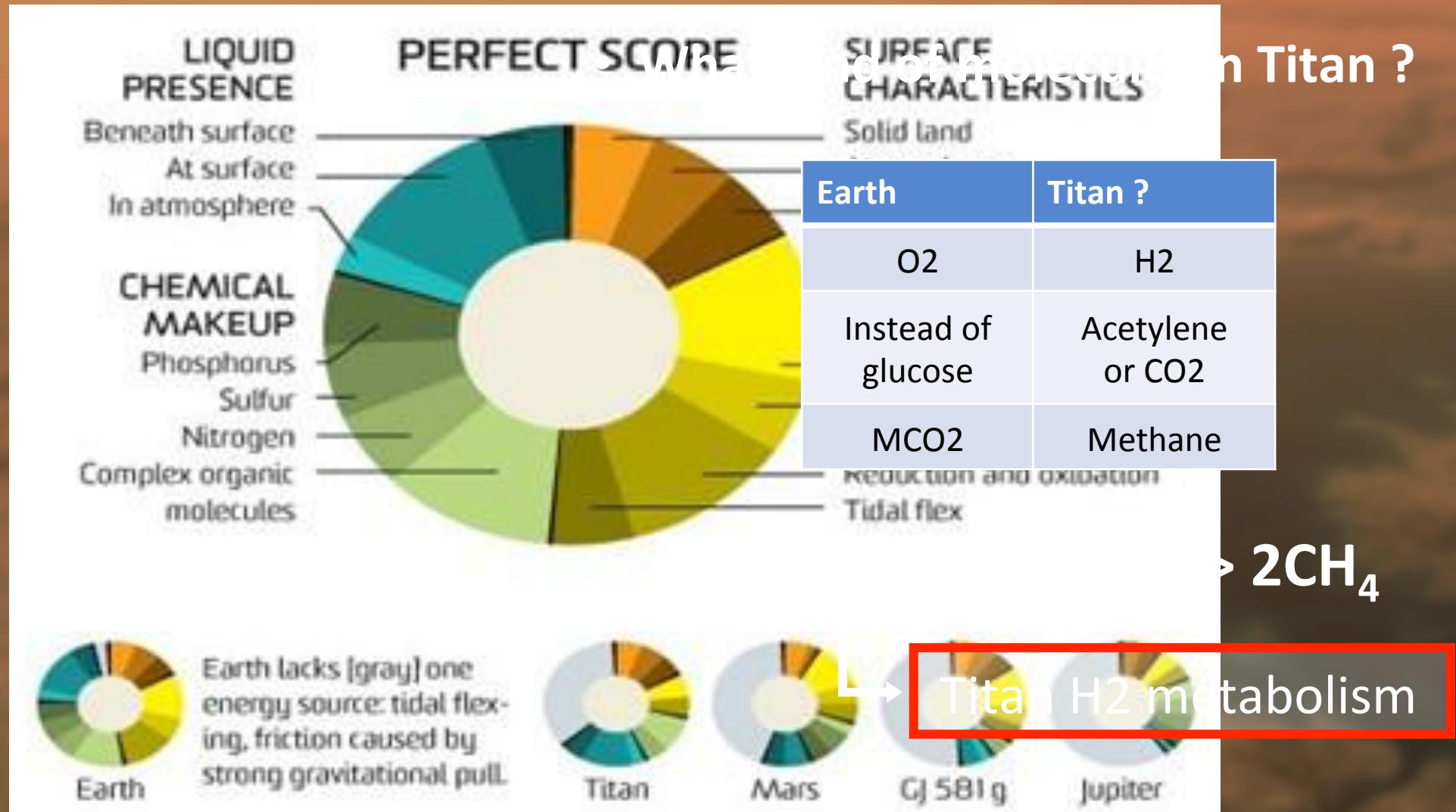
Actual objectives

- ✓ Titan's weather
- ✓ Recover informations about Saturn's magnetosphere
- ✓ Find the origin of Titan's complex molecules

Additionnal objectif

- ✓ Study Titan's organic inventory & astrobiological potential

What is the Titan's interest?



