

26<sup>TH</sup> CONGRESS OF THE EUROPEAN SOCIETY OF BIOMECHANICS



ORGANIZED BY

**POLITECNICO MILANO 1863** 





We would like to welcome you to the 26<sup>th</sup> Congress of the European Society of Biomechanics. This is the first online edition.

We could never have imagined at this time last year what we would live through in the last months and how this would presented great challenges. However, this situation has also offered us the opportunity to test and keep going using new technologies and different ways to reach out.

Abstract submission duly closed on January 31, 2021. More than 750 papers were submitted, despite the pandemic problems still active after more than one year!

We consider this figure an extraordinary indication of the strong interest towards biomechanics, the great scientific prestige of the European Society of Biomechanics and the willingness to show our scientific progresses in the field of biomechanics.

We made our best to organizing this edition from a scientific point of view, with 3 keynote speakers, 33 perspective talks, 3 award sessions. We would like to thank those who helped in the reviewing process, the chairs of the scientific tracks and the sessions, the organizers of the online events, the members of the ESB Council for their support and the sponsors (companies and project consortia) whose contribution is essential for the success of this virtual events. We encourage you to visit their virtual booths and interact with them. Special workshops will be held during the lunch breaks.

The on-line format of this event posed new problems and challenges which made us switch to handle and imagine a congress without physical contact among the participants. We thank all of you for your patience if something is hardly as you expect. However, we want you to have a touch of the spirit of Milan during the Tuesday's Social event. Hopefully it'll be a surprise for everyone...

We promise a memorable congress, in terms of scientific quality and Italian hospitality! We look forward to welcoming you at the ESB2021 in July!

On behalf of the Organizers

Francesco Migliavacca

Chair of the 26<sup>th</sup> Congress of the European Society of Biomechanics

Lucucen Un parous

Pasquale Vena

Scientific Chair of the 26th Congress of the European Society of Biomechanics

Tosquale Temp



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## PROGRAMME AT A GLANCE /////////

	SUNDAY, July 11	MONDAY, July 12	TUESDAY, July 13	WEDNESDAY, July 14
08:30 08:45 09:00			Mentoring	Mentoring
09:15			Break	Break
09:30				
09:45				
10:00			ORAL Session 4	ORAL Session 7
10:15				
10:30		ODENINO		
10:45		OPENING	Break	Break
11:00		Break		
11:15				
11:30		ORAL Session 1	ORAL Session 5	ORAL Session 8
11:45		ONAL Session I		
12:00				
12:15		Break	Break	Break
12:30				
12:45		Sponsor workshops	Sponsor workshops	Sponsor workshops
13:00				
13:15		Break	Break	Break
13:30		Keynote Lecture	Keynote Lecture	
13:45		N. Verdonschot	F. Caselli	00410
14:00		Durant	Decale	ORAL Session 9
14:15 14:30		Break	Break	
14:45				Break
15:00		ORAL Session 2	Poster sessions	Dieak
15:15				Keynote Lecture
15:30		Break	Break	D. Steinman
15:45				Break
16:00			Hulskes Medal	
16:15		Student Award	+ PhD Thesis Award	ODAL Occidenda
16:30				ORAL Session 10
16:45			Break	
17:00	Pre-Event	Break		Break
17:15			ORAL Session 6	CLOSING
17:30			OTIAL OCCION O	OLOGINA
17:45		ORAL Session 3		
18:00			ESB	
18:15			General Assembly +	
18:30		Break	award ceremony	
18:45				
19:00		Mentoring	Break	
19:15				
19:30		Break		
19:45 20:00			Social event	
20:00				
20:30		Student event		
20:45				
_00				



Prof. Federica Caselli

University of Rome Tor Vergata Department of Civil Engineering and Computer Science Rome, Italy

Federica Caselli is Associate Professor in Biomedical Engineering at University of Rome Tor Vergata. She graduated in Medical Engineering, in Mathematics, and obtained her Ph.D. in advanced computational methods in biomechanics. Dr. Caselli's research deals with the development of lab-on-a-chip devices for diagnostics and life science, with a special focus on microfluidic impedance cytometry for single-cell biophysical phenotyping. She has published about a hundred contributions in journals, conference proceedings and book chapters, including over thirty journal articles. She was awarded a grant from the "Scientific Independence of Young Researchers Programme" and she has been nominated in the "Women in Microfluidics & BioMEMS" list.



Prof. Dr. David Steinman

University of Toronto
Mechanical & Industrial
Engineering and Biomedical
Engineering

David Steinman is recognized as a pioneer in the integration of medical imaging and computational modelling, and their use in the study of cardiovascular disease development, diagnosis and treatment. His current research focuses on improving rupture risk prediction for cerebral aneurysms; elucidating the nature of turbulence in blood flow; and developing 'artinspired' data visualization and sonification techniques. Dr. Steinman co-founded the widely-used Vascular Modelling ToolKit, and spearheaded the International Aneurysm CFD Challenge series. He has been the recipient of numerous prestigious salary awards from the Heart & Stroke Foundation of Canada and is a Fellow of the American Society of Mechanical Engineers.



Prof. Dr. ir. Nico Verdonschot

Orthopaedic Research Laboratory of the Radboud University Medical Centre, Nijmegen, The Netherlands

Technical Medical Centre, Twente University, Enschede, The Netherlands

Dr. Verdonschot is an expert on computer modeling in the field of orthopaedic-biomechanics. He obtained a mechanical engineering degree at Twente University after which he worked at the orthopaedic department of the Radboud Medical Centre. Currently, he also works as the scientific director of the Technical Medical Centre of Twente University, thereby representing 400 researchers in the biomedical field. He is co-author of over 325 peer reviewed papers. He got an ERC advanced grant on the topic of Biomechanical diagnostic, pre-planning and outcome tools to improve musculoskeletal surgery. Furthermore, he is visiting professor of the Politecnico di Milano and has an honorary doctorate of the University of Aalborg.



Bercelli, Scott University of Florida, United States of America MULTISCALE
MODELING OF
VEIN GRAFT
ADAPTATION: A
PREDICTIVE TOOL
TO IDENTIFY
TARGETS FOR
IMPROVED
CLINICAL
OUTCOMES

Scott Berceli is currently the Vice-Chair of Research and the Axline Basic Science Professor of Surgery and Bioengineering at the University of Florida. He also serves as the Chief of Vascular Surgery at the Malcom Randall VAMC. He received his M.D. and Ph.D. in Chemical Engineering from the University of Pittsburgh, followed by surgical training at Harvard University and the University of Washington. His research focuses on the role of physical forces in modulating physiologic and maladaptive vascular adaptation. He has authored 131 peer-reviewed publications and 16 book chapters. He has been funded by the NIH, NSF, VA, and several private foundations over the last 20 years.

CB.2: Computational biology Time: 13/ July/2021: 4:30pm-5:30pm

Büchler, Philippe University of Bern, Switzerland

TOWARDS
PERSONALIZED
BIOMECHANICAL
SIMULATIONS
TO OPTIMIZE
REFRACTIVE
INTERVENTIONS

Philippe Büchler is currently Associate Professor at the ARTORG Center for Biomedical Engineering Research of the University of Bern. He obtained his PhD in Physics at the Ecole Polytechnique Fédérale de Lausanne in 2002. His present research mainly focuses on the development of patient-specific biomechanical models, combined with the in-vivo characterization of the mechanical behavior of soft tissues. His close collaboration with clinical and industrial partners results in research activities oriented towards practical applications. He is an author of ~60 publications in peer- reviewed journals, several chapter books and regularly contributions to international and national conferences.

