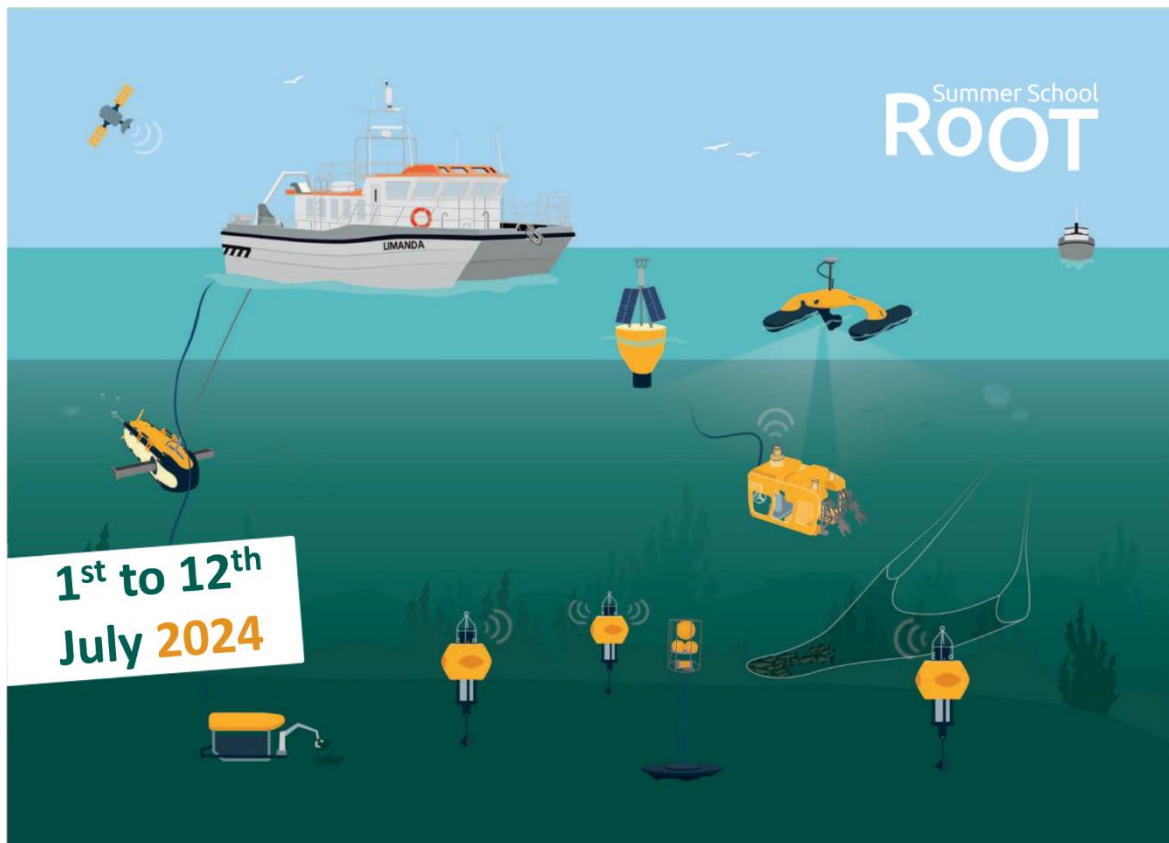


Summer School
ROOT
Rostock
Ocean Technology

- Program 2024 -



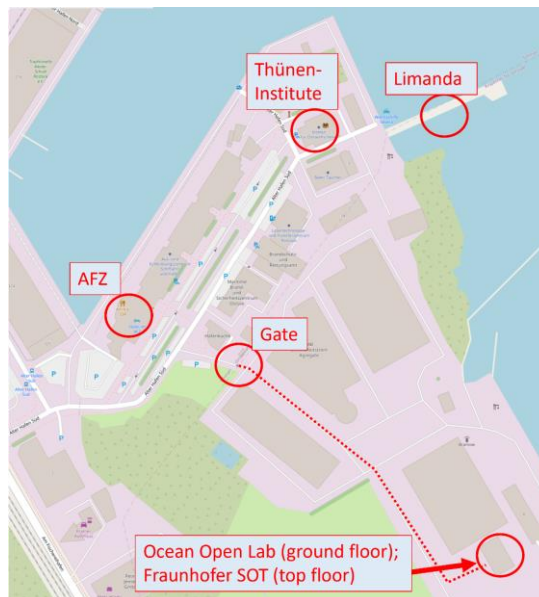


	Monday, 1st July	Tuesday, 2nd July	Wednesday, 3rd July	Thursday, 4th July	Friday, 5th July	Saturday, 6th July	Sunday, 7th July	Monday, 8th July	Tuesday, 9th July	Wednesday, 10th July	Thursday, 11th July	Friday, 12th July
Location	Thünen Institute	Ocean Open Lab	URO	Thünen Institute	Ocean Open Lab	Hamburg	Stralsund	Baltic Sea/DOL	BSH	IOW	Thünen Institute	Thünen Institute
Theme		Focus day Warnow-station project	Focus day Warnow-station project	Focus day seafloor detection	Focus day Warnow-station project				Focus day seafloor detection	Focus day Warnow-station project		
8:00												
9:00	Opening session & Icebreaker OTC Team	Introduction Sven Hille & Ralf Prien (IOW)	Subsea Mobility & Autonomy	Anna Canning (Atrium Environmental)	Framework Robotics GmbH	Field trip International Maritime Museum Hamburg (optional)	Field trip Ozeaneum Stralsund (optional)	Gear Demonstration on Limanda	Introduction BSH & OTC-Stone project Jean Guy Nistad (BSH) & Svenja Papenmeier (IOW)	Oliver Zieliski (IOW)	Presentation preparation	Presentation of results Warnow project
