**SEACONF CONFERENCE 2023**

**ROMANIAN NAVAL ACADEMY “MIRCEA CEL BATRAN”,**

**CONSTANTA, ROMANIA**

**Romanian - Norwegian Strategic Cooperation in Maritime Higher Education for enhancement human capital and knowledge base in field of marine intelligent technologies - MARINTECH**

Project No: 20-COP-0066

**MARINTECH PROJECT WORKSHOP**

**19th of May 2023/10.00-14.00**

**“*Innovative teaching/learning methods and smart technologies used in oceanography and bathymetry*”**

**Friday, May 19th, 2023**

08:30-09:00 – Registration for SeaConf and Workshop attendance

09:00-09:30 - Conference opening session (flag rising ceremony)

09:30-10:30 - SeaConf Conference plenary session

10:30-11:00 - Coffee break, photo group

11.00-14.00 - Marintech workshop section, presented as SeaConf sections

### 11.00-11.15 – paper 1

### 11.15-11.30 – paper 2

11.30-11.40 – paper 3

11.40-11.50 – paper 4

11.50-12.00 – paper 5

12.00-12.10 – paper 6

12.10-12.20 – paper 7

12.20-12.30 – paper 8

12.30-12.40 – paper 9

12.40-12.50 – paper 10

12.50-13.00 – paper 11

13.00-14.00 – *Discussions – debates, Q&A session* – Marintech will participate as guests

14.00 – Closing remarks

**Important dates:**

* Title and abstract submission: 31st of March;
* Full papers submission: 20th of April;
* Paper revisions, if the case, for final publishing version: 1st of May.

**Workshop Scientific Board:**

**Chairman:**

Captain (RO Navy) Associate Professor Dinu ATODIRESEI, PhD Eng. (Romania)

**Members:**

Professor Gouyuan LI, PhD (Norway)

Associate Professor Romeo BOŞNEAGU, PhD (Romania)

Associate Professor Rita AVRAM, PhD Eng. (Romania)

Associate Professor Andrei BĂUTU, PhD (Romania)

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Lecturer Andra NEDELCU, PhD Eng. (Romania)

Lecturer Dumitru CORDUNEANU, PhD Eng. (Romania)

Assistant Professor Doru COŞOFREŢ, PhD Eng. (Romania)

Dr Maria Emanuela MIHAILOV (Romania)

1. **APPLICATIONS OF SMART TECHNOLOGIES IN OCEANOGRAPHY AND**

**BATHYMETRY**

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**Abstract.** Oceanography and bathymetry are two interrelated fields that play an essential role in the maritime industry. Smart technologies are increasingly used in oceanography and bathymetry to collect and analyse data, improve predictive models, and increase the efficiency of operations. Autonomous underwater robots and vehicles are being used to collect data from the deep sea and to carry out underwater missions in areas inaccessible to humans. Data collected by such robots and autonomous underwater vehicles are processed using artificial intelligence and machine learning to provide accurate information about the underwater environment. This article presents the achievements of the Romanian-Norwegian team in the MARINTECH project, Romanian - Norwegian Strategic Cooperation in Maritime Higher Education for the enhancement of human capital and knowledge base in the field of marine intelligent technologies

**Keywords:** *Marintech project, smart technologies, higher education*

1. **SURVEY FOR INTERDISCIPLINARY CO-SUPERVISION ON BACHELOR THESIS IN NAUTICAL SCIENCE**

Authors: Baiheng , Hans-Ingar Johansen Aandahl , Romeo Bosneagu, Martin Lied Sæter, Doru Cosofret , Elena-Rita Avram, Houxiang Zhang and Guoyuan Li

**Abstract:** As the development of emerging technologies is applied in the maritime industry and nautical operations, an interdisciplinary supervision approach is expected to be designed in this subject to enable students the ability to handle the issues brought by the fusion of industrial conventions and technological evolutions. This paper provides the profile of the participants and the subject in which the co-supervision is to be engaged. We investigate how interdisciplinary supervision and co-supervision can be implemented in the nautical science undergraduate program. The resources of both undergraduate education and maritime-related research at the Department of Ocean Operations and Civil Engineering at NTNU are taken as the principal for the fundamental subject. As expected, not only do the undergraduates are benefitted from the co-supervision, the researchers taking co-supervision responsibilities also promote their insights by absorbing the human-dominant expertise knowledge generated by the students. Through the paper, we propose a route map to explore the mechanism of co-supervision in this subject and the expected outcomes.

