

# **EKC2023**

**Monday, August 14, 2023 - Friday, August 18, 2023**

## **Scientific Program**

# Science and Technology Divisions

## Marine and Ocean Engineering

The Marine and Ocean Division in EKC 2023 was motivated and proposed to introduce and exchange ideas and information in seeking the current issues and the challenges relative to the marine and ocean sectors. To achieve this goal, we wish to invite novel research which can offer meaningful insights into successful technologies for developing shipping greener and safer as well as to invite hot discussion on current policy and regulatory trends locally and internationally.

The scope of this Division can be more extensive than what is stated in the title, ranging from addressing the global challenges toward zero-emission and autonomy to demonstrating the effectiveness of different state-of-the-art technologies, while focus area for EKC 2023 would be digitalization and decarbonization.

Your participation and contribution to the science and technology sessions listed below are highly valued, as they present a unique opportunity to meet researchers and engineers from Europe and Korea. These individuals come from diverse backgrounds, including research institutes, industries, governmental agencies, and academic societies. By attending these sessions, you can actively engage with these experts and help us achieve our goal of sustainability in the marine and ocean sectors.

Sailing towards a greener future with digitalization and decarbonization

Maritime safety and decarbonization with emerging technologies with energy transition

Alternative marine fuels and zero-carbon shipping economy of the shipping sector

## Mechanical and Aerospace Technology

The EKAMA (European-Korean Association of Mechanics and Aerospace) was founded in 2018 during EKC 2018 held in Glasgow, UK, to gather all Korean scientists and engineers working in Europe on Mechanical and Aerospace Engineering together from the 9 Korean associations in Europe. One of our aims is to build up a European network with all these members and to enhance specialized cooperation between Europe and Korea. As the slogan of EKC 2023, the cooperation between scientific community and industrial communities, Green Industry, we focus on transfer of technologies in the field of Transportations, such as future Automobiles, aerospace, in particular satellites. Moreover, because we are always interested in the environmental problems, new trends for green technologies are one of our concerns. It is why green energy development is also a hot issue. Engineering approach for it, especially Mechanical one is welcome to be presented and discussed for our green earth. Aerospace is one of the main key words of this division, especially satellites, because the needs of telecommunication is exponentially growing up as well as scientific purposes to observe our own earth to prevent environmental changes. Korea has made an important development in this field during the last decades and EKAMA has prominent members working in this field. It could be a good opportunity to join both parts to establish strong links. Digital twin is one of the key words of Industry 4.0 combining design and manufacturing processes. All applications using numerical simulation are welcome to show today's state of the art.

It's why we propose in this year the following 5 sessions. - Future Mobility – Advanced

Technologies in Space Engineering and Applications – Inclusive Development through Appropriate Technology, STEM and Engineering Education – Emerging Trends and Advancements in Aeronautics and Mechanical Engineering – Advanced Technologies for Modelling and Simulation (Digital twin).

## **Electrical/Electronics Engineering & Information Technology**

Electrical-electronics engineering and computer science are rapidly evolving fields, with new advancements and technologies emerging at an unprecedented pace. This division will explore the latest trends and future directions in these fields, highlighting the cutting-edge research and development that is driving innovation across a wide range of industries.

We will discuss various topics including the latest developments in hardware and software, the role of artificial intelligence and machine learning, and the impact of these technologies on many industries.

Sessions will feature distinguished experts from academia and industry who will share their insights and experiences in these fields. Attendees will have the opportunity to engage in a thought-provoking discussion on the current state of electrical-electronics engineering and computer science, and the opportunities and challenges that lie ahead. We hope that these sessions will inspire attendees to explore new ideas and to collaborate with their peers to push the boundaries of these exciting fields.

Six sessions will be organized in the EI division at EKC 2023.

AR/VR technologies

Theory and practice of computer science and innovative information technology

Innovative semiconductor devices and circuits, packaging and systems, and their scientific and industrial applications.

Technologies and environments for Web 3.0

Micro and Nano Systems (From device to integrated systems)

To the Edge and Beyond AI in Computer Vision

## **Life Science & Health**

Life science is a field of understanding the basic principles of sustaining life and seeks and provides application methods based on it. Life science is positioned not only as a basic field of study, but also as an important field that can overcome global issues. The search for sustainability in order to overcome hazards to mankind such as climate change, environmental pollution, and the human diseases, such as coronavirus pandemic is emerging as a major task in life science research.

