



Underwater Exploration of an Icy Moon in a Virtual Environment

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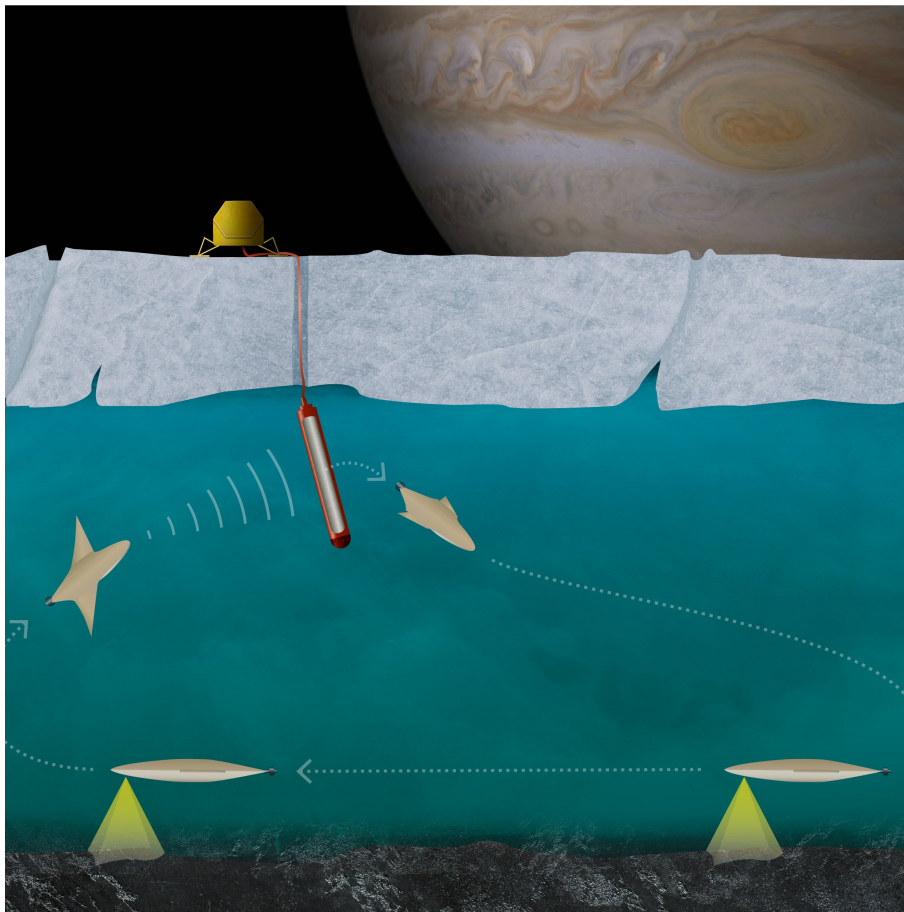
Images of the Icy Moons Europa (left) and Enceladus (right) Copyright: NASA/JPL-Caltech/Space Science Institute

- Huge oceans under icy moons around Jupiter and Saturn
- Liquid water is prerequisite for any kind of life
- Potential targets for future exploration missions by ESA, NASA, DLR, ...
- German Administration for Space Missions (DLR) Project „Technologies for Rapid Ice Penetration and subglacial Lake Exploration“ (TRIPLE)
- Development of technologies
- Test and validation in analogous environments



Team - Phase I:

- Universität Bremen (MARUM, CNI)
- RWTH Aachen University (IRT, Physics III B, MBD)
- DFKI (RIC)
- Technische Universität Braunschweig (IFF)
- GSI Gesellschaft für Systementwicklung und Instrumentierung mbH
- Alfred-Wegener-Institut (AWI)
- DSI Aerospace Technologie GmbH (DSI)