Ocular.1: Ocular biomechanics Time: 13/ July/2021: 9:30am-10:45am

Carriero, Alessandra The City College of New York, United States of America BONE FRACTURE TOUGHNESS: LESSONS LEARNT FROM BRITTLE BONES Dr. Carriero is Assistant Professor at the Department of Biomedical Engineering, The City College of New York. She obtained her MSc from Politecnico di Milano and her PhD from Imperial College London. She was post-doctoral fellow at ETH, at Lawrence Berkeley National Laboratory, and at Imperial College. She received several international recognitions for her innovative and outstanding research in the field of biomedical engineering, including the Sir George Macfarlane Award from The Royal Academy of Engineering in 2012, the John Haddad and the Harold Frost Awards from the American Society of Bone and Mineral Research in 2016, and a CAREER Award from National Science Foundation in 2017.

Hard-Tissue.4: Hard tissue biomechanics Time: 13/ July/2021: 4:30pm-5:30pm

Castilho, Miguel UMC Utrecht, Netherlands BIOFABRICATION OF FUNCTIONAL LIVING TISSUES: THE CROSSROAD OF TWO RESEARCH SOCIETIES Miguel Castilho is currently an Assistant Professor in (Bio) fabrication at the Department of Orthopedics, University Medical Center Utrecht and a guest researcher at the Department of Biomedical Engineering, Eindhoven University of Technology. He obtained his PhD in Biomedical Engineering at the University of Lisbon in 2015 and from 2015-2018 performed his postdoctoral studies at University Medical Center Utrecht. His research focus lies on combining 3D printing technologies and multi-scale modelling to design and fabricate bio-inspired materials along all different length scales. He is an author of > 24 publications in peer- reviewed journals, and several contributions to International Conferences.

Biomat. 2: Biomaterials Time: 12/ July/2021: 2:15pm-3:15pm

Cooper-White, Justin The University of Queensland, Australia MECHANO-MEDICINE: DECIPHERING MECHANO-SIGNALLING TO ELICIT CONTROL OVER PERIVASCULAR STEM CELL FATES Justin is currently is Professor of Bioengineering (School of Chemical Engineering), and Senior Group Leader (with the AIBN) at the University of Queensland (UQ), Co-Director of the UQ Centre in Stem Cell Ageing and Regenerative Engineering, CSO of Scaled Biolabs Inc., and Editor-in-Chief of APL Bioengineering. He obtained his PhD in Biopolymer Physics from UQ in 2000. After a short post-doctoral fellow at the University of Melbourne (UMelb, 2000-2002), he gained tenure at UMelb in 2003. After being recruited back to UQ in 2004, he was promoted to Full Professor in 2007. His research focuses on Mechanobiology, Stem Cell and Niche Ageing, and Regenerative Engineering. He has over 200 journal papers and 6 Worldwide patents awarded in USA, Europe, Asia and Australia.

Mechano.2: Mechanobiology Time: 13/ July/2021: 9:30am-10:45am

Di Martino, Elena	University of Calgary, Canada	MARKERS OF WALL VULNERABILITY IN AORTIC ANEURYSMS	Elena Di Martino is currently Professor at the Department of Civil Engineering and Director of the Centre for Bioengineering Research and Education, University of Calgary, Canada. She obtained her PhD in Cardiovascular Pathophysiology at the University of Milano in 1999. She was a post-doctoral fellow at Politecnico of Milano in 2000 and at the University of Pittsburgh 2001-2003. She is a member of the Libin Cardiovascular Institute of Alberta. Her present research mainly focuses on Cardiovascular Tissue Mechanics. She is an author of 48 publications in peer- reviewed journals, several chapter books, three patent applications, and more than 100 contributions to National and International Conferences.	CV-Mech.4: Cardiovascular mechanics Time: 13/ July/2021: 4:30pm-5:30pm
Dickinson, Alex	University of Southampton, United Kingdom	TOWARDS EVIDENCE-BASED PROSTHETIC SOCKET DESIGN: MODELLING AND OPTIMISATION TOOLS TO SUPPORT THE CLINICIAN	Alex is an Associate Professor at the Mechanical Engineering Department, University of Southampton, where he obtained his PhD in 2010. After post-doctoral research with Fraunhofer IPA he held a prestigious RAEng Research Fellowship (2015-20) 'Designing, Testing and Fitting the Next Generation of Prosthetic Limbs' and now leads a team working on prosthetic biomechanics. He is an IMechE Biomedical Engineering Division board member and Associate Editor (Reviews) for Medical Engineering & Physics. He has authored over 20 journal papers.	OP.2: Orthotics & prosthetics Time: Wednesday, 14/ July/2021: 1:15pm - 2:15pm
Elad, David	Tel Aviv University, Israel	BIOMECHANICS OF EARLY HUMAN LIFE	David Elad is currently emeritus professor of biomedical engineering at Tel Aviv University. He received his DSc in biomedical engineering from the Technion (1982). His research activities include experimental and computational problems in the respiratory and reproductive systems from cell to organ levels: Transport in the nasal cavity, shear stress and mucus secretion in cultured nasal epithelial cells, uterine peristalsis, transport across a tissue-engineered placental barrier, mechanobiology of a uterine wall model and biomechanics of infant feeding. He was a member of the World Council for Biomechanics and presently he is a fellow of AIMBE, BMES-USA, IAMBE and EAMBES.	Reproduct.2: Reproductive biomechanics Time: 14/ July/2021: 9:30am- 10:45am
Ethier, Ross	Georgia Tech, United States of America	OCULAR BIOMECHANICS AND MECHANOBIOLOGY	C. Ross Ethier is the Gellerstedt Chair in Bioengineer-ing and a Georgia Research Alliance Eminent Scholar in the Coulter Department of Biomedical Engineering at Georgia Tech/Emory. He obtained his PhD from MIT in 1986. His research is in the biomechanics of cells and whole organs, with specific emphasis on oc-ular biomechanics. He works on developing treat-ments for glaucoma, myopia and SANS, a syndrome affecting astronauts that is a major NASA health con-cern. He is an author of c. 185 papers in peer-re-viewed journals and two books. He has held multiple academic leadership positions in biomechanics.	Ocular.3: Ocular biomechanics Time: 14/ July/2021: 3:15pm-4:15pm
Ghajari, Mazdak	Imperial College London, United Kingdom	PREDICTING TRAUMATIC BRAIN INJURY AT THE CUTTING-EDGE INTERSECTION BETWEEN ENGINEERING AND MEDICINE	Mazdak Ghajari is an associate professor in Design Engineering, Imperial College London. He obtained his PhD from Imperil College in 2011 and secured an Imperial College research fellowship to establish the TBI biomechanics area at Imperial College, bringing together engineers, neuroscientists, biologists and designers. He is a member of the Centre for Blast Injury Studies and British Standardization Committee for head protection. His work brought him the young researcher award of the International Research Council of Biomechanics of Injury (IRCOBI), where he currently is a member of the scientific review committee.	Impact.2: Impact/injury biomechanics Time: 14/ July/2021: 1:15pm-2:15pm
Gijsen, Frank	Erasmus MC, Netherlands	IMAGE-BASED WALL SHEAR STRESS ANALYSES IN HUMAN CORONARY ARTERIES: WHERE ARE WE?	Dr. Gijsen obtained his PhD on cardiovascular flow modelling from the Eindhoven University of Technology. He moved to the Erasmus MC in 2001 to apply engineering tools, mainly focusing on image-based biomechanical modeling, in a clinical setting. Dr. Gijsen is an Associate Editor of the Journal of Biomechanics, co-founder and organizer of the yearly symposium on 'Cardiovascular Biomechanics in Vascular Biology and Cardiovascular Disease', (co-) author of more than 100 scientific papers with over 6000 citations.	CV-Imag.2: Imaging for cardiovascular applications Time: Wednesday, 14/ July/2021: 11:00am - 12:15pm



