European Society of Biomechanics

ESB2025

30th Congress of the European Society of Biomechanics

6 – 9 July 2025, Zürich, Switzerland

AI IN BIOMECHANICS: OPPORTUNITIES AND CHALLENGES

www.esbiomech2025.org

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WELCOME TO ZÜRICH!

Dear Colleagues and Friends,

It is with great pleasure that we welcome you to Zürich for the **30th anniversary edition of the European Society of Biomechanics Congress**. This milestone event not only celebrates three decades of advancing biomechanics in Europe and beyond, but also coincides with a remarkable local occasion—the **175th anniversary of ETH Zürich**, one of the world's leading institutions in science and engineering.

We are delighted to host **956 participants from 45 countries**, coming together to share research, exchange ideas, create new connections, and reconnect with old friends. Set in the heart of Switzerland's largest city, ESB 2025 promises a vibrant and forward-looking scientific programme. Under the theme **"AI in Biomechanics: Opportunities and Challenges"**, this year's congress explores how artificial intelligence is shaping the future of our field. We are proud to present an outstanding line-up of keynote speakers, including **Molly Stevens**, **Scott Delp**, and **Mackenzie Mathis**, and to host a thought-provoking **debate session** on the future of physical modelling in biomechanics.

The programme features more than 80 scientific sessions, mentoring events, interactive poster sessions, and opportunities to connect with industry leaders in the **Advancements in Biomechanics** session. In addition, our **pre-courses** and **scientific awards** continue to support early-career researchers and celebrate outstanding achievements in the field.

Beyond the lecture halls, take the time to enjoy the beauty of Zürich—its lakeside charm, historic old town, and panoramic views from the ETH Polyterrasse. Our social events, from the welcome reception to the congress dinner by the lake, are designed to create lasting memories and connections.

Thank you for being part of this special anniversary edition of the ESB Congress. We look forward to an inspiring week together!

Warm regards,

Prof. Dr.
William R. Taylor
ESB 2025 Chair
Laboratory for Movement Biomechanics, Institute for Biomechanics, ETH Zürich

Prof. Dr.
Stephen J. Ferguson
ESB 2025 Co-Chair
Laboratory for Orthopaedic Technology, Institute for Biomechanics, ETH Zürich

Prof. Dr.
Ralph Müller
ESB 2025 Co-Chair
Laboratory for Bone Biomechanics, Institute for Biomechanics, ETH Zürich

ESB 2025 ORGANISATION

Local Organising Committee

Prof. Dr. Edoardo Mazza
Dep. of Mechanical and Process Engineering, ETH Zürich

Dr. Alexander Ehret
Dep. of Mechanical and Process Engineering, Experimental Continuum Mechanics, ETH Zürich

Prof. Dr. Dominique Pioletti
Laboratory of Biomechanical Orthopaedics, EPFL Lausanne

Prof. Dr. Nicole Wenderoth
Neuro Control of Movement, ETH Zürich

Prof. Dr. Christina M. Spengler
Head of the Exercise Physiology Lab, ETH Zürich

Dr. Oliver Stoller
Executive Director, Competence Center for Rehabilitation Engineering and Science (RESC)

Prof. Philippe Zysset
Head of Musculoskeletal Biomechanics Program, University of Bern

Prof. Dr. Kamiar Aminian
Ecole Polytechnique Federale de Lausanne

Prof. Klaas Pruessmann
Department of Inform. Technol. Electrical Engineering, ETH Zürich

Dr. Deepak Kumar Ravi
Institute of Biomechanics, ETH Zürich

Prof. Dr. Philippe Büchler
ARTORG Center for Biomedical Engineering Research, University of Bern

Dr. Roland Zemp
Staff of Professorship for Movement Biomechanics, ETH Zürich

Ms. Joanne Lim
Staff of Institute for Biomechanics, ETH Zürich

Dr. Fransiska Bossuyt
Department of Health Sciences and Technology, ETH Zürich

Prof. Sandra Loerakker
Biomedical Engineering Department, Eindhoven University of Technology

European Society of Biomechanics

European Society of Biomechanics

The European Society of Biomechanics was founded in 1976 at a meeting of 20 scientists from 11 countries in Brussels. Its goal is to encourage research, disseminate knowledge and promote progress in biomechanics. It is now the largest biomechanics society in Europe with over 1500 members.

ESB 2025 in Zurich serves as the 30th anniversary edition of the ESB Congress.

ESB Council

- President: **Enrico Dall'Ara**, *University of Sheffield, United Kingdom*
- Vice President and Awards Committee: **Dieter Pahr**, *Vienna University of Technology, Austria*
- Secretary-General: **Michele Conti**, *University of Pavia, Italy*
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- Educational and Deputy Awards Committee: **Philipp Thurner**, *Vienna University of Technology, Austria*
- Deputy Treasurer and Sponsorship: **Marlène Mengoni**, *University of Leeds, United Kingdom*
- Meetings and External Affairs Committee: **Peter Varga**, *AO Research Institute Davos, Switzerland*
- Diversity-inclusion and Membership Committee: **Esther Reina Romo**, *University of Seville, Spain*
- Webportal and Working Groups Committee: **Sandra Loerakker**, *Eindhoven University of Technology, the Netherlands*
- Communications Committee: **Bernardo Innocenti**, *Université Libre de Bruxelles, Belgium*

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- **Alessio Amicone**, *ETH Zürich, Switzerland*
- **Chiara Dazzi**, *Charité – Universitätsmedizin Berlin, Berlin, Germany*
- **Jorge Barrasa Fano**, *KU Leuven, Belgium*
- **Laura Lafuente Gracia**, *KU Leuven, Belgium*
- **Gianluca Santesarti**, *Sapienza University of Rome, Italy*
- **Benedetta Fantaci**, *University of Zaragoza, Zaragoza, Spain*
- **Aurélie Levillain**, *Université Gustave Eiffel, Lyon, France*
- **Andrada Pica**, *Sapienza University of Rome, Italy*
- **Alexandra Tits**, *University of Liège, Liège, Belgium*
- **Rajdeep Ghosh**, *University of Sheffield, United Kingdom*
- **Anna Corti**, *Politecnico di Milano, Italy*

ESB 2025 International Scientific Committee

- Miguel Ángel Ariza Gracia; *University of Zaragoza, Spain*
- María Ángeles Pérez Ansón; *University of Zaragoza, Spain*
- Charlotte Apps; *Nottingham Trent University, UK*
- Stéphane Armand; *University of Geneva, Switzerland*
- Ayman Assi; *Saint-Joseph University of Beirut, Lebanon*
- Lorenz Assländer; *Universität Konstanz, Germany*
- Stéphane Avril; *École Nationale Supérieure des Mines de Saint-Étienne, France*
- Chris Awai; *ETH Zurich, Switzerland*
- Sam Bayat; *Centre Hospitalier Universitaire de Grenoble, France*
- Aurélie Benoit; *Université Paris Cité, France*
- Chris Bourauel; *University of Bonn, Germany*
- Mohamed Bouri; *EPFL, Switzerland*
- Claire Brockett; *University of Sheffield, UK*
- Philippe Büchler; *University of Basel, Switzerland*
- Aurélie Carlier; *Maastricht University, the Netherlands*
- Alessandra Carriero; *The City College of New York, USA*
- Dario Cazzola; *University of Bath, UK*
- Sara Checa Esteban; *Charité – Universitätsmedizin Berlin, Germany*
- Floren Colloud; *Arts et Métiers Institute of Technology, Paris, France*
- Michele Conti; *The University of Pavia, Italy*
- Michael Crichton; *Heriot Watt University, UK*
- Luca Cristofolini; *University of Bologna, Italy*
- Neil Cronin; *University of Jyväskylä, Finland*
- Sasa Cukovic; *ETH Zurich, Switzerland*
- Carolin Curtze; *University of Nebraska Omaha, USA*
- Enrico Dall'Ara; *University of Sheffield , UK*
- Elena De Momi; *The Polytechnic University of Milan, Italy*
- Clark Dickerson; *University of Waterloo, Canada*
- Georg Duda; *Charité – Universitätsmedizin Berlin, Germany*
- Mona Eskandari; *University of California, Riverside, USA*
- Nele Famaey; *KU Leuven, Belgium*
- Míriam Febrer; *Universitat Politècnica de Catalunya, Spain*
- Stephen Ferguson; *ETH Zurich, Switzerland*
- Paulo Fernandes; *University of Lisbon, Portugal*
- Linard Filli; *Balgrist University Hospital, Switzerland*
- Arielle Fischer; *Technion, Israel*
- Hélène Follet; *Inserm, France*
- Christian Gasser; *KTH Royal Institute of Technology, Sweden*
- Kate Gerber; *University of Basel, Switzerland*
- Costanza Giampietro; *Empa, Switzerland*
- Thomas Grupp; *Aesculap AG, Germany*

- Elie Hachem; *Mines Paris, France*
- Clint Hansen; *Christian-Albrechts-Universität zu Kiel, Germany*
- Benedikt Helgasson; *ETH Zurich, Switzerland*
- Heath Henninger; *University of Utah, USA*
- Eva Herbst; *ETH Zurich, Switzerland*
- Walter Herzog; *University of Calgary, Canada*
- Marie-Christine Ho Ba Tho; *University of Technology of Compiègne, France*
- Brian Horsak; *St. Pölten University of Applied Sciences, Austria*
- Wouter Huberts; *Eindhoven University of Technology, the Netherlands*
- Dominika Ignasiak; *ETH Zurich, Switzerland*
- Bernardo Innocenti; *Université Libre de Bruxelles, Belgium*
- Philipp J. Thurner; *TU Wien, Austria*
- Alison Jones; *University of Leeds, UK*
- Ilse Jonkers; *Katholieke Universiteit Leuven, Belgium*
- Ardian Jusufi; *Empa, Switzerland*
- Hans Kainz; *University of Vienna, Austria*
- Ludger Keilig; *University of Bonn, Germany*
- Sabine Kling; *ETH Zurich, Switzerland*
- Tatiana Kochetkova; *University of Basel, Switzerland*
- Damien Lacroix; *University of Sheffield, UK*
- Renate List; *Schulthess Klinik, Switzerland*
- Sandra Loerakker; *Eindhoven University of Technology, the Netherlands*
- Silvio Lorenzetti; *Zurich University of Applied Sciences, Switzerland*
- Renato M. Natal Jorge; *University of Porto, Portugal*
- Tristan Maerz; *ETH Zurich, Switzerland*
- Matthias Steinwachs; *SportClinic Zürich, Switzerland*
- Laoise McNamara; *University of Galway, Ireland*
- Marlène Mengoni; *University of Leeds, UK*
- Francesco Migliavacca; *the Polytechnic University of Milan, Italy*
- David Mitton; *Univ Lyon – IFSTTAR, France*
- Eng Kuan Moo; *Carleton University, Canada*
- Umberto Morbiducci; *Politecnico di Torino, Italy*
- Ralph Müller; *ETH Zurich, Switzerland*
- Annegret Mündermann; *University of Basel, Switzerland*
- Thomas O'Brien; *Liverpool John Moores University, UK*
- Dulce Oliveira; *INEGI, Portugal*
- Ariana Ortigas Vásquez; *Aesculap AG, Germany*
- Dieter Pahr; *TU Wien, Austria*
- Yohan Payan; T*IMC-imag, France*
- Christian Peham; *University of Veterinary Medicine, Vienna, Austria*
- Xiao-Hua Qin; *ETH Zurich, Switzerland*
- Michael Rainbow; *Queen's University, USA*
- Deepak Ravi; *ETH Zurich, Switzerland*
- Rosti Readioff; *University of Liverpool, UK*
- Gwendolen Reilly; *University of Sheffield, UK*
- Esther Reina Romo; *University of Seville, Spain*
- Mark Robinson; *Liverpool John Moores University, UK*
- Barbara Röhrnbauer; *Zurich University of Applied Sciences, Switzerland*
- Massimo Sartori; *University of Twente, the Netherlands*
- Wouter Schallig; *Erasmus MC, the Netherlands*
- Lennart Scheys; *KU Leuven, Belgium*
- Ajay Seth; *TU Delft, the Netherlands*
- Kathryn Stok; *University of Melbourne, Australia*
- Anne Tabard-Fougère; *Hôpitaux universitaires de Genève, Switzerland*
- Fulvia Taddei; *IRCCS, Italy*
- Alexandre Terrier; *EPFL, Switzerland*
- Sebastian Tobler; *Bern University of Applied Sciences, Switzerland*
- Harry van Lenthe; *Katholieke Universiteit Leuven, Belgium*
- Peter Varga; *AO Foundation, Switzerland*
- Pasquale Vena; *The Polytechnic University of Milan, Italy*
- Stefaan Verbruggen; *Queen Mary University of London, UK*
- Nico Verdonschot; *Radboud UMC, the Netherlands*
- Elke Viehweger; *University Children's Hospital Basel, Switzerland*
- Ruth Wilcox; *University of Leeds, UK*
- Joachim Wilke; *University of Ulm, Germany*
- Sophie Williams; *University of Leeds, UK*
- Amir Zadpoor; *TU Delft, the Netherlands*
- Marcy Zenobi-Wong; *ETH Zurich, Switzerland*
- Feihu Zhao; *Swansea University, UK*
- Philippe Zysset; *University of Bern, Switzerland*

ESB MEMBERSHIP

General Member Benefits

- Reduced rate at ESB Annual Congresses & endorsed meetings
- Free subscription to ESB Newsletter
- Electronic access to a large network of biomechanics specialists through ESB website
- Lab listed on the ESB website
- Job posting through the ESB media (website, LinkedIn, Twitter)
- Eligibility to large pool of ESB Awards
- Eligibility to candidate your Institution for organizing the annual ESB congress

Additional Student Benefits

- Job opportunities in biomechanics (offer, demand and information) in industry & academia
- Student events at the ESB Congress
- Eligibility to the ESB Mobility Award for Young Researchers (need to be a member in good standing for at least 6 months)
- Eligibility to ESB Student Award (see membership application review timeline to ensure you are eligible for awards) and Best Doctoral Thesis Award (need to be a member in good standing for at least 6 months)
- Eligibility to join the ESB Student Committee

Additional Corporate Benefits

Corporate Membership is designed for industrial parties. It is not intended for University or Research groups.