2. Titan's environment

Main characteristics

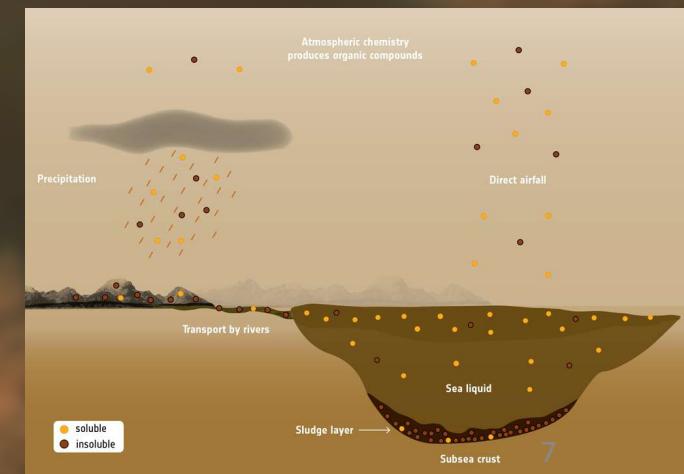
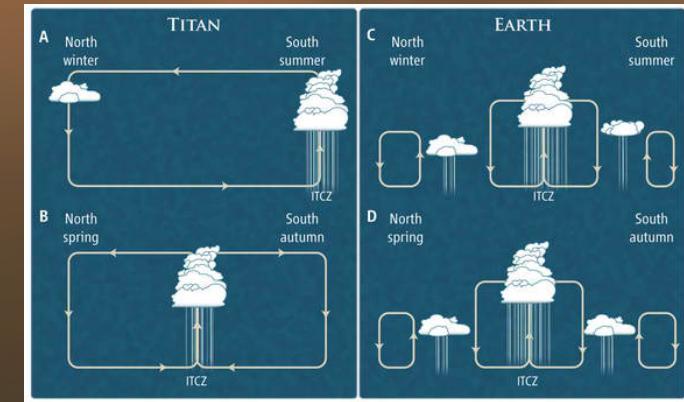
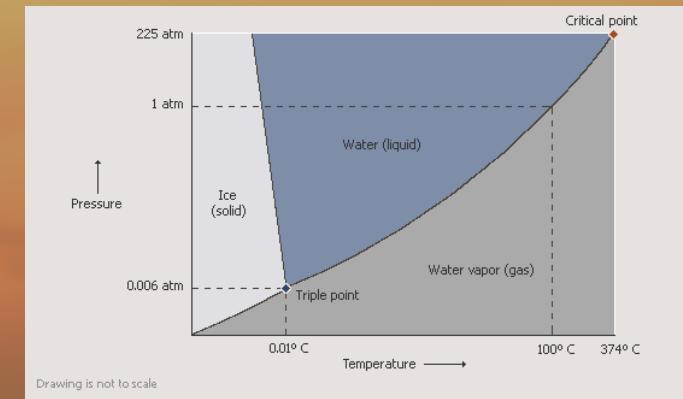
- 880 km
- High pressure
- Nitrogen 95%
- A methane cycle

