



**17<sup>th</sup> International Conference  
on Inorganic Membranes**

***New Frontiers for Inorganic Membranes***

**July 1-5, 2024**

Oceania Convention Center  
Florianópolis - Brazil

**PROGRAM BOOK**



**17<sup>th</sup> International Conference  
on Inorganic Membranes**  
*New Frontiers for Inorganic Membranes*

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## Dear Participants,

On behalf of the Organizing Committee, we welcome you to the 17th International Conference on Inorganic Membranes (ICIM 17) in Florianópolis, Brazil. We are pleased to host you for this landmark event, the first fully in-person ICIM since the COVID-19 pandemic.

Since its first edition in Montpellier, France, in 1989, ICIM has gone across the globe, establishing itself as a premier forum for sharing advances in inorganic membrane science and technology. This year's edition marks a significant milestone as the first ICIM held in Latin America, reflecting our ongoing commitment to the progress in inorganic membrane science, exploring new frontiers and fostering global collaborations.

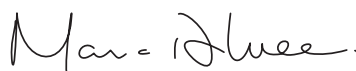
Our community has demonstrated resilience, especially during the challenges posed by the pandemic. The previous edition in Taipei, which adopted a hybrid format, showcased our ability to adapt under unprecedented circumstances. Now, as we gather in person, we have the unique opportunity to reconnect, share insights, and forge new partnerships face-to-face.

With a rich program covering Materials, Processes, and Applications, ICIM 17 is a platform for global researchers and industry professionals to exchange knowledge, share innovative applications, and explore the latest advancements in the field.

We are very grateful to all participants, sponsors, and organizers who have made this event possible. Your involvement enriches the conference experience, providing opportunities for learning, networking, and collaboration.

Welcome to Florianópolis, and welcome to ICIM 17!

Sincerely yours,



**Marco Di Luccio**  
Chair of ICIM 17  
Federal University of Santa Catarina



## Organizing Committee

**FEDERAL UNIVERSITY OF SANTA CATARINA (UFSC)**  
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Prof. Alan Ambrosi (Co-chair)  
Prof. Dachamir Hotza (Co-chair)  
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Mariane Proner

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**FEDERAL UNIVERSITY OF RIO GRANDE DO SUL (UFRGS)**  
Prof. Isabel Cristina Tessaro

**UNIVERSITY OF RIBEIRÃO PRETO (UNAERP)**  
Prof. Murilo Innocentini

**FEDERAL UNIVERSITY OF MINAS GERAIS (UFMG)**  
Prof. Wander Luiz Vasconcelos

### INTERNATIONAL SCIENTIFIC COMMITTEE

Allan Tung (*National Taiwan University, Taiwan*)  
Anita Buekenhoudt (*VITO, Belgium*)  
Anne Julbe (*European Institute of Membranes, France*)  
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Dachamir Hotza (*Federal University of Santa Catarina, Brazil*)  
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Toshinori Tsuru (*Hiroshima University, Japan*)  
Wanqin Jin (*Nanjing Institute of Technology, China*)  
Weishen Yang (*Dalian institute of Chemical Physics, China*)  
Wilhelm Meulenber (*Forschungszentrum Julich, Germany*)  
Yushan Yan (*University of Delaware, USA*)



## Conference Host 2024 Florianópolis, Brazil

Brazil is a captivating country renowned for its immense cultural and natural diversity. Within this enchanting nation lies Florianópolis, affectionately known as “Floripa”, the charming capital of the State of Santa Catarina. With 42 stunning beaches, Floripa seamlessly combines cultural, historical, and artistic heritage with awe-inspiring natural beauty, offering a unique and delightful experience.

Floripa, recognized as the first Creative City of Gastronomy in Brazil by UNESCO, tantalizes taste buds with its diverse culinary scene, ranging from traditional seafood-based cuisine to sophisticated gastronomy.

Offering a harmonious blend of nature, sports, beaches, culture, technology, innovation, entrepreneurship, entertainment, and gastronomy, Floripa serves as a year-round destination that appeals to everyone. The city’s allure stems from its rich history, vibrant culture, and breathtaking landscapes, ensuring an unforgettable journey for every traveler.

## ICIM 2024 has two parallel and synchronous session tracks, and each session track will be moderated by Session Chairs.

### 1) PRESENTATION LENGTH

You must arrive at least 15 minutes in advance of the start of the session. Please report to the room technical staff who will help you in setting up your presentation.

Plenaries: 45 minutes (including 5 minutes for Q&A and transition)

Keynotes: 30 minutes (including 5 minutes for Q&A and transition)

Oral Presentations: 20 minutes (including 3 minutes for Q&A and transition)

PhD Student Contest: 15 minutes (including 3 minutes for Q&A and transition)

### 2) PREPARING THE ORAL PRESENTATION

Language: English

Slide size: 16:9 is recommended. The projection equipment at the venue is 16:9.

#### HARDWARE AND SOFTWARE:

- The conference will provide a Windows laptop in each session room for the presentations. We strongly recommend you bring your presentation on a USB drive and transfer to the session room laptop.
- If you have your presentation on a Mac OS, please bring your own laptop as a backup. We recommend converting your presentation to MS PowerPoint for Windows and preview it at the Media Desk with the aid of our technical staff at least 30 minutes before the session begins.
- Old versions of Microsoft PowerPoint may also cause minor deviations. Please preview your presentation at the Media Desk before the beginning of the session.
- Videos must be playable with Windows Media Player. Please do not use special video codecs.
- The PowerPoint Presenter View (2nd screen) will be available during presentations.
- If you have any conference or presentation questions, please contact the organization team at the email [icim2024@contato.ufsc.br](mailto:icim2024@contato.ufsc.br), or the tech support at the Media Desk room during the conference.

### 3) PREPARING THE POSTER

**Poster size: Your poster should not exceed A0 size (H120 cm×W84 cm). Board size: H220 cm × W100 cm. Language: English**

#### General information:

- Posters should be printed before the conference and brought to the venue.
- The secretariat will provide double face tape or hanging hooks to fix the posters. Please, fix the posters before the poster section (preferably on Monday, July 1).
- The posters can be left mounted during the entire duration of the conference but must be taken down before the end of Friday morning session. Posters left on the boards will be taken down and NOT returned.

