

Diving into Titan's Atmosphere

IPPW 12 / Cologne, Germany

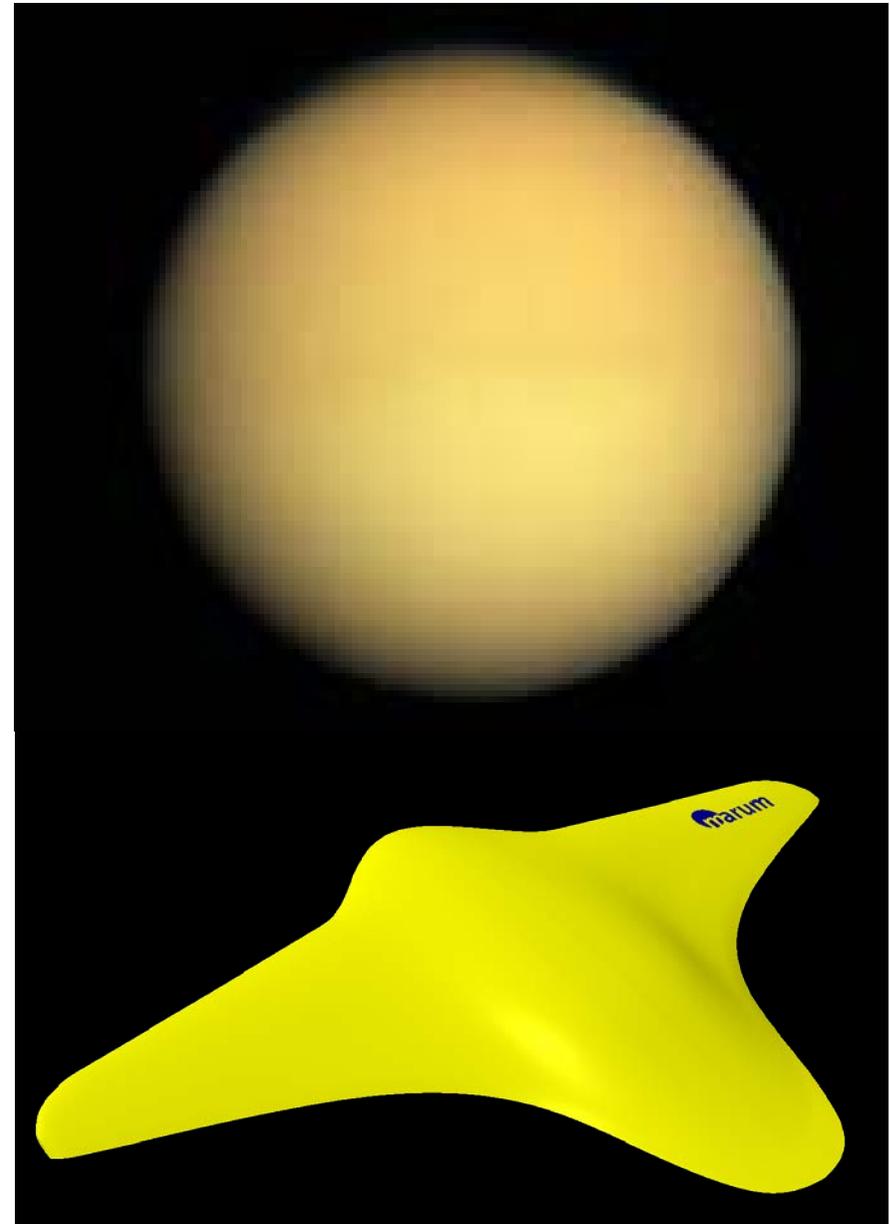
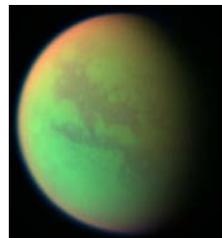
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Co-Funded by Federal Ministry of Economics and Technology on a basis of a decision by the German Bundestag (support code 50RA1401)

Introduction

- Background
- Deep sea glider concept
- Current status
- Spin in to future Titan Mission
- Conclusion



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The ROBEX Project



- Robotic Exploration of Extreme Environments (ROBEX)
- Bringing together expertise of space and deep sea exploration
- Science goals for demo missions
 - Deep sea seismic infrastructure
 - Lunar seismic infrastructure
- Glider Design by MARUM
- Airbus DS associated partner, responsible for autonomous navigation and control of the deep sea glider
- For further information please visit <http://www.robex-allianz.de>