Special characteristics

- Triple point
- Meteorological system
- Heavy molecule concentration



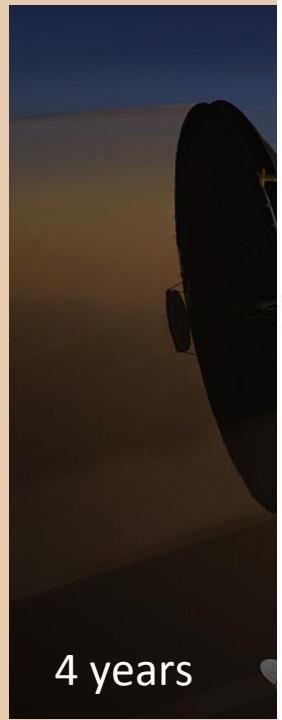
Study bottom of the sea



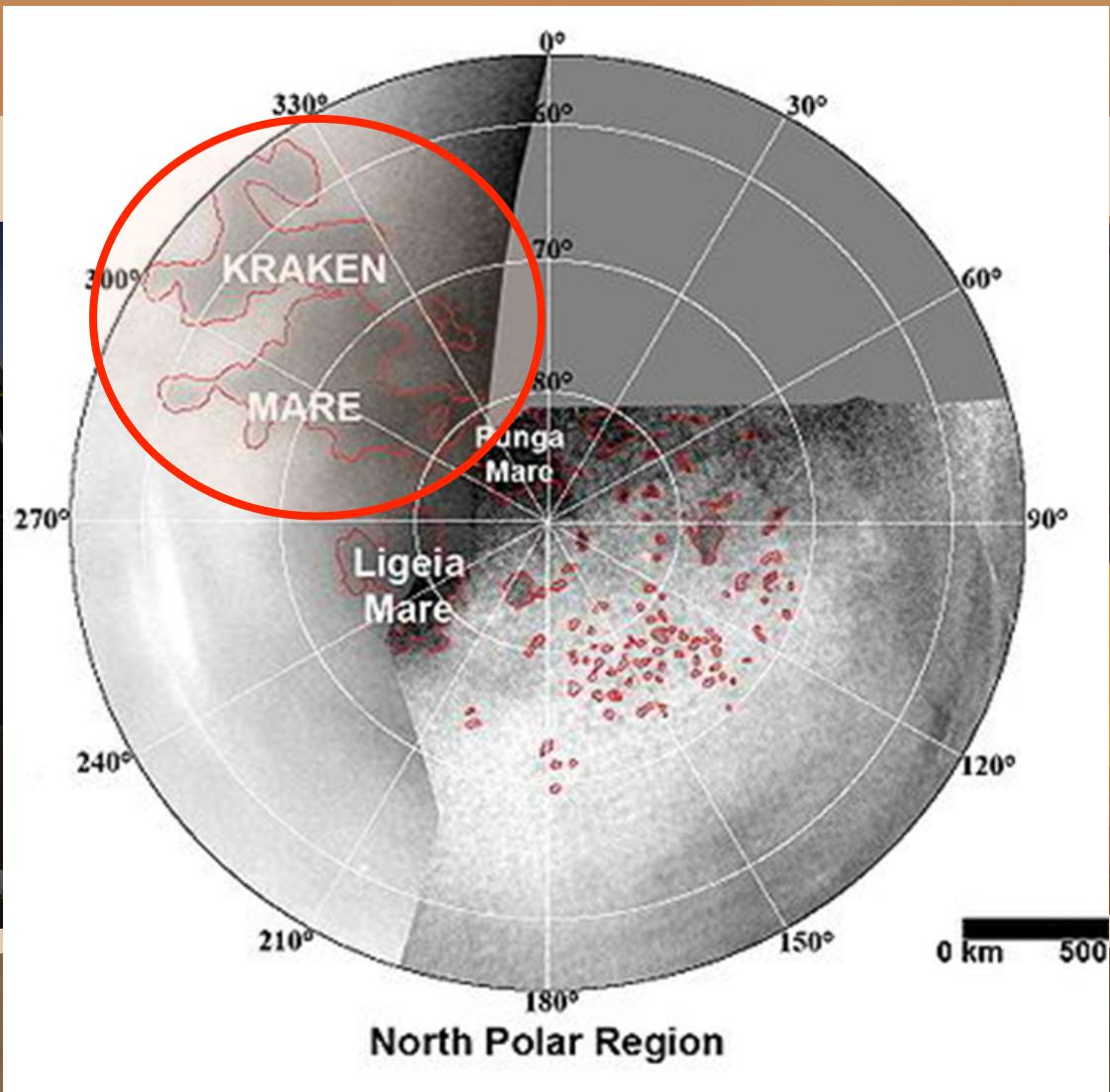
