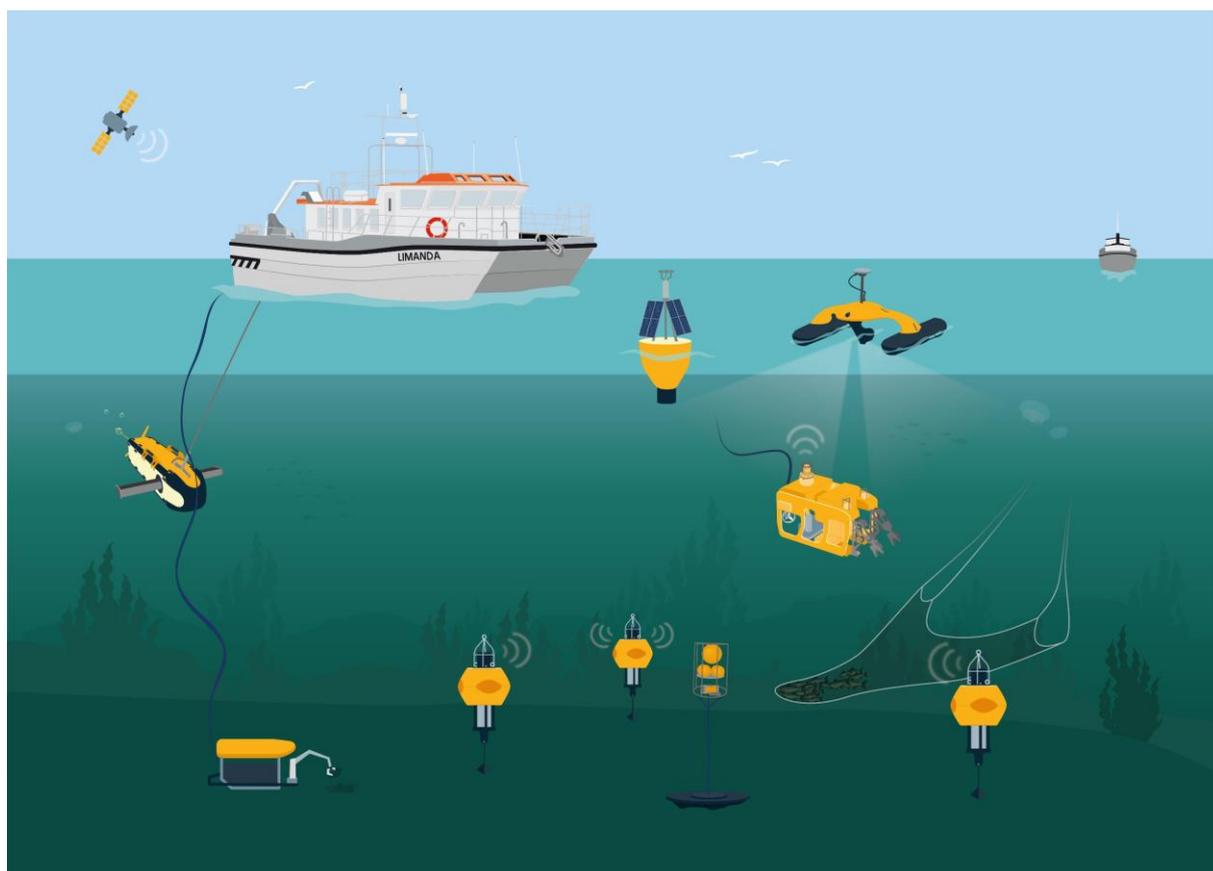


Summer School  
**ROOT**  
Rostock  
Ocean Technology

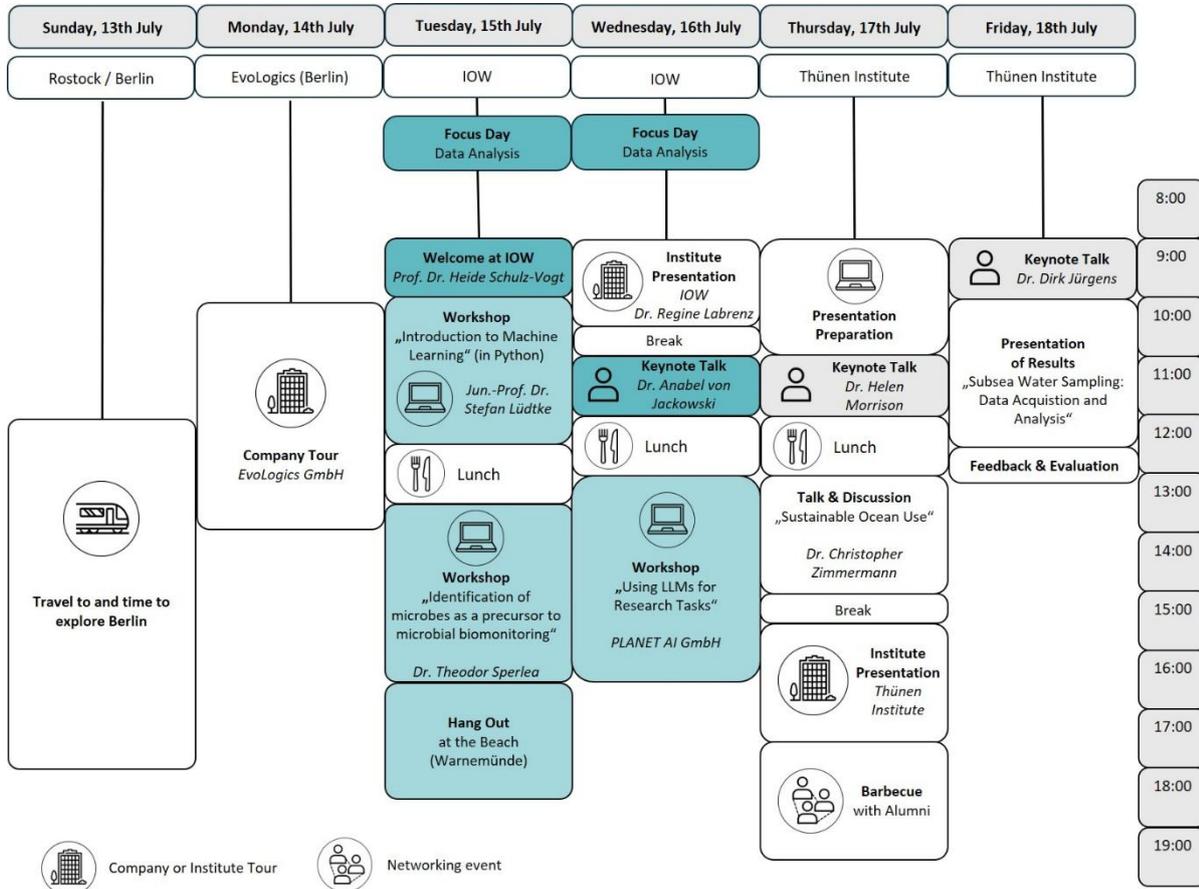
- Program 2025 -



|          | Monday, 7th July                                  | Tuesday, 8th July   | Wednesday, 9th July   | Thursday, 10th July  | Friday, 11th July   | Saturday, 12th July   |
|----------|---|---|---|--|---|---|
| Location | Thünen Institute                                  | SOT / Thünen Institute  | Uni Rostock   | Baltic Sea / DOL   | OTC-Campus  | Stralsund   |
| Topic    |   | Focus Day<br>Data Acquisition   | Focus Day<br>Data Acquisition   |  | Focus Day<br>Data Acquisition                                       |   |
| 8:00     |   |   |   |  |   |   |
| 9:00     | Opening Session & Icebreaker<br>OTC Team          | Introduction to Challenge<br>„Design and Construction of a Subsea Water Sampling Device“<br><br>Dr. Heike Link, Leonie Kandler & Fraunhofer SOT | Hands-on Practice<br><br>Jonas Thyrrann & Louis Rautmann<br>(Chair of Ocean Engineering, URO) | <br>Gear Demonstration