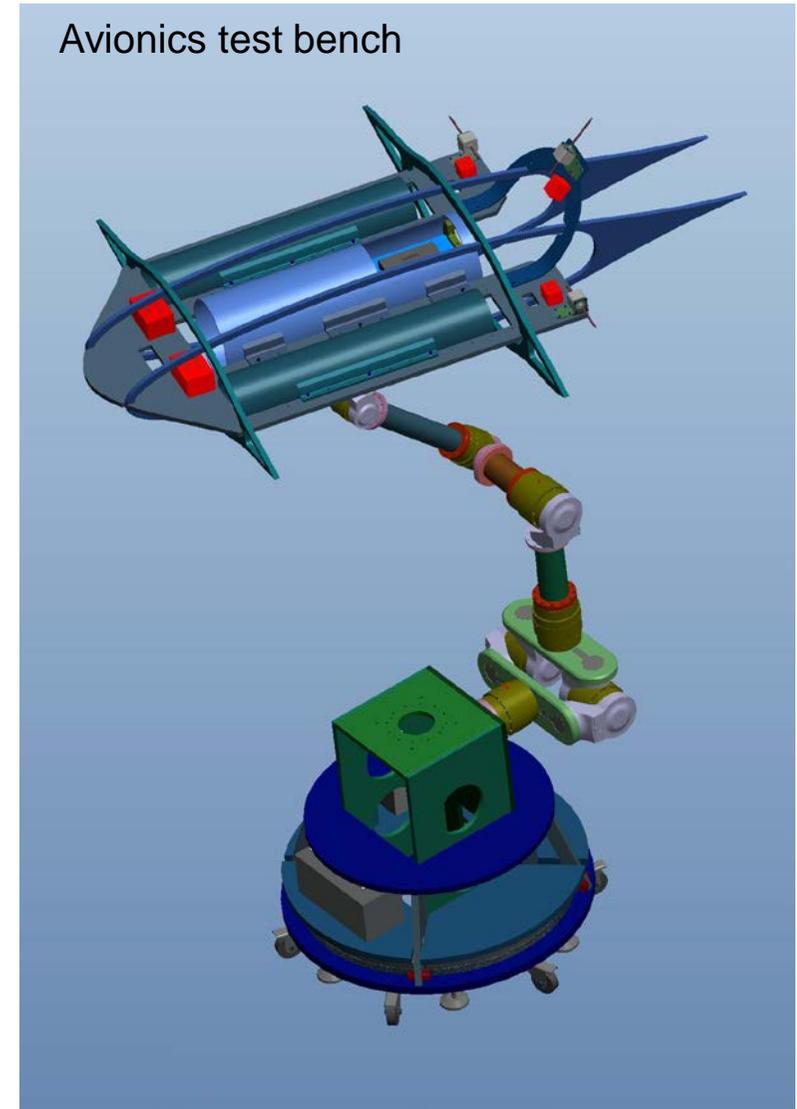
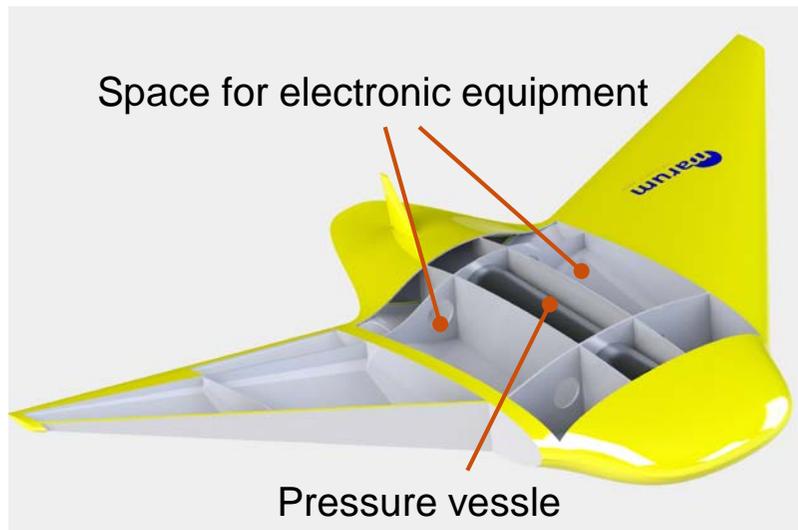
ROBEX

