Monday June 20

Institutional welcome **09.00 - 09.30**

Chair: Ferrara
Assistant: Marcucci

Keynote lecture 1 - (De Donato room)
09.30 - 10.30 Ugo Lafont
title TBC

Break **10.30 - 11.00**

Parallel sessions **11.00 - 13.00**

Emerging technologies - (De Donato room)

Chair: Ferrara-Grande
Assistant: Marcucci

1. *Pernigoni,* Lafont, Grande*: "Self-healing polymers for inflatable space structures"*
2. *Dijwar Yilmaz* Lewandowski, Perraud, Llevot, Carlotti: *"Self-healing polymers for space applications"*
3. *Ritzen,* Montano, Garcia*: "3D Printing of a Self-Healing Thermoplastic Polyurethane through FDM"*
4. *Katcharava,* Zhou, Bhandary, Marinow, Binder: *"Vitrimeric, self-healing 3D printable polymer networks as potential electrolytes for lithium-ion batteries"*
5. *Roels*, Terryn, Van Assche, Vanderborght, Brancart: "*From self-healing polymer to soft robot"*
6. *Pozo Ezquiva: "Quick Self-Healing in Tough Polymeric Materials"*
7. *Mustapha,* AlMheiri, AlShehhi , Rajput, Joshi, Antunes, AlTeneiji: *"The microencapsulation of tung oil with a natural hydrocolloid emulsifier for extrinsic self-healing applications"*
8. *Yen Fang Su,* Chen, Bagonyi, Al-Tabbaa*: "Chemically informed machine learning model for self-healing performance prediction of mineral additive based cementitious materials"*

Capsules (in cement based materials) - (Beltrami room)

Chair: Al Tabbaa-Antonaci
Assistant: Rizzieri

1. *Riordan,* Al-Tabbaa, Anglani, Tulliani, Antonaci, Palmer*: "Investigation of novel production methods for macro-capsules and micro-capsules and subsequent comparison of self-sealing effectiveness in capsule-containing mortar specimens"*
2. *Kumar,* Al-Tabbaa*: "Durability recovery potential of an encapsulated organic healing agents in conventional repair mortars"*
3. *Ribeiro da Sousa,* Freeman, Al-Tabbaa*: "Tailoring the shell properties for physically triggered self-healing in cementitious materials"*
4. *Sina ,* Chang, He, Schlangen, Jefferson, Mihai*: "Microcapsules triggering probability in self-healing cementitious material: A parametric study"*
5. *Anglani,* Tulliani, Antonaci*: "Encapsulated polyurethane for self-healing concrete applications using cementitious macro-capsules"*
6. *Papaioannou,* Gournis, Kilikoglou, Karatasios*: "Synthesis, optimization and healing efficiency of cement-based, macro-scale capsules for cement mixtures"*
7. *Piedrahita,* Asensio, Perilla, Csar Narvįez, Cadavid, Guerrero*: "Study of the influence of hybrid organic/inorganic microcapsule-based system for self-healing cementitious materials with low carbon footprint"*
8. *Hermawan*, Riordan, Al-Tabbaa, Gruyaert: "*Evaluation of workability, mechanical and self-sealing properties of concrete containing PU shell "water repellent cargo microcapsules*"

Polymers, composites and coatings - (Castigliano room)