on Limanda<br>Dr. Heike Link<br><br>Testing of Subsea Water Sampling Device with ROV<br>Fraunhofer SOT | Company Tour<br>Framework Robotics GmbH                             | <br>Field Trip<br>Ozeaneum Stralsund (optional) |
| 10:00    | Break   |   |   |  | Break   |   |
| 11:00    | Introduction to OTC<br>Prof. Dr. Uwe von Lukas    | Lunch   | Lunch   |  | Lunch   |   |
| 12:00    | Lunch   | Lunch   | Lunch   |  | Lunch   |   |
| 13:00    | Company Tour<br>Kraken Power GmbH and Campus Tour | Workshop<br>„Technical Ideation“<br>Leonie Kandler  | Hands-on Practice<br><br>Jonas Thyrrann & Louis Rautmann<br>(Chair of Ocean Engineering, URO) | Company Tour<br>Subsea Europe Services GmbH  | Film Screening<br>DEEP RISING<br>by Matthieu Rytz (2024) (optional) |   |
| 14:00    |   |   |   |  |   |   |
| 15:00    |   |   |   |  |   |   |
| 16:00    |   |   |   |  |   |   |
| 17:00    |   |   |   |  |   |   |
| 18:00    |   |   |   |  |   |   |
| 19:00    | City Tour in Rostock                              |   | Pizza Night with Alumni   |  |   |   |