Hill, Nicholas A	University of Glasgow, United Kingdom	PREDICTING FLOW AND PRESSURE IN THE CIRCULATION USING STRUCTURED-TREE MODELS	Nicholas Hill FIMA is Simson Professor of Mathematics at the University of Glasgow, and Executive Director of the SofTMech Centre which specializes in Mathematical and Computational Modelling of Soft Tissue Mechanics. He obtained his PhD in Applied Mathematics at Imperial College, London in 1985. His research interests include physiological fluid mechanics and the circulation, the mechanobiology of the large arteries including dissection, discrete-to-continuum upscaling from cells to tissue, and bioconvection. He is an author of 75+ publications in peer-reviewed journals, and is on the Editorial Boards of the Journal of Mathematical Biology, and Mathematical Medicine & Biology.	CV-Mech.3: Cardiovascular mechanics Time: 13/ July/2021: 11:00am- 12:15pm
Hoekstra, Alfons (1); Majoie, Charles (2)	1: University of Amsterdam, Netherlands 2: Amsterdam University Medical Centers	MODELLING STROKE AND STROKE TREATMENT, PAVING THE WAY FOR IN-SILICO STROKE TRIALS	Charles Majoie is full professor in Neuroradiology at the Amsterdam University Medical Centers, location AMC, Amsterdam. His main interest is diagnosis and endovascular treatment of neurovascular diseases, with focus on acute stroke. He was Co-Pl of the MRCLEAN trial, showing for the first time that endovascular treatment really improves outcome of patients with acute ischemic stroke.  Alfons Hoekstra is full professor in Computational Science and Engineering at the University of Amsterdam, where he leads the Computational Science laboratory. His main interest is in modelling human health and disease, multiscale modelling and simulation, reproducible and actionable simulation based science, and high performance computing.	IST.2: In silico trials and clinical biomechanics Time: 14/ July/2021: 9:30am- 10:45am
Janssen, Dennis	Radboud university medical center, Netherlands	COMPUTATIONAL MODELING OF PRIMARY FIXATION OF TOTAL KNEE ARTHROPLASTY	Dennis Janssen is the Head of Experimental Research of the Orthopaedic Research Lab of Radboud university medical center. He spent part of his PhD at SUNY Upstate Medical University in Syracuse, NY, obtained his degree in 2009. His research focuses on the analysis of fixation of orthopaedic implants, from fundamental mechanics of the implant-bone interface to population-based modelling and analysis of implant, patient, and surgery-related variations on implant fixation and peri-prosthetic bone adaptation. He is an author of 70+ peer-reviewed publications.	Msk.2: Musculoskeletal biomechanics Time: Monday, 12/ July/2021: 5:00pm - 6:15pm
Leardini, Alberto	IRCCS Istituto Ortopedico Rizzoli, Italy	CUSTOM-MADE DESIGN AND MANUFACTURING OF PROSTHESES AND ORTHOTICS	Alberto Leardini is Director of the Movement Analysis Laboratory and Responsible for the Line of Research "Innovative and Prosthetic Surgery" at Istituto Ortopedico Rizzoli. He has been the President of the Italian Digital Biomanufacturing Network, and now President-Elect of the International Society of Biomechanics. His research mainly focuses on Motion Analysis, Joint Biomechanics and Orthopaedics Implants; more recently on Prosthesis Design and Additive Manufacturing. He is author of 195 publications in peer- reviewed journals, 47 book chapters, more than 890 Contributions to National and International Conferences, and 4 patents.	OP.1: Orthotics & prosthetics Time: Monday, 12/ July/2021: 5:00pm - 6:15pm
Martelli, Saulo	Flinders University, Australia	MODELLING HUMAN LOCOMOTION FOR PERSONALIZED EXERCISE PRESCRIPTION FOR OSTEOPOROSIS	Saulo is currently Senior lecturer at the College of Science and Engineering, Flinders University. He obtained his PhD in Biomehanics at the University of Bologna in 2008. He was a post-doctoral fellow at the Rizzoli Orthopaedic Institute in 2008-2011 and at the University of Melbourne in 2012-2013. He is a member of the Australian and New Zealand Orthopaedic Research Society. His present research mainly focuses on hip and knee biomechanics. He is an author of 35 publications in peer-reviewed journals, book chapters and more than 100 Contributions to Conferences.	HM.2: Human movement Time: 13/ July/2021: 9:30am- 10:45am
McGarry, Patrick	NUI Galway, Ireland	ON THE THERMODYNAMICS OF CELL SPREADING AND CONTRACTILITY	Dr Patrick McGarry's research focuses on cell and tissue biomechanics. He has published over 75 journal papers and over 100 conference abstracts/proceedings. He has been awarded five major research grants by Science Foundation Ireland in the areas of cell, artery and cardiac biomechanics. His research group has graduated 16 PhD students and has been awarded ten major international research prizes. In 2017 he was appointed as Visiting Professor at the Technical University of Graz and as Faculty Fellow at the University of Texas at Austin. He held a visiting faculty position at the University of Cambridge in 2018.	Cell.3: Cellular and molecular biomechanics Time: 13/ July/2021: 11:00am- 12:15pm

