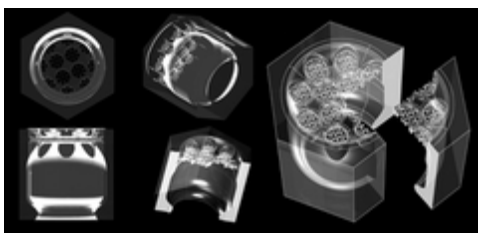
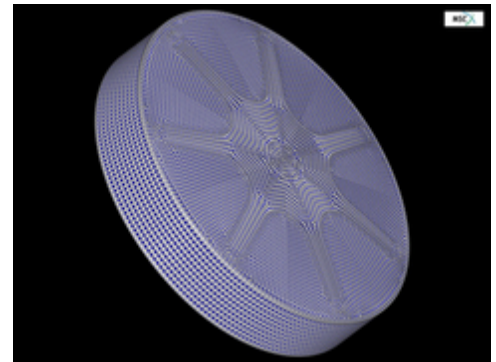


PlanktonTech - New approaches into bionics and evolution research

Evolutionary principles leading to high performance lightweight constructions in Marine Planktonic Organisms – fundamentals and technical applications

PlanktonTech is a Helmholtz Virtual Institute founded in 2008 at the Alfred Wegener Institute for Polar and Marine Science by the Helmholtz Society, the largest science organization in Germany. PlanktonTech concentrates on fundamentals of the evolutionary mechanisms leading to the optimisation of lightweight structures in marine plankton organisms. Newest methods in microscopy and modern computer engineering will help to understand the function and development of these structures. Additionally, their complex geometries will be combined with composite materials and used for prototypes of technical lightweight structures. Helmholtz Virtual Institutes are typically international, interdisciplinary and interinstitutional. Besides the Alfred Wegener Institute, Harvard University, Rutgers University, the universities of Kiel and Freiburg, the University of Technology of Berlin, the ITV Denkendorf, and the Institute of Lightweight Construction Jena are members of PlanktonTech.

The research within the virtual institute of PlanktonTech focuses on the remarkable shells of Diatoms and Radiolaria, which are highly stable with low material use. Using modern microscopic techniques, the shells will be transferred into 3D models that subsequently can be analysed with different calculation and optimisation methods, allowing the investigation into the biomechanical qualities and the principles of the evolution of the sea organisms. The 3D - data are also to be used for lightweight constructions in industrial applications. The combination of lightweight construction structures with composite materials is yet another main focus. This combination is meant to lead to the development of new products in numerous branches, such as architecture, car construction and medical technology.



PlanktonTech plays an important role in the new scientific and technical approach called "Bremerhavener Schule für Leichtbau" ("Bremerhaven school for lightweight construction"), including, amongst others, the [Intitute for Marine Resources \(Imare\)](#) and the [Friedrich Hustedt Diatom Centre](#), one of the world's largest collections of diatom shells.