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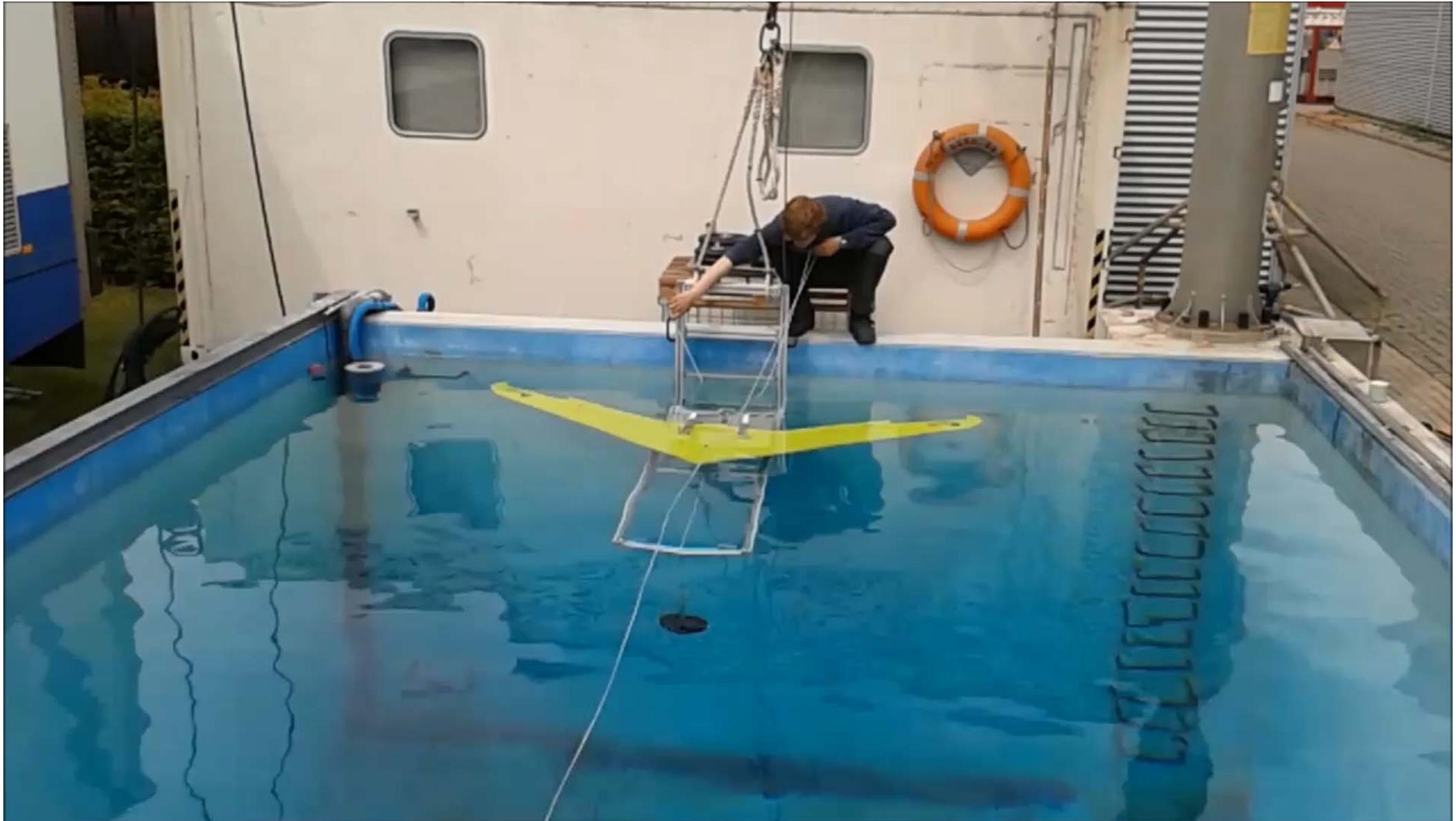


Preparation for control system tests

- Test set up
 - Motion of glider simulated by 7DoF robot arm
 - Hardware integrated in test dummy
- Scope of the test:
 - End-to-end verification of control chain
 - Sensors
 - Data processing
 - Actuators



Current tests on the glider



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Spin in to space

Venus

- Dense atmosphere
- High pressure
- High temperatures
- Earthlike gravity
- High pressure and temperature require to much structure to Hoover sufficiently

