

ESB-ITA 2024

XIII Annual Meeting

Pescara, 3-4 October 2024



Programme

XIII Annual Meeting of the Italian Chapter of the
European Society of Biomechanics

3-4 October 2024 Pescara



XIII Annual Meeting of the Italian Chapter of the European Society of Biomechanics

Thursday - 03 October 2024

Morning

8.00	Registration
8.45	Meeting Opening Ceremony - Professor Sergio Montelpare, Director of Department of Engineering and Geology, University G d'Annunzio Chieti Pescara - Professor Arcangelo Merla, University G d'Annunzio Chieti Pescara
9.30-10.00	Keynote Lecture: Anna Pandolfi (20 min + 10 min questions) "Multiscale and statistical approaches to model the collagen microstructure of the human cornea" Chair: M. Vasta
10.00-10.30	Coffee break + free poster exhibition
Thematic session "Challenges in dental biomechanics: innovative and advanced approaches" Chairs: G. Vairo, G. Putame	
10.30-10.45	Lugas A.T., Schierano G., Bignardi C., Audenino A., Terzini M., "Novel experimental methods for the investigation of cemented dental prostheses retrievability"
10.45-11.00	Santos M.S., Cabral J.M.S., Ferreira F.C., da Silva C.L., Carvalho M.S., Silva J.C., "Electrospun membranes with enhanced bioactivity for periodontal tissue engineering applications"
11.00-11.15	Masante B., Putame G., Tosini M., Lugas A.T., Roato I., Gabetti S., Santos M.S., Silva J.C., Sanginario A., Terzini M., Mussano F., Audenino A.L., Massai D., "Unravelling the effects of controlled mechanical stimuli on periodontal ligament stem cells"
11.15-11.30	Serino G., Giordano A., Scotti N., Audenino A., "A sight at the nanomechanical properties of 3D printable dental resins"
11.30-11.45	Rota I., Oliva N., Sardella A., Gastaldi D., "Image-based patient specific workflow to design membranes for guided bone regeneration"
11.45-12.00	Valente F. "Challenges in dental implants biomechanics: state of the art, innovations and advanced approaches"



12.00-14.00	Lunch + free poster exhibition + “Meet the Expert” event (13.00-14.00)
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Afternoon

General session 1 Chairs: D. Massai, S. Pasta	
14.00-14.15	Amicone A., Santschi M.X.T., Perez R.L., Weber P., Ferguson S.J., “Characterization of two distinct triphasic new PCL design scaffolds emulating articular cartilage structure”
14.15-14.30	Luppino F., Zoboli L., Bianchi D., Nannei A., Lazzarotti L., Centola M., Gizzi A., “Computational modeling and optimization of a subcutaneous insulin injection port”
14.30-14.45	Guazzelli N., Cacopardo L., Paties Montagner G., Degli Esposti L., Catalucci D., Iafisco M., Cascone M.G., Ahluwalia A., “In silico-in vitro design of biomimetic alveolar models for high-throughput inhalation tests”
14.45-15.00	Gabetti S., Daou F., Masante B., Israel S., Zenobi E., Scatena E., Rimondini L., Bignardi C., Cochis A., Massai D., “Direct perfusion and intermittent pressure bioreactor for mimicking and investigating the bone environment”
15.00-15.15	Pulcinelli M., Zoboli L., Bianchi D., Gizzi A., Schena E., Lo Presti D., “A 3D-printed tactile sensor for superficial soft tissue palpation”
15.15-15.30	Djoumessi R.T., Lenarda P., Gizzi A., Giusti S., Alduini P., Paggi M., “Modeling and simulation of the effect of laser tissue soldering in colon electromechanics”

