

## Master thesis (M.Sc.)

### **Development and evaluation of syntactic buoyancy materials for use in buoyancy-variable underwater systems at up to 1000 meters diving depth**

Due to their propulsion concept, buoyancy-variable underwater systems such as gliders and floaters are dependent on a very precise adjustment of their volume-to-weight ratio. Syntactic materials are used at high diving depths to give underwater systems additional buoyancy. Within the scope of the work, different variants for syntactic buoyancy materials for an underwater glider are to be developed. Both the classic approach of a polymer hollow glass sphere mixture and other innovative methods, for example using 3D printing, are to be considered and compared. After the development, at least one variant is to be manufactured and tested for its suitability for use at depths of up to 1000 meters. For this purpose, an appropriate test procedure is to be developed.

The following points must be addressed in detail:

- Research on the theoretical principles of hydrostatics and the requirements for buoyancy-variable underwater systems
- Research on existing solutions for syntactic buoyancy materials on the market
- Development and production of customized solutions with innovative approaches for use in an underwater glider
- Development and implementation of a test procedure for experimental testing of the solutions
- Documentation of the investigations as well as presentation and discussion of the results

The written report must be submitted before the end of the project period. It is expected that the results of the work will be presented in a colloquium in a lecture of about 20 minutes and defended in a subsequent discussion.

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2. Prof. Dr.-Ing. Sascha Kosleck

Candidate: xxxxxx

Project period: xx.xx.xxxx bis xx.xx.xxxx

Start date: xx.xx.xxxx

Rostock, xx.xx.xxxx

Prof. Dr.-Ing. Sascha Kosleck