

Fraunhofer-Allianz Verkehr

The Fraunhofer Transport Alliance bundles the traffic related competencies of its member institutes and works in individual transport sectors in different working groups.

The aim of the working group Waterborne is to support shipping companies, shipyards, ports as well as logistics service providers and the maritime supply industry in the fulfillment of their tasks and to develop tailor-made solutions for customers. Fraunhofer Waterborne offers the following competencies: ship operation, shipbuilding, measurement systems, maritime technology as well as maritime logistics, – politics and – communication.

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SMM 2022

Fraunhofer
Waterborne



Fraunhofer CML Innovating the Maritime Sector

Fraunhofer CML develops new solutions for the maritime sector and the maritime supply chain. At SMM 2022, the CML showcases developments for autonomous maritime technologies, the use of artificial intelligence in innovative solutions and software solutions for operational ship management. Among others: the autonomously operating research platform SeaML, the remote control of a rescue boat by means of virtual reality, damage detection by imaging methods and the optimization of personnel planning and deployment on board.

Fraunhofer FKIE Maritime Cyber Security

The increasing digital connectivity in the shipping industry requires modern cyber security approaches. Fraunhofer FKIE develops offensive and defensive solutions for the automated development process of secure integrated bridge systems. The »Bridge Attack Tool« and the »Cyber Incident Monitor« can identify vulnerabilities and validate protective countermeasures to harden maritime systems in terms of cyber security.

Fraunhofer ICT Chemical Technology

Energy and propulsion are a focal point at Fraunhofer ICT. Currently, silicon particles are also being investigated as an energy carrier in the maritime sector. As with hydrogen, there is no need to store the combustion product for recycling. Direct combustion with water produces heat and pure hydrogen to meet the energy demand for propulsion and electricity. According to our study, a cruise ship can thus save up to 50% of its energy consumption.

Fraunhofer IFAM Advanced Materials

In the field of maritime technologies, Fraunhofer IFAM deals with inquiries from the shipbuilding and offshore industries. Our focus ranges from corrosion protection and functional coatings to testing and inspection facilities. Especially the evaluation of surfaces is an enormous challenge in shipbuilding due to the size. To facilitate this process, an automated testing system for the evaluation of surface conditions has been developed at the institute, which we will present at SMM.

Fraunhofer IGP Intelligent Maintenance Management for Offshore Installations

IGP will be presenting a fully digitalised maintenance management system at SMM. Whereas in the past there were media discontinuities due to the need to carry numerous analogue documents for the inspection and maintenance of offshore plants, the process-accompanying documentation now takes place exclusively via app. Relevant information is provided on a process-specific basis using augmented reality. The result is a reduction in errors during execution and the streamlining of peripheral processes.

Fraunhofer IPM

Laser Scanning under water

In the future, underwater structures can be examined with the aid of laser-based measurement technology. With its ULI underwater LiDAR system, Fraunhofer IPM has for the first time enabled optical 3D measurements over distances of several tens of meters in turbid water. ULI measures ten times more accurately than sonar systems. The Airborne Bathymetric Laser Scanner ABS surveys shallow waters from the air and provides data for 3D maps. The system uses multi-wavelength LiDAR to measure seafloor topography.

Fraunhofer ISI Systems and Innovation Research

We conduct research on implementation and transformation pathways in transportation. Modelling tools include the agent-based transformation model MATISSE-SHIP. Simulation results for scenarios for large reductions in greenhouse gas emissions from shipping were developed jointly with the maritime industry. They show that even if there is no global agreement on the future of shipping, the fleet will change from diesel engines to alternative propulsion systems.



Fraunhofer IWES Sustainable Maritime Mobility

Our work focuses on wind power systems, design concepts and scientific studies for zero-emission shipping. The focus is on maritime hydro- and aerodynamics, automation and systems engineering, and materials technology. Together with Emden/Leer University of Applied Sciences, we bring together powerful modeling and simulation with measurement technology in the laboratory and at sea. Furthermore, we use crossover and upscaling effects between sail technology and conventional wind energy systems.

Fraunhofer LBF Research with system

In order to monitor systems and processes, the LBF is developing smart sensors that act independently of energy by means of elements for energy generation, so-called harvesters, and can thus be placed in places that are difficult to access. A rotary harvester is presented for applications in the drive train. To reduce vibrations, the LBF is developing vibroacoustic metamaterials that are characterised by spatially integrated systems for vibration reduction and achieve a broadband effect even under lightweight construction requirements.