 Two alternating groups (same program on both days, groups switch)

 Keynote Talk



### Confirmed speakers:

- Prof. Dr. Uwe Freiherr von Lukas (Institute Visual and Analytic Computing, University of Rostock & Fraunhofer IGD)
- Sascha Krohmann (Head of Digital Ocean Lab Fraunhofer IGD)
- Dr. Heike Link (Department Maritime Systems, Faculty of Interdisciplinary Research, University of Rostock)
- Jun.-Prof. Dr. Stefan Lüdtkke (Institute Visual and Analytic Computing, University of Rostock)
- Dr. Theodor Sperlea (OTC-Genomics, Leibniz Institute for Baltic Sea Research Warnemünde (IOW))
- Dr. Christopher Zimmermann (Thünen Institute)
- Dr. Anabel von Jackowski (Early Career Ocean Professional (ECOP) Network Programme)
- Dr. Helen Morrison (Federal Maritime and Hydrographic Agency (BSH))
- Dr. Dirk Jürgens (Voith Turbo Marine)
- Prof. Dr. Heide Schulz-Vogt (Vice Director of Leibniz Institute for Baltic Sea Research Warnemünde (IOW))
- Dr. Regine Labrenz (Knowledge and Technology Transfer, Leibniz Institute for Baltic Sea Research Warnemünde (IOW))
- Dr. Henning Schröder and Dr. Martina Beese (OTC-Genomics2, Planet AI GmbH)

Monday: July, 7<sup>th</sup>

## 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 (OTC) 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 and a safety briefing, the group will split into two. One group will take a tour of the Kraken Power manufacturing area, while the others get oriented on the Ocean Technology Campus during a guided walk. Afterwards, the groups will switch.

Kraken Power is part of the Ocean Technology Campus in Rostock and of the internationally operating Kraken Robotics Inc. The company's activities in Rostock include the research, development and manufacture of pressure-tolerant batteries and battery charging systems. These technologies are used in defence, offshore energy and marine research.

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 with Antje Schröder. Please grab a snack before the tour. Afterwards, you're more than welcome to go for dinner to wrap up the day together at [Oliven](#), where we reserved a table for the group.

| When?         | What?   | Where?                                     |
|---------------|---|--|
| 09:00 – 10:45 | Opening Session & Ice Breaker   | Thünen Institute                           |
| 10:45 – 11:00 | <i>Break</i>  |  |
| 11:00 – 12:00 | Introduction Talk Ocean Technology Campus by Uwe Freiherr von Lukas (Fraunhofer IGD)                    | Thünen Institute                           |
| 12:00 – 13:00 | <i>Lunch</i>  | AFZ (sponsored by RoOT)                    |
| 13:00 – 16:00 | Presentation of Kraken Power GmbH with Merle Fruhner<br><br>meanwhile: campus tour of OTC by Heike Link | Thünen Institute & Kraken Power<br><br>OTC |
| 18:30 – 20:00 | Tour of the city of Rostock (grab a snack before)   | Start: Tram station <i>Neuer Markt</i>     |

Tuesday: July 8<sup>th</sup>

Focus day: Data Acquisition



On your second day you will be introduced to this year’s technical challenge: the design and construction of a subsea water sampling device. Through an interview with the challenge owner Sascha Krohmann (Fraunhofer SOT, Head of the Digital Ocean Lab), you will define user requirements to serve as a foundation for the following development process.