McHugh, Peter Edward	NUI Galway, Ireland	COMPUTATIONAL METHODS FOR CARDIOVASCULAR APPLICATIONS: ACHIEVEMENTS AND FUTURE PERSPECTIVES	Peter McHugh is Established Professor of Biomedical Engineering, and Head of School of Engineering, at NUI Galway, Ireland. Following his primary degree in mechanical engineering (NUI Galway, 1987) he obtained his PhD in mechanics of solids from Brown University, USA (1992). His research is focused on applying computational and experimental methods to investigate the mechanics of medical devices and tissue, particularly in the cardiovascular domain. He has a very distinguished publication and research funding record, with 160 peerreviewed journal papers, over 350 conference papers, over €13m in funding, and 50 research student graduates (PhD/MSc). He has received numerous awards, including membership of the Irish Academy of Engineering (2019), Royal Irish Academy (2011), and the Alexander von Humboldt Fellowship (1995).	CV-Mech.1: Cardiovascular mechanics Time: Monday, 12/ July/2021: 5:00pm - 6:15pm
McNamara, Laoise	National University of Ireland Galway, Ireland	MULTI-SCALE, MULTIDISCIPLINARY RESEARCH INTO BONE MECHANOBIOLOGY DURING OSTEOPOROSIS	Laoise McNamara is a Professor in Biomedical Engineering at the National University of Ireland, Galway. She holds a PhD from Trinity College Dublin, completed Postdoctoral training at Mount Sinai School of Medicine (USA) and has been a Lecturer at NUI Galway and the University of Southampton (UK). She has dedicated her research career to enhancing mechanistic understanding of bone mechanobiology and osteoporosis. She is an author of more than 80 publications, several chapter books and more than 150 Contributions to International and National Conferences.	Cell.1: Cellular and molecular biomechanics Time: Monday, 12/ July/2021: 2:15pm - 3:15pm
Mofrad, Mohammad	University of California Berkeley, United States of America	NUCLEAR PORE COMPLEX MECHANOBIOLOGY	Mohammad R. K. Mofrad is a professor of Bioengineering and Mechanical Engineering at the University of California Berkeley. His research program (http://mechano.bio) combines the state-ofthe-art molecular and multiscale biomechanics, computational biology and bioinformatics, and statistical learning approaches toward understanding and diagnosis of human diseases. Prof. Mofrad is a Fellow of the American Institute for Medical and Biological Engineering (AIMBE).	Mechano.3: Mechanobiology Time: 13/ July/2021: 4:30pm-5:30pm
Nguyen, Thao (Vicky)	Johns Hopkins University, United States of America	BIOMECHANICS OF THE TISSUES OF THE EYE WALL AND APPLICATIONS TO GLAUCOMA	Thao (Vicky) Nguyen received her S.B. from MIT in 1998, and M.S. and Ph.D. from Stanford in 2004, in Mechanical Engineering. She was a research scientist at Sandia National Laboratories from 2004-2007 before joining Johns Hopkins University, where she is currently a Professor and The Marlin U. Zimmerman Faculty Scholar in Mechanical Engineering. She has received numerous awards, including the 2008 Presidential Early Career Award in Science and Engineering and the 2013 National Science Foundation CAREER Award. She currently serves as an Associate Editor for the Journal of Biomechanical Engineering and is the 2020 President of the Society of Engineering Science.	Ocular.3: Ocular biomechanics Time: Wednesday, 14/ July/2021: 3:15pm - 4:15pm
Pajic- Lijakovic, Ivana, Dusan	University of Belgrade, Faculty of Technology and Metallurgy, Serbia	COLLECTIVE CELL MIGRATION AND RESIDUAL STRESS ACCUMULATIONS	Ivana Pajic-Lijakovic is currently Scientific Advisor at the Department of Biochemical Engineering, University of Belgrade. She obtained her PhD in Biorheology at the University of Belgrade in 2002. She is a Subject Editor for Facets (Canadian Science Publishin) and a Guest Editor for Seminars in Cell and Developmental Biology, Special Issue Viscoelasticity of multicellular systems. Her present research mainly focuses on multiscale modeling of viscoelasticity of multicellular systems. She is an author of more than 80 publications in peer-reviewed journals and several chapter books.	Soft-Tissue.3: Soft tissue mechanics Time: Tuesday, 13/ July/2021: 11:00am - 12:15pm
Passini, Elisa	University of Oxford, United Kingdom	HUMAN IN SILICO DRUG TRIALS WITH MULTISCALE MODELS OF CARDIAC ELECTROMECHANICS	Elisa Passini is currently a Senior Research Associate at the Department of Computer Science, University of Oxford (UK). She obtained her PhD in Bioengineering at the University of Bologna in 2015, and she joined the Computational Cardiovascular Science group in 2013. Her research focuses on the development of human-based computer model of the heart to predict drug safety and efficacy. Elisa was awarded the 2017 International 3Rs prize for the contribution of her research to the Replacement, Refinement and Reduction of Animals in Research, showing how computer models can predict drug safety and efficacy with higher accuracy than animal experiments.	IST.1: In silico trials and clinical biomechanics Time: 12/ July/2021: 11:15am- 12:15pm



Pesce, Maurizio	Centro cardiologico Monzino, IRCCS, Italy	FORCE DETECTION AND FIBROSIS OF THE CARDIOVASCULAR SYSTEM. TOWARD A MECHANICAL FRAMEWORK OF AGING PROCESS	Maurizio Pesce is since 2011 the Group Leader of the Cardiovascular Tissue Engineering Research Unit at Centro Cardiologico Monzino, IRCCS, in Milano. He has a MSc in Biology and a PhD in Embryology. He made his postdoctoral training at the Gene Expression Programme of the European Molecular Biology Laboratory (EMBL) in Heidelberg (Germany) on transcriptional regulation of stem cells pluripotency, and worked for ten years as a Senior Researcher in cardiovascular regenerative medicine before becoming independent. His research focuses on decryption of mechano-paracrine pathways in fibrotic diseases of the cardiovascular system and on engineering of living replacements for cardiovascular therapy. He is Author of 88 publications, 30 peerreviewed abstract presentations, 8 book chapters and 3 patents.	Mechano.1: Mechanobiology Time: Monday, 12/ July/2021: 11:15am - 12:15pm
Prahl Wittberg, Lisa	KTH, Sweden	REDUCING THROMBOEMBOLIC EVENTS IN BLOOD VESSELS AND ARTIFICIAL PUMPS	Dr. Lisa Prahl Wittberg is currently Associate Professor and Head of the Division of Fluid Mechanics and Acoustics at the Department of Engineering Mechanics, Royal Institute of Technology (KTH), Stockholm. She obtained her PhD in Fluid Mechanics in Lund University in 2007. She joined KTH 2008 as a post-doctoral researcher and worked at the University of Cincinnati/Cincinnati Children's Hospital in 2012 as a visiting researcher. Her research interest focuses on complex fluids, in particular blood, using both detailed numerical simulations and experiments to study the physics of blood flow linked to clinical applications. The research is carried out in close collaboration with ECMO Centre Karolinska, Karolinska University Hospital. She is an author of 27 publications in peerreviewed journals, and more than 25 contributions to international and national conferences.	Biof&Resp.1: Biofluid and respiratory mechanics Time: 14/ July/2021: 9:30am- 10:45am
Royston, Thomas J	University of Illinois at Chicago, United States of America	PERSPECTIVES ON MUSCLE ELASTOGRAPHY: FORCES, FIBERS, FRACTALS AND FRACTIONAL CALCULUS	Thomas J. Royston, PhD, Professor and Head of Bioengineering at the University of Illinois at Chicago (UIC), earned his PhD in Mechanical Engineering from the Ohio State University in 1995. His NIH and NSF-supported research in mechanical wave motion and imaging in soft tissue-like materials, and acoustics applied to medical diagnostics and therapy has been recognized with the NSF Career Award, the NIH NIBIB Nagy Award and the Acoustical Society of America Lindsay Award. He is a Fellow of the American Society of Mechanical Engineers and American Institute for Medical and Biological Engineering, and has authored >85 peer-reviewed journal articles.	Msk-imag.1: Imaging for muscoloskeletal applications Time: 12/ July/2021: 5:00pm-6:15pm
Rus, Guillermo	University of Granada, Spain	WHY WILL VISCOSITY AND NONLINEARITY BIOMARKERS RECAST ELASTOGRAPHIC DIAGNOSIS?	Guillermo Rus [Professor at UGR] is the Head and founder of the NDE Lab and Ultrasonics Group. He specialized in ultrasonics as a Fulbright Postdoc at MIT, and later as visiting scientist at UCL (UK), NASA (US), Paris 6 (FR), Linköping IT, Chalmers (SE) and TUHH (DE). He actively collaborates with Caltech, Boston University, Rochester IT (US), Kings College, UCL (UK) and Karolinska (SE). He has authored 100+ JCR publications (90% Q1, 1000+ cites, h-index 20), 20+ invited seminars, and reviews/edits 60+ journals. His career has been awarded by the Prognosis Health Management Society (2014), UGR (2001), Juan Carlos Simó (2007), and Wessex Institute of Technology (2005).	Msk-imag.1: Imaging for muscoloskeletal applications Time: Monday, 12/ July/2021: 5:00pm - 6:15pm
Schiavazzi, Daniele E.	University of Notre Dame, United States of America	NEW TRENDS IN STOCHASTIC CARDIOVASCULAR MODELING	Daniele is currently an Assistant Professor in the Department of Applied and Computational Mathematics and Statistics at the University of Notre Dame, US. He obtained his Ph.D. in Applied Mathematics at Universita' degli Studi di Padova in 2013. He was a post-doctoral fellow at the University of California , San Diego in 2013-2015 and at Stanford University in 2015-2016. His research interests include stochastic analysis, uncertainty quantification, numerical modeling, data assimilation and use of computational models to inform clinical decisions under uncertainty. He has received a postdoctoral fellowship from AHA in 2015 and a DARPA Young Faculty Award in 2018.	VVUQ.2: Verification, validation and uncertainties quantification Time: 13/ July/2021: 4:30pm-5:30pm

