

DAY 1 | 3rd September 2018

8h00 – 9h00

Registration

9h00

Opening Session

9h30

Keynote Lecture

European Defence Trends in Materials and Structures Technologies Research

Giuseppe Giovanni Daquino

European Defense Agency | **Belgium**

Chair: Raul Fangueiro

| Cisterna Room | | Lisboa Room | | Atlântico Room | | |
|---------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10h15 | Session 8 - Impact, Ballistic and Blast Performance Chair: Jos Brouwers | Lead-Free Primary Explosives based on Transition Metal Coordination Compounds Jörg Serstorfer University of Munich (LMU) Germany | Session 9 - Advanced Materials and Technologies for Defense Chair: Sohel Rana | Raw and Processed Materials Used in the European Defence Industry Claudiu Pavel Joint Research Centre, European Commission Netherlands | Session 2 - Smart Materials and Structures Chair: Maria Conceição Paiva | Reduced Graphene Oxide Coating for Electromagnetic Interference Shielding Application Ricardo Andrade MackGrapple Brazil |
| 10h30 | | Ballistic Impacts Experiments and Modeling of Polyethylene/Protection Systems Lionel Gilson Royal Military Academy Belgium | | A Dynamic Mechanical Analysis of T2 Copper at High Strain Rates Shuai Chen ZNDY of Ministerial Key Laboratory, University of Science and Technology China | | Smart Acclimatization on Textile Systems for Defense Gilda Santos CITEVE - Technological Centre for the Textile and Clothing Industry of Portugal Portugal |
| 10h45 | | Alternatives for Protection of Structures and Components Under Near Field Blast Loadings Daniel Ambrosini University of Cuyo, CONICET Argentina | | Adaptive Camouflage Technologies of Defense Interest Bruno Marinho Management and Technological Innovation Agency Brazil | | Smart and Sustainable Materials for Military Applications based on Natural Fibres and Silver Nanoparticles Diana P. Ferreira Centre for Textile Science and Technology (2C2T), Minho University Portugal |
| 11h00 – 11h30 | COFFEE BREAK | | | | | |

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| 11h30 | <p>Invited Lecture Molecularly Imprinted Polymers and Optical Fiber Sensors for Security Applications Nunzio Cennamo University of Campania Luigi Vanvitelli Italy</p> |
| 11h45 | |
| 12h00 | <p>Experimental and Numerical Characterization of 3D-Printed PLA under Uniaxial High Strain-Rate Loading Hugo B. Rebelo CINAMIL, Military Academy and CERIS, ICIST and Department of Civil Engineering, Faculty of Science and Technology, Nova University of Lisbon Portugal</p> |
| 12h15 | <p>Propellant based on Sustainable Polymers from Succinic Acid Nicolis Araujo Federal University of Rio de Janeiro Brazil</p> |
| 12h30 | <p>The Effect of PACVD Modification on the Usable Properties of the Ballistic Textiles Applied for the Design of the Body Protectors Marcin Struszczyk Institute of Security Technologies MORATEX Poland</p> |
| 12:45 | <p>Textile Electrodes for Heart Rate Measurement: a Comparative Study for Firefighters' Monitoring André G. Ferreira University of Minho Portugal</p> |

Session 4 - Advanced Polymers, Fibrous and Textile Materials
Chair: François Bousso

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| <p>Invited Lecture Closing the gap between Advances in Nanotechnology and Advanced Materials and its deployment Lars Montelius INL Portugal</p> |
| <p>Lanthanum Hydroxide Nanoparticles / Multi-Wall Carbon Nanotubes Nanocomposite Arvind Kumar Bhakta University of Namur Belgium</p> |
| <p>Graphene-Based Nanocomposites with Improved Mechanical and Ballistic Protection Properties Israel Gago Technical University of Cartagena, Chemical and Environmental Engineering Department Spain</p> |
| <p>Application Argonium Plasma Jet with Frequency 10 KHZ in Atmospheric Environment Luis Madson Costa Technical Institute of Aeronautics Brazil</p> |
| <p>Ballistic Resistance of Magnesium Alloy, AZ31B Reinforced with Carbon Nanotube and Lead under Gas Gun Simulation Mohamad Faizal Abdullah National Defense University of Malaysia Malaysia</p> |