- Exclusive access to wide community of top EU scientists and researchers (1300+ ESB members)
- Exclusive right for job advertisement through ESB website, official social networks & ESB events
- Participate in all activities organised by the ESB (ESB Congress, Meetings of the ESB National Chapters and affiliated societies, …)
- Corporate logo and company link website on the ESB homepage (http://www.esbiomech.org/)
- Submit contents (product news, special offers for ESB members, workshops /webinars, …) for Newsletter, YouTube Channel
- Priority to be a lead sponsor for ESB activities
- 20% discount for ESB Congress exhibition booth
- Opportunity to have a presentation in a dedicated parallel Corporate session at the ESB Congress (only for Corporates having a booth)
- Opportunity to organise a parallel user or award session at the ESB congress
- Contact person gets Regular Member benefits and can punctually transfer these benefits to any other employee of the company

Becoming a member with the online tool is easy!

https://esbiomech.org/esb-membership-benefits/online-application-form

Members from institutions in Low Income or Lower-middle Income Countries can get a 80% fee reduction.

Corporate members of the ESB:

AMTI FORCE AND MOTION

BERTEC

BETA SIMULATION SOLUTIONS

BoB Biomechanics

Nobel Biocare

materialise innovators you can count on

PRACTICAL INFORMATION

Conference venue

The ESB 2025 Congress will take place at the **ETH Zürich Main Building**, a historic and prestigious venue located in the heart of Zürich.

Address:
ETH Zürich Main Building
Rämistrasse 101, 8006 Zürich, Switzerland

Getting there

From Zurich Airport (ZRH):

- Take a direct train to Zürich HB (Main Station) (~10 min).
- From Zürich HB, tram line 6 (direction Zoo) or tram line 10 (direction Zürich Flughafen) to **ETH/Universitätsspital** stop (approx. 8–10 min ride).

Public transport:

- The venue is easily accessible via Zürich's excellent tram and bus system.
- Single tram ticket (within zone 110) costs CHF 4.60 and is valid for one hour. For travel to and from Zurich Airport, single ticket costs CHF 7.60
- Visit ZVV for route planning: www.zvv.ch/en/home.html

On foot:

- From the main station, it is a ~20-minute walk uphill through the old town.

Polybahn cable car:

Directly from Central to ETH: Runs every 5 minutes from 6:30 AM till 9:00 PM on working days and 09:00 AM – 09:00 PM on Sunday. Polybahn special ticket costs 1.20 CHF, multi trip card for 6 rides costs 7.20 CHF.

The Polybahn special ticket is available at the ticket machine in front of the Polybahn (Central and ETH Polyterrasse), however the ticket price is included in the ZVV tariff zone 110 (City of Zurich). No additional ticket is required. ATTENTION: The Polybahn is not wheelchair accessible.

Parking

There is **no parking** available at ETH Zürich Main Building. Participants are strongly encouraged to use public transportation or nearby public parking garages, such as:

- **Parkhaus Urania** (Uraniastrasse 3, 8001 Zürich)
- **Parkhaus Central** (Seilergraben 5, 8001 Zürich)

We recommend using public transportation whenever possible.

Venue and designated rooms

The ESB 2025 Congress will take place across multiple levels of the ETH Zürich Main Building. Below is an overview of the designated spaces:

Level E (Ground floor)

- **Registration area**: Located by the fountain
- **Exhibition, posters & catering**: Main Hall, E South Foyer, and E North Foyer
- **Podium and award sessions will be held in the meeting rooms**: E3, E5, E7
- **Quiet room**: Room E33.5 (for prayer, breastfeeding, or moments of silence. Please respect the intended use)
- **Speakers' preview room**: Room E33.1
- **ESB 2025 secretariat**: Room E33.3

Level E0 (Mezzanine level)

Accessible from both E and F levels, not wheelchair accesible.

- **Poster sessions, networking & catering**: EO South and EO North
- **Meet the PI mentoring event**: will take place in the EO South and North foyers on Monday, 7 July, 12:00–13:00

Level F (First floor)

- **Plenary sessions:** Audi Max (Capacity: 422 seats): All plenary sessions will be livestreamed into rooms F3, F5, and F7
- **Podium and award sessions will be held in the meeting rooms**: F3, F5, F7
- **Poster sessions**: F Gallery

Level G (Second floor)

- **Podium sessions will be held in the meeting rooms**: Rooms G3 and G5

Coffee and lunch breaks

Coffee and lunch breaks are included in the registration fee and will be served according to the time schedule on the **E floor**, and in a smaller proportion on the **E0 floor**. There is a water fountain located on the E floor close to the registration desk, you can use to refill the water bottles which you will receive at the registration desk.

Internet access

Free Wi-Fi will be available throughout the venue.

WLAN SSID eduroam

Visitors to ETH Zürich can easily access Wi Fi via the eth visitors network. Just connect to the SSID "eth visitors" (available in both 2.4 GHz and 5 GHz), then register using your mobile phone number or email - an SMS or email will deliver a confirmation code, which you enter on the landing page. You can register up to three devices per number or address. Once confirmed, your device gets online 24 hours; simply reconnect when needed

Conference app

The **Conference4me** app is available for ESB 2025. It will allow you to:

- **Browse the programme and build your own agenda**
- **Access maps, updates, and conference materials**
- **Receive real-time notifications**
- **Give your input to organisers through surveys**
- **View abstracts linked to each session**
- **Ask questions in the app chat during the live streamed sessions (if you are not in the main room).**

Download it for **iOS** or **Android** before the event.

Poster areas

Poster sessions are set up in designated areas in the ETH Zürich Main Building to facilitate discussions. Catering will be available in poster areas during breaks.

Exhibition

The exhibition area will feature leading companies in the biomechanics field, showcasing innovative software, devices, and services.

Exhibition opening hours:

- Monday, 7 July | 9:00–18:30
- Tuesday, 8 July | 9:00–17:15
- Wednesday, 9 July | 9:00–16:00

Congress secretariat

The Codan Consulting team will be available onsite to assist with any queries that you might have related to the registration, scientific programme, exhibition and social events. Do not hesitate to stop at the Registration desk on the E floor for any question. Student assistants will be available in all meeting rooms and in the poster area to assist with technical questions

Registration opening hours

- Sunday 6 July | 09:30am – 6:00pm
- Monday 7 July | 07:30am – 6:30pm
- Tuesday 8 July | 08:00am – 6:30pm
- Wednesday 9 July | 08:00am – 5:00pm

Pre-Registrations:

We strongly **encourage participants arriving to Zurich on Sunday already to stop by and register directly on Sunday** in order to avoid queues on Monday morning. Please note that all registration documents have been prepared for pre-registered participants and sorted by last name. Therefore, when approaching the appropriate registration counter make sure to clearly state your last name (family name) under which you have registered.

Payments onsite:

All onsite payments must be made in EUR via credit/debit card (VISA or Mastercard only). Cash will not be accepted.

Name badges

Name badges are mandatory, please **always keep your badge with you**. ETH Zurich is an open building, and delegates will be identified according to the badges. Access to meeting rooms and catering will be allowed only for those wearing a badge. Please do not forget to bring your badge to the social events as attendance will be checked.

Poster setup

The **poster sessions** are scheduled as follows:

Poster session 1	Monday, 7th July, 12:45 – 13:30
Poster session 2	Tuesday, 8th July, 12:45 – 13:30

- The poster sessions will be held in the E North, E South, EO South foyers, and F gallery. Please consult the poster overview and venue map to locate your assigned poster number.
- Mounting times are as follows:
  For Poster Session 1: Sunday, 6 July, from 13:00 or early morning Monday, 7 July
  For Poster Session 2: Monday, 7 July after 17:00 or early morning on Tuesday, 8 July

Presentation upload

All speakers have been requested to upload their presentations in advance through **ConfTool**. A speaker upload desk will be available onsite in meeting room E33.1 and it is meant strictly for last-minute updates. Please bring your presentation on a USB stick and upload it at the **latest the day before** your session.

Abstract book

The abstracts are available both in the online programme via **ConfTool** and in the **Conference4me app**. Go to **Browse conference agenda** and click on the title of the session you are looking for in order to access the list of all presentations with the complete list of pdf of their abstracts.

Certificates of attendance

Certificates will be available for download via the **ConfTool** platform after the congress. Participants will be notified by email when certificates are ready for download.

Printing companies

More printing companies are available in the proximity of the congress venue, for instance:

- **ADAG PRINT**
  Universitätstrasse 25, 8006 Zürich, Switzerland
  https://adagmedia.ch/
  Open Monday-Friday 9:00-12:00 and 13:00-18:00

SOCIAL EVENTS

WILDSPITZ MOUNTAIN HIKE

Date: July 6, 2025 | 8:00am – 5:00pm
Starting point: Steinerberg, 9:00am

Detailed information has been sent to the registered participants. The tour is fully booked. One-day trip exploring the mountains outside of Zürich.

Zürich Old town walking tour

Date: July 6, 2025 | 2:00pm – 4:00pm and 3:00pm – 5:00pm
Meeting Point: ETH Zürich Main Hall; Rämistrasse 101, 8006 Zürich,
(registration area, by the fountain)

Picturesque alleyways, past historic buildings and a fascinating insight into the development of the city.

Human Movement Laboratory tour

Date: July 6, 2025 | 1:30pm, 3:30pm, 4:30pm
Meeting Point: ETH Zürich Main Entrance

The event is free, but registration is needed. The Human Movement Laboratory, located within the Gloria Cube (GLC) building, develops and combines state-of-the-art technologies to provide a deeper understanding of the kinetics and kinematics of the human musculoskeletal system.

Networking with Swiss wine and cheese

Date: July 7, 2025 | 6:45pm – 8:15pm
Venue: ETH Zürich, Room: Dozentenfoyer

Panoramic views of the city, delightful cheese and wines and opportunity to connect with felow delegates. Reserved for delegates who have booked this event, name badges will be checked at the entrance.

Welcome reception

Date: July 6, 2025 | 6:00pm – 7:30pm
Venue: ETH Zürich Main Hall

Great occasion to catch up with colleagues again after a year! Drinks reception taking place directly at the congress venue. Included in the registration fee, but registration required due to limited capacity.

ESB Congress dinner

Date: July 8, 2025
7:30pm – 11:30pm
Venue: LAKE SIDE; Bellerivestrasse 170

Restaurant located directly at the upper lakeshore. Holiday feeling and the main congress networking event. Reserved for delegates who have booked the dinner (or registration including networking package). Please bring the dinner ticket with you, tickets will be checked.

Lake Side is easily accessible by public transportation (tram, bus, S-Bahn) as well as by car. How to get there from ETH: tram number 9 from ETH/Universitätsspital, change to tramnumber 2 or 4 at Bellevue, get off at Fröhlichstrasse.

ESB Student evening

Date: July 7, 2025
8:00pm – 10:00pm
Venue: VSETH Building; Universitätstrasse 6

Drinks and snacks in a relaxed atmosphere. Free of charge but registration required due to limited capacity, badges will be checked at the entrance.

SPECIAL SESSIONS AT ESB 2025

ESB Debate session: Artificial intelligence will make obsolete the use of physical modelling in biomechanics

Date: July 8, 2:25pm
Place: Audi Max
Moderated by Ralph Müller

ESB Debate Session that promises to be both thought-provoking and entertaining. This debate will bring together two expert teams to argue for and against the bold motion

For the motion: Mackenzie Mathis and Scott Delp
Against the motion: Enrico Dall'Ara and Aurélie Carlier

As AI tools become increasingly powerful, this session will dive deep into the future of biomechanics—exploring not only the scientific and technical implications but also the ethical dimensions of relying on AI over traditional physical modelling approaches.

This session aims to foster a lively and engaging discussion on the role of artificial intelligence in biomechanics, providing diverse perspectives, also including ethical considerations. Expect lively arguments, sharp insights, and plenty of opportunities for the audience to engage and share their own perspectives.

Advancements in Biomechanics

esbiomech2025.org/advancements-in-biomechanics
Date: July 8, 2:25pm
Place: E5

In the "Advancements in Biomechanics" session, our sponsors and exhibitors take centre stage to present their latest developments, technologies, and solutions that are helping shape the future of biomechanics. From advanced simulation tools to next-generation medical devices, you'll hear directly from the companies driving progress across research, healthcare, sports, and industry.

Whether you're a researcher, clinician, engineer, or student, this session offers valuable insight into how industry is pushing biomechanical science forward — and where exciting opportunities for collaboration lie.

ARTIDIS®

Measuring Tumor Aggressiveness: How Nanotechnology is Shaping the Future of Cancer Diagnostics

Presenter: Celeste Manfredonia, Clinical Study Manager and Product Champion Organoids

BIOMOMENTUM

Multiaxial Mechanical Testing of Tissues and Biomaterials

Presenter: Eric Quenneville, PhD

materialise
innovators you can count on

The Impact of Engineering on Anatomy

Presenter: Giulia Rosellini, Academia Market Manager

BETA
SIMULATION SOLUTIONS

Artificial Intelligence in biomechanics: The next game changer

Presenter: Dr. Eng. Evangelos Karatsis

LaVision
FOCUS ON IMAGING

Non-intrusive Measurements of Flow Fields and Material Deformations in Biomedical Science

Presenter: Dr. Dave Hollis and Dr. Thorsten Siebert

prophysics

Cutting-edge technologies from the fields of 3D mocap, force and EMG measurement

Presenter: Fabian Bleiker, Sales Manager, prophysics

BoB Biomechanics

Biomechanical analysis with BoB (Biomechanics of Bodies)

Presenter: James Shippen, Director

MENTORING EVENTS

ESB Diversity in Biomechanics session

Date: July 7, 5:30pm
Place: Audi Max

Would you like to discuss how diversity and inclusion can be improved in academia, and more specifically in biomechanics? Join our "Diversity in Biomechanics" session.

You will have the opportunity to hear the testimonies and advice of inspiring people from our field, followed by informal discussions and exchange on initiatives and suggestions that could be launched within the ESB to improve diversity and inclusivity. Our goal is to provide a safe and friendly environment, where anyone can share experience, express feelings or ask for advice.

The "Diversity in Biomechanics" session has as main goal to discuss and identify which actions the ESB should and/or could take to improve gender and any other diversity in biomechanics. We are looking forward to an inspiring discussion!

Meet the PI

Date: July 7, 2025, 2025, 12:00pm – 1:00pm
Place: Foyer EO North & South

Would you like to ask advice to research experts of biomechanics on how to succeed in becoming an independent scientist or how to manage work-life balance? Would you like to know more about their current research, or what are their next scientific challenges?

Don't miss the Meet the Biomechanics Experts mentoring session!

KEYNOTE TALKS

MOLLY STEVENS

Monday 7 July, 1:30pm – 2:15pm
Lecture: ***Designing Biomaterials for Regenerative Medicine and Soft Robotics***

This talk will provide an overview of our recent developments in bioinspired materials for applications in regenerative medicine with focus on establishing translational pipelines to bring our innovations to the clinic. Our group has developed fabrication methods to engineer complex 3D architectures that mimic anisotropic and multiscale tissue structures and generate spatially arranged bioinstructive biochemical cues. I will discuss recent advances in our tunable nanoneedle arrays for multiplexed intracellular biosensing at sub-cellular resolution and modulation of biological processes. We are developing creative solutions for targeted and controlled delivery using soft robotics and nanotherapeutics with unique bioinspired characteristics that respond to external stimuli to release a payload. Our design approach keeps state-of-the-art fabrication approaches while keeping in mind versatility and scalability to maximise the application potential. Finally, I will explore how these versatile technologies can be applied to transformative biomedical innovations and will discuss our efforts in establishing effective translational pipelines to drive our innovations to clinical application while actively engaging in efforts towards the democratisation of healthcare.