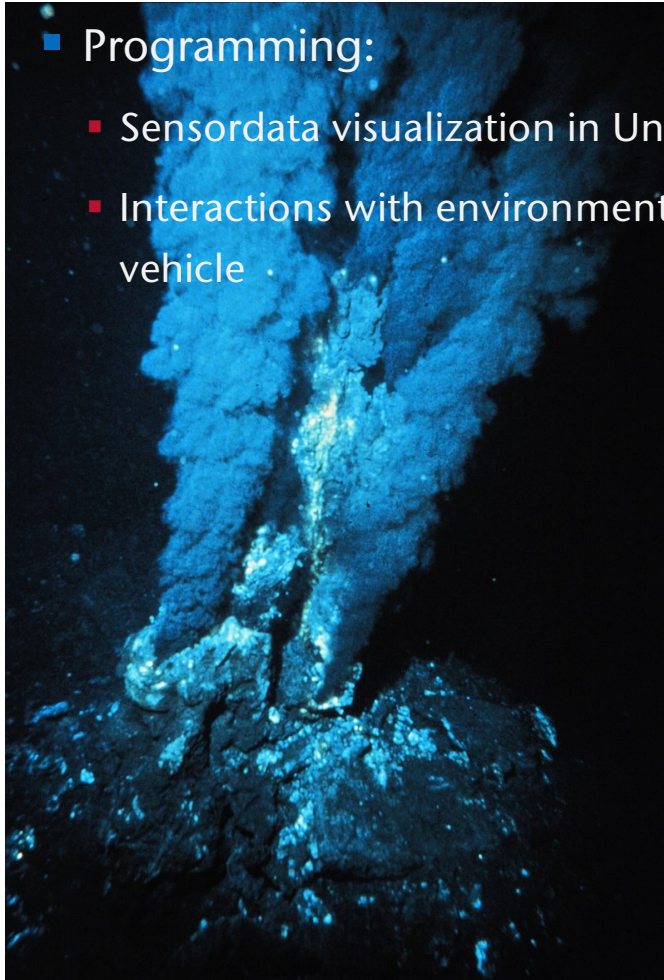
- Ice melting probe through the ice shield
 - Probe with sensors for direct measurements in the ice and at the ice-water interface
 - Autonomous underwater vehicle (AUV) for “autonomous” exploration of the ocean underneath the ice
- Nano AUV
 - Sensors
 - Acoustic communication
 - Acoustic and inertial navigation relative to the ice probe



Project Tasks

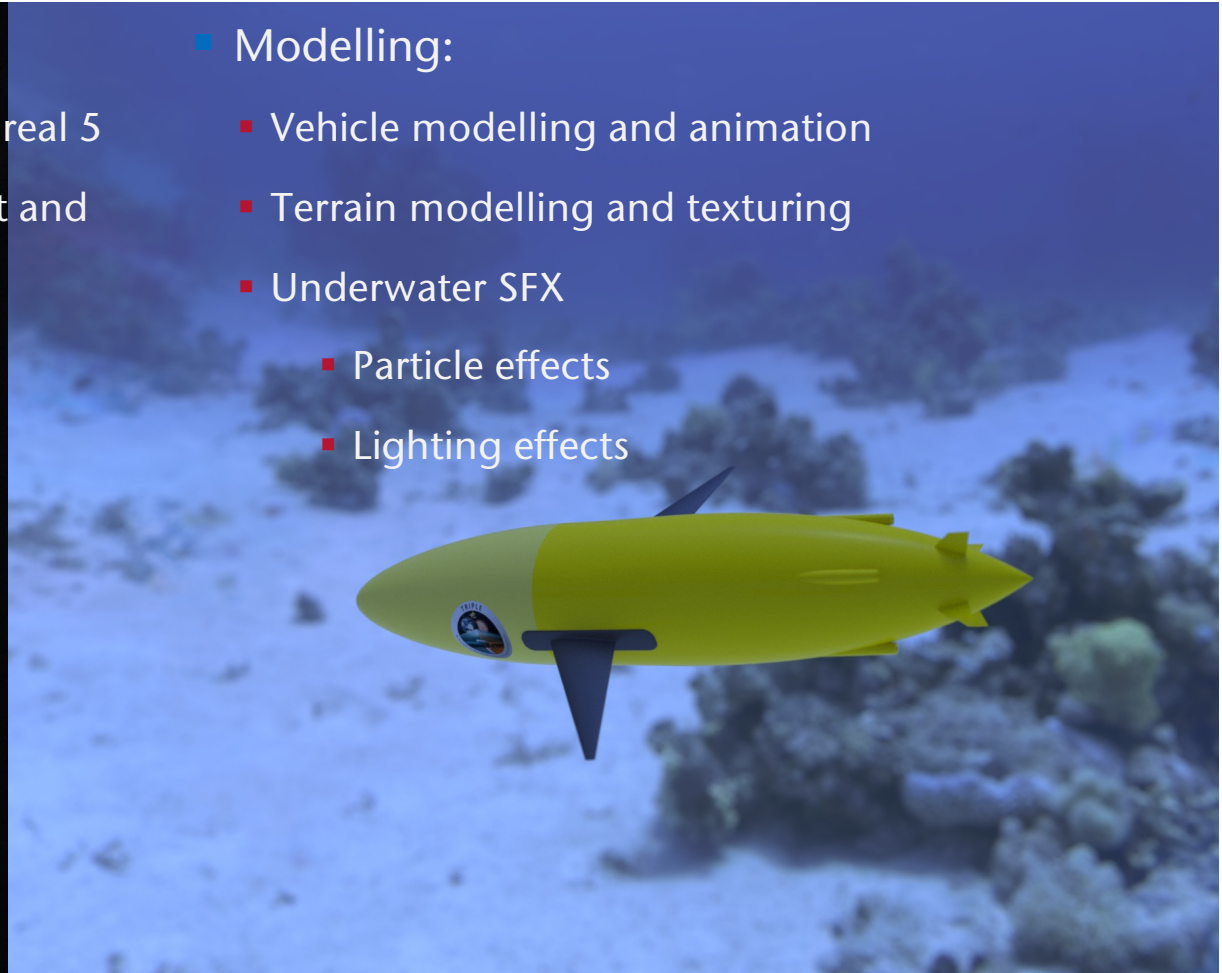
■ Programming:

- Sensordata visualization in Unreal 5
- Interactions with environment and vehicle



■ Modelling:

- Vehicle modelling and animation
- Terrain modelling and texturing
- Underwater SFX
 - Particle effects
 - Lighting effects

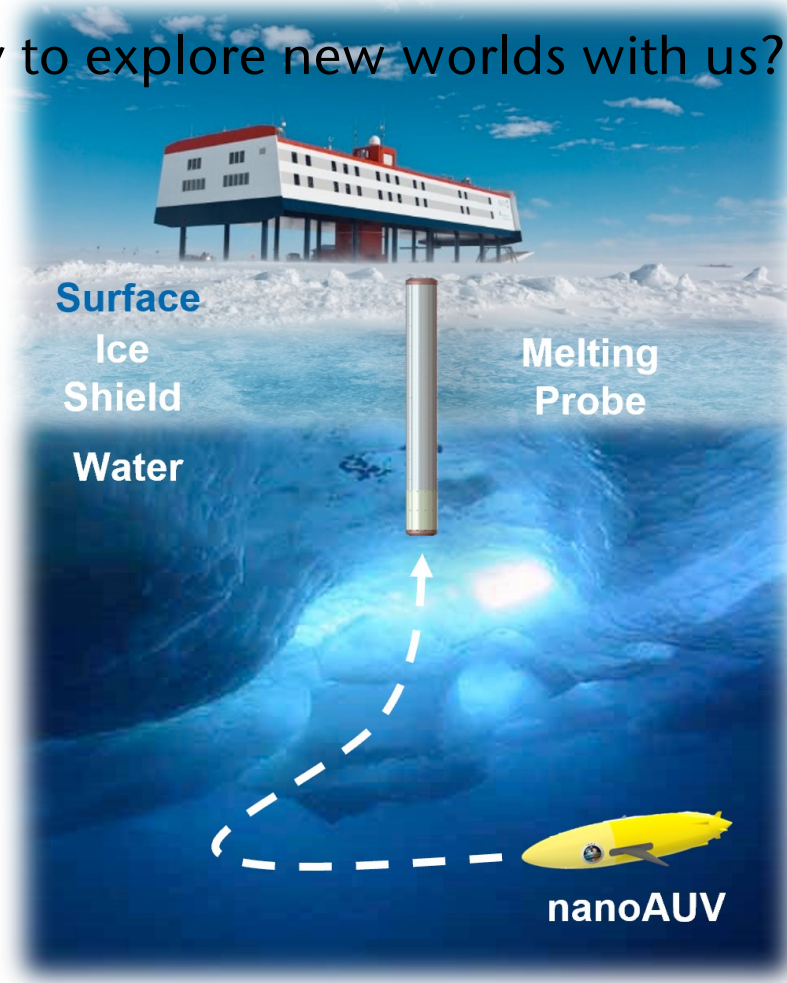


- This project is right for you, if
 - You study **computer science**, you know C++ and want to gain serious practice in computer graphics and VR programming
 - You study **digital media** and you are a creative mind with skills in 3D design & modelling (and/or 2D)
- If you like research & development in a space/underwater context
- Like to work with an interdisciplinary research team



- Prerequisites:
 - A bit of computer graphics / 3D knowledge
 - E.g., from “Computer graphics” or “Virtual Reality” course
 - A bit of programming skills in C/C++ and/or modelling skills
 - A bit of interest in Robotics, autonomous systems, marine systems
- The envisioned project team: mix of CS & DM students
- Further info:
 - bachmaye@uni-bremen.de & cgvr.informatik.uni-bremen.de
- Great opportunities for Master theses subsequently
- Language: German/english

Ready to explore new worlds with us?



Contact us at
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