## The conference program will address a range of contemporary inorganic membrane topics including (but not limited to):

### MEMBRANE MATERIALS

Porous and dense oxide ceramic membranes  
(e.g., metal oxides, oxide perovskites)  
Porous and dense non-oxide ceramic membranes  
(e.g., silica-based, carbides, nitrides, borides, halide perovskites)  
Porous and dense mineral-based membranes  
(e.g., zeolites, cordierites, apatites)  
Carbon-based, 2D materials (e.g., graphene, graphene oxide), 1D materials (e.g., nanotubes), and nanomaterials membranes  
Hybrid and composite membranes (e.g., Mixed Matrix Membranes, Metal Organic Frameworks)  
Porous and dense metallic membranes  
Gate-effect membranes  
Stimuli-responsive membranes

### MEMBRANE PROCESSES

Transport / Modeling / Simulation  
Process design / Economics / Life cycle assessment  
Process intensification  
Module and reactor design  
New characterization methods (e.g., coupled or in-situ strategies)  
Fouling control  
Scale-up and membrane production technology

### MEMBRANE APPLICATIONS

Energy / Electrochemical applications (e.g., batteries, fuel cells, electrolyzers)  
Food application / Biorefinery  
Biotechnology / Biomedical / Pharma  
Water / Wastewater  
Contactors / Percrystallization  
Membrane reactors  
Molecular separations (e.g., gas separation, vapor separation, azeotrope breaking)  
Environmental protection and climate impact mitigation (e.g., carbon capture, wastewater treatment, desalination)  
Other applications



## Monday, July 1

12:00 - 18:00	Registration
	<b>ROOM ESMERALDA 01</b>
13:30 - 16:15	<b>WORKSHOP - (HYBRID) CERAMIC MEMBRANES: MEMBRANE PREPARATION AND UP-SCALING, FOULING CONTROL, AND EMERGING APPLICATION AREAS</b> Chair: ALAN AMBROSI
13:30 - 13:35	Welcome
13:35 - 14:05	<b>Membrane Preparation and Up-scaling</b> Workshop Speaker: INGOLF VOIGT
14:05 - 14:35	<b>Application of Membranes in Industrial Streams</b> Workshop Speaker: ARIAN NIJMEIJER
14:35 - 15:00	<b>Fouling of Ceramic Membranes as Compared to Polymeric Membranes</b> Workshop Speaker: ANITA BUEKENHOUDT
15:00 - 15:15	Coffee Break
15:15 - 15:45	<b>Emerging Application Area of Organosilica Membranes</b> Workshop Speaker: TOSHINORI TSURU
15:45 - 15:52	<b>Small Groups, Ask an Expert - Round 1</b> Workshop Speaker: MIEKE LUITEN-OLIEMAN
15:53 - 16:00	<b>Small Groups, Ask an Expert - Round 2</b> Workshop Speaker: MIEKE LUITEN-OLIEMAN
16:01 - 16:08	<b>Small Groups, Ask an Expert - Round 3</b> Workshop Speaker: MIEKE LUITEN-OLIEMAN
16:09 - 16:15	<b>Small Groups, Ask an Expert - Round 4</b> Workshop Speaker: MIEKE LUITEN-OLIEMAN
16:15 - 17:30	FREE TIME
	<b>ROOM TOPÁZIO 01</b>
17:30 - 18:00	OPENING CEREMONY
18:00 - 18:45	<b>PLENARY - INORGANIC PROTON CONDUCTING MEMBRANE BASED MEMBRANE REACTORS</b> Plenary Speaker: ARIAN NIJMEIJER Chair: MARCO DI LUCCIO
18:45 - 20:45	Welcome Reception

## Tuesday, July 2

### ROOM TOPÁZIO 01

08:30 - 09:15 **PLENARY - RECENT DEVELOPMENTS IN CERAMIC MEMBRANES FOR GAS SEPARATION AND MEMBRANE REACTORS**  
Plenary Speaker: WILHELM MEULENBERG  
Chair: DACHAMIR HOTZA

### ROOM ESMERALDA 01

09:20 - 10:30 **PROCESSES AND APPLICATIONS 1**  
Chair: JUNHANG DONG

09:20 - 09:50 **Development of Membrane Reactor for Fischer- Tropsch Synthesis Using Fe-based Catalyst and ZSM-5 Membrane**  
Keynote Speaker: MASAHIKO MATSUKATA

09:50 - 10:10 **Monolithic Silicalite-1 Membranes for n-butane/i-butane Separation**  
Speaker: BIN WANG

10:10 - 10:30 **A Solar-based Membrane Reactor for Hydrogen Production**  
Speaker: STEFAN BAUMANN

### ROOM TOPÁZIO 01

09:20 - 10:30 **MATERIALS AND PROCESSING 1**  
Chair: DACHAMIR HOTZA

09:20 - 09:50 **Potential Contribution of Zeolite Membranes Towards Carbon Neutrality**  
Keynote Speaker: TAKAHIKO TAKEWAKI

09:50 - 10:10 **Engineering Hybrid Ceramic Membranes Through Innovative Grafting Approaches**  
Speaker: MARIE-ALIX PIZZOCCARO-ZILAMY

10:10 - 10:30 **Ba(Zr,Ce,Y)O<sub>3-δ</sub> Proton-Conducting Materials: Manufacture, Performance and Stability**  
Speaker: WENYU ZHOU

10:30 - 10:50 Coffee Break

### ROOM ESMERALDA 01

10:50 - 12:00 **PROCESSES AND APPLICATIONS 2**  
Chair: KANG LI

10:50 - 11:20 **Application of Ceramic Membranes for Water Treatment on Offshore Oil Production Platforms**  
Keynote Speaker: SILVIO WESCHENFELDER

11:20 - 11:40 **Ultra-high Pressure Reverse Osmosis by Using Microporous Organosilica Membranes for Concentrating Organic Aqueous Solutions**  
Speaker: HIROKI NAGASAWA