Biography:
Professor Dame Molly Stevens DBE FREng FRS is John Black Professor of Bionanoscience at the University of Oxford and also holds part-time professorships at Imperial College London and the Karolinska Institute.

Molly's multidisciplinary research balances the investigation of fundamental science with the development of technology to address some of the major healthcare challenges. She is a serial entrepreneur and the founder of several companies in the diagnostics, advanced therapeutics, and regenerative medicine space. Her work has been instrumental in elucidating the bio-material interfaces. She has created a broad portfolio of designer biomaterials for applications in disease diagnostics and regenerative medicine. Her substantial body of work influences research groups around the world (>430 publications, h-index 109, >50k citations, 2018, 2021, 2022 and 2023 Clarivate Analytics Highly Cited Researcher in Cross-Field research).

SCOTT DELP

Tuesday 8 July 2025, 1:30pm – 2:15pm
Lecture: ***Frontiers in Human Performance Research: Insights from Biomechanical Simulation and Machine Learning***

Rapid technical advancements in mobile sensing, computer vision, and data science have begun to enable planetary-scale experiments and major advancements in human health. In the next few years, these ongoing technical strides will culminate in a watershed moment for biomechanics and human performance research, when simulations run in real-time and AI becomes mainstream in studies of human movement and clinical applications. During my lecture, I will illustrate how our expanded capacity to amass large-scale datasets that characterize human movement, coupled with our accelerated ability to derive insights from automated data analyses, will inform clinical decisions and facilitate personalized training.

Biography:
Scott Delp is the James H. Clark Professor of Bioengineering, Mechanical Engineering, and Orthopaedic Surgery at Stanford University. He is the Founding Chairman of the Department of Bioengineering at Stanford and Director of the Wu Tsai Human Performance Alliance, which aims to transform human health through the science of peak performance. Dr. Delp is also the Director of the RESTORE Center, a NIH national centre focused on measuring real world rehabilitation outcomes and Director of the Mobilize Center, a NIH National Center of Excellence focused on Big Data and Digital Health. Scott's laboratory develops technologies to advance movement science and human health. Software tools created in his lab, including OpenSim, OpenCap, AddBiomechanics, and Simtk.org, have become the basis of an international collaboration involving thousands of scientists. He has published over 300 research articles and has recently released a book from MIT Press entitled Biomechanics of Movement: The Science of Sports, Robotics, and Rehabilitation. Dr. Delp has co-founded six health technology companies and is a member of the U.S. National Academy of Engineering.

MACKENZIE MATHIS

Wednesday 9 July, 2:20pm – 3:05pm
Lecture: ***Towards the Neural Basis of Adaptive Motor Control***

The neural activity of the brain is intimately coupled to the dynamics of the body. The motor system, which controls our outward behavior, spans multiple levels of hierarchical sensorimotor control: from the spinal cord, cerebellum, to the cortex and brainstem, at all levels, motor action is orchestrated. Yet we are experimentally limited to observing a small subset of all neurons of this hierarchy. Moreover, a mechanistic understanding of this complicated system is unknown, as mapping high-level behavior to neural activity is unconstrained. To address this, we built a large-scale model (MausSpaun) that captures hypothesized neural computations and coupled this with a novel model of the adult mouse forelimb in a physics simulation environment. We now use this model to better understand cortical computations during motor learning, which I will detail in my lecture.

Biography:
Prof. Mackenzie W. Mathis is the Bertarelli Foundation Chair of Integrative Neuroscience and an Assistant Professor at the Swiss Federal Institute of Technology, Lausanne (EPFL). Following the award of her PhD at Harvard University in 2017 with Prof. Naoshige Uchida, she was awarded the prestigious Rowland Fellowship at Harvard to start her independent laboratory at Harvard (2017-2020). She is an ELLIS Scholar, Vallee Scholar, a former NSF Graduate Fellow, and her work has been featured in the news at Bloomberg BusinessWeek, Nature, and The Atlantic. She was awarded the FENS EJN Young Investigator Prize 2022 & the Eric Kandel Young Neuroscientist Prize in 2023. Her lab works on mechanisms underlying adaptive behavior in intelligent systems. Specifically, the laboratory combines machine learning, computer vision, and experimental work in rodents with the combined goal of understanding the neural basis of adaptive motor control.

PRE-COURSES

Artificial Intelligence based shape representation

Date: 6 July 2025, 1:00pm – 3:00pm
Organizers: ***Nazli Tümer, Morteza Homayounfar, Edwin Tay***

Deep learning (DL) tools are increasingly integral to medical image analysis, particularly for shape representation. With rapid advancements in methodologies and network architectures, these tools leverage datasets to deliver cutting-edge results across a range of tasks. In this workshop, we will introduce participants to the fundamentals of shape representation using DL-based techniques through a mix of lectures and hands-on exercise. Additionally, we will cover Git version control to ensure that the developed DL-based models are traceable, reproducible, and aligned with the principles of open science.

Automated model discovery: A Hands-on programming experience

Date: 6 July 2025, 1:00pm – 3:00pm
Organizers: ***Ellen Kuhl, Mathias Peirlinck, Skyler St. Pierre, Moritz Flaschel***

This pre-course will cover a theoretical introduction, demos, and hands-on coding activities to automatically discover physics-based models from data. You should bring you own laptop and, if you like, your own data. We will provide benchmark data on brain, skin, arteries, and the heart, but are equally excited to help you analyse your own experiments. You will get the most out of this course if you familiarize yourself with the references and the code and prepare specific questions, but you are also welcome to attend if you are just curious about using artificial intelligence to explore biological systems.

Using the agent-based modelling software BioDynaMo for simulations in biomechanics

Date: 6 July 2025, 3:30pm – 5:30pm
Organizers: ***Roman Bauer, Vasileios Vavourakis***

BioDynaMo is a versatile, open-source simulation platform designed for modeling complex biological systems (https://www.biodynamo.org). It offers a flexible framework for building and simulating agent-based models, enabling researchers to explore a wide range of biological phenomena. Here, we will give an introduction into BioDynaMo and explain how the principles of agent-based modelling are supported. To this end, we will present several use cases to showcase the software capabilities. Afterwards, the team will run a hands-on tutorial session where a simple simulation is conducted. The course will conclude with an interactive conversation to address FAQs and any questions raised by the audience.

The Hard in Soft – Image-based tissue mechanics from hard to soft tissues

Date: 6 July 2025, 3:30pm – 5:30pm
Organizers: ***Marta Peña Fernández, Hari Arora, Uwe Wolfram***

Biological hard and soft tissues are architectured or multiscale materials that hardly fulfil the definition of representative volume elements. Their behavior strongly depends on porosity that spans from nanometer to millimeter length scales as well as an anisotropic layout of their constituents. They are made of widely available materials, partly with inferior properties. Yet their composition and arrangement enable disparate material properties ranging from strengths of over 700 MPa to deformability of over 200%. Image-based tissue mechanics is an excellent tool-box to unlock such properties and study their dependence on aging and disease.

DeepLabCut For Measuring Animal Motion

Date: 6 July 2025, 3:30pm – 5:30pm
Organizer: ***Mackenzie Mathis***

DeepLabCut is a deep learning-based python package for pose estimation that is open-source and free. It can be used on humans and other animals. It allows users to customize their models for specific keypoints (joints) of interest, or use a pretrained model. The workshop is tailored to new users of the software. It will include a short overview talk then hands-on practice with the code.

ESB 2025 SCIENTIFIC AWARD SESSIONS

Huiskes Medal for Biomechanics

8 July 2025, 4:00pm – 4:50pm, room: Audi Max

Award given to a senior researcher who has contributed significantly to biomechanics throughout their career.

Gerhard Holzapfel – TU Graz, Austria

Runner up:
Véronique Feipel – Université Libre de Bruxelles, Belgium

ON Orthoregeneration Award finalists

9 July 2025, 10:25am – 12:00pm, room: G5

Finalists:

- **Advanced Hybrid Scaffolds for Bone Tissue Regeneration** – *Ana Catarina Sousa, School of Medicine and Biomedical Sciences, Portugal*
- **Unveiling Mechanical and Morphological Changes in Chondrogenic Spheroids During Differentiation** – *Karolina Zofia Dabrowska, KU Leuven, Belgium*
- **Biomechanical Adaptations in Sheep's Gait Following End-to-End Neurorraphany for Nerve Regeneration** – *Bruna Silva, CDRSP – IPLEIRIA, Portugal*
- **Predicting Skeletal Tissue Growth and Differentiation for Bone Tissue Engineering** – *Timothy O. Josephson, Boston University, United States*

ESB Student Award

7 July 2025, 2:25pm – 3:25pm, room: Audi Max

Award honouring excellence in biomechanics already at young age.

Finalists:

- **A Robotic Testing Setup for Biotribiological Investigations on Complex Shaped Cartilage Surfaces** – *Luisa de Roy, Ulm University Medical Centre, Germany*
- **Prediction of Hemodynamics in Healthy Mitral Valves: Validation of Fluid-Structure Interaction Simulations** – *Lea Christierson, Lund University, Sweden*
- **Learning Hemodynamic Scalar Fields on Coronary Artery Meshes: a Benchmark of Geometric Deep Learning Models** – *Guido Nannini, Politecnico di Milano, Italy*
- **Fully Coupled Multi-Species Mechano-Transport Simulations in the Intervertebral Disc** – *Estefano Matias Munoz Moya, Universitat Pompeu Fabra, Spain*

ESB Early Investigator Award

9 July 2025, 3:30pm – 4:30pm

The ESB Early Career Researcher Award recognizes the development of an outstanding young researcher who contributes to the advancement of the theory and/or applications of Biomechanics.

Tommaso Ristori, Eindhoven University of Technology, the Netherlands: **YAP/TAZ as Mechanosensory Regulators of Blood Vessel Formation in Health and Disease**

Runner up:
Anna Corti – Politecnico di Milano, Italy

2025 Best Doctoral Thesis Award

9 July 2025, 3:30pm – 4:30pm

This award recognizes the development of an outstanding doctoral final thesis that has contributed to the advancement of theory and/or application of biomechanics. The selection is based on the original PhD document written in English and CV.

Apeksha Shapeti, KU Leuven, Belgium: **Force-Mediated Angiogenesis: Linking Mechanical mechanisms to Vascular Lesion Growth**

Runners up:
Elena Redaelli – Universidad de Zaragoza, Spain
Daniel Camacho – Universidad de Zaragoza, Spain

ESB 2025 Poster Award

The ESB poster award recognizes the best poster presented at the annual conference.

ESB Travel Awards

The European Society of Biomechanics organizes the Travel awards to financially help young researchers to participate at the ESB congress. The awards will be presented during the congress dinner.

PERSPECTIVE TALKS OVERVIEW

Knee biomechanics

TRANSLATING KNEE BIOMECHANICS INTO CLINICAL PRACTICE: FROM BASIC TESTING TOWARDS A SUBJECT SPECIFIC KNEE MODEL

Kittl, Christoph; Universitätsklinikum Münster, Germany

Biomedical imaging

EMERGING ELASTOGRAPHY TECHNOLOGIES WILL ENABLE NEXT GENERATION VISCOSITY AND NONLINEAR BIOMARKERS IN CLINICAL DIAGNOSIS

Rus, Guillermo; University of Granada, Spain

Rehabilitation engineering, exoskeletons, and assistive devices

WHAT IS MORE BEYOND BIOMECHANICS IN MOTOR REHABILITATION

Lan, Ning; University of Illinois at Chicago, USA

Implants and devices

PAVING THE PATH FOR IN SILICO CLINICAL TRIALS IN INDUSTRY

Favre, Philippe; Zimmer Biomet, Switzerland

AI and machine learning in biomechanics

A PATHWAY TO IMPROVING REHABILITATION OUTCOMES THROUGH AI-POWERED, CLINICALLY ACCESSIBLE BIOMECHANICS

Cotton, R. James; Northwestern University, USA

Clinical and translational biomechanics

GASTROINTESTINAL BIOMECHANICS: IN SILICO TOOLS FOR DIAGNOSIS AND SURGERY OPTIMIZATION

Carniel, Emanuele Luigi; University of Padova, Italy

Bone biomechanics

BONE MECHANO-ADAPTATION AND ITS INFLUENCE ON BONE GEOMETRY, MICROARCHITECTURE, AND QUALITY

Zimmermann, Elizabeth A.; McGill University, Canada

Skeletal adaptation

IN-SILICO TRIALS OF OSTEOPOROSIS THERAPIES: PATHWAYS TO OPTIMISE AND EXPLOIT EXISTING DRUG TREATMENTS

Pivonka, Peter; Queensland University of Technology, Australia

Clinical and translational biomechanics

ADVANCING CLINICAL REGISTRIES IN THE AGE OF DIGITAL TWINS

Mündermann, Annegret; University of Basel, Switzerland

Reproductive, fetal, and neonatal biomechanics

NOVEL INTERDISCIPLINARY PATHWAYS IN PELVIC FLOOR DISORDER DIAGNOSIS AND TREATMENT

Röhrnbauer, Barbara; Zurich University of Applied Sciences, Switzerland

Soft tissue biomechanics

BIOMECHANICS OF SPHEROIDS AS MODEL SYSTEMS TO UNDERSTAND CANCER INVASION

Verdier, Claude; Laboratoire Interdisciplinaire de Physique (LIPhy), France

Musculoskeletal modelling

FRACTURE RISK PREDICTION OF METASTATIC BONE: WHAT ARE THE NEXT STEPS FOR CLINICAL APPLICATION?