10:00	Break		Hands-on practice Chair of ocean engineering (URO)	Introductory talk & ROV Demo Evologics GmbH	Installing sensor at pier Chair of ocean engineering (URO)				Break	Break	Tour Elisabeth Mann Borgese (Research Vessel)	
11:00	Introduction OTC Uwe von Lukas (Fraunhofer IGD)	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Helen Morrison (BSH)	Workshop Jens Faber (IOW)	Keynote Alles Alge e.V.	Break
12:00	Peer Fietzek Kongsberg Discovery GmbH								Workshop „Design thinking“ Ingrid Kussatz	Talk „Acoustic seafloor detection“ Peter Feldens (IOW)	Measuring Warnow parameters	Workshop Matthias Hinz (BSH)
13:00	Break	Hands-on practice Chair of ocean engineering (URO)	Subsea Europe Services GmbH	Lunch	Lunch	Lunch	Lunch	Lunch	Break	Break	Break	Break
14:00	SOT & DOL Sascha Krohmann (Fraunhofer)								Kraken Power GmbH			
15:00		Pizza night with alumni							Christoph Humberg (University of Stockholm)	Hang out at the beach (Warnemünde)	Barbecue with alumni @Thünen	
16:00	City tour in Rostock											
17:00												
18:00												
19:00												

Two alternating groups (same program on both days, groups switch on Monday)
 Keynote talk
 Company tour