- 11:40 - 12:00 **Fabrication and Joining of Proton Conducting Cell Assemblies for Dehydrogenation of Alkanes**  
Speaker: JULIA LUCIA WOLTER
- ROOM TOPÁZIO 01
- 10:50 - 12:00 **MATERIALS AND PROCESSING 2**  
Chair: INGOLF VOIGT
- 10:50 - 11:20 **Development of Electrolysis Technologies in FME HYDROGENI**  
Keynote Speaker: MARIE-LAURE FONTAINE
- 11:20 - 11:40 **Graphene Oxide Membrane Deposited on Alumina Hollow Fiber Substrate for Hydrogen Separation**  
Speaker: MIRIA HESPANHOL MIRANDA REIS
- 11:40 - 12:00 **Performance of PDMS/SSZ-13 Mixed Matrix Membrane for CO<sub>2</sub>/N<sub>2</sub> Separation**  
Speaker: DANIEL DORNELLAS ATHAYDE
- 12:00 - 13:30 Lunch Break
- 13:30 - 14:15 **Plenary - Grafting of Ceramic Membranes: Boosting Application Potential in Liquid Filtration**  
Speaker: ANITA BUEKENHOUDT  
Chair: MARIE-LAURE FONTAINE
- ROOM ESMERALDA 01
- 14:20 - 15:30 **PROCESSES AND APPLICATIONS 3**  
Chair: MASAHIKO MATSUKATA
- 14:20 - 14:50 **Toward Non-Intermittent and Safe Photocatalytic Ceramic Membranes**  
Keynote Speaker: SERGIO YESID GOMEZ GONZALEZ
- 14:50 - 15:10 **High-temperature Ceramic-carbonate Dual-phase Membrane Reactor for Pre-combustion Carbon Dioxide Capture – Process Design and Techno-economic Analysis**  
Speaker: JERRY LIN
- 15:10 - 15:30 **Model-supported Analysis of Gas Transport in Oxygen Permeation Experiments Considering Asymmetric Membrane Structures and 3D-test Cell Geometry**  
Speaker: KAI WILKNER
- ROOM TOPÁZIO 01
- 14:20 - 15:30 **MATERIALS AND PROCESSING 3**  
Chair: MARIE-LAURE FONTAINE
- 14:20 - 14:50 **Valorization of Natural Material in Development of New Ceramic Composite Membranes - Application to Salts Rejection and Environmental Process**  
Keynote Speaker: SAAD ALAMI YOUNSSI

- 14:50 - 15:10 **Surfactant functionalised cobalt silica membranes – Gas permeation and thin Film Positron Annihilation Lifetime Spectroscopy characterization**  
Speaker: GIANNI OLGUIN
- 15:10 - 15:30 **Effects of Temperature on a Dynamic Deposition Layer of PDA on a Ceramic Hollow Fiber**  
Speaker: CRISTIANO PIACSEK BORGES
- 15:30 - 16:30 Coffee Break + Poster Section
- ROOM ESMERALDA 01**
- 16:30 - 18:00 **PROCESSES AND APPLICATIONS 4**  
Chair: JOSE SERRA
- 16:30 - 17:00 **Ceramic Membranes for Natural Gas Production: Challenges and Environmental Benefits**  
Keynote Speaker: DÁRLEY CARRIJO DE MELO
- 17:00 - 17:40 **Innovative Membranes for Oxygen Separation: Experimental Study of Their Performance and Long-term Stability at High Temperature**  
Speaker: FRANCESCA DRAGO
- 17:40 - 18:00 **Development of Sealing Layers for the Integration of Oxygen Transport Membranes in a Planar Separation Module**  
Speaker: PAOLO FEDELI
- 17:40 - 18:00 **Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> M<sub>x</sub>ene Based Membranes for Gas Separation**  
Speaker: DACHAMIR HOTZA
- ROOM TOPÁZIO 01**
- 16:30 - 18:00 **MATERIALS AND PROCESSING 4**  
Chair: TOSHINORI TSURU
- 16:30 - 17:00 **Evaluation of Different Atomic Layer Deposition Techniques for Pore Size Tuning of Ceramic Membranes From Ultra - to Nanofiltration**  
Keynote Speaker: MIEKE LUITEN-OLIEMAN
- 17:00 - 17:20 **Composite DD3R-alumina Hollow Fiber for CO<sub>2</sub>/CH<sub>4</sub> Separation**  
Speaker: RENAN BARBOSA
- 17:20 - 17:40 **Engineering Mechanical Strength: Integrating Freeze Casting and Tape Casting for LSCF Asymmetric Membranes Assembly**  
Speaker: PRISCILA LEMES
- 17:40 - 18:00 **Fabrication of Silicon Carbide Ultrafiltration Membranes via Low-Pressure Chemical Vapor Deposition for Oil-in-Water Emulsion Separation**  
Speaker: BEGÜM TANIS

## Wednesday, July 3

### ROOM TOPÁZIO 01

- 09:00 - 09:45 **PLENARY - SUBNANO-TUNING OF AMORPHOUS SILICON BASED MEMBRANES FOR IMPROVED PERFORMANCE: FABRICATION, CHARACTERIZATION, AND APPLICATION TO GAS AND LIQUID PHASE SEPARATION**  
Plenary Speaker: TOSHINORI TSURU  
Chair: ANITA BUEKENHOUDT

### ROOM ESMERALDA 01

- 09:50 - 10:20 **PROCESSES AND APPLICATIONS 5**  
Chair: ANITA BUEKENHOUDT
- 09:50 - 10:20 **Membrane Percrystallisation Technology and Concepts for Mineral Brines, Food and Pharmaceutical Compound**  
Keynote Speaker: JOE DA COSTA

### ROOM TOPÁZIO 01

- 09:50 - 10:20 **MATERIALS AND PROCESSING 5**  
Chair: SAAD ALAMI YOUNSSI
- 09:50 - 10:20 **Characterization of Nanoporous Active Layers of Composite Ceramic Membranes Via Time-resolved Electrical Measurements**  
Keynote Speaker: ANDRIY YAROSHCHUK