Building on the previously defined requirements, this workshop focuses on generating creative solution concepts for the subsea water sampling device. Using structured ideation techniques, you will explore and develop technical approaches to address this year’s challenge.

| When?         | What?  | Where?           |
|---------------|--|------------------|
| 09:00 – 12:00 | Introduction to challenge with Dr. Heike Link, Leonie Kandler & Fraunhofer SOT | Fraunhofer SOT   |
| 12:00 – 13:00 | <i>Lunch</i> (self-organized)  |                  |
| 13:00 – 15:30 | Workshop “Technical ideation” with Leonie Kandler                              | Thünen Institute |

## Wednesday, July 9<sup>th</sup>

### Focus day: Data Acquisition

In this session, you will pitch your ideas to experts from the Chair of Ocean Engineering and receive valuable feedback. Afterwards, you’ll dive into hands-on work in the workshop, using a prepared concept as the technical foundation. While time constraints don’t allow for fully spontaneous prototyping, this practical session offers the opportunity to explore key elements of marine engineering, apply tools and techniques, and gain valuable insights through teamwork.

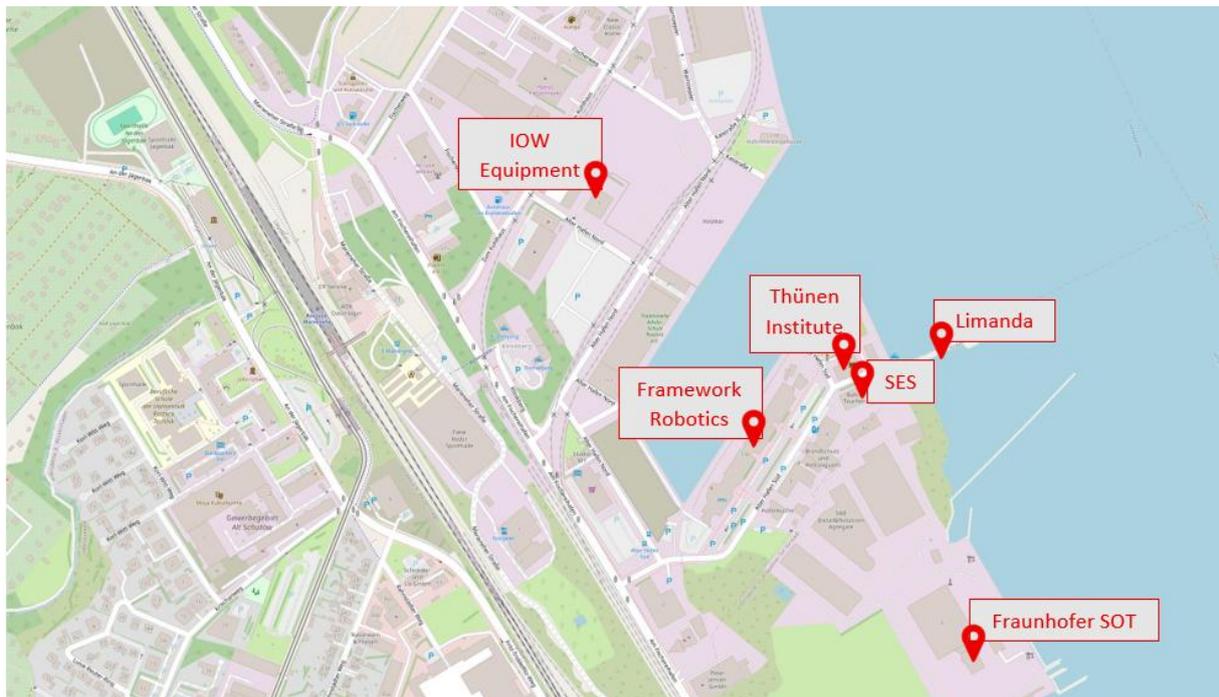
We will end the day with pizza and drinks.

| When?            | What?   | Where?                        |
|------------------|---|-------------------------------|
| 09:00 – 12:00    | Hands on practice with Jonas Thyrahn & Louis Rautmann (Chair of Ocean Engineering, URO) | URO, Albert-Einstein-Straße 2 |
| 12:00 – 13:00    | <i>Lunch at Mensa</i>   | Mensa                         |
| 13:00 – 18:00    | Hands on practice by Jonas Thyrahn & Louis Rautmann (Chair of Ocean Engineering, URO)   | URO, Albert-Einstein-Straße 2 |
| 18:00 – open end | Pizza for dinner with RoOT alumnis  | URO                           |