Follet, Helene; Inserm, France

Cardiovascular implants and devices

DESIGNING SELF-EXPANDABLE CARDIOVASCULAR DEVICES THROUGH GEOMETRY, MATERIAL, AND PROCESS OPTIMIZATION

Chiastra, Claudio; Politecnico di Torino, Italy

Movement and posture

BREAKING BARRIERS IN HUMAN MOTION CAPTURE WITH AI-POWERED LOW-COST MARKERLESS SYSTEMS

Horsak, Brian; St. Pölten University of Applied Sciences, Austria

Rehabilitation engineering, exoskeletons, and assistive devices

BILO: BRAIN IN THE LOOP OPTIMIZATION FOR COGNITIVE-DRIVEN ASSISTANCE

Sharbafi, Maziar; TU Darmstadt, Germany

Joint kinematics and kinetics

RECENT UPDATES ON FUNCTIONAL EVALUATION OF PATIENTS WITH ADULT SPINAL DEFORMITY

Assi, Ayman; Saint Joseph University of Beirut, Lebanon

Knee biomechanics

PHYSIOLOGIC DYNAMIC EX VIVO KNEE SIMULATORS: PAST, PRESENT AND FUTURE

Scheys, Lennart; KU Leuven, Belgium

Shoulder biomechanics

RECENT INNOVATIONS AND FUTURE DIRECTIONS TO IMPROVE DIVERSITY IN SHOULDER COMPUTATIONAL MODELING

Giles, Joshua William; University of Victoria, Canada

AI and machine learning in biomechanics

UNBOXING THE „BLACK-BOX“: EXPLAINING MACHINE LEARNING MODELS IN HUMAN MOVEMENT ANALYSIS

Slijepčević, Djordje; St. Pölten University of Applied Sciences, Austria

Respiratory and fluid biomechanics

DEVELOPMENT OF PREDICTIVE LUNG MODELS THROUGH NOVEL EXPERIMENTAL INSIGHTS

Shankel, Matthew; University of California at Riverside, USA

Cardiovascular biomechanics

THE PATH TO TISSUE FAILURE IN AORTIC DISEASE: CALL FOR A PARADIGM SHIFT

Pirola, Selene; Delft University of Technology, the Netherlands

Cardiovascular implants and devices

THE ROLE OF VIRTUAL PATIENTS IN ECMO THERAPY: FROM HIGH-RESOLUTION HEMODYNAMICS TO IN-VIVO BLOOD DAMAGE

Neidlin, Michael; RWTH Aachen University, Germany

Mechanobiology

UNVEILING THE FUTURE: THE ROLE OF 3D MODELS IN CAPTURING TUMOR MECHANICAL COMPLEXITY

Panzetta, Valeria; University of Naples Federico II, Italy

Reproductive, fetal, and neonatal biomechanics

COMPUTATIONAL MODELING IN PLACENTA RESEARCH: OPPORTUNITIES AND CHALLENGES

Grande Gutierrez, Noelia; Carnegie Mellon University, USA

AI and machine learning in biomechanics

DIGITAL TWINS OF CARDIOVASCULAR BIOMECHANICS: HOW CAN WE ACHIEVE THIS FOR EACH PATIENT?

Aggarwal, Ankush; University of Glasgow, United Kingdom

Animal biomechanics

LOCOMOTION NEUROMECHANICS WITH MORPHOLOGICALLY ADAPTIVE SOFT ROBOPHYSICAL MODELS

Jusufi, Ardian; Swiss Federal Laboratories for Materials Science and Technology, Switzerland

Cardiovascular biomechanics

EMERGING METHODS TO MEASURE CARDIAC KINEMATICS WITH MRI

Ennis, Daniel Bruce; Stanford University, USA

Soft tissue biomechanics

UNRAVELLING THE BLUEPRINT OF LOAD-BEARING ARCHITECTURE OF SOFT TISSUES FOR BIO INSPIRED INNOVATION

Barrera, Olga; Oxford Brookes University and University of Oxford, United Kingdom

Musculoskeletal biomechanics

MOLECULAR MECHANISMS OF MUSCLE CONTRACTION: PAST, PRESENT AND FUTURE

Herzog, Walter; University of Calgary, Canada

Movement and posture

STEPPING OUTSIDE THE BOX: CHALLENGES IN ASSESSING POSTURAL DYNAMIC STABILITY DURING FREE-LIVING MOBILITY

Curtze, Carolin; Universtity of Nebraska at Omaha, USA

Bone biomechanics

ELUCIDATING EARLY BONE PATHOLOGY: INTEGRATING BIOMECHANICS, AI, AND SYNCHROTRON IMAGING

Vergani, Laura Maria; Politecnico di Milano, Italy

Sunday, 6 July 2025

Plenary sessions will take place in Audi Max with simultaneous live streaming to rooms F3, F5 and F7.

8:00am – 5:00pm	ESB Hike Wildspitz		
9:30am – 6:00pm	Registration		
1:00pm – 3:00pm	**PRE-COURSE: ARTIFICIAL INTELLIGENCE BASED SHAPE REPRESENTATION** (Room E7) *Lecturers: Nazli Tümer, Morteza Homayounfar & Edwin Tay*	**PRE-COURSE: AUTOMATED MODEL DISCOVERY – A HANDS-ON PROGRAMMING EXPERIENCE** (Room E5) *Lecturers: Ellen Kuhl, Mathias Peirlinck, Skyler St. Pierre & Moritz Flaschel*	
1:30pm – 2:30pm	**HUMAN MOVEMENT LABORATORY TOUR I** Meeting point: ETH Zürich Main Hall (registration area, by the fountain)		
2:00pm – 4:00pm	**BIOMECHANICS DISCOVERY TOUR FOR CHILDREN** Meeting point: ETH Zürich Main Hall (registration area, by the fountain)	**ZÜRICH OLD TOWN WALKING TOUR I** Meeting Point: ETH Zürich Main Hall (registration area, by the fountain)	
3:00pm – 5:00pm	**ZÜRICH OLD TOWN WALKING TOUR II** Meeting Point: ETH Zürich Main Hall (registration area, by the fountain)		
3:30pm – 4:30pm	**HUMAN MOVEMENT LABORATORY TOUR II** Meeting point: ETH Zurich main entrance, (registration area, by the fountain)		
3:30pm – 5:30pm	**PRE-COURSE: DEEPLABCUT FOR MEASURING ANIMAL MOTION** (Room E33.5) *Lecturer: Mackenzie Mathis*	**PRE-COURSE: THE HARD IN SOFT – IMAGE-BASED TISSUE MECHANICS FROM HARD TO SOFT TISSUES** (Room E7) *Lecturers: Marta Peña Fernández, Hari Arora & Uwe Wolfram*	**PRE-COURSE: USING THE AGENT-BASED MODELLING SOFTWARE BIODYNAMO FOR SIMULATIONS IN BIOMECHANICS** (Room E5) *Lecturers: Roman Bauer & Vasileios Vavourakis*
4:30pm – 5:30pm	**HUMAN MOVEMENT LABORATORY TOUR III** Meeting point: ETH Zürich Main Hall (registration area, by the fountain)		
6:00pm – 7:30pm	**WELCOME RECEPTION** Location: ETH Zürich Main Hall		
7:45pm – 9:45pm	**INTERNATIONAL WOMEN IN BIOMECHANICS MEETING** Meeting point: ETH Zürich Main entrance		

Monday, 7 July 2025

Plenary sessions will take place in Audi Max with simultaneous live streaming to rooms F3, F5 and F7.

	Audi Max	E3	E5	E7	F3	F5	F7	G3	G5
7:30am – 6:30pm	Registration								
8:30am – 9:55am	1.1 **AI AND MACHINE LEARNING BIOMECHANICS I: CARDIOVASCULAR & ORGAN BIOMECHANICS;** *Chair: Alberto Redaelli*	2.1 **CARDIOVASCULAR BIOMECHANICS I** *Chairs: Umberto Morbiducci, Gil Marom*	3.1 **CARDIOVASCULAR IMPLANTS AND DEVICES I: ENGINEERING NEXT-GENERATION ENDOVASCULAR DEVICES** *Chairs: Richard G.P Lopata, Dario Carbonaro*	4.1 **BONE BIOMECHANICS I: STRUCTURE-FUNCTION** *Chairs: Dieter Pahr, Tatiana Kochetkova*	5.1 **SHOULDER BIOMECHANICS I: SHOULDER MUSCULATURE, KINEMATICS, AND SUBJECT SPECIFIC MODELLING** *Chairs: Ajay Seth, Jeremy Genter*	6.1 **3D BIOPRINTING, ADDITIVE MANUFACTURING, AND SCAFFOLDS I: COMPUTATIONAL DESIGN AND MECHANICS OF 3D PRINTED SCAFFOLDS AND SOFT MATERIALS** *Chairs: Pasquale Vena, Edwin Tay*	7.1 **JOINT KINEMATICS & KINETICS I: METHODOLOGY** *Chairs: Ayman Assi, Zimi Sawacha*	8.1 **TISSUE ENGINEERING** *Chairs: Philipp J. Thurner, Eng Kuan Moo*	9.1 **SOFT TISSUE BIOMECHANICS I: EXPERIMENTAL CHARACTERISATION OF SOFT TISSUES** *Chairs: Yohan Payan, Ciara Brigit Durcan*
9:55am – 10:25am	Coffee break (Location: E, EO North & South foyers)								
10:25am – 12:00pm	1.2 **AI AND MACHINE LEARNING BIOMECHANICS II: AI IN REHABILITATION & HUMAN MOVEMENT** *Chairs: Chris Awai Easthope, Scott Delp*	2.2 **CARDIOVASCULAR BIOMECHANICS II** *Chairs: Sónia I.S. Pinto, Denisa Martonova*	3.2 **CARDIOVASCULAR IMPLANTS AND DEVICES II: COMPUTATIONAL HEMODYNAMICS IN STENT AND VALVE ENGINEERING** *Chairs: Francesco Migliavacca, Alexandra Hauguel*	4.2 **BONE BIOMECHANICS II: WHOLE BONE** *Chairs: Harry van Lenthe, Elham Alizadeh*	5.2 **IMPLANTS AND DEVICES I: IN VIVO / IN VITRO AND PATHWAYS TOWARDS IN SILICO** *Chairs: Paulo Fernandes, Mattia Sisella*	6.2 **3D BIOPRINTING, ADDITIVE MANUFACTURING, AND SCAFFOLDS II: ADVANCED SCAFFOLD FABRICATION AND BIOPRINTING STRATEGIES FOR TISSUE ENGINEERING** *Chairs: Amir A. Zadpoor, Federica Buccino*	7.2 **REHABILITATION ENGINEERING, EXOSKELETONS, AND ASSISTIVE DEVICES I: BRAIN-IN-THE-LOOP & EXOSKELETONS** *Chair: Ning Lan*	8.2 **SPINE BIOMECHANICS I: INTERVERTEBRAL DISC – STRUCTURE & LOAD** *Chairs: Joachim Wilke, Thomas Slater*	9.2 **BIOMEDICAL IMAGING I: ADVANCED IMAGING TECHNIQUES** *Chairs: Dieter Pahr, Elis Newham*
12:00pm – 1:00pm	Lunch break & Exhibition viewing (Location: Level E) **MEET THE PI** (Location: EO North & South foyers)								
12:45pm – 1:30pm	**POSTER SESSION A1** (Location: Foyer E North) **POSTER SESSION B1** (Location: Foyer E South) **POSTER SESSION C1** (Location: Foyer EO South) **POSTER SESSION D1** (Location: Foyer F)								
1:30pm – 2:15pm	**KEYNOTE TALK MOLLY STEVENS: DESIGNING BIOMATERIALS FOR REGENERATIVE MEDICINE AND SOFT ROBOTICS** (Location: Audi Max) *Chairs: Stephen Ferguson, Michele Conti*								
2:25pm – 3:25pm	**ESB STUDENT AWARDS** (Location: Audi Max) *Chairs: Dieter Pahr, Philipp J. Thurner*								
3:30pm – 4:00pm	Coffee break (Location: E, EO North & South foyers)								
4:00pm – 5:25pm	1.3 **MUSCULOSKELETAL BIOMECHANICS I: EXPERIMENTAL APPROACHES** *Chair: Heath Henninger*	2.3 **CARDIOVASCULAR BIOMECHANICS III** *Chairs: Estefania Peña, Martina Colombo*	3.3 **COMPUTATIONAL METHODS FOR CARDIOVASCULAR APPLICATIONS I: TISSUE MODELLING AND CHARACTERIZATION** *Chair: Sandra Loerakker*	4.3 **SPORTS BIOMECHANICS I: STRATEGIES FOR STRENGTH, CONTROL, AND INJURY PREVENTION** *Chairs: Floren Colloud, Mark Sayers*	5.3 **IMPLANTS AND DEVICES II: IN SILICO STUDIES** *Chairs: Barbara Röhrnbauer, Edoardo Bori*	6.3 **FRACTURE HEALING** *Chairs: Francisco Correia Marques, Sara Checa Esteban*	7.3 **ANIMAL BIOMECHANICS;** *Chairs: Christian Peham, Robert Baines*	8.3 **CLINICAL AND TRANSLATIONAL BIOMECHANICS I** *Chairs: Annegret Mündermann, Alison N. Agres*	9.3 **OCULAR BIOMECHANICS** *Chairs: Miguel Angel Ariza Gracia, Philippe Büchler*
5:30pm – 6:30pm	**ESB DIVERSITY IN BIOMECHANICS** (Location: Audi Max) *Chairs: Esther Reina Romo, Marta Peña Fernández, Zimi Sawacha*								
6:45pm – 8:15pm	Networking with Swiss wine & cheese (Location: Dozentenfoyer, ETH Zurich Main Building)								
7:00pm – 10:00pm	Student Evening (Location: VSETH Building, Universitätstrasse 6, 8092 Zürich)								

Tuesday, 8 July 2025

Plenary sessions will take place in Audi Max with simultaneous live streaming to rooms F3, F5 and F7.