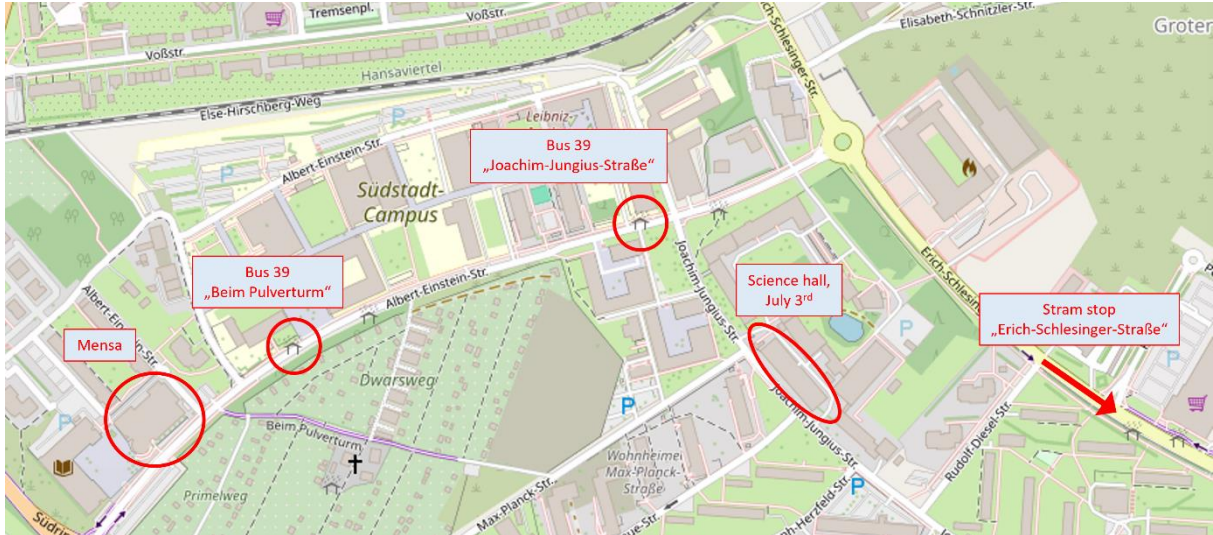
Locations

AFZ:	AFZ Aus- und Fortbildungszentrum Rostock GmbH, Alter Hafen Süd 334, 18069 Rostock; Canteen: Lokal „Am KAI 334“
Fraunhofer SOT:	Fraunhofer Smart Ocean Technologies, Alter Hafen Süd 6, 18069 Rostock
Limanda:	University of Rostock’s research catamaran
Ocean Open Lab:	Alter Hafen Süd 6, 18069 Rostock
Thünen:	Seminar room, Thünen-Institute for Baltic Sea Fisheries, Alter Hafen Süd 2, 18069 Rostock



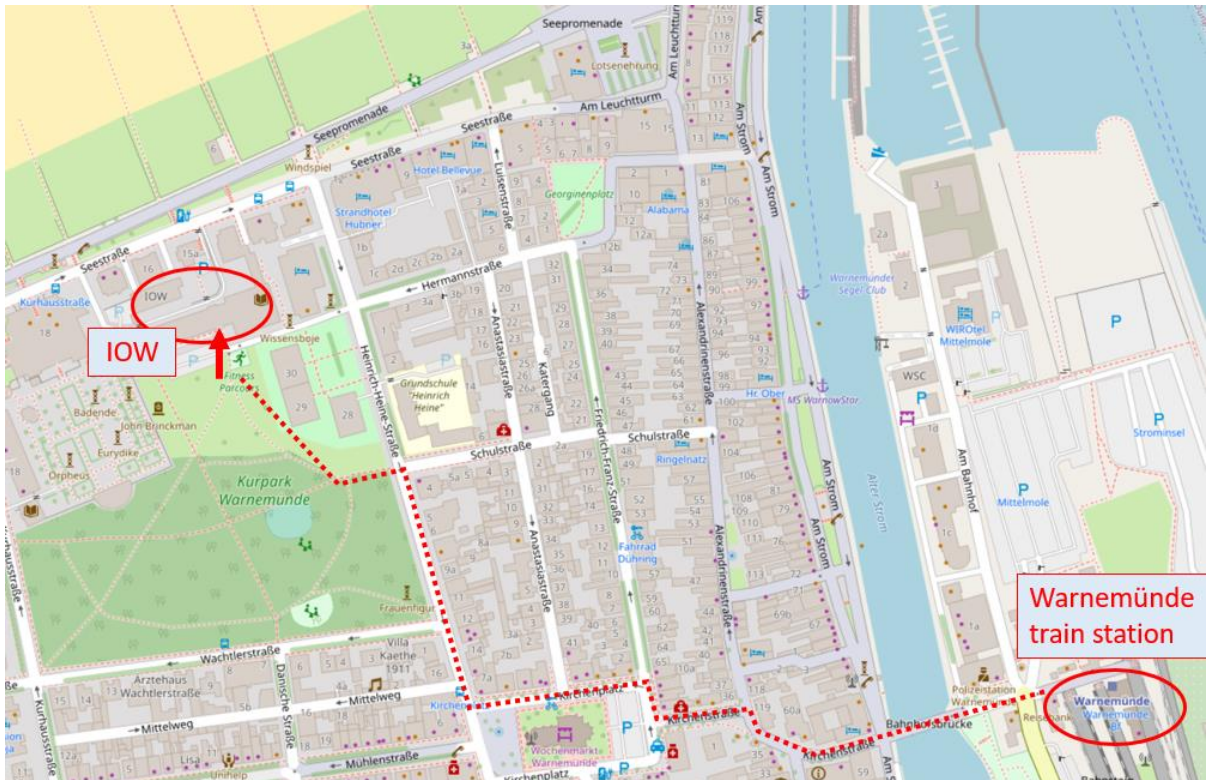
URO (Wednesday, July 3rd):