15.30-16.00	Coffee break + free poster exhibition
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General session 2 Chairs: F. Caselli, G. Luraghi	
16.00-16.15	Garzia S., Rygiel P., Cademartiri F., Celi S., Wolterink J.M., “Neural fields for diffeomorphic estimation of aortic wall deformation in 4D flow MRI”
16.15-16.30	Astore M., Marino M., “Hybrid modelling of arterial mechanics: integrating multiscale with data-driven approaches”
16.30-16.45	Griffo B., Lodi Rizzini M., Candreva A., Collet C., Munhoz D., Biscaglia S., Chiastra C., Gallo D., Morbiducci U., “Deep learning-based coronary artery wall shear stress estimation from real-world patients”



16.45-17.00	Signorello P., Cacopardo L., Sarmento B., Ahluwalia A., “Mucoadhesive magnetic nanoparticles for intestinal function restoration in childhood visceral myopathy”
17.00-17.15	De Campo G., Luraghi G., Eddington D.T., Dubini G.A., “Investigation of biomechanical stimuli in a microfluidic chip through in-silico models”
17.15-17.30	Recrosi F., Vasta M., Repetto R., Tatone A., Pandolfi A., “Nonlinear poroelastic model describing the lamina cribrosa IOP-induced cupping in the optic nerve”

Master Thesis Award Session Chairs: M. Marino, M. Palanca, S. Celi

17.45-18.00	Martina Tierno “Impact of commercial coronary stent cell shape and strut thickness on the hemodynamic-related risk of in-stent restenosis: a computational study”
18.00-18.15	Irena Radisic “Fully coupled multiscale models of cardiac electromechanics”
18.15-18.30	Giordana Marsili “Integration of customized electrodes in bicompartmental microphysiological system for Trans Epithelial Electrical Resistance measurements”

20.00	“Galà Lirico”: Chiara Tarquini, soprano – M° Raffaele Di Berto, pianoforte
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20.30	Social Dinner and ERC in Italy Awards Ceremony
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Friday - 04 October 2024

Morning

8.00	Registration
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9.00-9.30	Rector's greetings: Professor Liborio Stuppia
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9.30-10.00	Keynote Lecture: Benedikt Helgason (20 min + 10 min questions) "Biomechanical models for managing the risk of injurious falls in vulnerable populations" Chair: M De Bellis, C. Falcinelli
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General session 3 Chairs: M. Palanca, P. Gaziano	
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10.00-10.15	Pasini M., Cavazzoni G., Le Maitre C.L., Cristofolini L., Dall'Ara E., Palanca M., "Intervertebral disc degeneration affects the strain distribution in human metastatic vertebrae"
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10.15-10.30	Maioli V., Conconi M., Diquattro E., Traina F., Cristofolini L., Sancisi N., "The influence of the quadriceps muscle on the knee joint kinematics: an ex vivo study"
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10.30-10.45	Lissoni V., Stefanati M., Migliavacca F., Dubini G., Matas J.F., Luraghi G., "Towards digital twins of coronary artery disease: FEA, CFD or FSI?"
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10.45-11.00	Piersanti R., Bucelli M., Regazzoni F., Pagani S., Dedè L. Quarteroni A., "The I-heart simulator: a comprehensive and biophysically detailed computational model of the cardiac function"
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11.00-11.30	Coffee break + free poster exhibition
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General session 4 Chairs: U. Morbiducci, S. Celi	
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11.30-11.45	Corti A., Stefanati M., Leccardi M, De Filippo O., Depaoli A., Cerveri P., Migliavacca F., Corino V.D.A., Matas J.F., Mainardi L., Dubini G., "An integrated radiomica-biomechanics approach for coronary vulnerable plaques prediction"
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11.45-12.00	Calò K., Guala A., Mazzi V., Lodi Rizzini M., Dux-Santoy L., Rodriguez-Palomares J., Scarsoglio S., Ridolfi L., Gallo D., Morbiducci U., "Linking large-scale flow coherence and ascending aorta pathophysiology using 4D flow MRI"
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12.00-12.15	Costagliola E., Gandolfo C, Musumeci F., Pilato M., Pasta S., "Augmented reality of in-silico cardiac biomechanics"
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12.15-12.30	Dell'Agnello F., Vignali E., Capellini K., Cademartiri F., Celi S., "A dynamic CT based approach for the characterization of the aortic kinematics and mechanical properties"
12.30-12.45	Mastrofini A., Marino M., Karlof E., Hedin U., Gasser T.C., "Atherosclerotic carotid vessels and residual strains: a framework for patient-specific stress analyses"
12.45-13.00	Pettenuzzo S., Berardo A., Belluzzi E., Pozzuoli A., Ruggieri P., Carniel E.L., Fontanella C.G., "Human plantar fascia: from experimental tests to constitutive analysis"