10:20 - 10:40 Coffee Break

### ROOM ESMERALDA 01

- 10:40 - 11:55 **PROCESSES AND APPLICATIONS 6 - STUDENT AWARD COMPETITION**  
Chair: SERGIO YESID GOMEZ GONZALEZ AND STEPHANIE ROUALDES
- 10:40 - 10:55 **A Novel and Simple Fabrication Method for a Biomimetic-Inspired lath-Structured Ceramic Microfiltration Membrane for the Treatment of Oil in-Water Emulsions**  
Speaker: DANYAL NASEER
- 10:55 - 11:10 **Innovative Progress in Hybrid Alumina/Dopamine/Graphene Oxide Membrane for Wastewater Filtration**  
Speaker: ALINE MARIA DE JESUS MACHADO CARDOSO
- 11:10 - 11:25 **Silica Ceramic Membranes for Selective Separation of CO<sub>2</sub> in Natural Gas Processing**  
Speaker: DEBORA GUIMARAES DA SILVA
- 11:25 - 11:40 **Fluorite-Free Synthesis of High-Performance Si-Cha Zeolite Membrane for Efficient CO<sub>2</sub>/CH<sub>4</sub> Capture**  
Speaker: NANA WANG

- 11:40 - 11:55 **Mesoporous Silica Thin Membranes Supported on Macroporous AAO Suitable for ppb-level Nanoparticles Separation**  
Speaker: SHER LING LEE
- ROOM TOPÁZIO 01**
- 10:40 - 11:55 **MATERIALS AND PROCESSING 6 - STUDENT AWARD COMPETITION**  
Chair: DACHAMIR HOTZA AND THEODORE T. TSOTSIS
- 10:40 - 10:55 **From Disordered to Ordered Two-Dimensional Metal-Organic Frameworks on Porous Ceramic Supports for Membrane Separation Applications**  
Speaker: DAVID MAGNUS WOLF
- 10:55 - 11:10 **Nano-Templates to Fabricate Highly Porous Organosilica Membranes by Atmospheric - Pressure Plasma Surface Modification**  
Speaker: SHUN AOYAMA
- 11:10 - 11:25 **Synthesis Techniques for Ordered Mesoporous Organosilica Deposited on Porous Substrates**  
Speaker: DAAN BORGER
- 11:25 - 11:40 **Tuning Nanopores in Tubular Ceramic Nanofiltration Membranes with Atmospheric-Pressure Atomic Layer Deposition: Prospects for Pressure-Based In-Line Monitoring of Pore Narrowing**  
Speaker: MICHIEL NIJBOER
- 11:40 - 11:55 **Preparation of a Composite NF rGO-TiO<sub>2</sub> -pPD Membrane Deposited on Low-Cost Ceramic Support: Application for Dye Removal**  
Speaker: YOUNESS KOUZI
- 12:00 - 13:30 Lunch Break
- 13:30 - 17:00 Cultural Program - FREE TIME

## Thursday, July 4

### ROOM TOPÁZIO 01

- 08:30 - 09:15 **PLENARY - PALLADIUM MEMBRANES TECHNOLOGY DEVELOPMENTS FOR DECARBONIZATION: INDUSTRY PERSPECTIVE**  
Plenary Speaker: AADESH HARALE  
Chair: JERRY LIN

### ROOM ESMERALDA 01

- 09:20 - 10:30 **PROCESSES AND APPLICATIONS 7**  
Chair: ANNE JULBE

- 09:20 - 09:50 **Premix Membrane Emulsification With Microporous Dynamic Membranes to Produce Single and Multiple Emulsions Stabilized With Insect Proteins**  
Keynote Speaker: CARME GUELL
- 09:50 - 10:10 **Network Engineering of Organosilica Membranes for Efficient Pervaporation Dehydration**  
Speaker: JING ZHONG
- 10:10 - 10:30 **Intensified Catalytic Reactors Based on Solid-State Ion-Conducting Membrane**  
Speaker: JOSE SERRA
- ROOM TOPÁZIO 01**
- 09:20 - 10:30 **MATERIALS AND PROCESSING 7**  
Chair: JERRY LIN
- 09:20 - 09:50 **Organosilicon PECVD-Processed Membranes for the Selective Detection of BTEX**  
Keynote Speaker: STEPHANIE ROUALDES
- 09:50 - 10:10 **Controlled Nanoconfinement of Two-Dimensional Polyimide Network**  
Speaker: MARIE-ALIX PIZZOCCARO-ZILAMY
- 10:10 - 10:30 **Scaling up Proton Ceramic Electrolysis: Current Status and Perspectives**  
Speaker: MARIE-LAURE FONTAINE
- 10:30 - 10:50 Coffee Break
- ROOM ESMERALDA 01**
- 10:50 - 12:00 **PROCESSES AND APPLICATIONS 8**  
Chair: MIEKE LUITEN-OLIEMAN
- 10:50 - 11:20 **Water Separation from Potash Mining Dump Leachate by Membrane Distillation**  
Keynote Speaker: INGOLF VOIGT
- 11:20 - 11:40 **Novel Ceramic Filter Disks and Further Development of Tubular Nanofiltration Elements, their Characterization and First Use in The Treatment of Textile Wastewater**  
Speaker: CHRISTIAN PFLIEGER
- 11:40 - 12:00 **Highly Permeable Asymmetric Alumina Hollow Fibers for Treating Wastewater Contaminated with Congo Red Dye**  
Speaker: MIRIA HESPANHOL MIRANDA REIS
- ROOM TOPÁZIO 01**
- 10:50 - 12:00 **MATERIAL AND PROCESSING 8**  
Chair: KANG LI
- 10:50 - 11:20 **Synthesis of STT Zeolite Membranes for He or H<sub>2</sub> Separation From Methane**  
Keynote Speaker: XUERUI WANG