University of Rostock, Research hall (Forschungshalle),
Albert-Einstein-Str. 2, 18059 Rostock



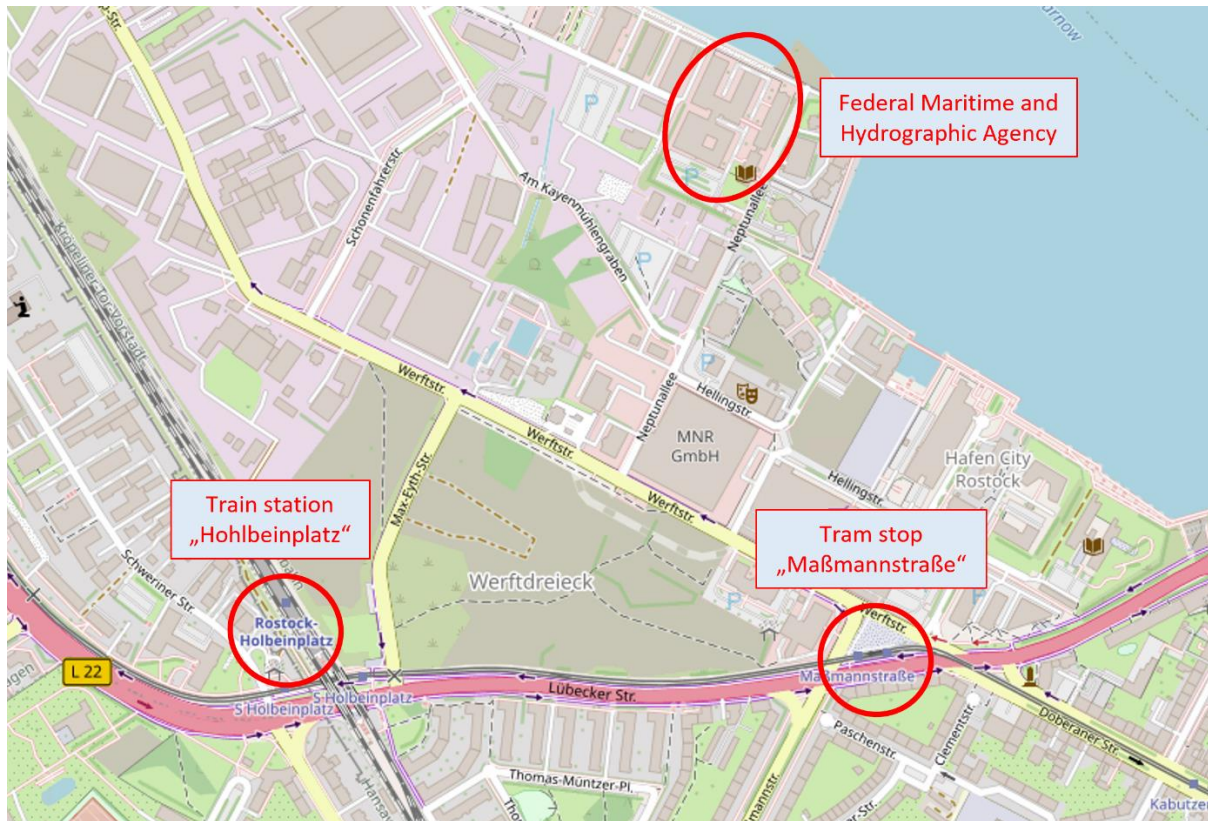
IOW (Wednesday, July 10th):