Session 6 - Nanomaterials and Nanostructures for Defense
Chair: Petra Pötschke

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| <p>Comparison of the Ballistic Stability of Composites based on Carbide of Boron, Corund, and Glass-Ceramics (Armored Sital) Yuri Merkulov Independent scientist Russian Federation</p> |
| <p>Integrity of Carbon Fibre-Reinforced Polymer Composites during Impact whilst under Fire Conditions Robert Chapple Institute for Materials Research and Innovation, University of Bolton United Kingdom</p> |
| <p>Abrasive Waterjet Machining of Aluminium / Boron Carbide Composite Kanthababu Mani Department of Manufacturing Engineering, College of Engineering Guindy, Anna University India</p> |
| <p>Damage Investigation Over Upper Skin Composite Panels of the Eurofighter Aircraft Michele Buonsanti Department Diceam Mediterranean University of Reggio Calabria Italy</p> |
| <p>Rheinfoced cork composites developed for helmet liner with improved damping performance Francisco J. Galindo-Rosales Transport Phenomena Research Center, Faculty of Engineering, University of Porto Portugal</p> |
| <p>A Hierarchical Impact Force Reconstruction Method for Aerospace Composites Mario Emanuele de Simone University of Bath United Kingdom</p> |

Session 1 - Advanced Composites for Defense Applications
Chair: Wang Shijie

| 13h00 – 14h00 | | LUNCH | | | | | |
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| 14h00 | Session 3 - CBRN Protection Chair: Rui Costa | Development of a Low-Cost Device for Detection of Explosives Vapors Liliana Martelo Higher Technical Institute – University of Lisbon Portugal | Session 7 - Auxetic Materials Chair: Jun Lou | Invited Lecture Auxetic Materials: Potential for Defense Applications Sohel Rana Fibrenamics, University of Minho Portugal | Session 4 - Advanced Polymers, Fibrous and Textile Materials Chair: Diana Ferreira | Increased Energy Absorption and Reliability of Beams by Improved Web-Flange Joints Nandan Khokar Biteam AB Sweden | |
| 14h15 | | | | | | | |
| 14h30 | | Rapid Deactivation of Organophosphorus Nerve Agents by Reactive Adsorbents Based on Nanocrystalline Metal (Hydr)Oxides Jiri Henych Institute of Inorganic Chemistry of the Czech Academy of Sciences Czech Republic | | Indentation and Impact in Dome-Shaped Auxetic Honeycombs Yousef Dobah University of Bristol United Kingdom | | Smart Textile Finishes - Maximum Protection, High Efficacy, Long Durability Mário Brito Smart Innovation Portugal | |
| 14h45 | | Chemical and Biological Warfare Protection and Self-Decontaminating Fabrics based on Oxide Nanoparticles João F. Pereira Fibrenamics, University of Minho Portugal | | Development and Characterization of High Performance Auxetic Fabrics Produced Using Purl Knitted Structures Rui Magalhães Centre for Textile Science and Technology (2C2T), University of Minho Portugal | | Meta-Aramid Fiber with Smart and Functional Behaviour Fernando Ribeiro Oliveira University Federal of Santa Catarina Brazil | |
| 15h00 | | Selection of Chemical Protective Suits by Users: Are the Standard Tests Results Sufficient? Denis Josse Alpes-Maritimes Fire and Rescue Services France | | Development of High Performance Auxetic Composites for Application in Protection Area Fernanda Steffens Federal University of Santa Catarina Brazil | | Soldier Monitoring Systems: The Potential of Natural Fibres and Metal Oxide Nanoparticles Sofia Costa Fibrenamics, University of Minho Portugal | |
| 15h15 | | Response of Auxetic Composite Sandwich Panel to Fragment Simulating Projectile Impact Matej Vesenjok Faculty of Mechanical Engineering, University of Maribor Slovenia | The Studied on Dynamic Plastic Deformation Behavior of 5052 Aluminium Alloy Ping Song Nanjing University of Science and Technology China | | | | |