Thursday/Friday, July 10<sup>th</sup> /11<sup>th</sup>

### Device testing and gear demonstration on Limanda

You will be split into two groups: Group 1 will be aboard Limanda on Thursday, Group 2 will be aboard Limanda on Friday. Aboard the research catamaran you will be able to test your self-built subsea water sampling device with a ROV guided by Fraunhofer SOT and Dr. Heike Link will demonstrate additional gear.



| When?         | What?                                    | Where?  |
|---------------|--|---------|
| 08:00 – 18:00 | Limanda trip to the DOL (Packed lunches) | Limanda |

The respective other group will start the day by getting to know [Framework Robotics](#): Their motto, “What you need is what we build”, reflects their commitment to offering customised underwater solutions tailored to their clients' needs. Their modular system can be configured in many different ways to serve a variety of purposes. The same applies to their developed ROVs and AUVs.

After a short break, you can take a stroll to the IOW Equipment Depot, where you can browse the marine gear used by the IOW to equip its research ships.

In the second part of the day the [Subsea Europe Services GmbH](#) will introduce itself. Subsea Europe Services is a German company focused on providing its customers with simplified and cost-effective subsea equipment for marine data acquisition. Here you can buy or rent gear for purposes, such as autonomous underwater inspection, multibeam surveying or environmental monitoring.

| When?         | What?  | Where?                               |
|---------------|--|--------------------------------------|
| 09:00 – 10:00 | Company introduction Framework Robotics GmbH         | Framework Robotics                   |
| 10:00 – 10:30 | <i>Walk</i>  |                                      |
| 10:30 – 12:00 | Tour through IOW Equipment Depot by Martin Karallus  | IOW Equipment depot, Alter Hafen N 1 |
| 12:30 – 13:00 | <i>Lunch</i> (self-organized)                        |                                      |
| 13:00 – 14:30 | Company introduction Subsea Europe Services GmbH     | SES                                  |
| 14:30 – 16:00 | Film: DEEP RISING by Matthieu Rytz (2024) - optional | tbd                                  |

## Saturday, July 12<sup>th</sup>

### Field trip to the Ozeaneum in Stralsund

The Ozeaneum is a public aquarium in the German city of Stralsund. It is a main attraction of the German Oceanographic Museum (Deutsches Meeresmuseum). Here, the group will have a guided tour with Dr. Judith Denking. To take part in this trip, meet Leonie Kandler at Rostock Hauptbahnhof at Track 5 (Gleis 5) for RE 9 (63911). The train leaves at 9 am sharp, so please arrive at the station by 8:45 am.

## Sunday, July 13<sup>th</sup>

### Travel day to Berlin

You are free to travel to Berlin some time during the day and explore the city on your own.

Due to track maintenance, the connection to Berlin is currently more difficult than expected. On Monday, July 7, we will look for solutions together for the journey to and from Berlin.

Your accommodation can be found at the following address:

a&o Berlin Friedrichshain  
Boxhagener Str. 73  
10245 Berlin

## Monday, July 14<sup>th</sup>

### Company tour at EvoLogics

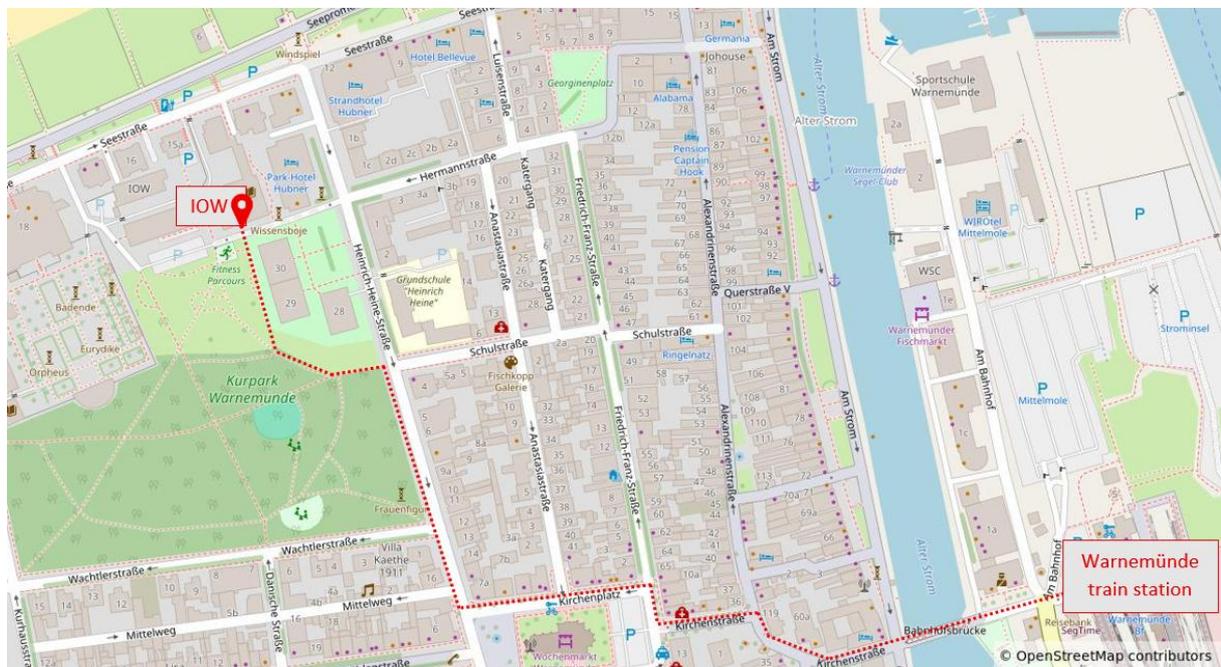
On your second day in Berlin, you will have the opportunity to visit [EvoLogics GmbH](#) at its headquarters. This Berlin-based company specialises in designing and manufacturing of underwater communication systems. These systems are based on bionic concepts and were modelled after the acoustic communication of dolphins. Since their founding in 2000, the company has developed a variety of products, including acoustic modems and positioning systems.

| When?         | What?                               | Where?   |
|---------------|-------------------------------------|--|
| 10:00 – 14:00 | Company introduction EvoLogics GmbH | EvoLogics<br>Wagner-Régeny-Str. 4,<br>12489 Berlin |

|            |                        |   |
|------------|------------------------|---|
|            |                        | tram station:<br>Landschaftspark<br>Johannisthal<br><br>„S-Bahn“ station:<br>Johannisthal |
| afterwards | Travel back to Rostock |   |

Tuesday, July 15<sup>th</sup>

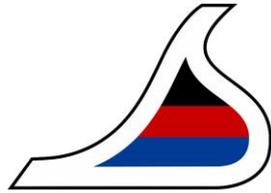
Focus day: Data analysis



Back in Rostock, you will be welcomed by Prof. Dr. Heide Schulz-Vogt at the IOW. Founded in 1992, the Leibniz Institute for Baltic Sea Research (German: Leibniz-Institut für Ostseeforschung Warnemünde, or IOW for short) as an oceanographic institute. Today, its main focus lies in the interdisciplinary study of coastal oceans and marginal seas, particularly the Baltic Sea. The institute is divided into the departments of physical oceanography, marine chemistry, biological oceanography and marine geology.

During the following workshop “Introduction to machine learning” with Jun.- Prof. Dr. Stefan Lüdtke you will learn about the basics of supervised machine learning and implement a model

in Python. We will also briefly cover how to use pre-trained models and discuss model evaluation.