1. **SURVEY ON INNOVATIVE WEB-BASED TEACHING AND LEARNING METHODS AND SMART TECHNOLOGIES APPLIED IN THE EDUCATIONAL PROCESS IN MARITIME HIGHER EDUCATION**

Doru Coșofreț1, Elena-Rita Avram1, Romeo Boșneagu1, Guoyuan Li2

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2.Norwegian University of Science and Technology, Alesund, Norway

**Abstract:** The development of smart technologies in recent years has had a significant impact on the maritime industry as well, allowing the improvement of operational efficiency, the increase of safety, the reduction of costs, and environmental impact. A particularly important element is the alignment of maritime higher education with technological evolution through the continuous improvement of study programs and their continuous correlation with the current requirements of the labour market in the maritime industry. The article presents the results of the evaluative research study on innovative web-based teaching and learning methods and intelligent technologies applied to students from the master's programs of the "Mircea cel Batran" Naval Academy. The study has three directions: the analysis of innovative teaching/learning/evaluation methods and tools adapted to the educational process of maritime higher education; identifying smart technologies applied to improve the educational process; evaluation of the way of involving the beneficiaries from the maritime industry in the educational process. The results of the study provide directions for action to maritime higher education institutions and beyond, to improve the educational process to approach technological evolution and to provide students with the skills and knowledge needed to use smart technologies within the maritime industry.

**Keywords:** Innovative web-based teaching/learning methods, Intelligent teaching/learning technologies, Maritime Higher Education**.**

1. **USABILITY VERIFICATION OF VIRTUAL-REALITY SIMULATORS FOR MARITIME EDUCATION AND TRAINING**

Wu, Baiheng; Oksavik, Arnfinn; Bosneagu, Romeo; Osen, Ottar; Zhang, Houxiang; Li, Guoyuan

1. **INVESTIGATIONS-BASED RESULTS OF THE HYDROGRAPHIC CONDITIONS WITH SPECIAL REFERENCE TO THE PROTECTED ROMANIAN LITTORAL’S TOURIST SWIMMING AREAS**

Razvan Mateescu\*1,3, Radu Manu2 , Romeo Bosneagu2, Elena Vlasceanu1, Dragos Marin1

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**Abstract.** The aim of the present work is related to the new hydrographic conditions within new developed coastal areas through coastal protection measures extension, to evaluate the impacts on the touristic bathing areas and its safety, as well. The new bathymetry, induced by sediment size, together with currents propagation into the bathing areas adjacent to the new arranged beach areas were subject of CTD and ADCP measurements in relation with the summer waves regime and sea level variations. Several experiments in normal use in the summery period conditions were considered relative to the marine hazards associated to these swimming areas, such as seasonal storm inducing currents and rip currents propagation in the near shore, but also and the specific marine currents setups around beach protection groins and longitudinal breakwater, the influence of vertical water movements, including up-welling and specific intensifications in the periods with complex stormy waves.

**6. SEASONAL VARIABILITY OF UNDERWATER ACOUSTIC PROPAGATION IN THE NW BLACK SEA**

N.C. SANDU, Maritime Hydrographic Directorate, Constantza, Romania

**Abstract:** Underwater acoustic propagation is related to zonal characteristics and temporal variability of the environmental parameters. In this paper, the modelling of underwater acoustic propagation is accomplished by WADER software, which use the Hodgson acoustic model to provide accurate propagation loss data at low and high frequencies. The results on various sonars (active/passive, bow-mounted/towed) and seasonal sound velocity profiles at Constanta areas are provided to indicate the sonar performance prediction in the northwest Black Sea waters.