	Audi Max	E3	E5	E7	F3	F5	F7	G3	G5
8:00am – 6:30pm	Registration								
8:30am – 9:55am	1.4 **AI AND MACHINE LEARNING BIOMECHANICS III: EXPLAINABLE ML & SENSOR-DRIVEN MOTION ANALYSIS** *Chairs: Neil Cronin, Mackenzie Mathis*	2.4 **REHABILITATION ENGINEERING, EXOSKELETONS, AND ASSISTIVE DEVICES II: BIOMECHANICS, PROSTHETICS & ASSISTIVE DEVICES**; *Chairs: Marta C. Mora, Daniel Baumgarter*	3.4 **CARDIOVASCULAR BIOMECHANICS IV** *Chairs: Irene Vignon-Clementel, Mauro Lo Rito*	4.4 **SOFT TISSUE BIOMECHANICS II: SOFT TISSUE REMODELLING AND MECHANOBIOLOGY**; *Chairs: Richie Gill, Rosti Readioff*	5.4 **MUSCULOSKELETAL MODELLING I: JOINT MECHANICS** *Chairs: Míriam Febrer-Nafría, Ning Guo*	6.4 **BONE BIOMECHANICS III: IMAGE-BASED FE** *Chairs: Peter Augat, Elizabeth A. Zimmermann*	7.4 **SPORTS BIOMECHANICS II: ELITE PERFORMANCE AND MOTION ANALYSIS** *Chairs: Silvio R. Lorenzetti, Arielle Fischer*	8.4 **3D BIOPRINTING, ADDITIVE MANUFACTURING, AND SCAFFOLDS III: MECHANICS AND MULTISCALE CHARACTERIZATION OF BIOMIMETIC SCAFFOLDS FOR BONE TISSUE ENGINEERING** *Chair: Xiao-Hua Qin*	9.4 **MOVEMENT & POSTURE I: ASSESSMENT TECHNOLOGIES AND MOVEMENT ANALYSIS IN REAL-WORLD CONTEXT**; *Chairs: Sasa Cukovic, Brian Horsak*
9:55am – 10:25am	Coffee break (Location: E, EO North & South foyers)								
10:25am – 12:00pm	1.5 **AI AND MACHINE LEARNING BIOMECHANICS IV: JOINT, BONE & MUSCULOSKELETAL MODELLING**; *Chairs: Hamed Hosseini, Ilse Jonkers*	2.5 **MECHANOBIOLOGY I: CELL LEVEL** *Chairs: Diana Massai, Costanza Giampietro*	3.5 **COMPUTATIONAL METHODS FOR CARDIOVASCULAR APPLICATIONS II: PATIENT-SPECIFIC ANALYSES AND PROCEDURAL PLANNING** *Chairs: Elie Hachem, Mirunalini Thirugnanasambandam*	4.5 **SOFT TISSUE BIOMECHANICS III: NUMERICAL MODELLING OF SOFT TISSUE MECHANICS** *Chairs: Rosti Readioff, Lara Esquivel*	5.5 **BIOMEDICAL IMAGING II: AI AND MEDICAL IMAGE ANALYSIS** *Chairs: Kate Gerber, Matteo Vicini*	6.5 **BONE BIOMECHANICS IV: MICROSCALE** *Chairs: Philippe Zysset, Aurélie Levillain*	7.5 **KNEE BIOMECHANICS I: BIOMECHANICAL TESTING** *Chairs: Thomas M. Grupp, Ariana Ortigas Vásquez*	8.5 **SPINE BIOMECHANICS II: SPINAL DEFORMITY – ASSESSMENT & MODELLING** *Chairs: Dominika Ignasiak, Jérôme Noailly*	9.5 **MOVEMENT & POSTURE II: NEUROMECHANICS, MOTOR CONTROL AND REHABILITATION STRATEGIES** *Chairs: Carolin Curtze, Seyyed Hamed Hosseini Nasab*
12:00pm – 1:00pm	Lunch break & Exhibition viewing (Location: E, EO North & South foyers)								
12:45pm – 1:30pm	**POSTER SESSION A2** (Location: Foyer E North) **POSTER SESSION B2** (Location: Foyer E South) **POSTER SESSION C2** (Location: Foyer EO South) **POSTER SESSION D2** (Location: Foyer F)								
1:30pm – 2:15pm	**KEYNOTE TALK SCOTT DELP: FRONTIERS IN HUMAN PERFORMANCE RESEARCH – INSIGHTS FROM BIOMECHANICAL SIMULATION AND MACHINE LEARNING** (Location: Audi Max) *Chairs: William R. Taylor, Esther Reina Romo*								
2:25pm – 3:25pm	1.6 **DEBATE SESSION: ARTIFICIAL INTELLIGENCE WILL MAKE OBSOLETE THE USE OF PHYSICAL MODELLING IN BIOMECHANICS** *Chair: Ralph Müller* *World team: Mackenzie Mathis & Scott Delp* *ESB team: Enrico Dall'Ara & Aurélie Carlier*	2.6 **MECHANOBIOLOGY II: BONE MECHANOBIOLOGY** *Chairs: Sara Checa Esteban, Andre P. G. Castro*	3.6 **ADVANCEMENTS IN BIOMECHANICS (CORPORATE SESSION)** *Chairs: Marlene Mengoni, Zimi Sawacha*	4.6 **SOFT TISSUE BIOMECHANICS IV: SOFT TISSUE BIOMECHANICS IN HEALTH, DISEASE, AND CLINICAL APPLICATIONS**; *Chairs: Yohan Payan, Nolwenn Fougeron*	5.6 **MUSCULOSKELETAL MODELLING II: MODEL PERSONALIZATION FOR CLINICAL APPLICATION** *Chairs: Hélène Follet, Sophie Hutchinson*	6.6 **RESPIRATORY BIOMECHANICS I: MULTISCALE PERSPECTIVES ON RESPIRATORY BIOMECHANICS** *Chairs: Hari Arora, Mona Eskandari*	7.6 **KNEE BIOMECHANICS II: KINEMATICS & KINETICS** *Chairs: Renate List, Barbara Postolka*	8.6 **JOINT KINEMATICS & KINETICS II: IN THE SETTING OF MUSCULOSKELETAL PATHOLOGIES** *Chairs: Lennart Scheys, Ariana Ortigas Vásquez*	9.6 **REPRODUCTIVE, FETAL, AND NEONATAL BIOMECHANICS I: MULTISCALE MODELLING AND INTERVENTION IN MATERNAL-FETAL HEALTH** *Chairs: Dulce Oliveira, Rita Moura*
3:30pm – 4:00pm	Coffee break (Location: E, EO North & South foyers)								
4:00pm – 4:50pm	**HUISKES MEDAL AWARD** (Location: Audi Max) *Chairs: Enrico Dall'Ara, Dieter Pahr*								
4:55pm – 5:25pm	**ESB AWARDS CEREMONY** (Location: Audi Max) *Chair: Dieter Pahr*								
5:30pm – 6:30pm	**ESB GENERAL ASSEMBLY** (Location: Audi Max)								
7:30pm – 11:30pm	ESB Congress dinner (Location: Lake Side, Bellerivestrasse 170, 8008 Zürich)								

Wednesday, 9 July 2024

Plenary sessions will take place in Audi Max with simultaneous live streaming to rooms F3, F5 and F7.

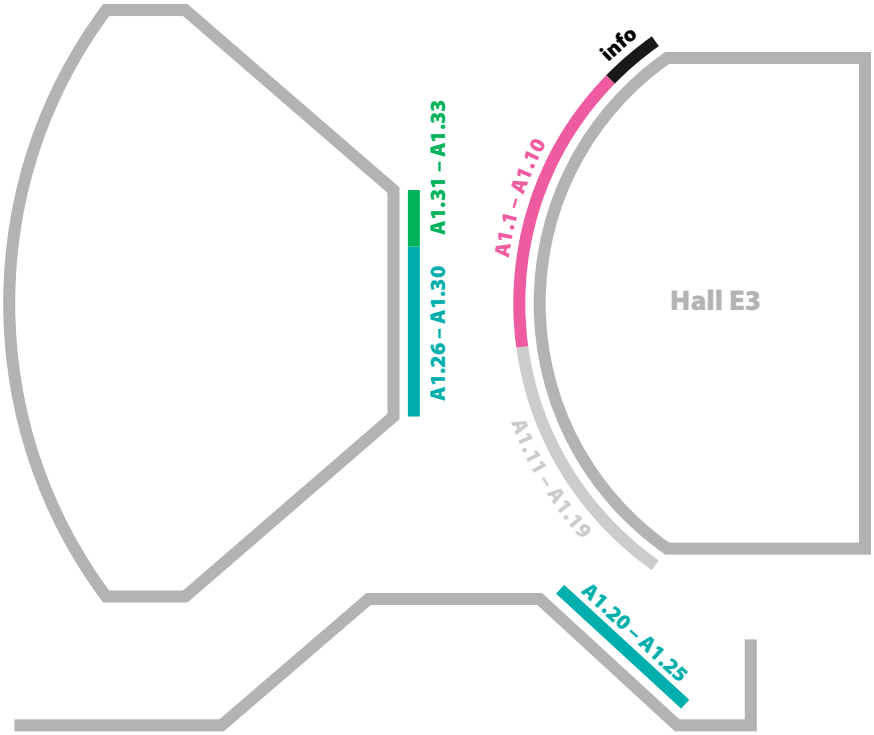
	Audi Max	E3	E5	E7	F3	F5	F7	G3	G5
8:00am – 5:00pm	Registration								
8:30am – 9:55am	1.7 **CARDIOVASCULAR BIOMECHANICS V** *Chairs: Dominik Obrist, Alexey Kamenskiy*	2.7 **COMPUTATIONAL BIOLOGY I: COMPUTATIONAL BIOLOGY TO ADVANCE CELL BIOMECHANICS** *Chairs: Aurélie Carlier, MªAngeles Pérez Ansón*	3.7 **MUSCULOSKELETAL BIOMECHANICS II: MODELLING & SIMULATIONS** *Chairs: Saulo Martelli, Maxence Lavaill*	4.7 **RESPIRATORY BIOMECHANICS II: MECHANICS-TO-MEDICINE: FROM CELLULAR INSIGHTS TO PREDICTIVE MODELS AND CLINICAL TRANSLATION** *Chairs: Mona Eskandari, Sam Bayat*	5.7 **MUSCULOSKELETAL MODELLING III: BONE & SPINE BIOMECHANICS** *Chairs: Ruth Wilcox, Aurélie Levillain*	6.7 **IMPLANTS AND DEVICES III: INNOVATIVE IMPLANT AND MEDICAL DEVICE DESIGN** *Chair: Bernardo Innocenti*	7.7 **KNEE BIOMECHANICS III: MODELLING** *Chairs: Nico Verdonschot, Erin Teule*	8.7 **3D BIOPRINTING, ADDITIVE MANUFACTURING, AND SCAFFOLDS IV: 3D PRINTED IMPLANTS AND FUNCTIONAL DEVICES: FROM OSSEOINTEGRATION TO BIOMECHANICAL PERFORMANCE** *Chair: Nazli Tumer*	9.7 **CLINICAL AND TRANSLATIONAL BIOMECHANICS II** *Chairs: Alison Jones, Roberto Leonardo-Diaz*
9:55am – 10:25am	Coffee break (Locations: E, EO North & South foyers)								
10:25am – 12:00pm	1.8 **COMPUTATIONAL METHODS FOR CARDIOVASCULAR APPLICATIONS III: CFD/FSI AND ARTERIES** *Chair: Philippe Meliga*	2.8 **MECHANOBIOLOGY III: MECHANOBIOLOGY IN CANCER RESEARCH** *Chair: Stefaan Verbruggen*	3.8 **CARDIOVASCULAR IMPLANTS AND DEVICES III: VIRTUAL TOOLS FOR VASCULAR AND EXTRACORPOREAL THERAPIES** *Chairs: Wouter Huberts, Thibault Vervenne*	4.8 **AI AND MACHINE LEARNING BIOMECHANICS V: IMAGING, SPINE AND PERSONALIZED MODELS**; *Chairs: Lennart Scheys, Guo Lingzhong*	5.8 **SPINE BIOMECHANICS III: SPINAL DISORDERS BIOMECHANICS** *Chairs: Marwan El-Rich, Kati Nispel*	6.8 **BONE BIOMECHANICS V: NANOSCALE** *Chair: Alessandra Carriero*	7.8 **HIP BIOMECHANICS** *Chairs: Sophie Williams, Anitha Praveen*	8.8 **BIOMATERIALS** *Chairs: Stephen Ferguson, Feihu Zhao*	9.8 **ON ORTHOREGENERATION AWARD** *Chairs: Marcy Zenobi-Wong, Matthias Steinwachs*
12:00pm – 1:10pm	Lunch break & Exhibition viewing (Locations: E, EO North & South foyers)								
1:10pm – 2:10pm	1.9 **CARDIOVASCULAR BIOMECHANICS VI** *Chairs: Michele Conti, Karol Calò*	2.9 **COMPUTATIONAL BIOLOGY II: COMPUTATIONAL BIOLOGY IN CANCER APPLICATIONS** *Chair: Friederike Schulte*	3.9 **MUSCULOSKELETAL / ORTHOPAEDIC INTERFACES** *Chairs: Alexandre Terrier, James Warren*	4.9 **IMPACT/INJURY BIOMECHANICS** *Chair: Mark Robinson*	5.9 **SPINE BIOMECHANICS IV: INTERVERTEBRAL DISC – BIOMECHANICS & DEGENERATION** *Chairs: Nicolas Newell, Ann-Kathrin Dagmar Greiner-Perth*	6.9 **OSTEOARTHRITIS** *Chairs: Ilse Jonkers, Aapo Ristaniemi*	7.9 **SKELETAL ADAPTATION** *Chairs: Enrico Dall'Ara, Tatiana Kochetkova*	8.9 **SHOULDER BIOMECHANICS II: GLENOHUMERAL BIOMECHANICAL MODELS AND ARTHROPLASTY** *Chairs: Clark Dickerson, Eva C. Herbst*	9.9 **REPRODUCTIVE, FETAL, AND NEONATAL BIOMECHANICS II: MECHANOBIOLOGY OF FEMALE REPRODUCTIVE AND PELVIC TISSUES** *Chairs: Renato Natal Jorge, Daniel Fidalgo*
2:20pm – 3:05pm	**KEYNOTE TALK MACKENZIE MATHIS: TOWARDS THE NEURAL BASIS OF ADAPTIVE MOTOR CONTROL** (Location: Audi Max) *Chairs: Ralph Müller, Sandra Loerakker*								
3:05pm – 3:30pm	Coffee break (Locations: E, EO North & South foyers)								
3:30pm – 4:30pm	**BEST DOCTORAL THESIS & EARLY INVESTIGATOR AWARD** (Location: Audi Max) *Chairs: Marlene Mengoni, Dieter Pahr, Michele Conti* **BEST DOCTORAL THESIS AWARD: FORCE-MEDIATED ANGIOGENESIS: LINKING MECHANICAL MECHANISMS TO VASCULAR LESION GROWTH** *Apeksha Shapeti, KU Leuven, Belgium* **EARLY INVESTIGATOR AWARD: YAP/TAZ AS MECHANOSENSORY REGULATORS OF BLOOD VESSEL FORMATION IN HEALTH AND DISEASE** *Tommaso Ristori, Eindhoven University of Technology, the Netherlands*								
4:30pm – 5:15pm	Closing ceremony (Location: Audi Max)								