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| 15h30 | | Non-Releasing Biocidal Coatings: A New Eco-Friendly Strategy to Prevent Marine Biofouling Amaya Igartua IK4-TEKNIKER Spain | | Characterization of Auxetic and Mechanical Behaviours of Auxetic Composites Developed Using Star Knitted Structures João Pedro Nunes Institute for Polymers and Composites (IPC), University of Minho Portugal | | The Studied on Dynamic Plastic Deformation Behavior of 5052 Aluminium Alloy Ping Song Nanjing University of Science and Technology China |
| 15h45 – 16h15 | COFFEE BREAK | | | | | |
| 16h15 | Session 9 - Advanced Materials and Technologies for Defense Chair: Shripad P. Mahulikar | Investigating the Mechanical Behaviours of 3D Warp Interlock Fabrics for Soft Body Armour Design François Boussu ENSAIT France | Session 8 - Impact, Ballistic and Blast Performance Chair: M. Balakrishnan | Development of A New Technology to Manufacture an Additional Ballistic Protection Panel (Add On) for the New Brazilian Armored Personnel Carrier (GUARANI) Julio Dolce da Silva Brazilian Army Brazil | Session 5 - Design and Analysis of Protection Materials and Composites Chair: Michele Meo | Invited Lecture Molecular Modeling of Mechanical Properties of Semicrystalline Polyethylene Jan Andzelm U.S. Army Research Laboratory United States |
| 16h30 | | | | Manufacture and Ballistic Testing of Sheared Dyneema® Plates Behjat Ansari University of Bristol United Kingdom | | |
| 16h45 | | Facilities, Skills and Competence in Advanced Materials Studies for Defense at C2T António Pereira Gonçalves Center for Nuclear Sciences and Technologies (C2TN), Higher Technical Institute, University of Lisbon Portugal | | Experimental Evaluation of Impact Resistant Composite Solutions for Commercial Aircraft Fuselage Luis Pina INEGI Portugal | | Experimental and Numerical Analysis of Combat Helmet Ballistic Performance José Antonio Loya University Carlos III of Madrid Spain |
| 17h00 | | A New Approach to Dual Use Research – Janus Project Panagiotis Kavouras National Technical University of Athens, School of Chemical Engineering Greece | | Mapping Ballistic Penetration Resistance of Hard Ceramic Targets Joaquim M. Vieira Department of Materials and Ceramic Engineering (DEMaC) and CICECO, University of Aveiro Portugal | | Characterization and Constitutive Modelling of Crushable Foams - Application to Highly Demanding Thermomechanical Loading Cases Paulo Antunes Critical Materials Portugal |

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| 17h15 | Activities at Onera on Materials and Structures for Defence Applications Stefan Drawin ONERA France | Vibration Analysis Of Carbon Fiber Composite High-Pressure Vessel Subjected To Mechanical Impact Maciej Panek Wrocław University of Science and Technology Poland | Comparison between Finite Element Models and Simplified Energetic Models for High Velocity Impacts on an Aluminium Plate Énio Chambel Military Academy Portugal |
| 17h30 | Joining Methods of High Entropy Alloys Used for Ballistic Targets Ionelia Voiculescu University Politehnica of Bucharest Romania | Modified Pendulum Impact Test on UHPFRC with Coarse Basalt Aggregate H.J.H. Brouwers Eindhoven University of Technology Netherlands | Comparison of Numerical Modelling Methods of Innovative Materials for Ballistic Shields Adrianna Mackiewicz Department of Mechanics, Materials Science and Engineering, Wrocław University of Science and Technology Poland |

18h00 **CLOSING**

19h00 **SOCIAL PROGRAM - WELCOME RECEPTION**
 Palace of the Marquis of Pombal - visit the palace wine cellar and taste of the best Portuguese wines grown in this region

DAY 2 | 4th September 2018

9h00 Conference Announcements

9h15

Keynote Lecture
Multifunctional Coatings based on Two-Dimensional Materials for Defense Applications
Jun Lou
Rice University, USA

Cisterna Room Lisboa Room Atlântico Room

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| 10h00 | <p>Energy of Micro Crystalline Cellulose- Carbon Nanotubes Reinforced Hybrid Cementitious Composites Shama Parveen Fibrenamics, University of Minho Portugal</p> | <p>Microstructural Analysis on Ballistic Tested Armour Steel Joints Fabricated Using Low Hydrogen Ferritic Consumables for Capping Pass Balakrishnan Marimuthu The Institute for Sustainability and Innovations in Structural Engineering (ISISE), Department of Mechanical Engineering, University of Coimbra Portugal</p> | |
| 10h15 | <p>Environmental Stimuli-Responsive Electrospun Composite Nanofibres for Textile Based Advanced Defense Applications Shah M Reduwan Billah Department of Chemistry, Durham University United Kingdom</p> | <p>Behind-Helmet Blunt Trauma: Matching Measurement to Injury Using Finite Element Modelling Ana Ferreira Azevedo Royal Military Academy Belgium</p> | |
| 10h30 | | <p>A Reduced-Order Modeling Based Design and Optimization for a Lightweight Multilayer Armor Plate against Blast and Impact Weiran Jiang University of Michigan, Ann Arbor USA</p> | |
| 10h45 | <p>Ballistic Composites Reinforced with Inorganic Nanotubes of Tungsten Disulfide Danica Simić Military Technical Institute Serbia</p> | <p>Simulation of Ballistic Impacts on Concrete with New Damage Luís Pereira Portuguese Air Force Academy Portugal</p> | |