Chair: Santiago Garcia-Hernandez
Assistant: Cibelli

1. *Garcia,* Montano, Urban, Hornat, van der Zwaag*: "On the relation between polymer architecture, entropy-driven damage closure and barrier restoration in self-healing polyurethane coatings"*
2. *Katcharava,* Bhandary, Marinow, Binder*: "Self-healing poly(ionic liquid)-based iongels as potential electrolytes for lithium-ion batteries"*
3. *Arati, Bley, Brandelero, Teyssedre: "Electrical properties and recovery of trans-esterification based vitrimers for the electronic field"*
4. Natasa Tomic: "*Nanocomposite conductive hydrogels based on PVA with improved self-healing efficiency by cellulosic modifiers*"
5. *Patrick: "Sustained Self-healing of Laminated Fiber-Composites via in situ Thermal Remending"*
6. *Costa Cornellà*, Brancart, Van Assche: "*Self-healing, recyclable, and degradable castor oil-based elastomers for sustainable soft robotics"*
7. *Hager: Self-healing ionomers " from zwitterionic ionomers to bio-based materials*
8. *Veermesch,* Mangialetto, De Vleeschouwer, Van Den Brande, Van Mele: *"How can computational methods support experimental research to study self-healing polymer networks? A case study on the effect of hydrogen bonds on the kinetics of reversible Diels-Alder reactions"*

Lunch **13.15 - 14.15**

Keynote lecture 2 - (De Donato room)

Chair: Grande
Assistant: Molteni

14.15 - 15.00 Nele De Belie
Progress regarding Smart, Multi-functional, Advanced Repair Technologies In Cementitious Systems obtained through the EC Project SMARTINCS

Parallel sessions **15.15 - 17.15**

Polymers, composites and coatings - *(De Donato room)* **Chair: Grande- Turteltaub** **Assistant: Pernigoni**	**Bacteria in Concrete -** (Beltrami room) **Chair: Paine - Borg** **Assistant: di Summa**	**Nanoengineered self healing** (Castigliano room) **Chair: Cuenca - Carsana** **Assistant: Kannikachalam**
1. *Bhandari: "Self-healable ionic liquid based electrolytes for Li-ion batteries tuned by Li-salt content and quadrupolar H-bonding"* 2. *Kaymazlar, Andac, Garcia:"Self-healable and recyclable polydimethylsiloxane elastomers through metal- ligand coordination"* 3. *Turteltaub,* Kumthekar, Ponnusami, van der Zwaag*: "Uncertainty Quantification of the lifetime of Self-Healing Thermal Barrier Coatings"* 4. *Grande, Benazzo, Rigamonti, Bettini, Sala: "On the fracture healing response of an aeronautic-grade fiber reinforced epoxy vitrimer composite"* 5. *Yoshie, Kim, Seshimo, Ejima, Houjou, Xia, Nakagawa: "Self-healing by flexible and strong hydrogen bonds in Polymers"* 6. *Zechel, Abend, Dahlke, Schubert, Hager: "Approaches for the quantification of scratch-healing of polymers"* 7. *Zhang, Xiao: "High-Performance Self-Healing Epoxy Based on Microencapsulated Epoxy-Amine Chemistry"* 8. *Furia, Roels, Terryn, Vanderborght, Van Assche, Brancart: "Fused Granulate Fabrication of self-healing polymers composite"*	1. *Sandalci,* Tezer, Bundur*: "Effect of mineral characteristics on self-healing ability of bacterial cement based mortars"* 2. *Gebhard,* Hamley-Bennett, Reeksting, Bagga, Skevi, Justo-Reinoso, Ofiteru, Paine*: "A bacteria-centric approach to optimising self-healing concrete applications"* 3. *Minoru Takagi,* Lima, Mederiors-Junior, Resende, Couto Ribeiro*: "Antibiosis and watertightness of self-healing concrete with antimicrobial crystalline admixture for water and wastewater structures"* 4. *Ghahremaninezhad,* Baffoe*: "Bio-inspired Self-healing Cementitious Materials"* 5. *Abu Askar,* Zdeb*: "Behavior of Bacillus Bacteria from Sewage Water as a Self-Healing Agent for concrete cracks"* 6. *Paine,* Tan, Skevi, Justo-Reinoso, Hamley-Bennett, Reeksting, Gebhard*: "Aerobic non-ureolytic bacteria-based self-healing concrete: Effects of environmental and exposure conditions"* 7. *Tezer, Nele De Belie, Nico Boon, Michael Harbottle: "Non-axenic biomasses as bacterial self-healing agents in cementitious mortar "* 8. *Ofiteru,* Bagga, Justo-Reinoso, Hamley-Bennett, Paine, Gebhard*: "Self-healing concrete the surprise in the wastewater"*	1. *Cuenca,* Ferrara*: "Use of nanomaterials for improving durability of self-healing concrete elements"* 2. *Ksencamalar: "Design and Characterization of Self-Healing Geopolymer Mortar Containing Magnetic Nanoparticle Obtained by Green Synthesis Method"* 3. *Tsampali: "Influence of cellulose fiber addition on self-healing and water absorption of cement mortar"* 4. *Feng, Qian: "Rapid self-sealing of macro cracks of cementitious composites by in-situ crosslinking"* 5. *Suh, Byungsun Park, Gwang-Myong Lee, Sanghwa Jung, Young-Keun Cho: "Evaluation of Coated Inorganic Materials on the Properties of Cement Hydra"* 6. *Risdaraneni: "The Healing Performance of Mortar Containing Bacteria Impregnated Expanded Clay Aggregate Coated with Sodium Alginate"* 7. *Tri Nguyen: "Development of Self-Healing System in Concrete using Bacillus Subtilis Natto Immobilized in Light Weight Aggregate"*