13.00-14.00	Lunch + free poster exhibition
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Afternoon

14.00-14.30	Keynote Lecture: Christian Gasser (20 min + 10 min questions) "AAA patient selection through FEM-based postprocessing of medical images" Chair: A. Gizzi
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14.30-15.45	ESB-ITA Assembly (Master Thesis Award ceremony)
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15.45-16.00	Coffee break + free poster exhibition
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General session 5 Chairs: E. Gasparotti, A. Corti	
16.00-16.15	De Nisco G., Tierno M., Lodi Rizzini M., Gallo D., Morbiducci U., Chiastra C., "Coronary stent design and hemodynamic-related risk of in-stent restenosis"
16.15-16.30	Verdirame I., Fanni B.M., Buongiorno R., Dell'Agnello F., Berti S., Cademartiri F., Parodi G., Danielli F., Berti F., Pennati G., Petrini L., Celi S., "Study of left atrial appendage hemodynamics by integrating time-resolved CT and mesh morphing"
16.30-16.45	Mazzi V., Calò K., Gallo D., Steinman D.A., Morbiducci U., "Towards a unified theory of flow disturbances: the link between wall shear stress and vorticity topologies"
16.45-17.00	Mazzoli M., Gasparotti E., Gervasi A., Haxhiademi D., Celi S., "Effect of aortic morphology for ECMO investigation: a combined SSM and CFD study"



17.00-17.15	Lodi Rizzini M., Candreva A., Stahli B., Biscaglia S., Campo G., Chiastra C., Morbiducci U., Gallo D., “Hemodynamic characterization of coronary lesions in elderly patients with myocardial infarction”
17.15-17.30	Singh J., Gasparotti E., Vignali E., Mariotti A., Salvetti M.V., Celi S., “PIV analysis on a patient-specific 3D printed aorta phantom for hemodynamic flow investigation”
17.30-18.00	Awards ceremony (Best Oral, Best Poster) + closure

Posters

Posters: on exhibit both days

Poster sessions: during all free exhibition moments

- Marta Tosini, Leonardo Mortati, Mark Pace Florida, Alberto L. Audenino, Umberto Morbiducci, Diana Massai, Gianpaolo Serino, “MICROMECHANICAL CHARACTERIZATION OF BOVINE PERICARDIUM USING NANOINDENTATION AND AFM”

- Rossana Buongiorno, Ilaria Verdirame, Benigno Marco Fanni, Francesca Dell’Agnello, Katia Capellini and Simona Celi, “AN OPTIMIZED FRAMEWORK INTEGRATING 3D UNET TO SEGMENT LEFT ATRIAL APPENDAGE FOR WALL MOTION ESTIMATION”

- Marco Daghero, Simone Borrelli, Taian M. Vieira, Mara Terzini, “A NOVEL TESTBENCH TO MEASURE SURGICAL INSTRUMENTS LOADS VIA MOTION CAPTURE AND ROBOTIC ARM INTEGRATION”

- Margherita De Luca, Andrea Formaggio, Mara Terzini, Simone Borrelli, Giovanni Putame, Francesca Moretto, Teresa Esposito, Rosanna Vaschetto, Umberto Morbiducci, Carlo Olivieri, Alberto L. Audenino, “A SYSTEMATIC PERFORMANCE EVALUATION OF DEVICES CAPABLE OF DELIVERING CPAP THERAPY IN A CLOSED-LOOP CONFIGURATION”