Session 6 - Nanomaterials and Nanostructures for Defense
Chair: Robert Young

Session 5 - Design and Analysis of Protection Materials and Composites Chair: Paulo Antunes

| 11h00 – 11h30 | | COFFEE BREAK | |
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| 11h30 | | Electrically Conductive Peek Filaments for Additive Manufacturing by FDM José Covas University of Minho Portugal | Invited Lecture Shape Memory Ceramics: Recent Progress and Perspectives for Future Protective Applications Chee Lip Gan Nanyang Technological University Singapore |
| 11h45 | | Graphene Nanocomposites for Defense Applications Robert J Young National Graphene Institute and School of Materials, University of Manchester United Kingdom | |
| 12h00 | | | Hybrid Ballistic Solutions Ricardo Pinto INEGI Portugal |
| 12h15 | | Waterborne Polyurethane Composites with Few Layer Graphene for High Performance Coatings Maria da Conceição Paiva University of Minho Portugal | |
| 12h30 | Special Session on Graphene Chair: Maria da Conceição Paiva | Electrically Conductive Polymer Based Composites for Thermoelectric Applications Petra Pötschke Leibniz Institute of Polymer Research Dresden Germany | Plasma Electrolytic Oxidation Coatings for Engine Components of Light Armored Vehicles Amaya Igartua ik4-tekniker Spain |
| 12h45 | | | Quality Metrics Parameters of Personal Protection Equipment Inese Ziemele Riga Technical University Latvia |
| 13h00 – 14h00 | | LUNCH | |

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| 14h00 | Session 4 - Advanced Polymers, Fibrous and Textile Materials Chair: José Borges | Invited Lecture Ballistic Performance of Nonwoven Fabrics for Lightweight Armours Francisca Martínez IMDEA Materials Institute & Technical University of Madrid Spain | Session 1 - Advanced Composites for Defense Applications Chair: Sohel Rana | Invited Lecture Carbon Nanotube/ Fiber Reinforced Ceramic Composites Shijie Wang Institute of Materials Research and Engineering (IMRE), A*STAR (Agency for Science, Technology, and Research) Singapore | Special Session on AuxDefense Chair Giuseppe Daquino | Study of the Energy Absorption Capability of Para-Aramid Fabrics Carina Cunha Fibrenamics, University of Minho Portugal |
| 14h15 | | Functionalised Fabrics for Organic Compounds Degradation Ana Maria Ferraria CQFM (IN and IBB) Higher Technical Institute Portugal | | Multi-Impact Response of Composite Sandwiches Incorporating Cork Cores Paulo Reis University of Beira Interior Portugal | | Influence of Carbon Nanotubes in the Performance of a Ballistic Helmets Fernando Cunha Fibrenamics, University of Minho Portugal |
| 14h30 | | Flexible Textile Supercapacitors based on Nitrogen-Doped Carbon Nanomaterials Rui Costa Faculty of Sciences, University of Porto Portugal | | Influence of the Consolidation Pressure on the Shock Wave Propagation in UHMWPE Composites Torsten R Lässig Fraunhofer Ernst-Mach-Institut, Freiburg Germany | | Study of the Influence of the Polymer Matrix on the Energy Absorption in Reinforced Composites with Three-Dimensional Auxetic Meshes João Bessa Fibrenamics, University of Minho Portugal |
| 14h45 | | Functionalization of a Non-Newtonian Fluid Composed of Silica Nanoparticles into Cotton Substrates for Anti-Stab Protection Filipa Fernandes Ooze Nanotech Portugal | | Novel Multi-Scale Cimentitious Composites Developed Using Microcrystalline Cellulose (MCC) and Sisal Fibers Shama Parveen Fibrenamics, University of Minho Portugal | | Influence of Different Loading Rates on Energy Absorption Capability of Para-Aramid Fabrics Sónia Costa Fibrenamics, University of Minho Portugal |
| 15h00 | | Degradation of DMMP: Functionalised Fabrics as an Efficient Photocatalyst Pedro Neto Unidade Militar Laboratorial de Defesa Biológica e Química Portugal | | Deep Penetration of Ultra-High Molecular Weight Polyethylene Composites by a Sharp-Tipped Punch Burigede Liu Department of Engineering, University of Cambridge United Kingdom | | Advanced fibrous structures for external layer of ballistic vests Ana Leitão Fibrenamics, University of Minho Portugal |
| 15h15 | | | | Effects of Inclination Angle on Pullout Performance of Hooked End Fiber Embedded in UHPC Y.Y.Y. Cao Eindhoven University of Technology Netherlands | | Study on the Usability of Innovative Knee and Elbow Pads based on Auxetic Composites Marta Brito Fibrenamics, University of Minho Portugal |
| 15h30 | | | | | | Biomimicry Principles And UX In Product Design For Defense Filipe Moreira Fibrenamics, University of Minho Portugal |