## BRIESE RESEARCH

### FORSCHUNGSSCHIFFFAHRT

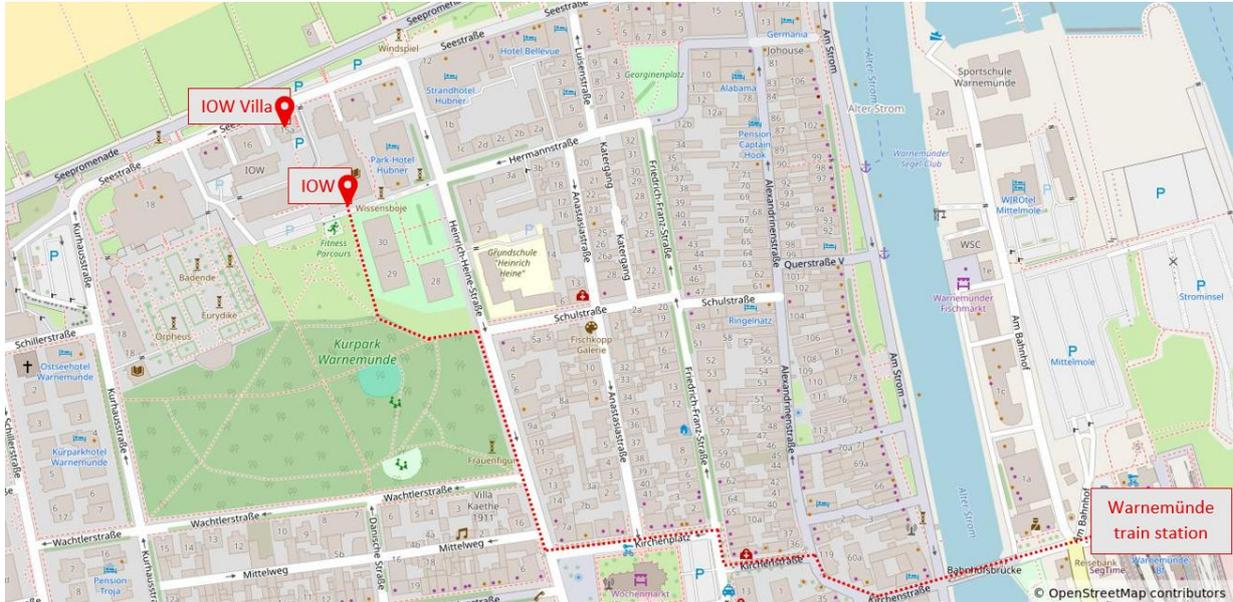
After a catered lunch by the “Grüne Kombüse” which is generously sponsored by Briese Schiffahrts GmbH & Co. KG, you will continue with the next workshop with Dr. Theodor Sperlea: “Identification of microbes as a precursor to microbial biomonitoring”. Biomonitoring is a central step in assessing the status of ecosystems. The idea behind biomonitoring is that some groups of organisms (so-called taxa) are sensitive to environmental changes; a high abundance of an indicator organism might indicate that the ecosystem is healthy, a low abundance might indicate that some intervention is needed. In our part of the course, we will show you some methods that are currently used or that might be used in the future in figuring out what microorganisms live in a sample. We will use the ML model you trained in a previous workshop and also do some lab-based identification work.

At the end of the day you are welcome to hang out at the nearby beach of Warnemünde - don't forget your swimwear in case you want to take a dip in the Baltic Sea!

| When?         | What?   | Where? |
|---------------|---|--------|
| 09:00 – 09:30 | Welcome to IOW by Prof. Dr. Heide Schulz-Vogt   | IOW    |
| 09:30 – 12:30 | Workshop: “Introduction to machine learning” by Jun. – Prof. Dr. Stefan Lüdtke                          |        |
| 12:30 – 13:30 | <i>Lunch</i> by the “Grüne Kombüse”, sponsored by BRIESE  |        |
| 13:30 – 16:30 | Workshop: “Identification of microbes as a precursor to microbial biomonitoring” by Dr. Theodor Sperlea |        |
| 16:30         | Hangout at the Beach  |        |

Wednesday, July 16<sup>th</sup>

### Focus day: Data analysis



You will start the day off in the Baltic Sea Research Villa with an Institute presentation of the IOW by Dr. Regine Labrenz. After a short break the mini-workshop from [ECOP-DACH](#) Coordinator Dr. Anabel von Jackowski will focus on the UN Decade of Ocean Science for Sustainable Development (2021-2030, 'the Ocean Decade'), which seeks to stimulate ocean science and knowledge generation. All under the central theme “The Science we need, for the ocean we want.” But what does this theme really refer to? You will discuss the global science-policy structures in place along with the programs, projects, and actions carried out during the UN Ocean Decade, and how these, together with efforts from the private sector, can contribute to identifying and overcoming existing gaps to address the numerous challenges the oceans and coastal areas are facing today.