- Federica Bianconi, Massimiliano Leoni, Argyrios Petras, Emiliano Schena, Luca Gerardo-Giorda, Alessio Gizzi, “COMPUTATIONAL MODELING OF CARDIAC LASER ABLATION”

- F. Fontana, L. Cacopardo, I. Valente, N. Guazzelli, G. Paties Montagner, M. Ciardelli, F. Pratesi, A. Corti, A. Ahluwalia,” MECHANICAL CHARACTERIZATION OF THE THYMIC NICHE FOR BIO- MIMETIC APPROACHES”

- Pierfrancesco Gaziano, Lorenzo Zoboli, Alessio Gizzi, Michele Marino, Giuseppe Vairo, “MODELING THE DEGRADATION PROCESS IN BIOABSORBABLE BONE IMPLANTS: A COMPUTATIONAL APPROACH”

- Camilla Gironi, Nicolas Emiliani, Giulia Molinari, Cecilia Lotto, Laura Cercenelli, Barbara Bortolani, Gabriele Molteni, Emanuela Marcelli, “IN SILICO MODEL FOR OSSICULAR CHAIN RECONSTRUCTION OF THE MIDDLE EAR”



- Talal Bin Irshad, Giovanni Putame, Giulia Pascoletti, Giordano Franceschini, Elisabetta M. Zanetti, "PRE-OPERATIVE PLANNING AND OPTIMIZATION OF MANDIBULAR RECONSTRUCTIONS"

- Lorenzo Zoboli, Pierfrancesco Gaziano, Daniele Bianchi, Giuseppe Vairo, Michele Marino and Alessio Gizzi, "OXYGEN INHIBITION IN PHOTOPOLYMERIZATION FOR TISSUE BIOPRINTING APPLICATIONS"

- Francesca Rossi, Dario Carbonaro, Carlo Guala, Giovanni Giordano, Claudio Chiastra, Stefano Magnetti, Alberto Audenino, "TOWARDS THE PREDICTION OF SPRINGBACK IN SHAPE SETTING FOR NITI ANNULOPLASTY RINGS"

- Anna Corti, Jasper de Kort, Alberto Aciri, Francesco Migliavacca, Maurizio Domanin, Luca Mainardi, Santi Trimarchi, Valentina D.A. Corino, "PREDICTING HIGH-RISK CAROTID PLAQUES: A RADIOMIC ANALYSIS"

- Virginia Fregona, Giulia Luraghi, Behrooz Fereidoonhezahad, Frank JH Gijssen, Francesco Migliavacca, José Félix Rodríguez Matas, "IN SILICO MECHANICAL THROMBECTOMY: HOW DOES CLOT COMPOSITION INFLUENCE THE OUTCOME?"

- Cristian Brandi, Alexis Lefevre, Adele De Ninno, Filippo Ruggiero, Enrico Verona, Michael Gauthier, Paolo Bisegna, Aude Bolopion, Federica Caselli, "REAL-TIME IMPEDANCE-BASED DIELECTROPHORETIC ACTUATION FOR SELECTIVE MANIPULATION OF FLOWING PARTICLES"

- Elena Redaelli, Begoña Calvo, Giulia Luraghi, Jose F Rodriguez Matas, Jorge Grasa, "A NOVEL IN-VIVO TECHNIQUE BASED ON AI TO DETERMINE THE MECHANICAL PROPERTIES OF THE CORNEAL TISSUE"



of the European Society of Biomechanics
Pescara, 03-04 October 2024

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Location

Aurum Largo Gardone Riviera – 65126 – Pescara (PE)

Sponsors



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Exemplar S.r.l, Corso Vittorio Emanuele II, 161 10139 Torino
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