- 11:20 - 11:40 **Hierarchical MFI Zeolite Membranes for Superior Xylene Separation**  
Speaker: YUTING ZHANG
- 11:40 - 12:00 **Design of Novel MOF/Palladium Composite Membranes for Hydrogen Separation**  
Speaker: MARTIN DROBEK
- 12:00 - 13:30 Lunch Break
- 13:30 - 14:15 **PLENARY - SILOXENE MEMBRANES FOR LIQUID SEPARATIONS**  
Plenary Speaker: DAVIDE MATTIA  
Chair: WILHELM MEULENBERG
- ROOM ESMERALDA 01**
- 14:20 - 15:30 **PROCESSES AND APPLICATIONS 9**  
Chair: DAVID WANG
- 14:20 - 14:50 **CO<sub>2</sub> Electro-Catalytic Reduction Into CH<sub>4</sub> in a Pressurized Protonic Electrochemical Membrane Reactor**  
Keynote Speaker: JOSE SERRA
- 14:50 - 15:10 **Concentration and Purification of Graphene Dispersions Using Ceramic Microfiltration Membrane**  
Speaker: DILSON MAIA
- 15:10 - 15:30 **Protonic Ceramic Membranes: Up-Scaling and Application to E-fuels Synthesis**  
Speaker: JULIAN DAILLY
- ROOM TOPÁZIO 01**
- 14:20 - 15:30 **MATERIALS AND PROCESSING 9**  
Chair: WILHELM MEULENBERG
- 14:20 - 14:50 **Switching Ceramic Surface Chemistry From Oxide to Non-Oxide Using Thermal ALD - Evaluation of BN/ $\alpha$  Al<sub>2</sub>O<sub>3</sub> MF Membranes**  
Keynote Speaker: ANNE JULBE
- 14:50 - 15:10 **Pebax ®/ZIF-67 Mixed Matrix Membranes: Effect of Particle Size and Pressure on Permeability and Selectivity**  
Speaker: DANIEL EIRAS
- 15:10 - 15:30 **UIO-66-NH<sub>2</sub> MOF/organosilica Mixed-Matrix Membrane for Water Desalination**  
Speaker: YANG PAN
- 15:30 - 16:30 **Coffee Break + Poster Section**
- ROOM ESMERALDA 01**
- 16:30 - 17:30 **PROCESSES AND APPLICATIONS 10 - STUDENT AWARD COMPETITION**  
Chair: ALAN AMBROSI AND ARIAN NIJMEIJER



- 16:30 - 16:45 **Development of a CFD Modeling Approach Applied to Gas Separation in Hollow Fiber**  
Membrane Module: pt.1- Analysis of Fluid Flow  
Speaker: NATHAN DE OLIVEIRA FRANCISCO
- 16:45 - 17:00 **Development of a CFD Modeling Approach Applied to Gas Separation in Hollow Fiber Membrane Module: pt.2- Analysis of Mass Transfer Models**  
Speaker: BERNARDO GREGORIO
- 17:00 - 17:15 **Novel Crystallization of Pharmaceutical Compounds Using Porous Carbon Membranes**  
Speaker: CATARINA SEQUEIRA
- 17:15 - 17:30 **Green Delamination of 2D LDH Nanosheets Incorporated in Mixed Matrix Membrane for CO<sub>2</sub> Capture**  
Speaker: PO-CHUN WU
- ROOM TOPÁZIO 01**
- 16:30 - 17:30 **MATERIALS AND PROCESSING 10 - STUDENT AWARD COMPETITION**  
Chair: CRISTIANO PIACSEK BORGES AND TAKAHIKO TAKEWAKI
- 16:30 - 16:45 **Tuning Mesoporous Ceramic Membranes With Alkyl-Based Phosphonic Acid Molecules for Solvent Nanofiltration**  
Speaker: DAAN BORGER
- 16:45 - 17:00 **Fast Firing Strategy to Obtain Ceramic Membranes Shaped by Centrifugal Casting**  
Speaker: JESSICA T. AND ORTIZ FLORENCIANO
- 17:00 - 17:15 **In-situ Growth of MoS<sub>2</sub> Nanosheets Layer on a Low Cost Flat Ceramic Substrate for Efficient Separation of Dyes**  
Speaker: ZAKARYA CHAFIQ ELIDRISSI
- 17:15 - 17:30 **Exploring the Impact of Nax and Agx Zeolite Additions on Mixed-Matrix Carbon Membranes**  
Speaker: LUCAS KIRSCH SCHINDEL
- 17:30 - 20:00 Free Time

## Friday, July 5

### ROOM TOPÁZIO 01

- 09:00 - 09:45 **PLENARY - REACTIVE SEPARATIONS WITH INORGANIC MEMBRANES: TRANSITIONING FROM FUNDAMENTAL STUDIES TO PRACTICAL APPLICATIONS**  
Plenary Speaker: THEODORE T. TSOTSIS  
Chair: DAVIDE MATTIA
- 09:45 - 10:15 **Keynote - Size Suppression of Metal Oxides in Mesoporous Silica Membranes for Wastewater Treatment**  
Keynote Speaker: DAVID WANG
- 10:15 - 10:45 **Keynote - A Molten Carbonate Membrane Enabled Liquid Gallium-CO<sub>2</sub> Battery for Energy Storage and CO<sub>2</sub> Reduction**  
Keynote Speaker: JUNHANG DONG
- 10:45 - 11:15 CLOSING CEREMONY
- 11:15 - 12:30 Brunch



## DR. AADESH HARALE

Saudi Aramco, Saudi Arabia

*Plenary title: Palladium membranes technology developments for decarbonization: industry perspective*

### curriculum vitae

Dr Aadesh Harale is part of Saudi Aramco's Research and Development Center in Dhahran. He obtained his master's degree from Cleveland State University – Department of Chemical Engineering in 2004, and received his PhD from University of Southern California – Department of Chemical Engineering in 2008. He was research engineer at Research Triangle Institute, RTP area, North Carolina in 2008 and since 2009 he is been at Saudi Aramco. His current research focuses on low carbon hydrogen production with integrated palladium-alloy membranes, electrified hydrocarbon reforming processes, CO<sub>2</sub> capture and conversion, and ammonia dehydrogenation. He is leading several technology projects under Saudi Aramco's sustainability research program. He has published more than 30 journal articles, a book chapter and has more than 40 granted and applied patents.