POSTERS MAP

Poster session A1

7 July 2025 12:45pm – 1:30pm, Foyer E North

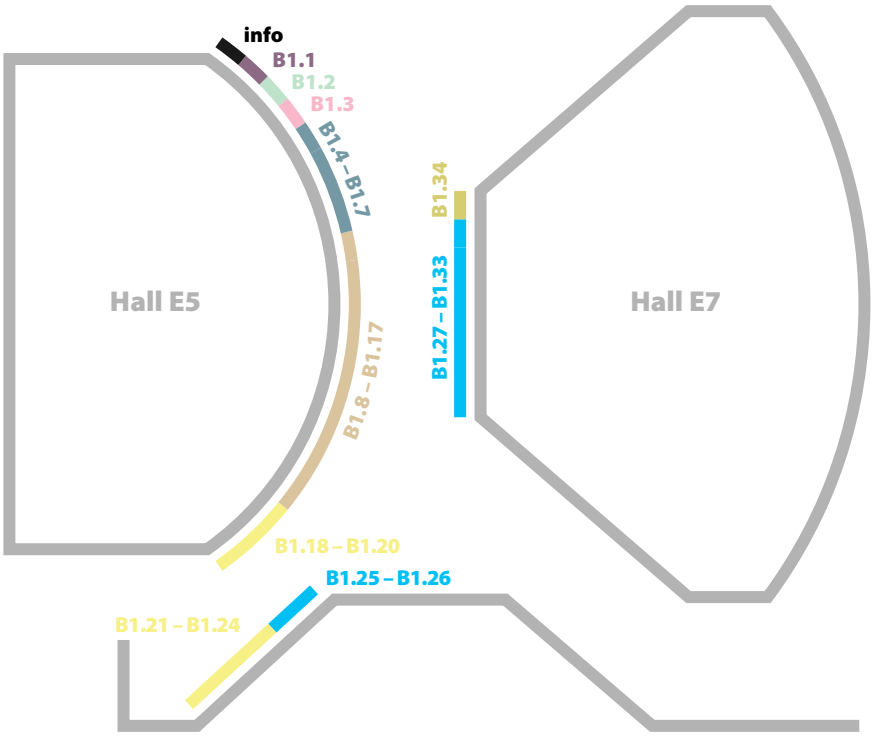
- Poster A1.1 – A1.10
  Movement and posture
- Poster A1.11 – A1.19
  Rehabilitation engineering, exoskeletons, and assistive devices
- Poster A1.20 – A1.30
  Spine biomechanics
- Poster A1.31 – A1.33
  Sports biomechanics



Poster session B1

7 July 2025 12:45pm – 1:30pm, Foyer E South

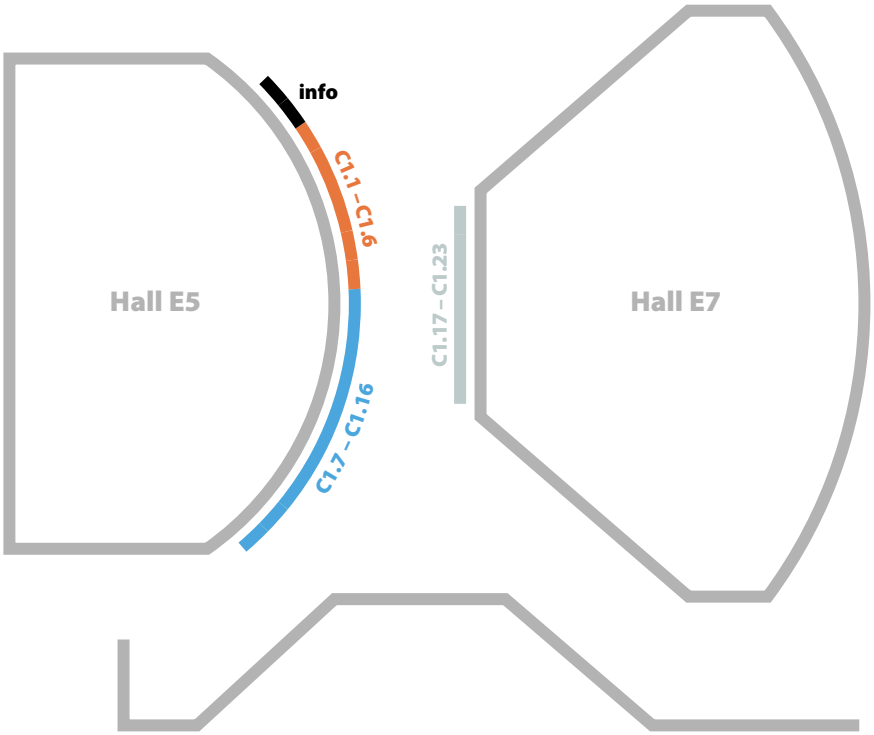
- Poster B1.1
  Animal biomechanics
- Poster B1.2
  Fracture healing
- Poster B1.3
  Ankle and foot biomechanics
- Poster B1.4 – B1.7
  Hip biomechanics
- Poster B1.8 – B1.17
  Bone biomechanics
- Poster B1.18 – B1.24
  Musculoskeletal biomechanics
- Poster B1.25 – B1.33
  Musculoskeletal modelling
- Poster B1.34
  Orthoregeneration



Poster session C1

7 July 2025 12:45pm – 1:30pm, Foyer E0 South

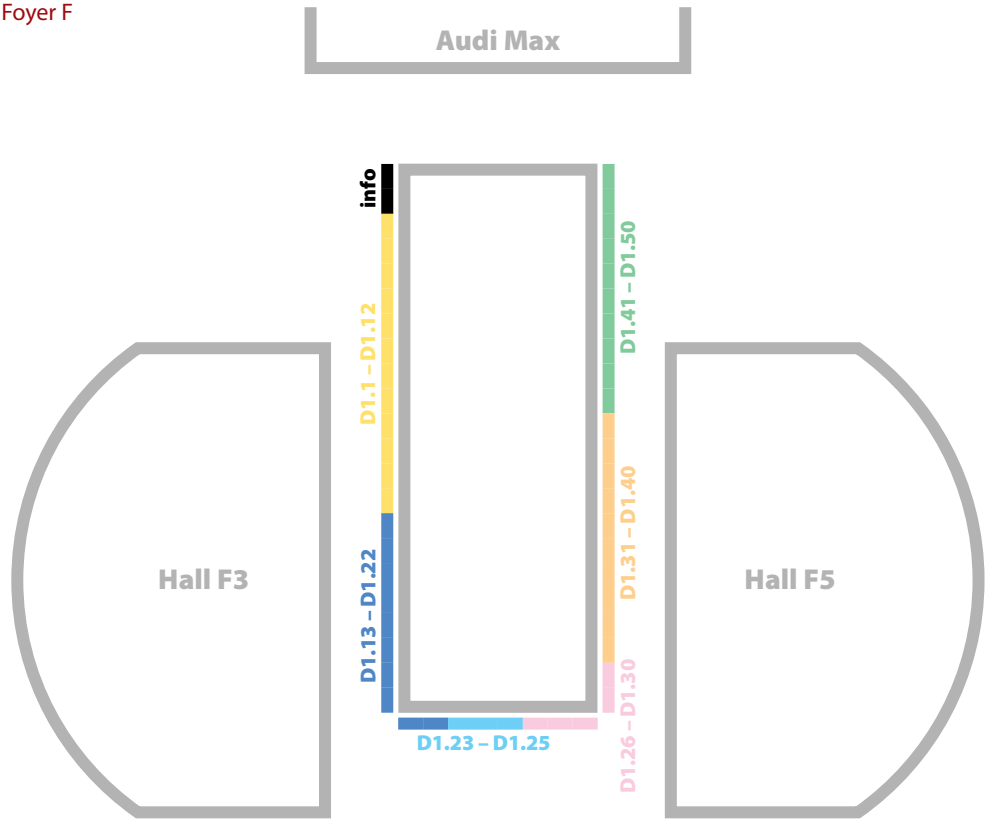
- Poster C1.1 – C1.6
  Biomaterials
- Poster C1.7 – C1.16
  Biomedical imaging
- Poster C1.17 – C1.23
  Clinical and translational biomechanics



Poster session D1

7 July 2025 12:45pm – 1:30pm, Foyer F

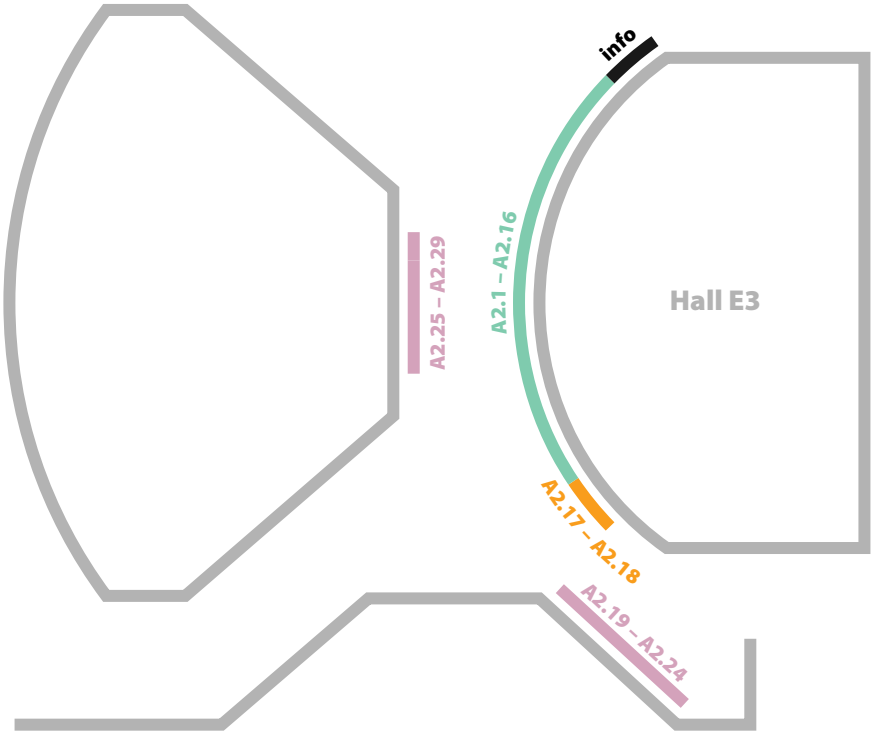
- Poster D1.1 – D1.12
  Tissue engineering
- Poster D1.13 – D1.22
  Implants and devices
- Poster D1.23 – D1.25
  3D bioprinting, additive manufacturing, and scaffolds
- Poster D1.26 – D1.30
  Neuromuscular and control biomechanics
- Poster D1.31 – D1.40
  AI and machine learning in biomechanics
- Poster D1.41 – D1.50
  Soft tissue biomechanics



Poster session A2

8 July 2025 12:45pm – 1:30pm, Foyer E North

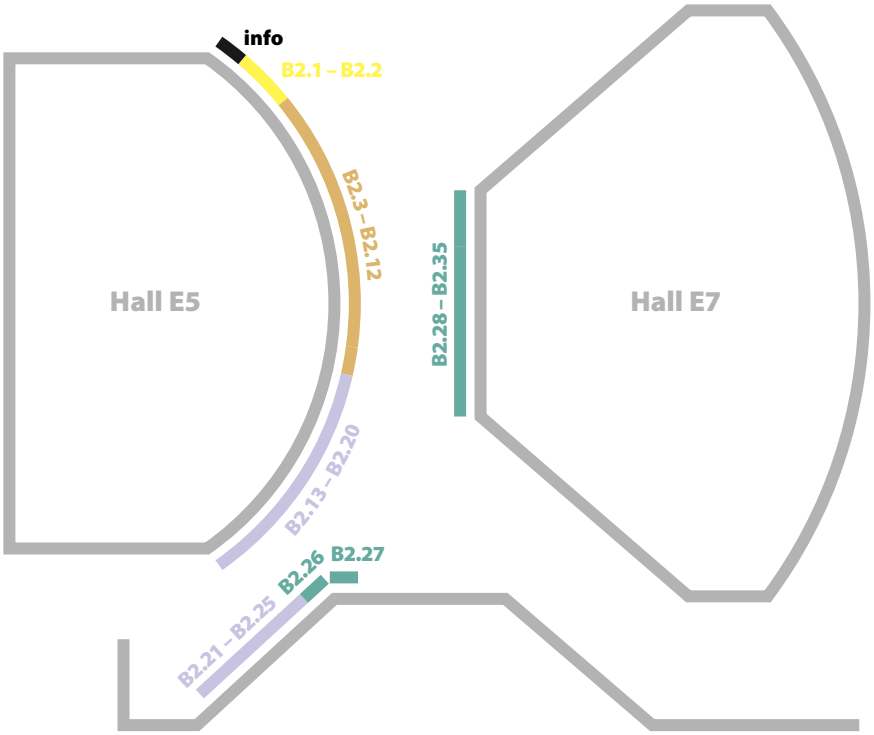
- Poster A2.1 – A2.16
  Cardiovascular biomechanics
- Poster A2.17 – A2.18
  Cardiovascular implants and devices
- Poster A2.19 – A2.29
  Computational methods for cardiovascular applications



Poster session B2

8 July 2025 12:45pm – 1:30pm, Foyer E South

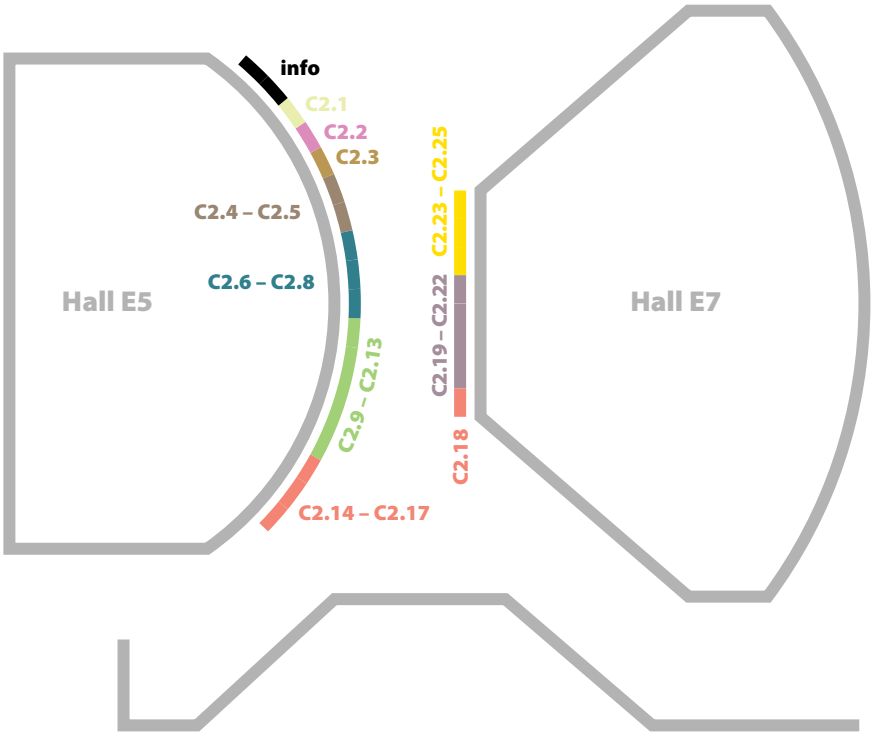
- Poster B2.1 – B2.2
  Impact/injury biomechanics
- Poster B2.3 – B2.12
  Joint kinematics and kinetics
- Poster B2.13 – B2.25
  Knee biomechanics
- Poster B2.26 – B2.35
  Mechanobiology