Leibniz-Institut für Ostseeforschung, Warnemünde
Seestraße 15, 18119 Rostock



BSH (Tuesday, July 9th):

Federal Maritime and Hydrographic Agency, Neptunallee 5,
18057 Rostock



Monday: July, 1st

Meet the Ocean Technology Campus!

We will break the ice and get to know each other. Uwe Freiherr von Lukas, head of the chair for marine graphics at the University of Rostock (URO) and the Ocean Technology Campus Steering Committee, as well as the director of the Fraunhofer Institute for Computational Graphics Research (IGD) Rostock, will then give an introduction about the Ocean Technology Campus Rostock.

After lunch, Peer Fietzek (Senior Business Developer Manager Ocean Science at Kongsberg Discovery GmbH) will give a keynote talk about his motivation, career and opportunities in ocean tech. Followed by this, you will get a tour around the Ocean Technology Campus, where we will gain insight into the Fraunhofer-Gesellschaft and their department Smart Ocean Technologies (SOT) and the DOL (Digital Ocean Lab).

To finish off the day, we will get a chance to get to know the beautiful city of Rostock better and take part in a guided tour. Please grab something to eat before the tour.

When?	What?	Where?
09:00 – 10:00	Registration & Opening Session	Thünen
10:00 – 11:15	Icebreaker	Thünen
11:00 – 11:15	Break	
11:15 – 12:00	Introduction Talk Ocean Technology Campus by Uwe Freiherr von Lukas (Fraunhofer IGD)	Thünen
12:00 – 13:00	Lunch	AFZ
13:00 – 14:00	Keynote by Peer Fietzek (Kongsberg Discovery GmbH)	Thünen
14:30 – 16:30	Introduction and tour Ocean Technology Campus Basecamp with Patrick Bethke (SOT) & Sascha Krohmann (DOL)	Fraunhofer SOT
18:30 – 20:00	Tour of the city of Rostock (grab something to eat before)	Start: Tram station Neuer Markt

Tuesday: July 2nd

Focus day: Warnow-station project

Sven Hille and Ralf Prien (IOW) will introduce the Warnow-station project - showcasing the OTC Ocean Talents school work - and the prevailing conditions of the Baltic Sea and the Warnow river. They will also give insights in sensor-based measuring systems at the IOW, such as the HyFiVE project (**H**ydrography on **F**ishing **V**essels) and GODESS (**G**otland **D**eep **E**nvironmental **S**ampling **S**tation). Afterwards you will be visiting the Warnow station and ask questions with a focus on the requirements of the analysis, which will help you in the active work phase to discuss ideas and to design a target process for a prototype. After lunch, Ingrid Kussatz from the Yamaton team will lead a workshop whose main aim is to encourage participants to use their own practical skills in a project of their own.

We will end the day with a company presentation by Kraken Power GmbH.