## DR. ANITA BUEKENHOUDT

VITO, Belgium

*Plenary title: Grafting of ceramic membranes: boosting application potential in liquid filtration*

### curriculum vitae

Dr. Anita Buekenhoudt graduated in 1983 at the UAntwerpen as master in physics. In 1990 she obtained a PhD in solid-state physics at the University of Leuven. After a two year post-doc, she joined the Flemish Institute for Technological Research, VITO in Mol. There she is active in the Business Unit Separation and Conversion Technology as project manager and head of the project team "Membranes in Chemistry". Her work focuses on the development, characterization and application of porous membranes in a broad range of challenging liquid separations relevant for the chemical industry. For this purpose her team develops new processes and if relevant, own innovative ceramic membranes. She has attracted and managed several national and international funded R&D projects, and industrial contract work on this topic. She is author of about 80 publications, 5 book chapters, > 70 international presentations, and inventor of 11 patents.



## DR. ARIAN NIJMEIJER

University of Twente, Netherlands

*Plenary title: Inorganic Proton Conducting Membrane Based Membrane Reactors, Processes and Applications 10 - Student Award Competition, Application of Membranes in Industrial Streams*

### curriculum vitae

Arian Nijmeijer holds a PhD in Inorganic Material Science from the University of Twente. He is Senior Principal Science Expert Membrane Technology as well as Principal Engineer Process Development in Shell with more than 20 years of experience in membrane technology for energy efficient separations in the energy sector. In his role, Arian coordinates membrane research, development and deployment in the field of membrane reactors, gas and liquid separations, using the full range of membrane materials such as ceramic, polymeric and metal membranes. One of his focus areas is the development of membrane reactors for hydrogen production and chemical conversions. Since November 2006, Arian is leading the Inorganic Membranes group of the University of Twente as a 0.2 FTE full professor.



## DR. DAVIDE MATTIA

University of Bath, UK

*Plenary title: Siloxene Membranes For Liquid Separations*

### curriculum vitae

Davide Mattia, FIChemE, CEng, is Professor of Chemical Engineering and Deputy Dean in the Faculty of Engineering and Design at the University of Bath. He earned a MEng in Materials Engineering in 2002 from the University 'Federico II, Napoli, Italy, and a PhD in Materials Engineering from Drexel University, Philadelphia, USA, in 2007. He joined Bath in 2008 as a Lecturer and was promoted to a full Professor in 2016. His current research focuses on using membranes to address environmental challenges, including the sustainable manufacturing of materials and the removal of organic micropollutants from water. He is a past Royal Academy of Engineering Research Fellow, holds an EPSRC Established Career Fellowship in Water Engineering and is PI on the £9Mn EPSRC Programme Grant SynHiSel on highly selective membranes. He has authored more than 100 publications in peer-reviewed journals and holds several patents on membrane-related inventions. He is the co-founder of Naturbeads Ltd. a start-up manufacturing biodegradable cellulose microbeads as a replacement for plastic microparticles used in a wide range of products.



## DR. JERRY LIN

Arizona State University, USA

*Plenary title: Inorganic Membranes: Past, Present, and Future - A Personal Journey and Perspective*

### curriculum vitae

Jerry Y.S. Lin is a Regents' Professor at Arizona State University. He was department chair of chemical engineering at ASU from 2006-2009 after his 13-year appointment as a faculty member at University of Cincinnati. Prof. Lin's main research areas are membrane science, adsorption/catalysis, and energy storage. He has published about 400 papers mostly in chemical engineering journals and is an inventor of 9 US and European patents and 5 pending US patents. Prof. Lin's research was recognized by several national awards including AIChE Institute Award for Excellence in Industrial Gas Technologies in 2009 and AIChE Gerhold Award in 2021. He is an elected Fellow of American Society for Advancement of Science (AAAS), American Institute of Chemical Engineers (AIChE) and North American Membrane Society (NAMS). Prof. Lin is currently co-Editor-in-Chief of Journal of Membrane Science and JMS Letters.



## DR. WILHELM A. MEULENBERG

Forschungszentrum Jülich, Germany

*Plenary title: Recent developments in ceramic membranes for gas separation and membrane reactors*

### curriculum vitae

Prof. Dr. Wilhelm A. Meulenberg is head of the department Gas Separation Membranes at the Institute of Energy and Climate Research IEK-1 at Forschungszentrum Jülich GmbH, Germany. He graduated 1994 in two different studies - Metallurgy and Materials Technology and Mineralogy at the RWTH Aachen, Germany. There he also obtained his Ph.D. in 1999. Topic of his Ph.D. was the manufacturing characterization of ceramic shell moulds for investment casting at the Institute of Gesteinshüttenkunde of RWTH Aachen, Germany. Since then, he has been working at Forschungszentrum Jülich GmbH in various areas of materials development and component manufacturing for high temperature fuel cells and ceramic gas separation membranes. From 1999 to 2001, he worked in the development of high temperature fuel cells at the Institute of Materials and Processing for Energy Applications IWW-1. From 2001 to 2003, he was personal scientific assistant to the Executive Board at Forschungszentrum Jülich GmbH. In 2003, he started to build up the field of inorganic gas separations at the Institute of Energy and Climate Research IEK-1, where currently he is the head of the department. Recent research is focussed on the field of mixed ionic electronic conductors for gas separation and membrane reactors for the production of synthetic fuels and chemicals in membrane reactors. In addition, he works in the field of porous membranes for separation of hydrogen and CO<sub>2</sub> from different gas mixtures. His Google Scholar h-index in 2023 is 38 (i10=92) with more than 5700 citations. In parallel, he had a position from 2010 - 2019 at the University of Queensland, Australia - an Adjunct Associate Professorship. Since 2016 until today, Wilhelm Meulenberg is Full Professor at the University of Twente, Netherlands for ionic conductors.



## DR. THEODORE TSOTSIS

University of Southern California, USA

*Plenary title: Reactive separations with inorganic membranes: transitioning from fundamental studies to practical applications*

### curriculum vitae

Theo Tsotsis is the Robert E. Vivian Professor in Energy Resources in the Mork Family Department of Chemical Engineering and Materials Science at the University of Southern California (USC), where he served as the Department's inaugural Chair in 2005. His research interests are in the areas of transport, adsorption and reaction in complex porous media, reaction engineering, reactor design, and membrane separations. He is the author of over 290 technical papers, numerous book chapters, eight U. S. and one European patent, and one book. He has also edited two Technical Meeting Proceedings volumes. He has worked on a broad array of problems, ranging from the abstract and theoretical (symmetry breaking instabilities, reaction rate oscillations) to the practical and applied (CO<sub>2</sub> capture and storage, and membrane reactors and bioreactors). Professor Tsotsis was the co-founder of USC's NSF/IGERT Center in Environmental Engineering. He is a Fellow of the AIChE.