3. Modification on TSSM



Probe



4 years



+



Instruments modification

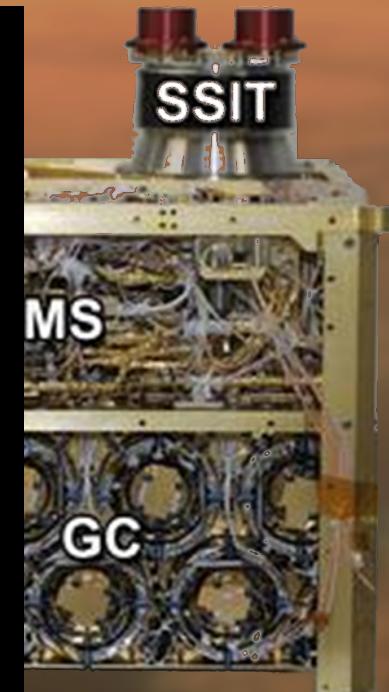
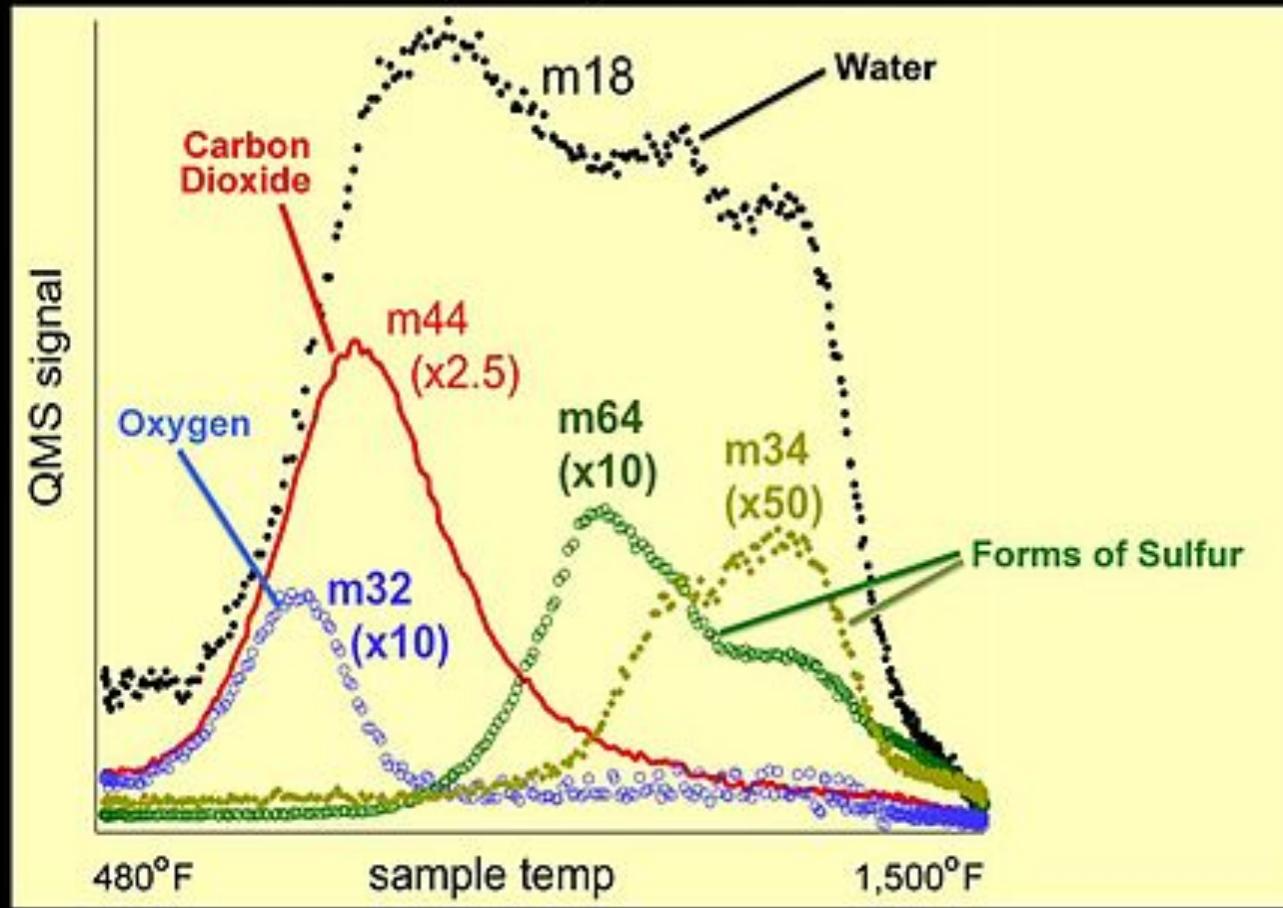
Titan's sediments and muds samples