The Life science and Health division embraces six sessions that discuss topics in the area of emerging technologies in biomedical science, agriculture, cancer, environments.

## **Environment and Energy**

The European Union and Korea have recently pledged carbon neutrality so-called “net zero” by 2050. Without such immediate action by cutting carbon emissions, the lives and livelihoods of people worldwide can be threatened by the climate change problem. Scientific findings and research are considered as the fastest technical approach to net zero. Since Korea is a key player in state-of-art technologies and the EU has led energy transition and sustainable development, the collaboration between Korea and Europe can benefit each other. Therefore, this division facilitates diverse collaboration opportunities in the environment & energy fields by sharing their knowledge, insight, and ideas.

## **Chemical Engineering and Material Science**

Chemical Engineering and Material Sciences are fundamental and challenging fields to study and acquire the knowledge to be understood. The fields have inspired and contributed to the emergence of various chemistry-based materials, such as, nanomaterials, biomaterials, electronic/optical/magnetic materials, ceramics, polymers, metal alloys, smart materials, semiconductor materials, and composite materials associating with design of complicated structures through the innovation of technology by the advancements in the study of fundamental science. The knowledge acquired from the studies will greatly impact on our society and coming life.

In the sessions of Chemical Engineering and Material Science at EKC 2023, the recent scientific issues that are considered for environment and human being will be discussed with various up-to-date results from studies in the fields.

## **Basic Science**

Basic sciences are defined as scientific disciplines such as physics, mathematics, biology, and chemistry. These disciplines are called basic sciences because they provide a fundamental understanding of natural phenomena and the processes by which matter in nature is transformed. In the EKC2023 conference, we will discuss the fundamental understanding of natural phenomena. Furthermore, we will go beyond the fundamental understanding and discuss applications in real life to enrich human life.

## **Built Environment and Engineering Design**

As there is greater pressure for sustainable development, the requirements for the built environment are becoming more demanding. There is broad agreement that densely populated urban areas should be more sustainable than rural areas. However, while over half of the planet's population lives in cities, they account for more than 75% of the consumption of non-renewable resources, causing climate change. The Built environment and Engineering design Division will take a new perspective on the sustainable built environment and strategic approaches to responding to climate change. Also, the sustainability of the environment needs to be discussed in line with traditional architectural design, history, and theory. Therefore, the sessions aim to bring together architects, historians, designers, built environment professionals, climate and energy researchers, policy experts, and government officials to discuss recent research and works. The sessions of the BE will allow delegates to increase their knowledge and skills related to building design, history, sustainable development, and the performance of buildings and materials. A total of seven oral sessions are organised at EKC 2023.

Dialogue with the existing – Revaluations of existed urban and architecture

Sustainable building technology and urban environment

Realization of architectural ideas for public value in sustainable way

Urban spatial structure and urban regeneration

Indoor and outdoor environmental quality

Housing - academic and industrial collaboration for humans

The processes of industrial and technological development

## **Others**

Due to demographic development, South Korea and many European countries face a shortfall of skilled workforce in STEM areas. In the STEM area, very few women are studying and working. Encouraging women to study and work in STEM will be one solution to increase the skilled workforce and fill the shortage of science and technology manpower in this area. To recruit more women to STEM and improve the retention rate of women, the policies, systems, programs, and workplace culture need to be supported.

EKC 2023 (it is also the 50th anniversary of VeKNI, and the 1st anniversary of VeKNI women) in

Munich is a great opportunity to discuss the contributions of women in STEM to industry and society, their allyship at work, and their roles in the Industry 4.0/5.0 era.

The goal of this session is: To share the experience that was helpful at each stage of career formation in the growth process of Korean-European women scientists and engineers of various generations, countries, genders, and cultures, and compare them by country. Based on that, to get some orientation for personal, social, political, and structural, and support.

Expected Performance is: Compare and benchmark the differences or commonalities between Europe and Korea in policy and institutional support supported from the perspective of life cycle or growth stage and utilize them

## **Poster**

# **Industry Forum**

## **Hydrogen & Power to X Technologies**

## **Marine Applications**

## **Offshore Wind**

## **Emerging Trends of IT Industry**

## **Others**