When?	What?	Where?
09:00 – 11:00	Introduction of the Warnow-station project & prevailing conditions, presentation of sensor-based measuring system (CTD, Marnet Monitoring Stations) by Sven Hille & Ralf Prien (IOW)	Ocean Open Lab
11:00 – 12:00	Visiting Warnow-station, gain information for project by Sven Hille (IOW)	SOT pier

When?	What?	Where?
12:00 – 13:00	Lunch	AFZ
13:00 – 15:30	Workshop “User centered design for product innovation”: general introduction, methods of requirement analysis and active project work by Ingrid Kussatz (Yamaton)	Ocean Open Lab
15:30 – 16:30	Presentation of Kraken Power GmbH	Ocean Open Lab

Wednesday, July 3rd

Focus day: Warnow-station project with subsea mobility & underwater technologies

Please, bring your Laptop!

Large-scale and constant marine data collection throughout the water column requires autonomous underwater measurement systems that can operate under changing conditions and over long time periods remotely. On this day, you will gain insights into the design and operation of an autonomous underwater system for data collection by the team of the chair in ocean technology. You will be building a working mini-underwater measurement station for the Warnow-station project!

We will end the day with networking and pizza sponsored by Brieze Schifffahrts GmbH & Co. KG.

When?	What?	Where?
09:00 – 11:00	Keynote Subsea Mobility & UW Technologies & Presentation of prototype by Louis Rautmann & Jonas Thyran (URO)	URO
11:00 – 12:00	Working on Warnow-station project supervised by Ansgar Leefken and his team (URO)	URO
12:00 – 13:00	Lunch	Mensa
13:00 – 18:00	Working on Warnow-station project supervised by Ansgar Leefken and his team (URO)	URO
18:00 – open end	Pizza for dinner with RoOT alumnis	URO

Thursday, July 4th

Focus day: acoustic seafloor detection

We will start with an inspirational talk by Anna Canning (Atrium Environmental), who will talk about her motivation and finding her way from academia to starting her own company.

Afterwards the company EvoLogics GmbH, part of the OTC_BASE and OTC-DaTA projects, will give a demonstration and introduction of the ROV (remotely operated underwater vehicles) with insight into the preparation and operating process of ROVs. You will gather and review data with a side-scan sonar system mounted to an autonomous surface survey vehicle.

After lunch Peter Feldens (IOW) introduce you with a lecture to acoustic seafloor detection. At the end of the day, Subsea Europe Services GmbH, which is part of the Ocean Technology Campus Rostock, will be presenting its devices in the water. The company automates complex sensor systems and combines them with unmanned surface and underwater vehicles to create autonomous measuring systems. The data is required for offshore wind farms, munitions recovery and the safety of marine infrastructure in the North and Baltic Seas.

When?	What?	Where?
09:00 – 10:00	Keynote by Anna Canning (Atrium Environmental)	Thünen
10:00 – 12:30	EvoLogics GmbH– demonstration of ROV	Thünen/ SOT pier
12:30 – 13:30	<i>Lunch</i>	Mensa
13:30 – 15:00	Talk: acoustic seafloor detection by Peter Feldens (IOW)	Thünen
15:00 – 16:30	Company Introduction & gear presentation Subsea Europe Services GmbH	Fraunhofer

Friday, July 5th

Limanda & Focus day: Warnow-station project (water-column measurement)

The participants will be split into two groups (8 persons per group) for Friday and Monday, groups switch program Monday, July 8th.

Group 1: Gaining insights into field sampling, challenges and new approaches in practice on a field trip with our research catamaran “*Limanda*” to the DOL (Digital Ocean Lab). Ever seen zooplankton under the microscope alive and work with acoustic seabed detection on board? We provide lunch packs for that day.

Group 2:

Please, bring your Laptop!