15h45
–
16h15

COFFEE BREAK

16h15

Invited Lecture

IR-Signatures of Low Flying Aircraft and Their Engine-Embedded Fuselage's Emissivity

Shripad Mahulikar

Indian Institute of Technology Bombay | **India**

16h30

16h45

SHM TB30 – Methodology and Tools for Assessing the Structural Health and Life Extension of Legacy Aircraft

Paulo Antunes

Critical Materials | **Portugal**

17h00

Plasma Electrolytic Oxidation Coatings for Engine Components of Light Armored Vehicles

Igartua Amaya

Fundacion TEKNIKER | **Spain**

17h15

An Overview of Mechanical Behaviour of Cellular Metals as Fillers in Thin-Walled Structures

Isabel Duarte

University of Aveiro | **Portugal**

17h30

Influence of Silane Coupling Agent on Shear Thickening Fluids (STF)

Thiago Santos

Federal University of Rio Grande do Norte – PPGET | **Brazil**

Thermal Isolation/Barriers for Small Caliber Weapon Applications

Adam Foltz

US Army Ardec Picatinny Arsenal | **United States**

Mechanical Properties of Ultra High Performance Fiber Concrete and its Response to Impact Loading

Anna Mina

Department of Civil and Environmental Engineering, University of Cyprus and School of Civil Engineering, National Technical University of Athens | **Cyprus**

Different Composite Behaviours Under Blast Loading

Arthur Voisin

Renault Trucks Defense / GEMTEX | **France**

Performance of Structural Blast Mitigation Measure for Oil and Gas Industrial Facilities

Damjan Cekerevac

Institute for Sustainability and Innovation in Structural Engineering | **Portugal**

UHPFRC Resistance to Projectile Impact in Dependence on Fibre Content

Jindřich Fornůšek

CTU in Prague | **Czech Republic**

Spallation Observed in Hard Metals During Taylor- Impact Tests

Torsten Lässig

Fraunhofer Institut für Kurzezeitdynamik, Ernst-Mach-Institut (EMI) | **Germany**

18h00

CLOSING SESSION

20h00

SOCIAL PROGRAM - CONFERENCE DINNER

Vila Galé Collection Palácio dos Arcos

DAY 1 & 2 | 3rd - 4th September 2018

9h00 –
18h00

Poster Session

Modification the Polyamide 6 Film with Silver Selenide

Remigijus Ivanauskas

Kaunas University of Technology | **Lithuania**

Peculiarities of The Silver Selenide Layers Formation on the Different Nature Fibers Surface

Daiva Milasiene

Kaunas University of Technology | **Lithuania**

Passive and Active Chemical Protection

Ana Leitão

Center for Textile Science and Technology, University of Minho | **Portugal**

Dyeing of Meta-Aramid Fibres Previously Functionalized with PDDACI

Fernando Ribeiro Oliveira

Federal University of Santa Catarina | **Brazil**

Military Textiles – Protection Mechanisms

Fernanda Steffens

Federal University of Santa Catarina | **Brazil**

The Thermal Colour and the Emissivity of Printed Pigments on Knitted Fabrics for Application in Diurnal Thermal Camouflage Garments

Catarina Pimenta

Centre for Textile Science and Technology (2C2T), University of Minho | **Portugal**

Trends in Camouflage

Danielle Beduschi

University of Minho | **Portugal**

Creating Fibrous Composites Enhanced With Electric Field

Wiesława Urbaniak-Domagala

Lodz University of Technology | **Poland**

Predicting the mechanical properties of Cellulosic and Polyester Yarns using CLARA: Cloud Learning Autonomous Reacting Algorithms

Sérgio Branco

University of Minho | **Portugal**