Mars

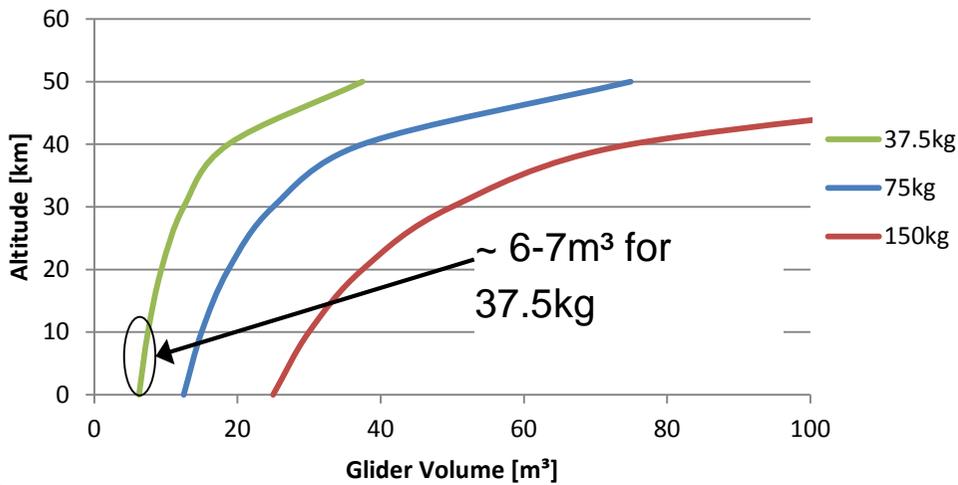
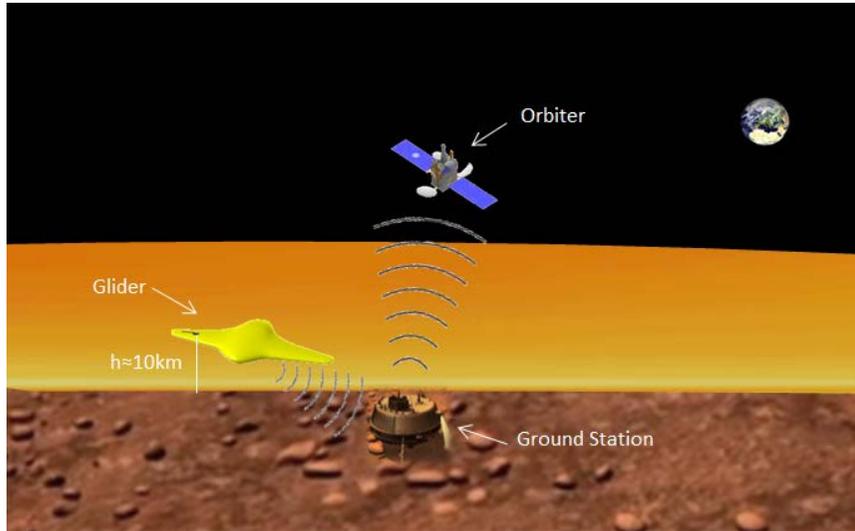
- Atmosphere with low density
- 1/3 of earth's gravity
- Not enough buoyancy due to low density

Titan

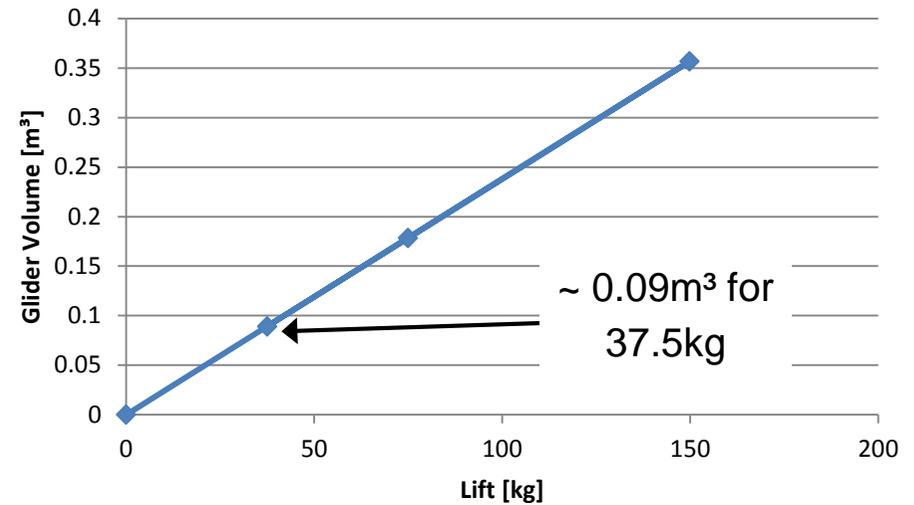
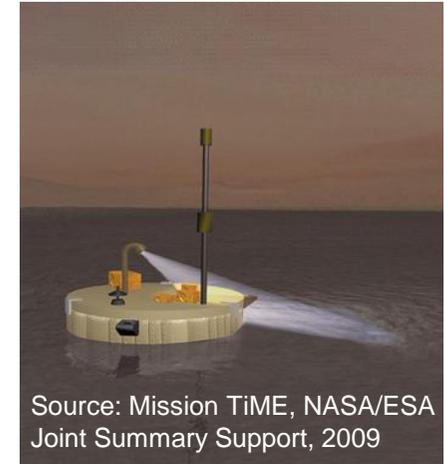
- Very dense atmosphere
- 1/7 of earth's gravity
- Low temperatures
- 1.5 times ambient pressure on earth at surface

