

ICM
2022

**The 4th International Conference on Materials:
Advanced and Emerging Materials**
19–21 October 2022 | Barcelona, Spain

Program and Abstract Book

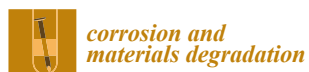
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4th International Conference on Materials: Advanced and Emerging Materials

MGS Auditorium
Barcelona, Spain
19 – 21 October 2022

Conference Chairs

Prof. Dr. Maryam Tabrizian
Prof. Dr. Filippo Berto

Organised by



Conference Secretariat

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**4th International Conference on Materials:
Advanced and Emerging Materials**
19 – 21 October 2022, Barcelona, Spain

		Wednesday 19 Oct 2022	Thursday 20 Oct 2022	Friday 21 Oct 2022
Morning		Registration Welcome <i>S1. Materials Characterization - Part I</i>	<i>S4. Soft and Bio-materials - Part I</i>	<i>S4. Soft and Biomaterials - Part II</i>
		Coffee Break	Coffee Break	Coffee Break
		<i>S2. Nanotechnology in Material Sciences and Engineering - Part I</i>	<i>S3. Materials Processing and Manufacturing</i>	<i>S2. Nanotechnology in Material Sciences and Engineering - Part II</i>
Afternoon		Lunch	Lunch	Closing Remarks & Awards Ceremony
		<i>S6. Optical, Electrical and Magnetic Materials</i>	<i>S1. Materials Characterization - Part II</i>	
		Coffee Break & Poster Session A	Coffee Break & Poster Session B	

Wednesday 19 October 2022: 08:15 - 13:05 / 14:35 - 17:40

Thursday 20 October 2022: 09:00 - 13:05 / 14:35 - 17:50 / **Conference Dinner: 20:00**

Friday 21 October 2022: 09:00 - 13:15

Conference Programme

Wednesday 19 Oct 2022

- 08:15 Registration Desk Open (Check-in)
08:45 – 09:00 Welcome from the Chairs
09:00 – 09:45 **Plenary Talk** : **Kazunori Kataoka** - Engineered nanosystems and nanoconjugates with smart functionalities for targeted therapy of intractable diseases
Chair: **Maryam Tabrizian**

Session 1. Part I

Materials Characterization

Session Chairs: **Tomasz Garbowski** and **Emil Babić**

- 09:45 – 10:00 **Emil Babić** - Are compositionally complex alloys intrinsically better than conventional ones?
10:00 – 10:15 **Damian Mrówczyński** - The role of imperfections in numerical homogenization of multi-layered panels with a corrugated core
10:15 – 10:30 **Natalia Staszak** - Numerical homogenization of three-layer plates with a soft core
10:30 – 10:45 **Lukmanul Hakim Zaini** - Nanofibrils from oil palm trunk: Effect of delignification and fibrillation technique
10:45 – 11:00 **Ewa Olewnik-Kruszkowska** - The role of surfactants in the formation of homogenous polymeric films based on polylactide and cellulose acetate propionate

11:00 – 11:30 **Coffee Break**

Session 2. Part I

Nanotechnology in Material Sciences and Engineering

Session Chairs: **Tohid Didar** and **Danatbek Murzalinov**

- 11:30 – 11:50 **Keynote Talk** : **Tohid Didar** - Micro and nano engineered bio-interfaces for diagnostics, therapeutics and public health
11:50 – 12:05 **Ateeque Siddique** - Chemotherapy-Eluting Nanoparticle Acrylic Bone Cement for Local Adjuvant Treatment of Spinal Metastases

- 12:05 – 12:20 **Shadmad Khan** - Patterning Pathogen-responsive DNAzymes onto Food Packaging for Real-time Food Monitoring in situ
- 12:20 – 12:35 **Chongchong Tang** - Phase formation and thermal stability of quaternary MAX phase thin films in the Cr-V-C-Al system: an experimental combinatorial study
- 12:35 – 12:50 **Danatbek Murzalinov** - Formation of light-emitting particles with different parameters by coating ZnO on a silicon surface with several porosity levels
- 12:50 – 13:05 **Alessandro Corozzi** - Bioinspired Hydrophobic Coatings for Antifouling Application

13:05 – 14:35 **Lunch**

Session 6

Optical, Electrical and Magnetic Materials

Session Chairs: **Federico Bella** and **Kristen Dellinger**

- 14:35 – 15:05 **Invited Talk** : **Federico Bella** - Advanced Materials Supporting the Lithium and post-Lithium Energy Technologies
- 15:05 – 15:20 **Agnieszka Pawłowska** - A new type of an Organic Memristive Device based on interactions between polymer thin-films
- 15:20 – 15:40 **Keynote Talk** : **Kristen Dellinger** - Next-generation substrates for surface-enhanced Raman spectroscopy
- 15:40 – 15:55 **Anamika Kumari** - A scheme to determine the carrier density distribution, potential profile, and subband quantization of a conducting interface LaVO₃/SrTiO₃