TSSL sample processing and delivery system

Sample Manipulation System

Gas extraction :
- Derivatization
- Thermal Processing
- Combustion

Major gases released from the bedrock called "John Klein" and analyzed by the SAM instruments



Sample Analysis in Mars (SAM)
Mass Spectrometer
Gas Chromatograph

The sampler System

- **Sampler system components**

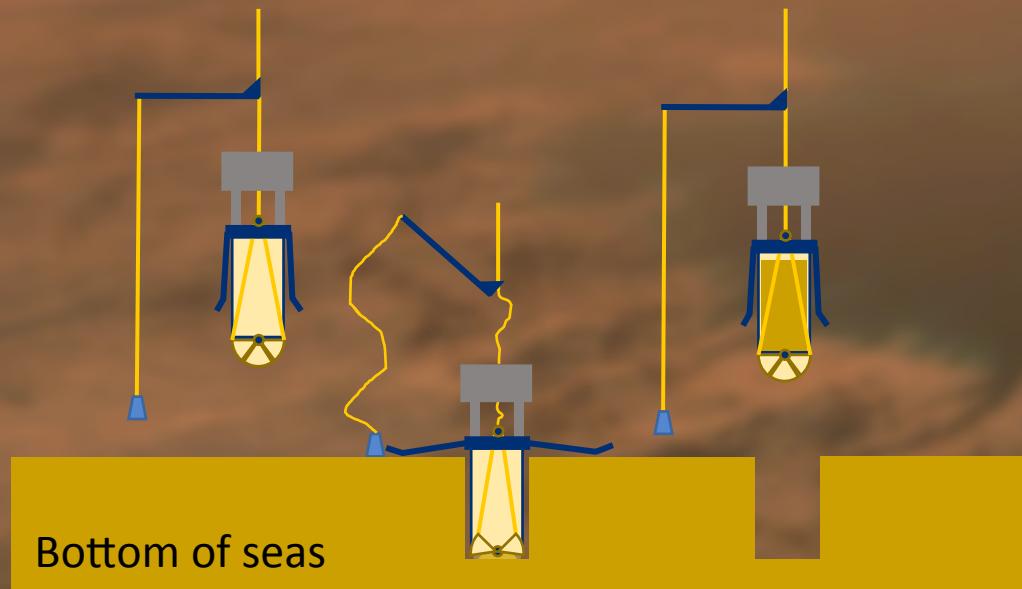
Electric engine

Cable

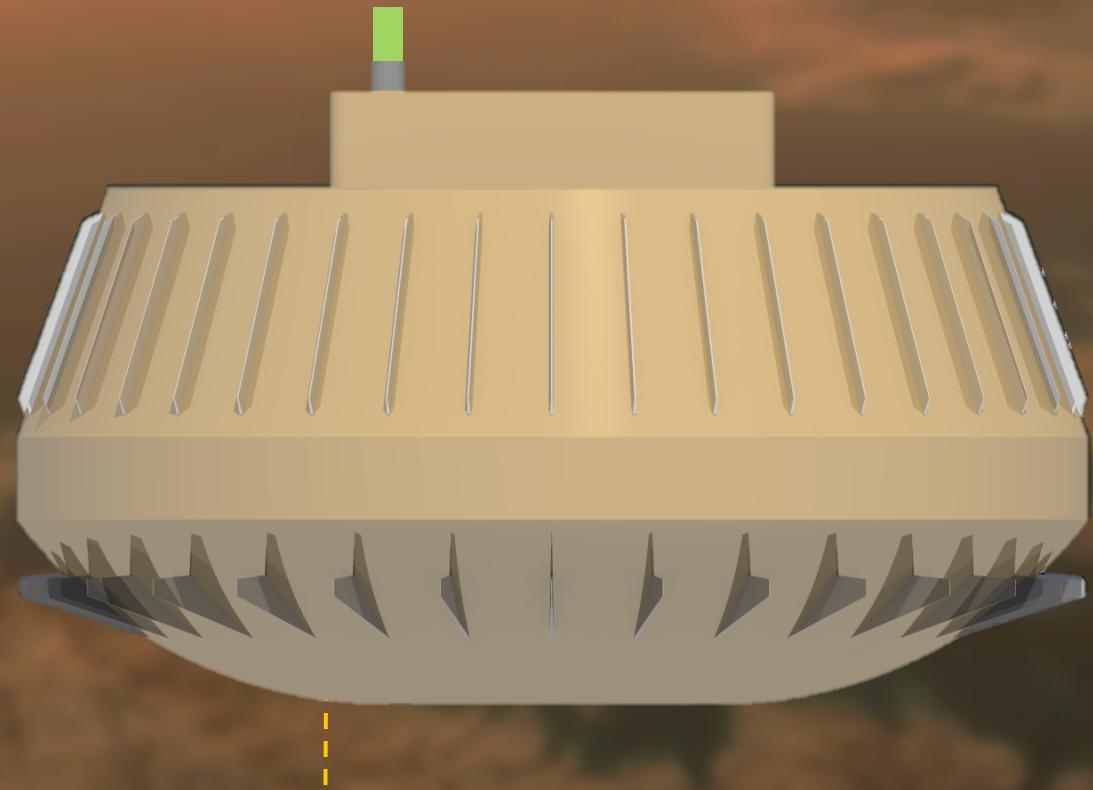
Sampler

350 m

200 cm¹³



- **Assembly Design** (*sectional view*)



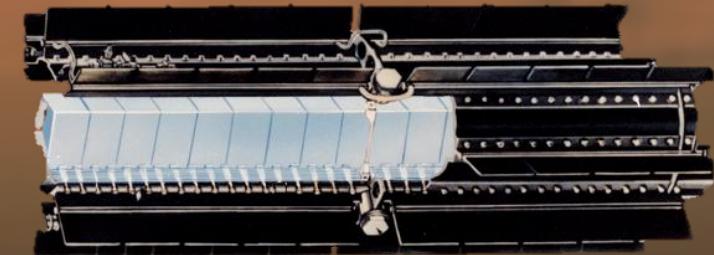
4. TSSM modification consequences

Energy Balance



Equipments	Electrical consumption (W)	
	TSSM	TSSM - Egeus
Instruments	25	40
Telecom system	7	7
Total	32	47

The RTG generator



Mass 10 kg
Generate 60 W

Mass Balance



9 hours → Some months

Equipments	Mass (kg)	
	TSSM	TSSM - Egeus
Total Lander	62	70
Power source	8	10
Total	70	80