Estimations of Volume

Gliding in Titan's atmosphere



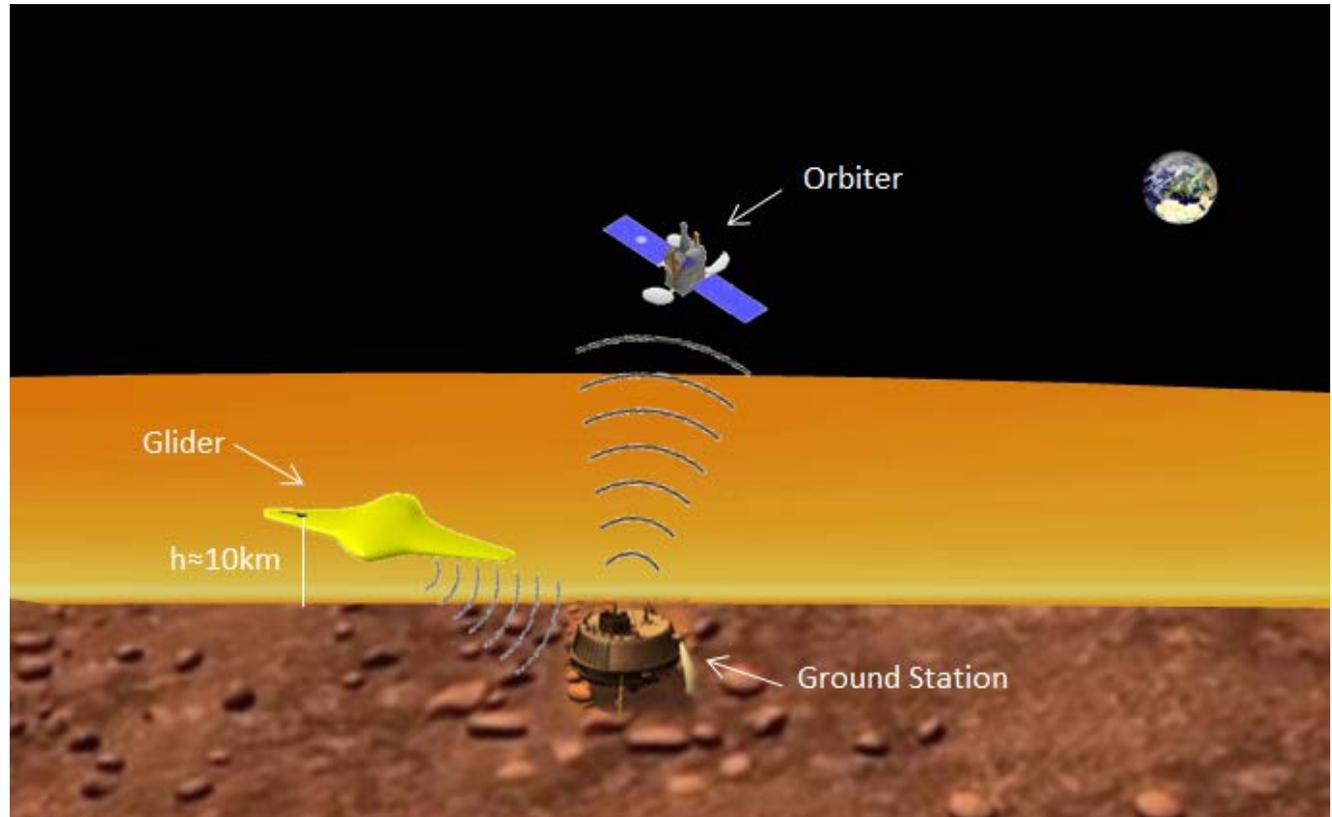
Gliding in a methane lake



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Conclusion

- Deep sea environment to test the glider and its software
- A glider combines the properties of balloons and aerodynamic vehicles
- First estimations show that the concept could work in Titan's atmosphere and in a methane lake



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Glider design by 