## DR. TOSHINORI TSURU

Hiroshima University, Japan

*Plenary title: Subnano-tuning of amorphous Silicon-based membranes for improved performance: Fabrication, characterization, and application to gas and liquid phase separation*

### curriculum vitae

Toshinori Tsuru received his Ph.D. degree in 1991 after he graduated from The University of Tokyo in 1983. He moved to Hiroshima University in 1995, and was promoted to a full professor in 2006. He has been dedicated to membrane science and technology for more than 40 years. His research experience started with nanofiltration in terms of membrane preparation and the transport mechanism of electrolytes through charged porous membranes. Upon joining Hiroshima University, his interests have expanded to inorganic and organic/inorganic hybrid membranes, involving the preparation of subnano-nanoporous Si-based membranes, characterization, transport mechanism, and the applications to gas and liquid phase separation. He has authored and co-authored over 300 SCI papers and 50 book chapters. He served as the President of The Membrane Society of Japan in 2013 and 2014, and is also an editorial board member in Journal of Membrane Science. He is selected as Distinguished Professor at Hiroshima University.

## Dr. Andriy Yaroshchuk

- Universitat Politècnica de Catalunya, Spain
- Characterization of nanoporous active layers of composite ceramic membranes via time-resolved electrical measurements

## Dr. Anne Julbe

- Institut Européen des Membranes, France
- Switching ceramic surface chemistry from oxide to non-oxide using thermal ALD - Evaluation of BN/ $\alpha$ -Al<sub>2</sub>O<sub>3</sub> MF membranes

## Dr. Carme Guell

- Universitat Rovira i Virgili, Spain
- Premix membrane emulsification with microporous dynamic membranes to produce single and multiple emulsions stabilized with insect proteins

## Dr. Dárley Carrijo de Melo

- PETROBRASS.A., Brazil
- Ceramic membranes for natural gas production: challenges and environmental benefits

## Dr. David Wang

- The University of Sydney, Australia
- Size Suppression of metal oxides in mesoporous silica membranes for wastewater treatment

## Dr. Ingolf Voigt

- Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany
- Water separation from potash mining dump leachate by membrane distillation

## Dr. Joe da Costa

- The University of Queensland, Australia
- Membrane percrystallisation technology and concepts for mineral brines, food and pharmaceutical compounds

## Dr. Jose Serra

- Spanish National Research Council (CSIC) and Universitat Politècnica de València (UPV), Spain
- CO<sub>2</sub> electro-catalytic reduction into CH<sub>4</sub> in a pressurized protonic electrochemical membrane reactor

## Dr. Junhang Dong

- University of Cincinnati, United States of America
- A molten carbonate membrane enabled liquid gallium-CO<sub>2</sub> battery for energy storage and CO<sub>2</sub> reduction

## Dr. Marie-Laure Fontaine

- SINTEF, Norway
- Development of electrolysis technologies in FME HYDROGENI

## Dr. Masahiko Matsukata

- Waseda University, Japan
- Development of membrane reactor for Fischer-Tropsch synthesis using Fe-based catalyst and ZSM-5 membrane

## Dr. Mieke Luiten-Olieman

- Ph.D, University of Twente in the Netherlands.
- Her main interests are also low-fouling silicon carbide membranes, recovery of valuable metal with membrane crystallization, and interfacial hybrid nanofilm formation

## Dr. Saad Alami Younssi

- Hassan II University of Casablanca, Morocco
- Valorization of natural material in development of new ceramic composite membranes. Application to salts rejection and environmental process

## Dr. Sergio Yesid

- Chemical Engineering and Mechanical Engineering at Universidad de los Andes (UniAndes), Bogotá.

## Dr. Silvio Weschenfelder

- PETROBRASS.A., Brazil
- VApplication of ceramic membranes for water treatment on offshore oil production platforms

## Dr. Stephanie Roualdès

- Institut Européen des Membranes, France
- Organosilicon PECVD-processed membranes for the selective detection of BTEX

## Dr. Takahiko Takewaki

- Mitsubishi Chemical Corporation, Japan
- Potential contribution of zeolite membranes towards carbon neutrality

## Dr. Xuerui Wang

- Nanjing Tech University, China
- Synthesis of STT zeolite membranes for He or H<sub>2</sub> separation from methane

# Approved abstracts

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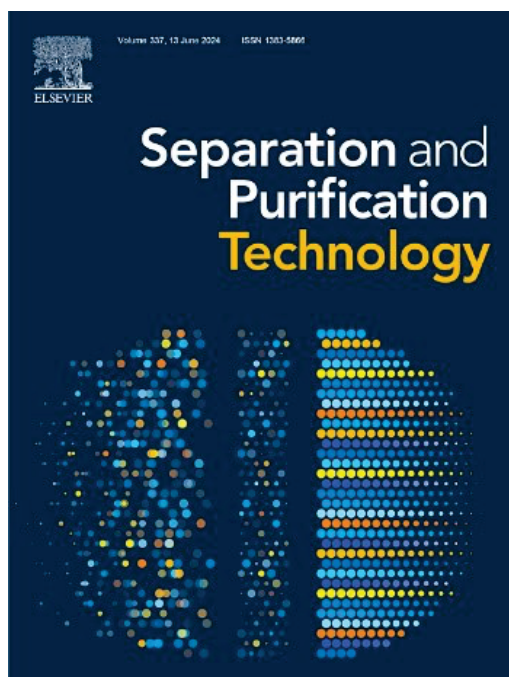
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Registered participants presenting their work at the 17th ICIM will have the possibility to publish full papers in Special Issues of the following journals covering the research fields of the conference. Before submission, please carefully read the general guidelines and the specific instructions on manuscript preparation (reported in the Guide for Authors of the Journals).



## Separation and Purification Technology

Participants of the 17th ICIM are invited to submit their papers on Inorganic Membrane Materials to a special issue of Separation and Purification Technology, "Innovations in Inorganic Membrane Technology: Expanding Frontiers in Separation and Purification".