Lander's volume : $1,10 \text{ m}^3$

Methan density : $422,62 \text{ kg.m}^{-3}$

Floating ability : Ok

Egeus's Impact on TSSM

- **Scientifically**

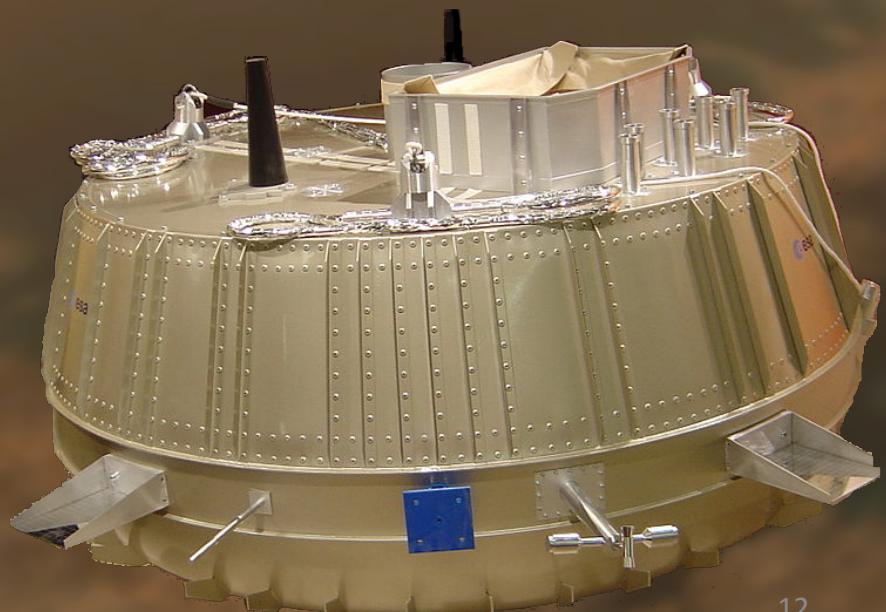
Ability to study solid sample (Sampler system + SAM)