Schwiedrzik, Jakob	Empa, Switzerland	NOVEL DEVELOPMENTS IN EXPERIMENTAL MICROMECHANICS AND THEIR APPLICATION TO MINERALIZED TISSUES	Jakob is currently heading a research team at Empa Swiss Federal Laboratories for Materials Science and Technology. He studied Mechanical Engineering at TU Vienna and obtained his PhD in Biomedical Engineering at the University of Bern in 2014 on the topic of analytical, computational, and experimental micromechanics of bone. He was a postdoctoral fellow at Empa from 2014 to 2017. His present research focuses on instrument and method development in experimental micromechanics as well as multiscale mechanics of hierarchical materials. He authored 40 publications in peer reviewed journals and more than 25 contributions to international conferences as presenting author.	Hard-Tissue.4: Hard tissue biomechanics Time: Tuesday, 13/ July/2021: 4:30pm - 5:30pm
Snedeker, Jess;	University and ETH Zurich, Switzerland	MATRIX AGEING AND THE LINK TO CONNECTIVE TISSUE DISEASE	Trained as a mechanical engineer (BSc Lehigh University 1996), Jess first worked in industrial product design and manufacturing process engineering (1996-1998). He began applying engineering approaches to the study of human physiology in his graduate work (MSc Penn State 2000, PhD ETH Zurich 2004). He has led an independent research group in Zurich since 2006 with dual faculty appointments at the University of Zurich (Medical Faculty, D-Orthopedics) and ETH Zurich (Institute for Biomechanics). He heads the Swiss Center for Orthopedic Innovation at the Balgrist Campus, designated and funded as a "research infrastructure of national importance" since 2016.	Cell.4: Cellular and molecular biomechanics Time: Wednesday, 14/ July/2021: 3:15pm - 4:15pm
Tuszynski, Jack A.	Politecnico di Torino, Italy	A COMPUTATIONAL PERSPECTIVE ON VIRTUAL LIVER DESIGN: FLUID FLOW, ZONATION, FIBROSIS AND MECHANICS	Jack Tuszynski is currently Allard Research Professor of Oncology and Professor of Physics Pat the University of Alberta and Professore Ordinario at DIMEAS, Politecnico di Torino. He obtained a PhD in Theoretical Physics at the University of Calgary in 1983. He held visiting professor appointments at the Univ. of Duesseldorf, University of Giessen, Catholic University of Leuven, Ecole Normale Superieur in Lyon and Nankai University in Tianjin, China. He is an author of over 500 publications in peer- reviewed journals, 12 books, 27 book chapters and has given more than 200 invited and 200contributed talks at national and internationalconferences and seminars on all six continents.	Cell.2: Cellular and molecular biomechanics Time: 12/ July/2021: 5:00pm-6:15p
Yuan, Guangyin	Shanghai Jiao Tong University, People's Republic of China	CHALLENGES AND SOLUTIONS FOR ADDITIVE MANUFACTURING OF BIODEGRADABLE MAGNESIUM IMPLANTS	Dr. Guangyin Yuan is a tenured professor in the School of Materials Science and Engineering at Shanghai Jiao Tong University, China. He received his Ph.D. in Materials Science and Engineering from Southeast University, China in 1999. He then worked as a JSPS researcher from 2002 to 2004 in Tohoku University, Japan. He is the standing committee member of the Chinese Biomaterials Society Medical Metal Branch and vice President of the Chinese Medical Magnesium Alloy Industry Technology Innovation Strategic Alliance. His research focused on the development of novel biodegradable magnesium-based alloys for medical applications. He has published over 100 research papers which have been cited over 3500 times.	AM-Bioprint.2: Additive manufacturing for biomedical applications and bioprinting Time: 13/ July/2021: 9:30am- 10:45am
Zysset, Philippe	University of Bern, Switzerland	MULTISCALE TRABECULAR AND COMPACT BONE MECHANICS	Philippe Zysset is Professor of Biomechanics at the ARTORG Center for Biomedical Engineering Research of the University of Bern. He was a research fellow at Harvard Medical School in 1989-1990 and obtained his PhD in Biomechanics at EPFL in 1994. He was a post-doctoral fellow at the University of Michigan in 1995-1997, assistant rofessor at EPFL in 1997-2003 and professor at TU-Wien in 2003-2011. His research mainly focuses on multiscale structure-function relationships of musculoskeletal tissues. He is an author of more than 200 articles in peer-reviewed journals, proceedings and books. Next to his teaching of biomechanics, he is leading a master's program in biomedical engineering.	Hard-Tissue.6: Hard tissue biomechanics Time: Wednesday, 14/ July/2021: 11:00am - 12:15pm



#### Marco Viceconti

Alma Mater Studiorum - University of Bologna, Italy

Marco Viceconti is full professor of Computational Biomechanics in the department of Industrial Engineering of the Alma Mater Studiorum – University of Bologna, and Director of the Medical Technology Lab of the Rizzoli Orthopaedic Institute. He started his career as researcher in biomechanics in 1989 at the University of Florida – Madison, under the supervision of Prof Alì Seireg. Over the years he worked on various topics related to neuromusculoskeletal biomechanics, but in the last 20 years he focused primarily on In Silico medicine, where patient-specific physics-based computer models are used as clinical decision support systems. He served two full mandates in the Council of the European Society of Biomechanics, including a term as President. He is currently one of 25 members of the World Council of Biomechanics. According to SCOPUS he published 351 papers

(H-index = 50). In 2018 he became Fellow of the Royal Academy of Engineering.

#### **BEST PhD THESIS AWARD**



#### Guillaume Durandau

University of Twente, Enschede, the Netherlands Thesis title:

Towards the next Generation in Human-machine interfacing: Controlling Wearable Robots via Neuromusculoskeletal Modelling

Guillaume Durandau obtained his engineering diploma at ISEN-Toulon, France, and his master's degrees at the University of Sherbrooke, Canada. During his master's, he spent four months at the CINESTAV, Mexico. He also obtained during his master, the Mitacs Globalink Research Award. In 2016, he started his PhD at the Institute of Neurorehabilitation Systems, UMG, Gottingen, Germany, under the supervision of Prof. Dario Farina and Dr Massimo Sartori and then moved in 2017 to the University of Twente, Enschede, the Netherlands to continue his PhD under the supervision of Prof.

Herman van der Kooij and Assoc. Prof. Massimo Sartori. During his PhD, he won the Best Demo Award in 2018 at the 7th IEEE International Conference on Biomedical Robotics and Biomechatronic and Best paper Published by IEEE-EMBS in 2017-18, 3rd place at the 7th Dutch Bio-medical Engineering Conference. He is currently a Postdoc researcher at the Department of Biomechanical Engineering at the University of Twente, Enschede, the Netherlands.

## STUDENT AWARD FINALISTS

#### Katia Capellini

AN IMAGE-BASED CFD AND RBF MESH MORPHING APPROACH: AN ALTERNATIVE FOR STANDARD FSI TECHNIQUE

#### Gabriele Nasello

MECHANO-DRIVEN REGENERATION PREDICTS BONE INGROWTH IN LARGE ANIMAL MODEL BASED ON SCAFFOLD IMPLANTATION SITE

#### Karol Calò

IN VIVO AORTIC HEMODYNAMICS ANALYSIS COMBINING COMPLEX NETWORKS THEORY AND 4D FLOW MRI

#### Anna Corti

A FINITE ELEMENT – AGENT-BASED COUPLED MODEL OF RESTENOSIS: LINKING TISSUE DAMAGE TO CELLULAR DYNAMICS

#### **SUNDAY 11 July PRE-EVENT 16:00 – 18:00 (CET time)**

### How to pursue successfully your academic career?

Are you interested to know more about the ups and downs of an academic career? Do you want to know what are the challenges and how to succeed in becoming an independent scientist? Then, this special session is for you!