Separation and Purification Technology is a journal dedicated to the dissemination of novel methods for separation and purification in chemical and environmental engineering for homogeneous solutions and heterogeneous mixtures, published by Elsevier. Submissions are open on July 1, 2024. The deadline for manuscript submission is December 31, 2024. When submitting your manuscripts, please specify that your paper is a contribution to this Special Issue by selecting the Article Type "VSI: Inorganic Membranes".

## Open Ceramics

Participants of the 17th ICIM are invited to submit their papers on Inorganic Membrane Materials to a special issue of **Open Ceramics**, "*Development of novel ceramic membranes and applications*". Open Ceramics is an official, peer-reviewed, open-access journal of the European Ceramic Society, published by Elsevier.

The deadline for manuscript submission is September 30, 2024.

We are pleased to inform you that this Special Issue will waive 100% of the APC (Article Publishing Charge) for submissions received before the submission deadline.

When submitting your manuscripts, please specify that your paper is a contribution to this Special Issue by selecting the Article Type "Novel Ceramic Membranes".



## Event Venue

Oceania Convention Center | Address: Rua do Marisco, 550 - Ingleses, Centro | Florianópolis - SC.

## Opening Hours - Secretariat

July 1<sup>th</sup> - 12h00 to 18h00

July 2<sup>th</sup> - 7h30 to 18h00

July 3<sup>th</sup> - 8h00 to 17h00

July 4<sup>th</sup> - 7h30 to 17h30

July 5<sup>th</sup> - 8h00 to 12h30

## Opening Ceremony

Will be held on June 1, 2024 from 17h30 to 18h00 at Topázio 1.

## Registration and Material Delivery

Third parties will not be allowed to pick up the credentials/materials. A photo ID is required to pick up the credentials/materials.

The use of a credential is essential and compulsory for access to the venue and scientific sessions.

Declaration of Attendance

Attendance declarations should be requested from the event secretariat.

## Certificates

A certificate of participation in the event will be issued to all registered participants, which will be available from July 5th on the event website: [www.icim2024.org.br](http://www.icim2024.org.br)

## Event Secretariat

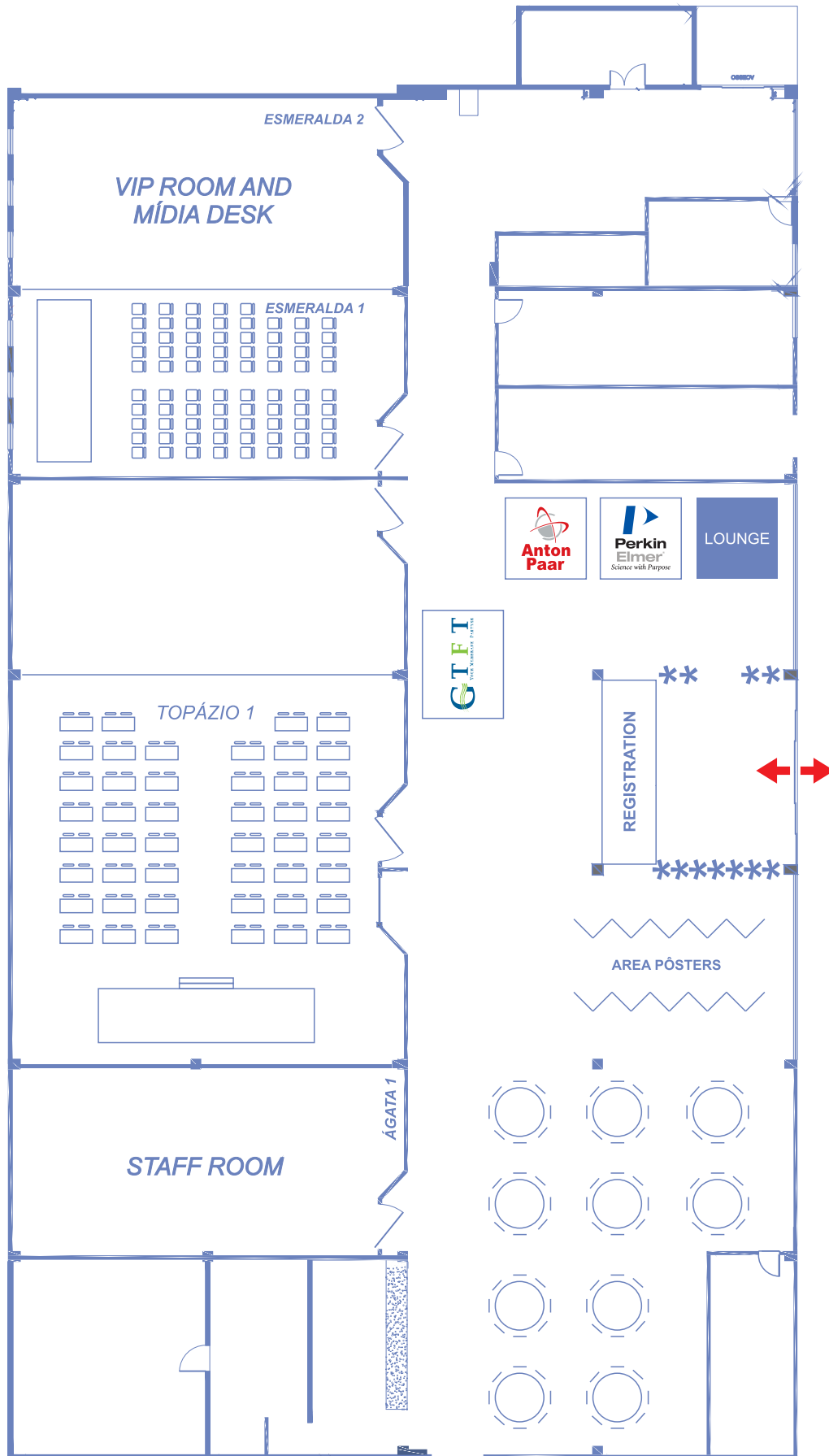
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- To avoid inconvenience, please do not leave bags, briefcases or other personal belongings behind when you leave for breaks or meals.
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