15:55 – 17:25 **Coffee Break and Poster Session A**

Thursday 20 Oct 2022

- 09:00 – 09:45 **Plenary Talk** : **Molly Shoichet** - Emulating the Environment : Soft Materials Enable 3D Cell Culture
Chair: **Maryam Tabrizian**

Session 4. Part I

Soft and Bio-materials

Session Chairs: **Derek Rosenzweig** and **Frej Mighri**

- 09:45 – 10:05 **Keynote Talk** : **Derek Rosenzweig** - Leveraging 3D biofabrication, bioengineering and biophysical approaches for musculoskeletal tissue regeneration and local therapeutic delivery
- 10:05 – 10:20 **Leandro S. Oliveira** - Preparation of hybrid films of locust bean galactomannans and starch from cassava peels
- 10:20 – 10:35 **Florina Daniela Cojocar** - Polysaccharides-calcium phosphates beads for the treatment of osteoporotic fractures
- 10:35 – 10:50 **Frej Mighri** - Development and characterization of biocompatible porous PLA-Chitosan scaffolds without solvent treatment
- 10:50 – 11:05 **Piotr Rychter** - Hydrolytic degradation of methylene carbonate/lactide copolymers with functional, active carboxylic side groups as a carrier of biologically active agent, including drugs for use in dermatology and cosmetology

11:05 – 11:35 **Coffee Break**

Session 3.

Materials Processing and Manufacturing

Session Chairs: **Antanas Ciuplus** and **Regita Bendikiene**

- 11:35 – 11:50 **Rafał Zybala** - Residual stress measurement and properties investigation of cold sprayed titanium and titanium alloy coatings after laser surface treatment
- 11:50 – 12:05 **Katherine Pérez** - Formation of PEO coatings on binary material Mg-33wt%Ti processed by high energy ball milling (HEBM)

- 12:05 – 12:20 **In Gyeong Kim** - Manufacture of Invar Sheets Using a Continuous Electrodeposition Technique for the OLED FMM
- 12:20 – 12:35 **Sharon Koppka** - Influence of microstructure and porosity on bending strength of nanoporous, selective laser-sintered glasses
- 12:35 – 12:50 **Jorge Santos** - Effect of a physical vapor deposition film applied on decorative electroplated coatings of plastic substrates
- 12:50 – 13:05 **Anne-Marie Layher** - Additive Manufacturing of Preforms for Special Glass Fibres made of Al-doped Fused Silica

13:05 – 14:35 **Lunch**

Session 1. Part II

Materials Characterization

Session Chairs: **Joseph Poon** and **Lilia Sabantina**

- 14:35 – 15:05 **Invited Talk : Joseph Poon** - High-Entropy Alloys: Opportunities, Challenges, and Progress
- 15:05 – 15:20 **Huseyin Zengin** - Evolution of microstructure, mechanical properties and corrosion resistance of Mg–2.2Gd–2.2Zn–0.2Ca (wt%) alloy by extrusion at various temperatures
- 15:20 – 15:35 **Adriana S Franca** - Development of antioxidant films based on oil/water emulsions with sunflower proteins and cellulose nanoparticles
- 15:35 – 15:50 **Jakub Mokrzycki** - Assessment of ammonium ions removal from aqueous solutions using zeolite-composite materials derived from fly ash
- 15:50 – 16:05 **Constantin Mulaja Tshakatumba** - Tailings recycling into fired building bricks and anti-acid bricks
- 16:05 – 16:20 **Nadia Muhammad Hussain** - Characterization and Minimization of the Four-Point Probe for Direct Blood Impedance Measurements in Vacutainer Tube

16:20 – 17:50 **Coffee Break and Poster Session B**

20:00 **Conference Dinner at Abrassame**

Friday 21 Oct 2022

Session 4. Part II
Soft and Bio-materials

Session Chairs: **Roman Perez** and **Pierre Bagnaninchi**

- 09:00 – 09:30 **Invited Talk : Roman Perez** - Therapeutic biomaterials for the stimulation of tissue regeneration
- 09:30 – 09:50 **Keynote Talk : Pierre Bagnaninchi** - Imaging cell and tissue physical properties
- 09:50 – 10:05 **Martin Humenik** - Microstructured arrays based on self-assembled fibrillar networks for specific cell immobilization
- 10:05 – 10:20 **Raquel Giménez** - Soft functional materials by bottom-up 1D assembly of pyrazole dendrons
- 10:20 – 10:40 **Keynote Talk : Arnab Chanda** - Investigation of Mechanical Properties in Novel Auxetic Skin Grafts
- 10:40 – 10:55 **Faisal Abdelrahim** - Influence of Anodization Parameters on The Surface and Corrosion Resistant Characteristics of Titanium Nanotubes Formed on Ti Substrate in Simulated Body Fluids