Poster session C2

8 July 2025 12:45pm – 1:30pm, Foyer E0 South

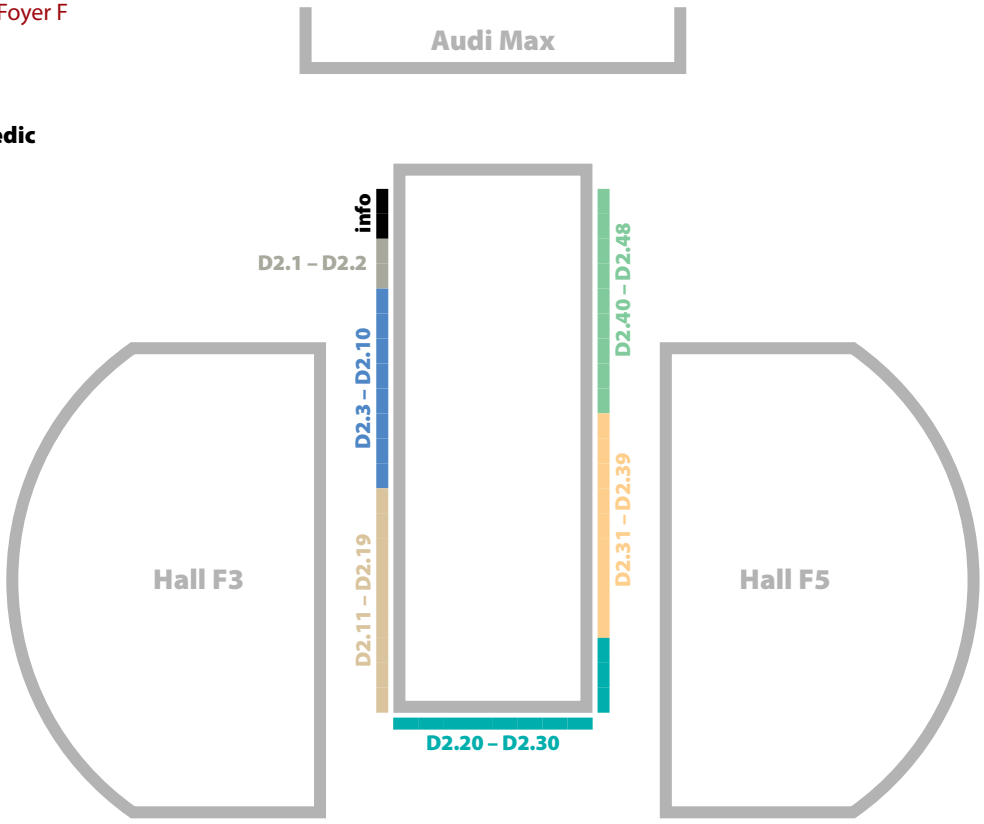
- Poster C2.1 **Ageing biomechanics**
- Poster C2.2 **Ocular biomechanics**
- Poster C2.3 **Respiratory and fluid biomechanics**
- Poster C2.4 – C2.5 **Reproductive, fetal, and neonatal biomechanics**
- Poster C2.6 – C2.8 **Computational biology**
- Poster C2.9 – C2.13 **Cellular and molecular biomechanics**
- Poster C2.14 – C2.18 **Dental biomechanics**
- Poster C2.19 – C2.22 **Shoulder biomechanics**
- Poster C2.23 – C2.25 **Osteoarthritis**



Poster session D2

8 July 2025 12:45pm – 1:30pm, Foyer F

- Poster D2.1 – D2.2 **Musculoskeletal/orthopaedic interfaces**
- Poster D2.3 – D2.10 **Implants and devices**
- Poster D2.11 – D2.19 **Bone biomechanics**
- Poster D2.20 – D2.30 **Spine biomechanics**
- Poster D2.31 – D2.39 **AI and machine learning in biomechanics**
- Poster D2.40 – D2.48 **Soft tissue biomechanics**



POSTERS OVERVIEW

Poster session A1 – Foyer E North

MOVEMENT AND POSTURE

A1.1 200 SEX DIFFERENCES IN POSTURAL CONTROL IN MIDDLE SCHOOL (11-14 YEARS) STUDENTS USING STABILOMETRY
Loovis, E. Michael

A1.2 202 EFFECT OF VIRTUAL REALITY-INDUCED POSTURAL THREAT ON CENTRE OF PRESSURE DISPLACEMENT
Michaud, Lucas

A1.3 245 EVOLUTION OF SMOOTHNESS AND REGULARITY DURING THE INTRODUCTION OF A NEW TOOL AMONG PROFESSIONALS
Dellai, Jason

A1.4 259 DEVELOPMENT AND VALIDATION OF A SIMPLIFIED SYSTEM FOR UPPER LIMB MOTION ANALYSIS AND REHABILITATION BIOFEEDBACK
Griskevicius, Julius

A1.5 277 REDUCING UNHELPFUL BACK BELIEFS DOES NOT IMMEDIATELY INFLUENCE LIFTING BIOMECHANICS: A RANDOMIZED CONTROLLED TRIAL
Schmid, Stefan

A1.6 288 VALIDATE GAIT VIDEO-BASED APPROACH FOR FLOQUET MULTIPLIER ANALYSIS IN GAIT STABILITY
Kim, Jeongsik

A1.7 606 EXPLORING FULL-DAY LUMBAR SITTING POSTURE AND BEHAVIOUR IN INDIVIDUALS WITH LOW BACK PAIN: A PRELIMINARY STUDY
McClintock, Frederick Anderson

A1.8 643 WALKING ENERGY EXPENDITURE AND METABOLIC COST ARE ELEVATED ON TREADMILLS THAN OVERGROUND ACROSS SPEEDS
Das Gupta, Sauvik

A1.9 931 DEVELOPING UPPER LIMB INERTIAL MOTION CAPTURE FOR CLINICIANS: A SURVEY OF NEEDS AND EXPECTATIONS
McInnes, Mhairi Fionna

A1.10 1033 WITHIN-SESSION TEST-RETEST RELIABILITY OF A SMARTPHONE APPLICATION FOR MEASURING SPINAL MOTOR BEHAVIOUR
Cerrito, Adrien

REHABILITATION ENGINEERING, EXOSKELETONS, AND ASSISTIVE DEVICES

A1.11 183 IMPACT OF A PASSIVE EXOSKELETON ON KINEMATICS, AND MUSCLE ACTIVITY DURING STAIR NAVIGATION: A SEX-SPECIFIC ANALYSIS
Garcia, Gabriela

A1.12 250 INNOVATIVE INSOLE TO REDUCE FOCAL PLANTAR PRESSURE
Zhang, Yajie

A1.13 330 PASSIVE ANKLE EXOSKELETONS AND POSTURAL CONTROL: A CENTRE OF PRESSURE-BASED INVESTIGATION
Tavares, Ruth

A1.14 511 OPTIMAL ASSISTANCE FOR WEAKENED MUSCLES USING PNEUMATIC GEL MUSCLE ACTUATOR: A BILEVEL OPTIMIZATION APPROACH
Renganathan, Gunarajulu

A1.15 517 A SELF-ADAPTIVE TRANSFEMORAL PROSTHETIC SOCKET WITH A MOTORIZED CORSET
Polizzotto, Maria Grazia

A1.16 607 IN VIVO JOINT LOADS IN THE COURSE OF REHABILITATION AFTER HIP ARTHROPLASTY
Damm, Philipp

A1.17 611 AN INNOVATIVE ADJUSTABLE OFFLOADING ANKLE-FOOT ORTHOSIS
Saffuri, Eshraq

A1.18 752 REDUCING ARTEFACTS IN EMG SIGNAL ACQUISITION IN EXOSKELETON RESEARCH
Pitz, Imke

A1.19 1043 PASSIVE VS HYBRID UPPER-BODY EXOSKELETONS IN LIFTING AND OVERHEAD MAINTENANCE TASKS: A PRELIMINARY STUDY
Piol, Alessandro

SPINE BIOMECHANICS

A1.20 199 COMPARISON OF BIPOLAR CONSTRUCT CONFIGURATIONS IN ADULT SPINE DEFORMITY: A FINITE ELEMENT ANALYSIS
Vergari, Claudio

A1.21 212 CAN THE PASSIVE STIFFNESS OF HUMAN PARASPINAL MUSCLE TISSUE BE PREDICTED FROM CROSS-SECTIONAL AREA AND NUMBER OF FIBERS?
Dehghan Hamani, Iraj

A1.22 229 ROD MATERIALS AND SCREW CONFIGURATION IN POST-CERVICAL LAMINECTOMY FUSION: A PERSONALIZED FE ANALYSIS
Khalaf, Kinda

A1.23 243 BIOMECHANICAL AND CLINICAL EFFECTS OF SPINAL TRACTION: ENHANCING LUMBAR HEALTH AND RESTORING SPINE FUNCTION
Arieira, Ana

A1.24 247 OPTIMIZING ADDITIVELY MANUFACTURED PEDICLE SCREWS: BALANCING POROSITY AND STRUCTURAL STABILITY
Lim, Dohyung

A1.25 315 EVALUATING FLEXIBILITY OF SCOLIOTIC SPINE USING A NOVEL GENERIC SPINE MODEL FOR PREOPERATIVE PLANNING
Su, Yifan

A1.26 358 PREDICTION OF ADJACENT VETEBRAL BODY DEGENERATION POST LUMBAR FUSION SURGERY USING A DAMAGE BASED BONE REMODELING APPROACH
Ananth Swaminathan, Siddarth

A1.27 441 INTERBODY FUSION CAGE REDUCING SUBSIDENCE RISK
Kok, Joeri

A1.28 961 DAMAGE SIMULATION DERIVED FROM DIAGNOSTIC CT IMAGING PREDICTS THE STRENGTH AND STIFFNESS OF HUMAN VERTEBRAE
Alkalay, Ron

A1.29 578 INTERNAL STRAIN FIELD PROPAGATION IN METASTATIC HUMAN VERTEBRAE ASSESSED WITH DIGITAL VOLUME CORRELATION
Kunnoth, Sriram

A1.30 736 STRUCTURAL ANALYSIS OF VERTEBRAE USING AUTOMATIC SEGMENTATION AND IMAGE-BASED NUMERICAL METHODS
Nadal, Enrique

SPORTS BIOMECHANICS

A1.31 295 BIOMECHANICAL ANALYSIS OF KARATE ROUNDHOUSE KICK: SKILL LEVELS AND EXECUTION CONDITIONS
Boada Benitez, Nicolas Alejandro

A1.32 422 ELASTICITY AT THE TURNING POINT OF THE BACK SQUAT: A WEARABLE APPROACH
Hering, Daniele

A1.33 490 JEFFERSON CURL VS. ROMANIAN DEADLIFT: A SUBMAXIMAL ANALYSIS OF BACK MUSCLE ACTIVATION
Yona, Tomer

Poster session B1 – Foyer E South

ANIMAL BIOMECHANICS

B1.1 453 NUMERICAL ANALYSIS OF DISTAL JOINTS OF EQUINE LIMB - A PILOT STUDY OF THE PREDICTION OF OVERLOAD INJURIES IN HORSES
Jankowski, Krzysztof

FRACTURE HEALING

B1.2 595 APPLICATION OF MECHANOBIOLOGICAL FRACTURE HEALING SIMULATIONS TO PEDIATRIC FRACTURES
Lipphaus, Andreas

ANKLE AND FOOT BIOMECHANICS

B1.3 1119 NONINVASIVE ASSESSMENT OF EARLY TENDON DAMAGE IN AN IN VIVO OVERLOAD MODEL USING HIGH-FREQUENCY ULTRASOUND IMAGING
Chainani, Pooja

HIP BIOMECHANICS

B1.4 389 DOES A REDUCTION IN BODY WEIGHT REDUCE JOINT FRICTION IN VIVO?
Zierke, Julian N.

B1.5 636 PROBABILITY OF FRACTURE GIVEN A FALL DERIVED FROM BIOFIDELIC FEMS COMPARED TO T-SCORE AND FRAX
Jha, Dheeraj

B1.6 680 A SIMPLIFIED METHOD FOR DETERMINING HIP JOINT CENTRE POSITION FOR MOTION CAPTURE
O'Regan, Eimear Bernadette

B1.7 841 TRIBOLOGICAL DEGRADATION OF THE ACETABULUM IN PRECLINICAL STUDIES: GEOMETRY VERSUS MATERIAL
Leonardo-Diaz, Roberto

BONE BIOMECHANICS

B1.8 276 BIOMECHANICAL ANALYSIS AND HYPERELASTIC MODELLING OF PORCINE GROWTH PLATES UNDER COMPRESSION
Hucke, Lucie

B1.9 376 SYMMETRIC NORMALIZATION ALGORITHM FOR ESTIMATING PHYSIOLOGICAL STRAIN IN BONES
Henyš, Petr

B1.10 448 VERIFICATION OF MICRO-FINITE ELEMENT ANALYSIS: CONVERGENCE ANALYSES ON TRABECULAR BONE MORPHOLOGY, APPARENT ELASTIC MODULUS, AND VON MISES STRESS
Correa Belloso, Alejandra

B1.11 449 MICRO-FINITE ELEMENT MODELLING OF HUMAN TRABECULAR BONE CORES: A CONVERGENCE ANALYSIS
Correa Belloso, Alejandra

B1.12 587 HOW LESIONS WITH AXIAL-TRANSVERSE CORTICAL INVOLVEMENT IN THE THE FEMORAL SHAFT AFFECT FRACTURE RISK
Rizvi, Abbas

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B2.35 364 MODELING THE MECHANOBIOLOGY OF LUNG CANCER CELLS: INFLUENCE OF SENESCENCE AND HYPOXIA
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C2.3 545 A PHYSICAL SIMULATOR OF THE RESPIRATORY SYSTEM
Quicken, Sjeng

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C2.4 310 THE EFFECT OF AGEING ON MECHANICAL PROPERTIES OF DIFFERENT SILICONE IMPRESSION MATERIALS
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C2.5 480 COMPUTATIONAL MODELLING OF PROTECTIVE SILICONE OBTURATORS FOR PATIENTS WITH CLEFT PALATE
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C2.7 328 AGENT-BASED MODELLING FOR SIMULATING BIOLOGICAL TISSUE GROWTH: CHALLENGES AND OPPORTUNITIES
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C2.16 701 SIMULATING ADHESIVE FAILURE OF A DENTAL ADHESIVE USING A CONTACT DESCRIPTION WITH STRESS-BASED GLUE FAILURE
Keilig, Ludger