Aperitif **17.30 - 19.00**

Tuesday June 21

Keynote lecture - (De Donato room)

Chair: Carvelli
Assistant: Azadi

08.45 - 09.45 Tony Jefferson
The challenge of simulating the self-healing behaviour of cementitious composites

Keynote lecture 4
09.45 - 10.15 Hernandez Santana
Self-healing and recyclable nitrile rubber: a myriad solution for the automotive industry

Break **10.45 - 11.15**

Parallel sessions **11.15 - 13.15**

Aggressive environments - (De Donato room)

Chair: Bolzoni, Jonkers
Assistant: Kompella

1. *Pourhaji*, Serna Ros, Alonso*: "Assessment of the effect of self-healing on the chloride penetration of concrete in the cracked and uncracked zones"*
2. *Rossi,* Copuroglu, Jonkers*: "How self-healing induced by bacteria-based self-healing precursors affected the chloride penetration resistance of cracked mortar specimens"*
3. *Van Mullem,* De Brabandere, Van de Voorde, Kong, Snoeck, De Belie*: "Chloride Resistance of Self-healing Mortar Containing Superabsorbent Polymers Quantified via Chloride Diffusion Testing"*
4. *De Brabandere,* Van Mullem, Van de Voorde, Kong, Snoeck, De Belie*: "Chloride Resistance of Self-healing Mortar containing Superabsorbent Polymers measured via a (Quasi) Steady-State Migration Test"*
5. *Borg: "Investigation of the Durability and Self-Healing properties of Ultra-High Performance Concrete based on Crystalline Admixtures and Nano-Additives, exposed to a Chloride-rich Aggressive Environment"*
6. *Cibelli*, Ahmed, Di Luzio, Ferrara*: "Chloride penetration tests in cracked and healed UHPFRCC: numerical simulation via a discrete multiphysics model"*
7. *Cappellesso,* Sekine, Gruyaert, Van Tittelboom, De Belie*: "Self-healing products stability in cracked concrete under cyclic freeze-thaw condition"*
8. *Afroughsabet,* Al-Tabbaa*: "Influence of Superabsorbent Polymer (SAP) and Ground Granulated Blast-furnace Slag (GGBS) on the Freeze-thaw Resistance of Concrete Pavement*"

Modelling and life cycle - (Beltrami room)