10:55 – 11:30 **Coffee Break**

Session 2. Part II
Nanotechnology in Material Sciences and Engineering

Session Chair: **Zeinab Hosseinidoust**

- 11:30 – 12:00 **Invited Talk : Konstantin Neyman** - In-silico designing bimetallic nanoparticles
- 12:00 – 12:15 **Zeinab Hosseinidoust** - Self-Assembling Nanofibrous Viral Microgels as Sprayable Antimicrobials Targeting Multidrug-Resistant Bacteria
- 12:15 – 12:30 **Mansi Pahuja** - Ni-Foam-Graphene-CNTs-SnSeP: An efficient electrocatalyst covering universal pH range and tap water splitting for hydrogen evolution reaction
- 12:30 – 12:45 **Karolina Ogródowska** - Nanosilica Modification of Epoxy Matrix in Hybrid Basalt-Carbon FRP Bars - Impact on Microstructure and Mechanical Properties
- 12:45 – 13:00 **Gema Tabares** - Fabrication of MoTe₂(1-x)Se_{2x} alloy-based hydrogen gas sensor

13:00 **Awards Ceremony and Closing Remarks**

Welcome from the Chairs

Dear colleagues, friends, and the wider material science community:

On behalf of the organizing committee, it is our great pleasure to invite you to the 4th International Conference of Materials, organized by MDPI's Open Access journal *Materials*. This conference will be held in the beautiful city of Barcelona from October 19 to October 21, 2022. The first three editions of the conference were in electronic format, and each was a great success. This has encouraged the organizing committee to take this tradition to the next level by organizing the 4th edition of this conference in Barcelona, where all stakeholders working on various aspects of materials science and material engineering can come together. The aim is to make this event a forum for discussion, knowledge exchange and fruitful interactions among participants in this exponentially growing field.

Stakeholders from academia and industry as well as from governments and research institutes are welcome to join this event and share their findings on various topics related to materials, such as:

- Materials Characterization
- Nanotechnology in Material Sciences and Engineering
- Materials Processing and Manufacturing
- Soft and Bio-materials
- Fibers and Membranes
- Optical, Electrical and Magnetic Materials

We are very enthusiastic about this 4th Materials Conference and are relying on you to make it a successful event.

We look forward to meeting you in Barcelona!

Prof. Dr. Maryam Tabrizian
Conference Chair



Editor-in-Chief of *Materials*.
McGill University, Canada

Prof. Dr. Filippo Berto
Conference Chair



Associate Editor-in-Chief of
Materials. Norwegian University of
Science and Technology, Norway



materials

an Open Access Journal by MDPI

Materials (ISSN 1996-1944) is a peer-reviewed, open access journal of materials science and engineering published semimonthly online by MDPI. *Materials* provides a forum for publishing papers which advance the in-depth understanding of the relationship between structure, properties, and functions of all kinds of materials. It covers all aspects of materials science and engineering including synthesis, structure, mechanical, chemical, electronic, magnetic, and optical properties, as well as their various applications.

Among other databases, *Materials* is indexed by the Science Citation Index Expanded (Web of Science), MEDLINE (PubMed), and Scopus.

Journal Webpage: <https://www.mdpi.com/journal/materials>

Impact factor: **3.748** (2021); 5-Year Impact Factor: 4.042 (2021)

Abstracts

Poster Exhibition

A22. Investigation of the relationship between the change in microstructure and mechanical characteristics of dissimilar welds

Antanas Ciuplys, Regita Bendikiene, Saulius Baskutis, Jolanta Baskutiene

Kaunas University of Technology, Lithuania

The present study investigates the relationship between the change in microstructure and mechanical characteristics of various dissimilar welded stainless steels and a standard structural steel. It refers to a weld joining two materials from different alloy systems commonly used in heat exchangers, pressure vessels, and power plant systems. It is clear that maintaining the integrity of such welds is critical to safety issues. Therefore, detailed microscopic and experimental studies were performed to evaluate the relationship between these welds. The microscopic analysis did not reveal the presence of any weld defects such as porosity or cracks. Changes in welds were evaluated after hardness and tensile tests. The hardness profiles revealed differences between austenitic and martensitic steel welds that later showed extremely high values in the heat-affected zone, which caused fractures in this zone during a tensile test. The welds of all austenitic steel grades withstood the tensile test with fractures observed in the base metal zone. The achieved results revealed that the higher hardness of the martensitic phase is closely related to the formation of an untempered coarse martensitic structure and higher carbon content.



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