During this session topics such as how to transition from post-doc to an independent academic, how to reach a good work/life balance, and we will give you tips on supervising students and leading successfully your own group will be discussed. Also the differences between academia and industry so that you can see what fits best will be discussed.

The topics will be introduced by a panel of academics (Aurelie Carlier, Ilse Jonkers and Damien Lacroix) and a researcher who decided to work in a medical device company (Giuliano Lamberto). Ample time for live questions and chances to interact with each other's to share views and concerns will be given.





During lunch breaks (12:30-13:15) there will be the following workshops:

Date: Monday, 12/July/2021				
EXEMPLAR - DASSAULT SYSTEMES.1	Workshop: "EXEMPLAR - Simulia workflow for life science applications"			
PARAMETRIC DESIGN - ANSYS.1	Workshop: "How ANSYS transforms the cardiovascular activity: from Research to Medical Innovation, from Regulatory to Clinical Applications"			
QUALISYS	Workshop: "Streamline your research with QUALISYS motion capture"			

Date: Tuesday, 13/July/2021				
CERENOVUS	Workshop: "Endovascular Stroke treatment and career paths in the biomedical industry"			
EXEMPLAR - DASSAULT SYSTEMES.2	Workshop: "EPYGON - Towards the implementation of ASME V&V 40-2018 for the structural assessment of EPYGON transcatheter mitral valve"			
PARAMETRIC DESIGN - ANSYS.2	Workshop: "How ANSYS transforms the orthopedic activity: from research to medical Innovation, from regulatory to clinical applications"			
ZEISS	Workshop: "X-ray computed tomography and digital volume correlation in musculoskeletal research"			

Date: Wednesday, 14/July/2021			
EXEMPLAR - DASSAULT SYSTEMES.3	Workshop: "INSILICO TRIALS - A new in silico tool for TAVI standard tests available on InSilicoTrials.com, the first cloud-based platform"		
MATERIALISE	Workshop: "Automating musculoskeletal modeling workflows: challenges and solutions"		
PARAMETRIC DESIGN - ANSYS.3	Workshop: "ANSYS overview and PARAMETRIC DESIGN researches in the respiratory field"		

The event will be held fully on-line with pre-recorded presentations (with the exception of Plenary Talks and awards).

The Perspective Talks, the Podium presentations and the Flash presentations of e-posters will be broadcast on-line following the sequence reported in the conference agenda (see the website for updates). The starting time of each session is reported. Each session will be organized according to the total duration of the session (60 min or 75 min). If a Perspective Talk is scheduled in a session, this talk will open the session, followed by 5 minues of discussions. Discussion time slots will be given every three or four presentations at most, depending on the number of scheduled presentations.

The discussion time slots are dedicated to Questions and Answers. Due to time restrictions, it would be desirable to place the questions in the chat, the chairman of the session will select the questions and allows the presenters to answer.

The presenters are kindly asked to attend the whole session in order to take part to the Q&A.

As the schedule may be tight, attendees and presenters are kindly asked to limit the discussion within the available time slots. However, at the end of each session a 15 minutes break is scheduled, if needed the virtual room is available during the break for further discussions.

#### Information for Chairmen

In all session room at least one person of the technical staff from POLIMI will be present.

The POLIMI staff member will:

- · assist the chairman in verifying the presence of the presenters in the room;
- play the video presentations upon introduction of the chairman
- call one of the presenters in the room to play the role of the chairman in case the primary chairman has connection problems or similar.

As in classical congresses, if a presenter is missing, please stick to the original schedule and the time of the presentation of the missing presenter can be used for discussion.

The Chairmen are kindly asked to stop the discussion when allotted time expires.

Chairmen can introduce the presentation just by simply announcing the name of the presenter and the title of the presentation; there is no time for more detailed introductions to the talks.

#### General information

All video-presentations will be freely available for streaming after the congress for approximatively three months. We hope this is of help for those of you who miss interesting presentations because of the tight schedule or an unfavorable time zone.

The .pdf files of the e-posters will be available for download from the beginning of the Congress and for the same time period of the video-presentations.

#### **GUIDELINES** for poster presentations

The Flash pre-recorded presentations will be broadcasted in blocks of 3 (6 minutes in total) followed by 6 minutes discussion.

#### **GUIDELINES** for **KEYNOTE** and award sessions

Keynote Speakers will give their talk for 30 minutes followed by a general discussion of 15 minutes. Presenters of the Students award will have 12 minutes for the presentation followed by 5 minutes of discussion.

Huiskes medal and Best PhD thesis will have 25 minutes presentation followed by 5 minutes discussion.

Date: Mo	onday, 12/July/202	21		
10:30 am	Open: Opening			
- 11:00 am	Opening Ceremony			
11:00 am				
- 11:15 am	Break			
11:15 am - 12:15 pm	CV-Imag.1: Imaging for cardiovascular applications Chair: Henk	CV-Impl.1: Implants and devices for cardiovascular applications	Dental.1: Dental biomechanics Chair: Christoph Bourauel	IST.1: In silico trials and clinical biomechanics Chair: Peter Varga
	Marquering	Chair: Giancarlo Pennati		onan i oto taiga
	Mechano.1: Mechanobiology Chair: Sandra Loerakker	Msk.1: Musculoskeletal biomechanics Chair: Claudia Mazzà	Orth-dev.1: Implants and devices for orthopaedic applications Chair: Luca Cristofolini	Spine.1: Spine Chair: Christian Liebsch
	TM-Meth.1: Computational methods in tissue mechanics Chair: Michele Marino			
12:15 pm		:	:	:
- 12:30 pm	Break			
12:30 pm	EXEMPLAR	PARAMETRIC	QUALISYS:	
- 01:15 pm	- DASSAULT SYSTEMES.1: Workshop: "EXEMPLAR - Simulia workflow for life science applications"	DESIGN - ANSYS.1: Workshop: "How ANSYS transforms the cardiovascular activity: from Research to Medical Innovation, from Regulatory to Clinical Applications"	Workshop: "Streamline your research with QUALISYS motion capture"	
01:15 pm	Break			
01:30 pm	DIEAN			
01:30 pm	Key-1: Keynote Lecture Nico Verdonschot Chair: Harry van Lenthe			
02:15 pm	Chair: Manuela Galli			
02:15 pm	Break			
02:30 pm				