To start the day, Framework Robotics GmbH, one of the leading Start Up companies in the ocean technology sector will introduce themselves and show their workplace and some of their products. Afterwards participants will install and test their own construction for the Warnow-station sensor at the pier guided by the chair of ocean technology team (URO). After lunch, 4

participants will carry out vertical water-column measurements with the Warnow-station sensor accompanied by Sven Hille (IOW), while another 4 participants will carry out horizontal CTD measurements along a transect on the Warnow on board of the *Klaashahn* with Jens Faber (IOW) to detect horizontal changes along the Warnow. After 2 hours the groups switch.

Group 1:

When?	What?	Where?
08:00 – 18:00	<i>Limanda</i> trip to the DOL (Lunch packs)	<i>Limanda</i>

Group 2:

When?	What?	Where?
09:00 – 09:30	Company Introduction: Framework Robotics GmbH	AFZ
10:00 – 12:00	Warnow-station project: installing sensor at pier with Jonas Thyran (URO)	SOT pier
12:00 – 13:00	<i>Lunch</i>	AFZ
13:00 – 18:00	Warnow-station project: measurements with Sven Hille (IOW) Transect Warnow measurements on <i>Klaashahn</i> with Jens Faber (IOW)	SOT pier

Saturday, July 6th

Field trip to the International Maritime Museum Hamburg

The private museum in Hamburg's HafenCity houses a collection of model ships, construction plans, uniforms, German ocean science and maritime art.

Meeting in front of the main train station @ 8:45 AM

Departure by train to Hamburg @ 9:08 AM, arrival in Hamburg @ 11:38 AM

Guided tour (90 min) @ 1:00 PM, afterwards time to spend on your own.

Sunday, July 7th

Field trip to the Ozeaneum in Stralsund

The natural history museum is part of the German Oceanographic Museum and features exhibitions and aquariums focused mainly on the North Sea and Baltic Sea. Information on departure will be announced in due course.

Monday, July 8th

Limanda & Warnow-station project (water column measurement)

The participants will switch groups from Friday, July 5th (see schedule above).

Tuesday, July 9th

Focus day: acoustic seafloor detection – OTC-Stone project

Please, bring your Laptop!

Acoustic seafloor detection is one of the research fields of the Ocean Technology Campus Rostock. You will meet the Federal Maritime and Hydrographic Agency (BSH). They will provide the participants with insights into the OTC-Stone project and workflows of acoustic seafloor detection using deep learning. Upon arrival, there will be introductory talks about the BSH by Jean-Guy Nistad (BSH) and cooperation with the IOW by Svenja Papenmeier (IOW), who will also talk about habitat mapping and the relevance of reefs followed up by an introduction to the OTC-Stone project. Matthias Hinz (IOW & BSH) will introduce the OTC-Stone workflow and methods of AI-based boulder detection.

After a short break, “Open source in marine science” will be in the spotlight with a keynote by Helen Morrison (BSH), which will provide an insight on the value, perspectives and current status, followed by a discussion part. Composed of open source software is also the OTC-Stone workflow that will be demonstrated live by Matthias Hinz.

After lunch, during a data workshop, participants will first be guided and then work independently on the OTC-Stone workflow (data analysis) and Open Source software for AI-based object detection. It will be suitable for all levels of experience, but if you want to gain in-depth knowledge, you can prepare by familiarizing yourself QGIS (<https://qgis.org>), Python (e. g. with Anaconda & Spyder) and the YOLO object detection algorithms using either Ultralytics (<https://docs.ultralytics.com>) or Darknet (<https://darknetcv.ai>). You may send an SSH public key to matthias.hinz@bsh.de access to the OTC-Stone demo server.