Chair: di Luzio - Freeman
Assistant: Xi

1. *Masoero,* Alex, Ofiteru*: "MASKE+NUFEB: particle-based simulations of bacterial self-healing in concrete"*
2. *Masoero: "MASKE: A simulator of chemo-mechanical degradation in cementitious materials"*
3. *Narayanasamy, Castro-Alonso, Macias-Franco, Sa¡nchez-Muoz, Oropeza-Navarro, Cortes-Martnez, Betancourt-Ch¡vez, Balagurusamy: "Validation of the survival and activity of inoculated bacterial strains in bioconcrete using molecular tools: gene sequence analyses and expression"*
4. *Cibelli,* Ferrara, Di Luzio*: "Numerical simulation of self-healing in plain and fibre-reinforced concrete via a discrete multiphysics model: two case studies"*
5. *di Summa,* Parpanesi, De Belie, Ferrara*: "How to address sustainability and economic viability of advanced cementitious based materials by means of Life Cycle Assessment (LCA) and Life Cycle Cost (LCC) tools integrated into a holistic design-wise approach"*
6. *Maddalena,* Sweeney, Tuinea-Bobe, Balzano, Arena, Jefferson*: "Life cycle Assessment of self-healing concrete with shape memory polymers"*
7. *Ghare,* Ozaki, Osada*: "Finite Element Analysis of Repeated Crack-Healing Behavior in alumina/SiC Composite Ceramics for Specimen with Chevron Notch"*
8. *Freeman,* De Nardi, Gardner, Jefferson*: "Tailoring healing agents for self-healing cementitious materials using predictive modelling and physical testing"*
9. *Perelmuter: "Modeling materials self-healing with bridged crack approach"*

UHPC - (Castigliano room)

Chair: Schlangen - Lo Monte
Assistant: Davolio

1. *Neves,* Zahabi Zadeh, Almeida, Miranda, Cunha, Pereira*: "Improved Methodologies to Assess the Self-healing Performance in High-Performance Fibre-Reinforced Cement Composites (HPFRCC)"*
2. *Zahabi Zadeh, Neves, Almeida, Miranda, Cunha, Pereira: "Digital Image Correlation (DIC) for Assessment of Self-healing Capacity of Thin Concrete Slabs"*
3. *Mo Li: "Understanding self-healing process and robustness along crack depth in cementitious materials"*
4. *Luque: "Study of self-healing at short ages for a 3D printable ECC material"*
5. *Tamilasaran,* Blanco, Goodier*: "Effect of steam curing on the recovery of mechanical and durability performance of Engineered Cementitious Composites (ECC)"*
6. *He,* Schlangen*: "Self-healing performance of strain hardening cementitious composite (SHCC) incorporating bacterial embedded polylactic acid (PLA) particles"*
7. *Al Obaidi,* He, Schlangen, Ferrara*: "Self-Healing Effect on Steel Fiber - UHPC Matrix Interface Pre- Damaged and Exposed to Different Exposure Conditions"*
8. *Xi, Huang,* Al-Obaidi, Lo Monte, Ferrara*: "Evolution of long-term self-healing performance of UHPC exposed to different aggressive environments under sustained load"*

Lunch **13.15 - 14.45**

Keynote lecture 5 - (De Donato room)

Chair: de Belie
Assistant: Marcucci

14.45 - 15.45 Olga Speck
Plant-inspired damage control: An inspiration for efficient use of resources and reduction of waste generation

Parallel sessions **15.45 - 17.45**

Research and case studies from European projects - (De Donato room)
Chair: de Belie –Ferrara
Assistant: Marcucci