- **Physically**

Mass increase after update

- **Technically**

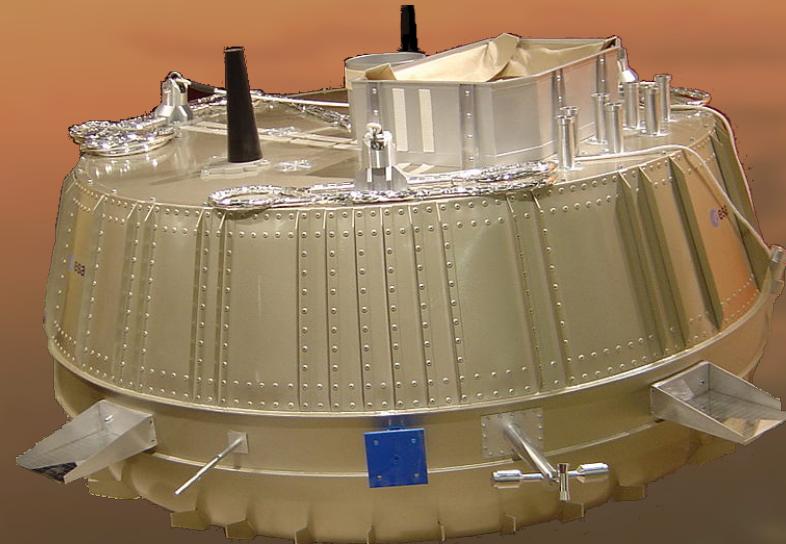
Same launching characteristics

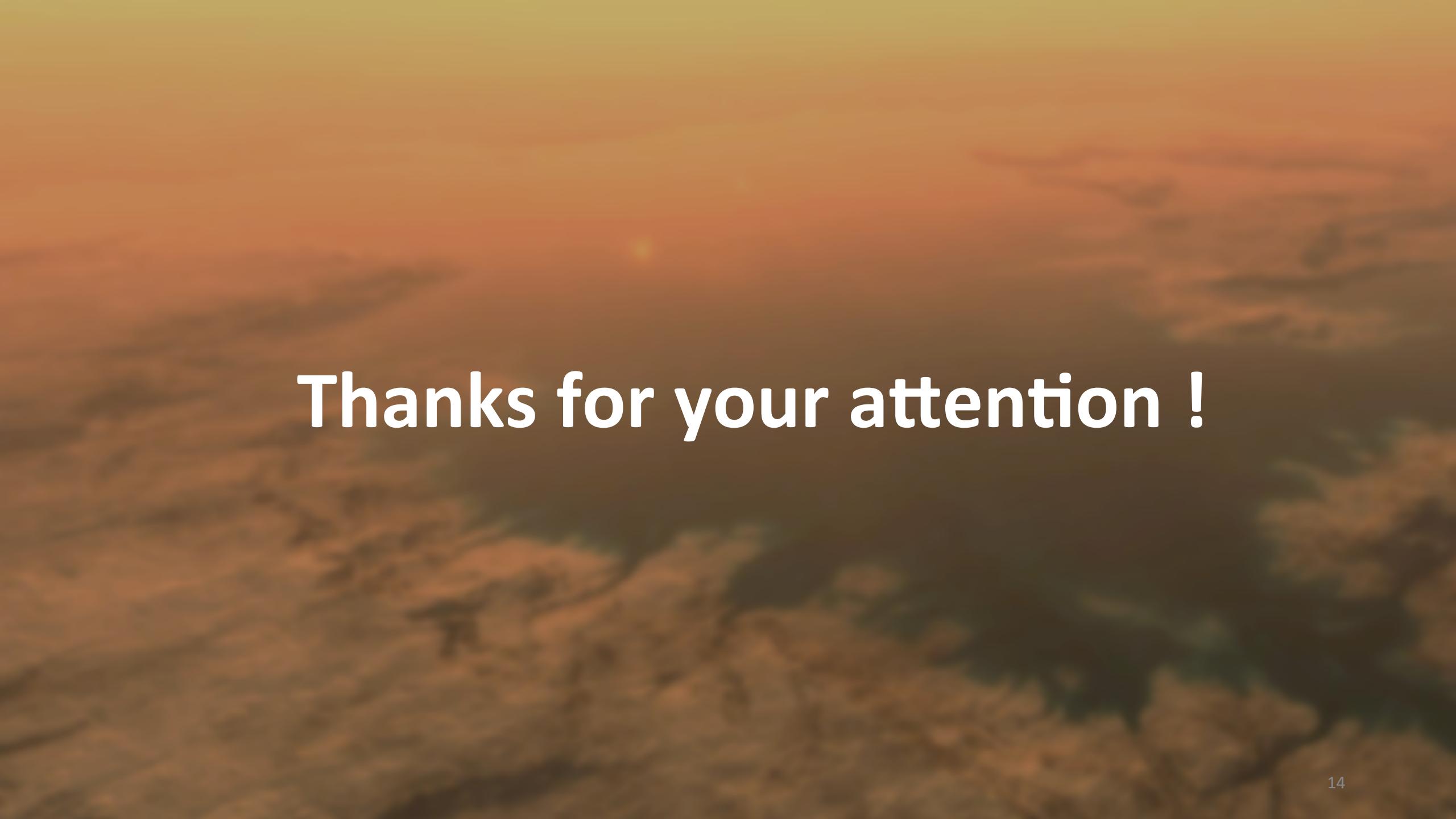


Conclusion

Added objectives at TSSM

- └→ Improve scientific interest of TSSM
 - └→ Instrument modifications
 - └→ without interference with the TSSM's scheduling





Thanks for your attention !