02:30 pm - 03:30 pm	AM-Bioprint.1: Additive manufacturing for biomedical applications and bioprinting	Biomat.1: Biomaterials Chair: Arti Ahluwalia	CB.1: Computational biology Chair: Aurélie Carlier	Cell.1: Cellular and molecular biomechanics Chair: Laoise McNamara
	Chair: Giuseppe Vairo			
	CV-Impl.2: Implants and devices for cardiovascular applications Chair: Emiliano Votta	CV-Meth.1: Computational methods for cardiovascular applications Chair: Irene Vignon- Clementel	Hard-Tissue.1: Hard tissue biomechanics Chair: Enrico Dall'Ara	HM.1: Human movement Chair: Carlo Albino Frigo
	Orth-dev.2: Implants and devices for orthopaedic applications Chair: Boyko Gueorguiev	VVUQ.1: Verification, validation and uncertainties quantification Chair: José Félix Rodriguez Matas		
03:30 pm		:	:	:
- 03:45 pm	Break			
03:45 pm -	std-aw: Student Award Chair: Markus Heller			
05:00 pm 05:00 pm	Chair: Aurélie Carlier			
- 05:15 pm	Break			
05:15 pm - 06:30 pm	Cell.2: Cellular and molecular biomechanics Chair: Monica Soncini, Marco Agostino Deriu	CV-Impl.3: Implants and devices for cardiovascular applications Chair: Claire Conway	CV-Mech.1: Cardiovascular mechanics Chair: Peter Edward McHugh	Msk-imag.1: Imaging for muscoloskeletal applications Chair: Guillermo Rus
	Msk.2: Musculoskeletal biomechanics Chair: Dennis Janssen	OP.1: Orthotics & prosthetics Chair: Alberto Leardini	Reproduct.1: Reproductive biomechanics Chair: Kristin M. Myers, David Elad	Soft-Tissue.1: Soft tissue mechanics Chair: Rosaire Mongrain, Marie Christine Ho Ba Tho
	Spine.2: Spine Chair: Fabio Galbusera	TE.1: Tissue engineering Chairs: Andrea Remuzzi, Matteo Moretti		

Date: Tuesday, 13/July/2021				
09:30 am - 10:45 am	AM-Bioprint.2: Additive manufacturing for biomedical applications and bioprinting Chair: Michele Conti	CV-Mech.2: Cardiovascular mechanics Chair: Hao Gao	CV-Meth.2: Computational methods for cardiovascular applications Chair: Caitriona Lally	Hard-Tissue.2: Hard tissue biomechanics Chair: Uwe Wolfram
	HM.2: Human movement Chair: Zimi Sawacha	Mechano.2: Mechanobiology Chair: Ralph Müller	Msk-imag.2: Imaging for muscoloskeletal applications Chair: Claudio Vergari	Ocular.1: Ocular biomechanics Chair: Anna Pandolfi
	Orth-dev.3: Implants and devices for orthopaedic applications Chair: Bernardo Innocenti	Soft-Tissue.2: Soft tissue mechanics Chair: Olfa Trabelsi	Spine.3: Spine Chair: Tomaso Villa	
10:45 am - 11:00 am	Break			
11:00 am - 12:15 pm	Cell.3: Cellular and molecular biomechanics Chair: Damien Lacroix	CV-Mech.3: Cardiovascular mechanics Chair: Umberto Morbiducci	CV-Meth.3: Computational methods for cardiovascular applications Chair: Stephane Avril	Hard-Tissue.3: Hard tissue biomechanics Chair: Dieter Pahr
	Impact.1: Impact/ injury biomechanics Chair: Christophe Bastien	Msk.3: Musculoskeletal biomechanics Chair: Nicola Sancisi	Orth-meth.1: Computational methods for orthopaedic applications Chair: Luca Modenese	Soft-Tissue.3: Soft tissue mechanics Chair: Ivana Dusan Pajic-Lijakovic
	TE.2: Tissue engineering Chair: Diana Massai			
12:15 pm - 12:30 pm	Break			
12:30 pm - 01:15 pm	CERENOVUS: Workshop: "Endovascular Stroke treatment and career paths in the biomedical industry"	EXEMPLAR - DASSAULT SYSTEMES.2: Workshop: "EPYGON - Towards the implementation of ASME V&V 40-2018 for the structural assessment of EPYGON transcatheter mitral valve"	PARAMETRIC DESIGN - ANSYS.2: Workshop: "How ANSYS transforms the orthopedic activity: from research to medical Innovation, from regulatory to clinical applications"	ZEISS: Workshop: "X-ray computed tomography and digital volume correlation in musculoskeletal research"



01:15 pm - 01:30 pm	Break				
01:30 pm	Key-2: Keynote Lecture Federica Caselli				
- 02:15 pm	Chair: David Mitton Chair: Gabriele Dubini				
02:15 pm - 02:30 pm	Break				
02:30 pm - 03:30 pm	Poster_CardioVasc 1: Poster session - Cardiovascular 1 Chair: Claudio Chiastra	Poster_CardioVasc 2: Poster session - CardioVascular 2 Chair: Cathriona Lally	Poster_Cell & Molec: Poster session - Cellular and Molecular Chairs: Aurelie Carlier, Arti Ahluwalia	Poster_Emerg Biomech: Poster session - Emerging Topics in Biomechanics Chair: Daniele Schiavazzi	
	Poster_Loc-Rehab 1: Poster session - Locomotion and Rehabilitation 1 Chair: Ilse Jonkers	Poster_Msk-Orth 1: Poster session - Muscoloskeletal and Orthopaedics 1 Chair: Veronica Cimolin	Poster_Msk-Orth 2: Poster session - Muscoloskeletal and Orthopaedics 2 Chair: Dieter H. Pahr	Poster_Msk-Orth 3: Poster session - Muscoloskeletal and Orthopaedics 3 Chair: Claudia Mazzà	
	Poster_Other Biomech: Poster session - Other Topics in Biomechanics Chair: Michele Marino	Poster_Tissue Biomech 1: Poster session - Tissue Mechanics 1 Chair: Simona Celi	Poster_Tissue Biomech 2: Poster session - Tissue Mechanics 2 Chair: David Mitton		
03:30 pm - 03:45 pm	Break				
03:45 pm - 04:45 pm	Huiskes & PhD session Chair: Harry van Lenthe Chair: Markus Heller				
04:45 pm - 05:00 pm	Break				
05:00 pm - 06:00 pm	Biomat.2: Biomaterials Chair: Miguel Castilho	CB.2: Computational biology Chair: Alfons Hoekstra	CV-Impl.4: Implants and devices for cardiovascular applications Chair: Keefe Manning	CV-Mech.4: Cardiovascular mechanics Chair: John LaDisa	
	Ergo-Rehab.1: Ergonomics/ Occupational biomechanics/ Rehabilitation Chair: Veronica Cimolin	Hard-Tissue.4: Hard tissue biomechanics Chair: Jakob Schwiedrzik	Mechano.3: Mechanobiology Chair: Manuela Teresa Raimondi	Orth-meth.2: Computational methods for orthopaedic applications Chair: Ilse Jonkers	
	Spine.4: Spine Chair: Luigi La Barbera	Sport.1: Sport biomechanics Chair: Carlo Albino Frigo	VVUQ.2: Verification, validation and uncertainties quantificatio Chair: Lorenza Petrini		
06:00 pm					
07:00 pm	Assembly: ESB General Assembly				

Date: Wednesday, 14/July/2021				
09:30 am - 10:45 am	A&P.1: Animal and plant biomechanics Chair: Mauro Malvè	Biof&Resp.1: Biofluid and respiratory mechanics Chair: Sean McGinty	CV-Mech.5: Cardiovascular mechanics Chair: Christian Vergara	CV-Meth.4: Computational methods for cardiovascular applications Chair: Miguel A. Martinez
	Hard-Tissue.5: Hard tissue biomechanics Chair: David Mitton	IST.2: In silico trials and clinical biomechanics Chair: Marco Viceconti	Mechano.4: Mechanobiology Chair: Maurizio Pesce	Orth-meth.3: Computational methods for orthopaedic applications Chair: Dennis Janssen
	Reproduct.2: Reproductive biomechanics Chair: Emanuele Luigi Carniel	TM-Meth.2: Computational methods in tissue mechanics Chair: Giuseppe Vairo		
10:45 am - 11:00 am	Break			
11:00 am - 12:15 pm	Biomat.3: Biomaterials Chair: Silvia Farè	CV-Imag.2: Imaging for cardiovascular applications Chair: Frank Gijsen	CV-Impl.5: Implants and devices for cardiovascular applications Chair: Liguo Zhao	CV-Meth.5: Computational methods for cardiovascular applications Chair: Simona Celi
	Hard-Tissue.6: Hard tissue biomechanics Chair: Philippe Zysset	IST.3: In silico trials and clinical biomechanics Chair: Jerome Noailly	Mechano.5: Mechanobiology Chair: Liesbet Geris	Msk.4: Musculoskeletal biomechanics Chair: Ilse Jonkers
	Orth-meth.4: Computational methods for orthopaedic applications Chair: Helene Follet	Spine.5: Spine Chair: Timothy Patrick Holsgrove		
12:15 pm - 12:30 pm	Break			
12:30 pm - 01:15 pm	EXEMPLAR - DASSAULT SYSTEMES.3: Workshop: "INSILICO TRIALS - A new in silico tool for TAVI standard tests available on InSilicoTrials.com, the first cloud- based platform"	MATERIALISE: Workshop: "Automating musculoskeletal modeling workflows: challenges and solutions"	PARAMETRIC DESIGN - ANSYS.3: Workshop: "ANSYS overview and PARAMETRIC DESIGN researches in the respiratory field"	