1. *Davolio,* Altomare, Al Obaidi, Ferrrara*: "A methodology to assess the evolution of the UHPC performance as affected by autogenous healing, sustained load, and aggressive environments"*
2. *Kannikachalam,* Clerque Vela, Ginori Ocampo Pacheco, Lo Monte, De Belie, Ferrara*: "Methodology to evaluate self-healing effects on fatigue capacity of Ultra High-Performance Concrete"*
3. *Kannikachalam,* Snoeck, Cailleux, De Belie, Ferrara*: "Self-healing capabilities of Ultra High-Performance Concrete subjected to impact loading"*
4. *Charron,* Lauch, Desmettre*: "Comprehensive evaluation of self-healing of concrete containing different admixture under realistic conditions"*
5. *Roig Flores: "Evaluation of the self-healing efficiency of concrete with a crystalline admixture: Interlaboratory analysis from COST Sarcos RRT3 group"*
6. *Tang,* Al-Tabbaa*: "Effect of combined mineral and polymer additives on self-healing strain-hardening cementitious composites (SH2CC) for cyclic loading conditions")*
7. *Krelani: "Self-Healing Concrete Under severe conditions, wet/dry saline water and chloride environment including freeze/thaw cycles combining different mechanical loading"*
8. *Barros,* Knockaert*: "Facilitators and hurdles influencing the commercialization of self-healing technologies in the construction industry"*

Metals/ceramics - (Beltrami room)
Chair: Brancaart - Bosman
Assistant: Cibelli

1. *Fu,* van der Zwaag, van Dijk*: "Self healing of creep-induced damage in a ternary Fe-3Au-4W alloy by multiple healing agents"*
2. *Sekine,* Nakao*: "Advanced self-healing design controlled by kinetic competition of chemical reactions in self-healing ceramics"*
3. *Akutsu,* Nakao: *"Effect of high temperature viscoelasticity glass on self-healing ability in self-healing ceramics"*
4. *Arseenko,* Hannard, Kashiwar, Ding, Villanova, Zhao, Maire, Idrissi, Simar*: "Design, Friction Stir Processing and characterization of a new healable aluminium alloy"*
5. *Huong Nguyen,* Kuo, Nanko*: "Crack-healing performance and oxidation behavior of SiC dispersed in Yttrium silicate composites"*
6. *Khlaisongkhram,* Kuo, Nanko*: Crack healing via thermal oxidation of AlN-dispersed Al2O3 composites*
7. *Gheysen,* Pyka, Hannard, Villanova, Winiarski, Brinek, Chirazi, Simar*: "Investigation of the healing ability of a newly developed AlMg alloy produced for Laser Powder Bed Fusion (LPBF)"*
8. *Molteni,* Confalonieri, Grande, Gariboldi*: "Thermally-triggered self-healing mechanism in Al-Sn composite Phase Change Materials"*
9. *Ding,* Brouwer, Popovich, Hermans, Sloof: *Mo(Alx,Si1-x)2 healing particles for high temperature ceramics*

Advanced binders in cement based materials - (Castigliano room)
Chair: Lo Monte - Carvelli
Assistant: Al Obaidi

1. *Chen,* Hamad, Al-Tabbaa: *"Effect of Mineral Admixtures on Self-Healing Performance of Low-Carbon Infrastructure Materials with Supplementary Cementitious Materials"*
2. *Cirak: "Reducing Shrinkage Reinforcement with Self-Healing Concrete"*
3. *Nguyen*, Carvelli, Ismail, Illikainen, Kinnunen*: "Autogenous self-healing of polypropylene fiber reinforced ettringite-based composite"*
4. *Chandan Malagar: "Development of a mini rotary shear setup for the evaluation of self-healing in clay-rich geomaterials"*
5. *Tsangouri: "Acoustic Emission as an essential tool for healing assessment"*
6. *Lo Monte,* Ferrara: *"Link between structural durability and sustainability in the framework of the H2020 project ReSHEALience: the importance of Self-Healing in Ultra High-Performance Fibre-Reinforced Cementitious Composites"*
7. *Da Rocha Gomes,* Ferrara, Moreno, Sanchez: Cementitious grouts containing crystalline admixtures to improve autogenous healing
8. *Dabral: "Experimental comparison of crack width and spacing provisions according to different structural codes and recommendations for RC beams with concrete from traditional concrete to UHPFRC"*

Conference dinner **19.30 – 00.00**

Wednesday June 22

Keynote lecture 6 - (De Donato room)