When?	What?	Where?
09:00 – 09:15	Introductory talks BSH and cooperation to IOW by Jean-Guy Nistad (BSH) & Svenja Papenmeier (IOW)	
09:15 – 09:40	Introductory talk about habitat mapping and the OTC-Stone project by Svenja Papenmeier (IOW)	
09:40 – 10:00	Talk about the OTC-Stone workflow and methods of AI-based boulder detection by Matthias Hinz (BSH & IOW)	

10:00 – 10:15	<i>Break</i>	BSH
10:15 – 11:15	Keynote Talk “Open Source for Users and Developers” by Helen Morrison (BSH)	
11:15 – 11:45	Live demonstration of the OTC-Stone software by Matthias Hinz (BSH & IOW)	
11:45 – 12:45	<i>Lunch</i>	
12:45 – 13:45	Workshop: guided application of OTC-Stone workflow by Matthias Hinz (BSH & IOW)	
13:45 – 14:00	<i>Break</i>	
14:00 – 17:00	Workshop: independent application of OTC-Stone workflow supervised by Matthias Hinz (BSH & IOW)	

Wednesday, July 10th

Focus day: Warnow-station project – water-column measurements and analysis

Please, bring your Laptop!

This day will focus on the Baltic Sea ecosystem and challenges, mixing with keynotes by Oliver Zielinski (director of the IOW) introducing the IOW and talking about optical sensorics, as well as Christoph Humborg (director of the Baltic Sea Science Centre Stockholm University) providing insight on the Baltic Sea Health focusing on previous approaches and opportunities with new technologies. Keynotes are followed by a discussion part in which all the participants are invited to actively take part in.

The workshop part that day will introduce you to the analysis of water-column data measured and to identify water-column changes along the Warnow river.

When?	What?	Where?
09:00 – 10:00	Keynote by Oliver Zielinski (director of the IOW)	IOW
10:00 – 10:15	<i>Break</i>	
10:15 – 12:00	Workshop: water-column data analysis with Jens Faber (IOW)	
12:00 – 13:00	<i>Lunch</i>	
13:00 – 16:15	Workshop: water-column data analysis with Jens Faber (IOW)	
16:15 – 16:30	<i>Break</i>	
16:30 – 17:30	Keynote by Christoph Humborg (Stockholm University) on Monitoring the Baltic Sea Health	
18:00 -	Hang out at the beach	Warnemünde

Thursday, July 11th

Sustainable Ocean Use: How can technology help?

We will get the chance to visit the research vessel of the IOW *Elisabeth Mann Borgese* at the port.

Sustainability will be in the focus during the second half of the day. Before lunch three young and inspiring researches, Claudia Farack, Christian Schulz and Christopher Gebhardt, will talk about algae farming and their way from an idea to the foundation of an association for the protection and the promotion of science and research into aquaculture with algae.

After lunch Christopher Zimmermann, director of the Thünen Institute, will speak about fisheries management and novel monitoring approaches and have an open discussion round, followed by a tour showing different research instruments by Andreas Hermann (Thünen).

We will finish with a networking BBQ sponsored by Briese Schifffahrts GmbH & Co. KG.

When?	What?	Where?
09:00 – 10:00	Group work on results presentations for July 12 th	Thünen
10:00 – 11:00	Visiting reseach vessel <i>Elisabeth Mann Borgese</i>	Port
11:00 – 12:00	Talk Alles Alge e.V. by Claudia Farack, Christian Schulz & Christopher Gebhardt	Thünen
12:00 – 13:00	<i>Lunch</i>	AFZ
13:00 – 14:45	Sustainable Ocean Use – Discussion by Christopher Zimmermann (Thünen)	Thünen
14:45 – 15:00	<i>Break</i>	
15:00 – 17:00	Novel fisheries monitoring equipment walkthrough with Andreas Hermann (Thünen)	Thünen
18:00 – open End	Barbecue on the grounds of the Thünen Institute	Thünen

Friday, July 12th

Presentations & Feedback

The last day will be started by presenting your results of the Warnow-station project.

Finally, we will have a concluding get-together to feed back on the previous days and to recap all the information gained throughout the summer school.

When?	What?	Where?
09:00 – 11:00	Presentation of results	Thünen
11:15 – 11:30	<i>Break</i>	
11:30 – 12:30	Feedback/Evaluation	Thünen

With special thanks to:



And with invited speakers from:



We thank your sponsor for supporting our networking events