01:15 pm					
- 01:30 pm	Break				
01:30 pm - 02_45 pm	AM-Bioprint.3: Additive manufacturing for biomedical applications and bioprinting Chair: Claudio Capelli	CV-Mech.6: Cardiovascular mechanics Chair: Nicholas A Hill	Impact.2: Impact/ injury biomechanics Chair: Peter Zioupos	Mechano.6: Mechanobiology Chair: José Manuel García-Aznar	
	Msk-imag.3: Imaging for muscoloskeletal applications Chair: Zimi Sawacha	Ocular.2: Ocular biomechanics Chair: Philippe Büchler	OP.2: Orthotics & prosthetics Chair: Alex Dickinson	Orth-meth.5: Computational methods for orthopaedic applications Chair: Marlene Mengoni	
	Soft-Tissue.4: Soft tissue mechanics Chair: Estefania Peña	Spine.6: Spine Chair: Andre P. G. Castro	TM-Meth.3: Computational methods in tissue mechanics Chair: M. Ángeles Anson		
02:45 pm	Break				
03:00 pm	Dieak				
03:00 pm	Key-3: Keynote Lecture David Steinman				
03:45 pm	Chair: Jerome Noailly Chair: Alberto Redaelli				
03:45 pm	Break				
04:00 pm	Dieak	;	;	,	
04:00 pm - 05:00 pm	Biof&Resp.2: Biofluid and respiratory mechanics Chair: Choon Hwai Yap	Cell.4: Cellular and molecular biomechanics Chair: Jess Snedeker	CV-Mech.7: Cardiovascular mechanics Chair: Ali Cagdas Akyildiz	CV-Meth.6: Computational methods for cardiovascular applications Chair: Claudio Chiastra	
	Ergo-Rehab.2: Ergonomics/ Occupational biomechanics/ Rehabilitation Chair: Benedikt Helgason	Ocular.3: Ocular biomechanics Chair: Thao (Vicky) Nguyen	Orth-dev.4: Implants and devices for orthopaedic applications Chair: Gianluca Tozzi	Orth-meth.6: Computational methods for orthopaedic applications Chair: Stephen Ferguson	
	TM-Meth.4: Computational methods in tissue mechanics Chair: Jorge Grasa				
05:00 pm					
- 05:15 pm	Break				
05:15 pm	Closing				
05:45 pm	Ologing				

## ESB 2022 ANNOUNCEMENT ////////



#### Congress venue: Alfandega Porto Congress Centre



#### **ESB 2022 Congress Chairs:**

#### João Manuel R.S. Tavares Associate Professor

Department of Mechanical Engineering Faculty of Engineering of the

University of Porto, Portugal

#### Paulo R. Fernandes

Associate Professor Department of Mechanical Engineering Instituto Superior Técnico, University of Lisbon, Portugal

#### Renato Natal Jorge

Professor Department of Mechanical Engineering

Faculty of Engineering of the University of Porto, Portugal

#### ESB 2022 Local Organising Committee

Marco Parente - FEUP/INEGI/LABIOMEP Pedro Martins - FEUP/INEGI/LABIOMEP Dulce Oliveira - INEGI/LABIOMEP

Nilza Ramião - INEGI/LABIOMEP Elisabete Silva - INEGI/LABIOMEP

#### Filipa Sousa - FADEUP/LABIOMEP

João Paulo Vilas-Boas - FADEUP/LABIOMEP

João Folgado - IST/IDMEC

Enrico Dall'ara, University of Sheffield, ESB Council

#### Join us in Porto for ESB 2022 for an exciting programme!

Pre-congress courses Plenary lectures Award sessions Podium presentations

Perspective talks

Social events

Poster sessions Affiliated societies sessions Corporate members session **ESB General Assembly** Women in Biomechanics

Start-up ideas competitions Entrepreneurship and innovation forum

Career connections

26 June 2022 - Welcome reception c/o Codan Consulting 27 June 2022 – Students' night at ESB 28 June 2022 – ESB congress dinner

#### **ESB 2022 Congress Secretariat**

Provaznicka 11, Prague 1, Czech Republic in fo @codan-consulting.com+420 251 019 379

#### **KEY DATES**

#### October 2021

Call for perspective talks submission

#### **30 November** 2021

Perspective talks submissions deadline

#### December 2021

Call for abstract submission

#### 31 January 2022

Abstract submission deadline

#### 31 March 2022

Abstract review notification

#### **16 May** 2022

Early registration deadline













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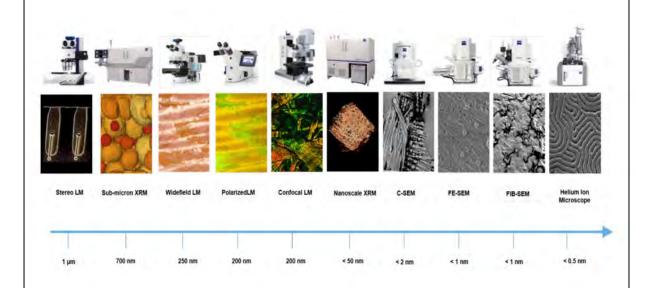
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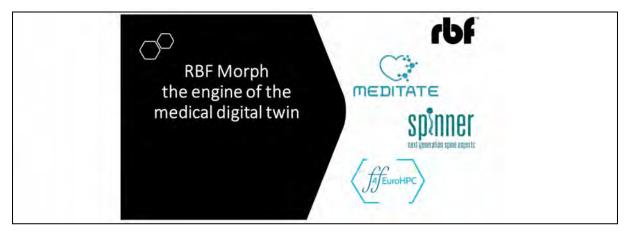


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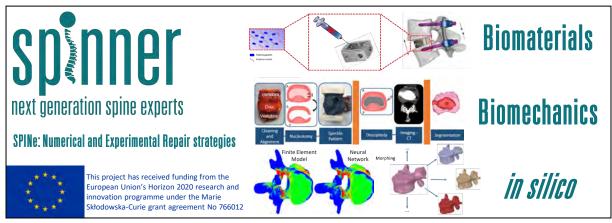




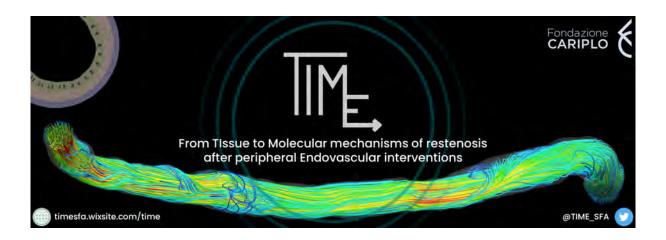














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