Chair: van der Zwaag
Assistant: di Summa

09.30 - 10.30 Joost Brancart
Self healing soft robotics

Break **10.30 - 11.00**

Parallel sessions **11.00 - 12.30**

Polymers, composites and coatings - (De Donato room) **Chair: Bamonte - Grande** **Assistant: Pernigoni**	**Vascular networks (in concrete/cements) -** (Castigliano room) **Chair: Justo Reinoso-Gardner** **Assistant: Chemello**	**Multifunctional (Self sensing/shape memory) -** (Castigliano room) **Chair: Vlachakis-Maddalena** **Assistant: di Summa**
1. *Bose*: "*Electroactive Self-healing Soft Robotic Gripper Using Reversible Diels-Alder Reactions"* 2. Langenbach, Bakkali-Hassani, Tournilhac, Norvez: *"Self-Healing ENR-based Elastomers with Fast Elastic Return for Soft Robotics"* 3. *El Diwiny*: "*Physical Intelligence for Delaying Damage In Soft Multi-Materials"* 4. *Chenming Li,* Binde*: "Synthesis and Characterization of Hydrogen Bonded, Self-Healing Polymeric Ionic Liquids as Potential Electrolytes"* 5. *Mangialetto,* Ehrhardt, Hennecke, Van Durme, Van Mele, Van den Brande*: "Influence of hydrogen-bonding, phase-separation and Diels-Alder chemistry on the rate of self-healing of thermoreversible thermosetting networks*" 6. *Terryn*, Brancart, Roels, Kashef Tabrizian, Hardman, Thuruthel, Ferrentino, Sahraeeazartamar, Iida, Van Assche, Vanderborght: "*Self-healable soft robots, flexible electronics and electronic skins"*	1. *He*, Schlangen: "*Experimental validation of a discrete lattice model for simulating mechanical regains in a vascular self-healing cementitious material*" 2. *Justo Reinoso*, De Nardi, Reeksting, Gardner, Jefferson, Gebhard, Paine: "*Use of 3D mini-vascular networks to protect and deliver bacterial spores in self-healing concretes"* 3. *Salman*, De Nardi, Gardner: *"A Study of Damage Healing Cycles in Vascular Networks Containing Silicate-Based Healing Agents"* 4. *Shields*, De Nardi, Cappellesso, Jefferson, De Belie, Van Tittelboom: "*A comparison of brittle versus ductile vascular networks: why ductile networks are preferable for scaling up*" 5. *Gardner*, Coopamootoo, De Nardi, Jefferson: "*3D-printed mini-vascular networks for crack-sealing in the concrete cover zone"* 6. *Zhi Wan*, Savija: *"Mechanical properties and healing efficiency of 3D-printed ABS vascular based self-healing cementitious composite"*	1. *Vlachakis, Al-Tabbaa: "Investigation of the stress and strain sensing properties of filler-free geopolymer coatings for structural health monitoring"* 2. *Balzano: "The Journey of the hybrid shape memory polymer tendons: challenges, improvements, and future research directions"* 3. *Wang,* Haigh, Al-Tabbaa*: "Novel measurement techniques of piezoresistive properties for self-sensing concrete"* 4. *Milone,* Tulliani, Al-Tabbaa*: "Electrical and physical characterisation of cementitious composites with carbon-based additives"* 5. *Zheng,* Al-Tabbaa*: "Graphene-enabled plastic fibre: a sustainable alternative for self-sensing cementitious materials*" 6. *Orozco: "Electroactive performance and cost evaluation of carbon nanotubes and carbon black as conductive fillers in self-healing shape memory polymers and other composites"*

Keynote lecture 7 - (De Donato room)

Chair: Grande
Assistant: Al-Obaidi

12.30 - 13.15 Sybrand van der Zwaag
Future perspective

Closing **13.15 - 13.45**

Lunch **13.45 - ONWARD**