## BRIESE RESEARCH

FORSCHUNGSSCHIFFFAHRT

After a catered lunch by the “Grüne Kombüse” which is sponsored generously by Briese Schiffahrts GmbH & Co. KG, you will dive into the next workshop titled: “Using LLMs for research tasks”. This workshop is brought to you by Dr. Martina Beese and Henning Schröder from PLANET AI GmbH and offers participants a foundational understanding of utilizing Large

Language Models (LLMs) in research. Through interactive sessions, you will explore effective prompting techniques and current applications of LLMs. They will engage in practical exercises to develop and test tools that optimize workflows. The workshop culminates with presentations and a critical review of LLM usage.

| When?         | What?   | Where?                                   |
|---------------|---|--|
| 09:00 – 10:30 | Institute Presentation IOW by Dr. Regine Labrenz            | IOW<br>"Baltic Sea<br>Research<br>Villa" |
| 10:30 – 11:00 | Break   |  |
| 11:00 – 12:00 | Keynote Talk by Dr. Anabel von Jackowski                    |  |
| 12:00 – 13:00 | Lunch by the "Grüne Kombüse", sponsored by BRIESE           |  |
| 13:00 – 16:30 | Workshop: "Using LLMs for research tasks" by PLANET AI GmbH |  |

Thursday, July 17<sup>th</sup>

### Sustainable Ocean Use: How can technology help?



On Thursday morning you will get the chance to work in groups on the presentation you will hold on Friday. During your talk you can focus on either the challenge of designing and constructing your own water sampling device or the analysis of your water sample you got to do at the IOW. Get creative and pitch your ideas to the whole group on Friday!

The keynote talk from Dr. Helen Morrison will focus on "Open Marine Data: BSH's Contribution to the Copernicus Marine Service". As a key partner in the Copernicus Marine Service, the

Federal Maritime and Hydrographic Agency (BSH) brings regional modelling expertise to support physical and biogeochemical reanalyses of the North West European Shelf and the Baltic Sea. The resulting quality-controlled datasets are made openly available through the Copernicus Marine platform, enabling broad access to regional analyses and forecasts via tools like the MyOcean Pro web viewer. These datasets also inform products such as the Ocean Monitoring Indicators and the annual Ocean State Report—powerful tools for linking marine science to policy and societal decision-making. Her talk will provide an overview of the Copernicus Marine Service, with a special focus on BSH’s contributions and the value of open marine data.

After lunch Christopher Zimmermann, director of the Thünen Institute, will speak about fisheries management and novel monitoring approaches and have an open discussion round. After a short break the Thünen Institute will give a presentation on their work. The Thünen Institute in Rostock specializes in researching Baltic Sea fisheries, focusing on the sustainable use and management of fish stocks in the region. The institute analyses fishing activities, evaluates fish stocks, and develops strategies to make fishing more ecologically compatible and economically efficient. The institute also supports fisheries policy by providing scientific advice, thereby contributing to the conservation of marine resources.

We will finish with a networking BBQ on the grounds of the Thünen Institute.

| When?               | What?  | Where?           |
|---------------------|--|------------------|
| 09:00 – 11:00       | Group work on result presentation for July 18 <sup>th</sup>                    | Thünen Institute |
| 11:00 – 12:00       | Keynote talk by Dr. Helen Morrison   |                  |
| 12:00 – 13:00       | <i>Lunch</i> (self-organized)  |                  |
| 13:00 – 15:00       | Sustainable Ocean Use – Talk and Discussion by Christopher Zimmermann (Thünen) |                  |
| 15:00 – 15:15       | <i>Break</i>   |                  |
| 15:15 – 17:30       | Institute Presentation Thünen Institute  |                  |
| 17:30 – open<br>End | Barbecue on the grounds of the Thünen Institute                                |                  |

Friday, July 18<sup>th</sup>

### Presentations & Feedback

The last day will be started off with a keynote talk by Dr. Dirk Jürgens from Voith Turbo Marine. This company provides individually tailored propulsion system or complete ship concepts for numerous vessels. Afterwards we will listen to your pitches and presentations you filled with your own ideas.

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. Please be prepared to fill out an evaluation form as this helps us to improve the summer school.

| When?         | What?                            | Where?           |
|---------------|----------------------------------|------------------|
| 09:00 – 10:00 | Keynote talk by Dr. Dirk Jürgens | Thünen Institute |
| 10:00 – 12:30 | Presentation of results          |                  |
| 12:30 – 13:00 | Feedback/Evaluation              |                  |

With special thanks to:



And with invited speakers from:



BUNDESAMT FÜR  
SEESCHIFFFAHRT  
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**VOITH**



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