1. **BLACK SEA. WEATHER EVOLUTION FROM 1950 TO THE PRESENT**

Boantă Diana Ștefania, Rădulescu Cristiana-Corina, Mărgărint Dragoș, Romanian Naval Academy

**Abstract:** This theme offers a broad perspective on the weather conditions in the Black Sea. A statistic on the weather in the Black Sea will be produced, providing data on the weather factors from 1950 to the present.

1. **DEVELOPMENT AND IMPLEMENTATION OF A NEW TOURIST PORT ON THE BLACK SEA**

Rădulescu Cristiana-Corina, Boantă Diana Ștefania, Mărgărint Dragoș

**Abstract:** The current topic is the development of a new tourist port in the area of the Romanian Black Sea coast. This project represents a real challenge from the social, economic and Oceanographic research point of view. The advantages of the implementation and development of such a project in this area are represented by the social, micro and macro-economic impact. The implementation of such a project can be the equivalent of a great success at the local level. This project can be developed and implemented only after thorough research specific to Oceanographic and Hydrographic research. Likewise, the protection of the marine environment must represent a priority in the development and implementation of such a project.

1. **TYPES OF AUTONOMOUS UNDERWATER VEHICLES (AUVS) USED IN OCEANOGRAPHIC AND HYDROGRAPHIC RESEARCHES**

Mărgărint Dragoș, Boantă Diana Ștefania, Rădulescu Cristiana-Corina

**Abstract**: Autonomous Underwater Vehicles (AUVs) are programmable, robotic vehicles that, depending on their design, can drift, drive, or glide through the ocean without real-time control by human operators. These vehicles can allow scientists to conduct other experiments from a surface ship while the vehicle is off collecting data elsewhere on the surface or in the deep ocean. There are seven types of AUVs: Remus, Sentry, Mesobot, Orpheus, Slocum Glider, Spray Glider and Autonomous Benthic Explorer (ABE)

1. **TEACHING ESP THROUGH INTERCOMPREHENSION-TERMS RELATED TO OCEANOGRAPHY**

Raluca Apostol-Mateş1, Romeo Boșneagu1,

1.”Mircea cel Bătrân” Naval Academy, Fulgerului Street, Constanța, Romania

**Abstract**: Teaching ESP (English for Special Purposes) for a Romanian speaking teacher is demanding sometimes, especially when the domain is related to engineering and its connective domains, business, or seamanship. When dealing with medicine, geography, geology, meteorology, oceanography or others, aquiring new and specific vocabulary could be done using the method called intercomprehension. This is very duable due to the fact that many terms to be taught are easily recognizable because they come from Latin. The present paper’s aim is to show how a method used for other purposes (comprehending each other by using your own language when the languages involved are from the same family) could be used in successfully teaching specialized vocabulary in oceanography and meteorology.

1. **THE ROLE OF OF BALLAST WATER TREATMENT SYSTEM CHLORINATION TYPE- PURIMAR IN ROMANIAN SHORE PROXIMITY**

Adrian Stoianovici, Romanian Naval Academy Constanta

**Abstract:** Presentation of Ballast Water Treatment System Chlorination type – PURIMAR contain short introduction about the necessity of treating ballast water according with IMO resolution, a system description and a system configuration showing major components, how are interconnected and general operating procedure. In order to reduce and stop the threaten of spreading invasive species and to prevent an ecological damages to biodiversity IMO State Members adopted a convention-Ballast Water Management Convention-would represent a significant step towards protecting the marine environment for this and future generations. The Ballast Water Treatment System Chlorination type is using sea water in order to filter and produce an effluent which is injected into ballast water tanks during sea voyages and reduce close to zero the total amount of residual oxidants. During cargo operation in close proximity of Romanian shore the system is treating the ballast water in order to reduce to minim as possible the invasion of foreign species which could damage the marine biodiversity.