C2.17 803 INVESTIGATING THE JUNCTION STABILITY OF ABUTMENT-FREE ZIRCONIA CROWNS DIRECTLY SCREWED TO IMPLANT FIXTURE
Fouda, Ahmed

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Milewski, Grzegorz

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C2.20 719 STATISTICAL SHAPE MODELS AFFECT MUSCLE MOMENT ARMS OF THE GLENOHUMERAL MUSCLES
Genter, Jeremy

C2.21 885 ANALYZING MUSCLE ACTIVATION DURING FUNCTIONAL INTERNAL ROTATION IN REVERSE SHOULDER ARTHROPLASTY: A PILOT STUDY
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C2.22 1031 PROBABILISTIC INSIGHTS INTO HUMAN SHOULDER BIOMECHANICS
Engelhardt, Laura

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Kochetkova, Tatiana

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Sensini, Alberto

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D2.4 656 STATE OF THE ART OF BONE REGENERATION IN SILICO MODELS
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D2.5 662 ASSESSING PEDICLE SCREW PRIMARY STABILITY USING IMPACT ANALYSIS
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Mosayebi, Mahdieh

D2.7 825 CAN LOCALIZED BLADDER VOLUME MEASUREMENTS IMPROVE THE DIAGNOSIS OF OVERACTIVE BLADDER? A COMPUTATIONAL STUDY
Fox, James

D2.8 862 BIOMECHANICAL INVESTIGATION ON UHMWPE WEAR IN TKA: A PRELIMINARY ROLL-ON-PLANE FINITE ELEMENT MODEL
Sisella, Mattia

D2.9 957 TAILORING METAMATERIAL STRUCTURES IN FEMORAL IMPLANT DESIGN TO REDUCE STRESS SHIELDING
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D2.10 989 TOPOLOGY OPTIMIZATION STRATEGIES FOR SPINAL FUSION CAGES: THE OPTIMAL DESIGN FOR PROMOTING EARLY BONE INGROWTH
Paganelli, Martina

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Fontcuberta-Rigo, Margalida

D2.12 840 TARGETING THE MICROMETERS SCALE ON THE RELATION OF BONE CRYSTALLINITY, ELASTIC MODULUS AND MINERAL DENSITY
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D2.13 856 FRACTURE ANGLE AFFECTS OPTIMIZED TREATMENT OF COMMINUTED DISTAL FEMUR FRACTURES
Yu, Xinyue

D2.14 879 VOLUMETRIC VERSUS SURFACE-BASED TRABECULAR BONE ADAPTATION: A MICRO-FINITE ELEMENT MODEL
Van Klei, McKinley

D2.15 939 FEMUR BIOMECHANICS WITH THE MESH-ORIENTED FINITE ELEMENT METHOD: IMPLEMENTATION AND APPLICATIONS
Noailly, Jérôme

D2.16 970 SYNCHROTRON X-RAY RADIATION INDUCED DAMAGE IN BONE DURING IN SITU µCT EXPERIMENTS
Sikorski, Marcin

D2.17 1039 EX VIVO STUDIES IN TRABECULAR BONE ADAPTATION UNDER BIOPHYSICAL STIMULATION
Ploeg, Heidi-Lynn

D2.18 1053 CT-DERIVED STRUCTURAL METRICS FOR SKULL BONE DYNAMICS IN BONE CONDUCTION HEARING
Niermann, Johannes

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van Leeuwen, Timo

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D2.21 878 USE OF MACHINE LEARNING TECHNOLOGIES IN THE ASSESSMENT OF FRACTURE RISK IN METASTATIC VERTEBRAE
Ródenas, Juan José

D2.22 882 CHANGES IN FLEXION AND EXTENSION MOVEMENTS FOLLOWING FUSION SURGERY: A LARGE ANIMAL STUDY
Reich, M. Simon

D2.23 898 PREDICTING FUSION CAGE SUBSIDENCE: COMPARING PATIENT-SPECIFIC FINITE ELEMENT MODEL OUTPUTS WITH CLINICAL OUTCOME DATA
Lali, Francis

D2.24 902 3D VERTEBRAL POSITIONING FROM BIPLANAR RADIOGRAPHS FOR SPINAL STIFFNESS MEASUREMENT IN SCOLIOSIS PATIENTS
Conticello, Salvatore

D2.25 934 BIOMECHANICAL EVALUATION OF VERTEBRAE WITH METASTATIC LESIONS USING SUBJECT-SPECIFIC FINITE ELEMENT MODELS
Ghosh, Rajdeep

D2.26 498 BIOMECHANICAL ANALYSIS OF LUMBAR DISC HERNIATION VIA IMAGE SEGMENTATION AND MODELLING
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D2.27 969 EFFECT OF AGE-RELATED DEGENERATION ON INTERVERTEBRAL DISC SURFACE STRAINS
Pasini, Margherita

D2.28 1011 ANALYSIS OF THE LOCAL MECHANICAL RESPONSE OF SCREW-INSTRUMENTED VERTEBRAE THROUGH MULTISCALE MODELLING
Borrelli, Simone

D2.29 1035 REPLACING CT WITH CT-LIKE MRI FOR KINEMATIC MODEL CREATION IN THE HEALTHY AND DEFORMED SPINE
Peeters, Birgitt

D2.30 1091 IMPACT OF ILLIOPSOAS-PRETENSION ON SPINAL AND ABDOMINAL MUSCLE ACTIVATION – AN EXPLORATIVE STUDY
Baumgartner, Daniel

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Zierke, Julian N.

D2.32 903 MACHINE LEARNING-BASED CLASSIFICATION OF FUNCTIONAL SEVERE STENOSIS BASED ON ADIPOSE TISSUE ATTENUATION
Pillitteri, Marta

D2.33 644 PREDICTION OF ENERGY EXPENDITURE FROM A SINGLE SHANK IMU FOR BOTH OVERGROUND AND TREADMILL WALKING
Das Gupta, Sauvik

D2.34 1023 ALTERNATIVES FOR REAL-TIME GRIP POSTURE RECOGNITION WITH ARTIFICIAL INTELLIGENCE IN AFFORDABLE HAND PROSTHESES
Mora, Marta C.

D2.35 1052 KINEMATIC FEATURE EXTRACTION AND CLASSIFICATION OF KNEE OSTEOARTHRITIS USING MARKERLESS MOTION ANALYSIS
Galasso, Svonko

D2.36 1062 ENHANCING TIBIAL FRACTURE OSTEOSYNTHESIS WITH SYNTHETIC DATA: A MATHEMATICAL APPROACH
Heyland, Mark

D2.37 1077 AI-DRIVEN CLINICAL DECISION SUPPORT FOR GAIT REHABILITATION
Easthope Awai, Chris

D2.38 1082 REINFORCEMENT LEARNING IN BIOMECHANICAL MODELS: COMPARING SIMULATED AND REAL-WORLD REACHING MOVEMENTS
Easthope Awai, Chris

D2.39 1090 LEVERAGING AI FOR REAL-WORLD BIOMECHANICAL RECONSTRUCTION FROM A SINGLE MOVING CAMERA
Cotton, R. James

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D2.41 352 POSTERIOR CRUCIATE LIGAMENT IN THE OSTEOARTHRITIC HUMAN KNEE: COMPOSITIONAL CHANGES AND BIOMECHANICS
Ristaniemi, Aapo

D2.42 771 COMPUTATIONAL MATERIAL CHARACTERISATION OF CARTILAGE BASED ON BIOT POROELASTIC THEORY
Cross, Ryan

D2.43 386 ISOGEOMETRIC ANALYSIS OF DIFFERENTIAL GROWTH IN THE MIDGUT AND MESENTERY
Saiki, Mchina

D2.44 492 USAGE OF THE ADAPTIVE QUASI-LINEAR VISCOELASTIC MODEL TO PREDICT DIFFERENT LOAD CASES OF PORCINE LIVER IN TENSION
Pahr, Dieter

D2.45 557 IMPACT OF TISSUE PRESERVATION ON ARTERIAL WALL MECHANICAL BEHAVIOUR
Dreesen, Silke

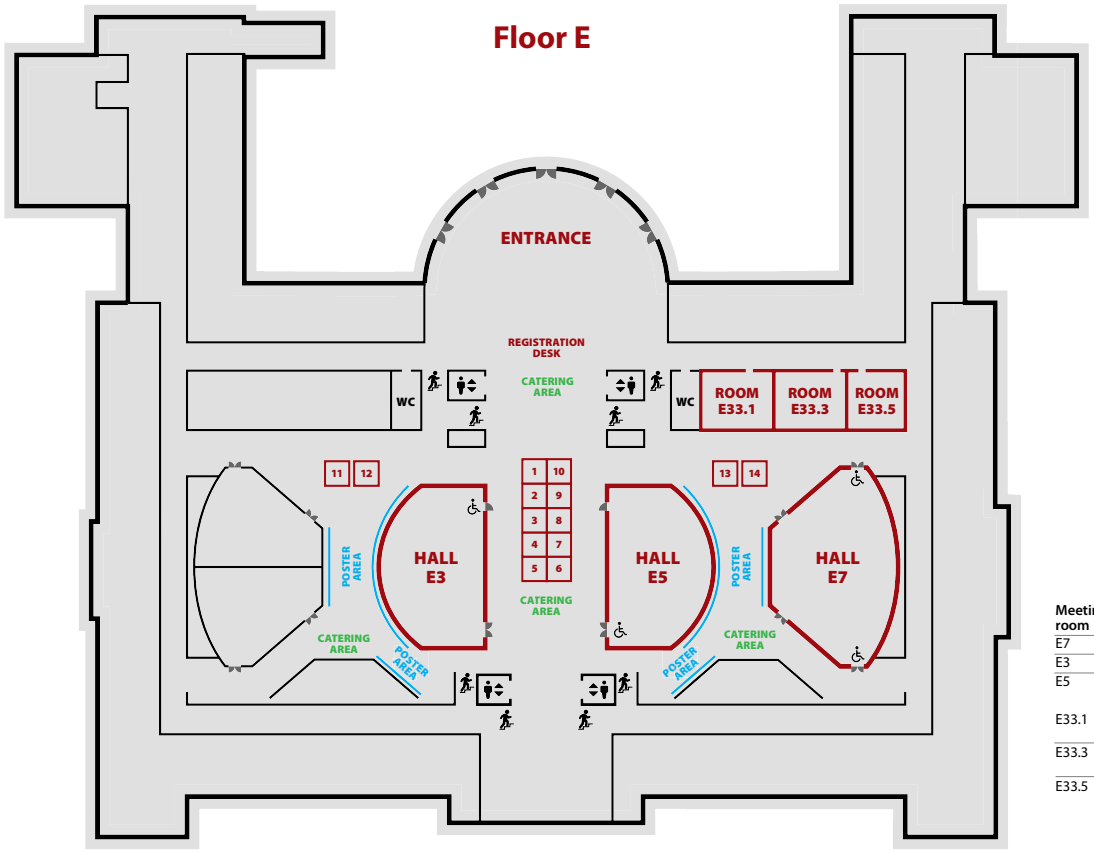
D2.46 631 BIAXIAL TESTING AND SENSORY TEXTURE EVALUATION OF PLANT-BASED AND ANIMAL DELI MEAT
St. Pierre, Skyler Rene

D2.47 742 MECHANICAL DAMAGE IN FASCIA: EXPERIMENTS AND ADVANCED CONSTITUTIVE MODELING
Peña, Juan A.

D2.48 768 BRIDGING BIOMECHANICS AND CHEMISTRY OF THE HUMAN MENISCUS USING ATOMIC FORCE MICROSCOPY AND MASS SPECTROMETRY IMAGING
Lebedeva, Aleksandra N.

ESB 2025 VENUE PLANS

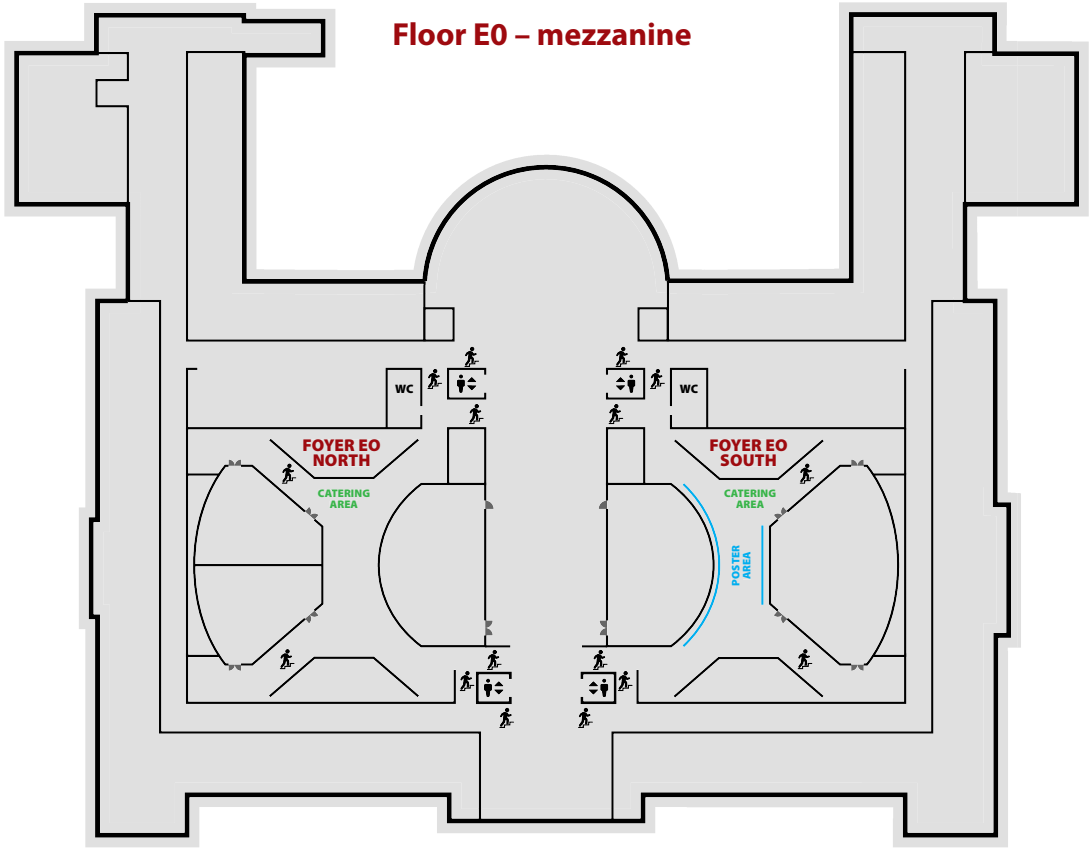
Floor E



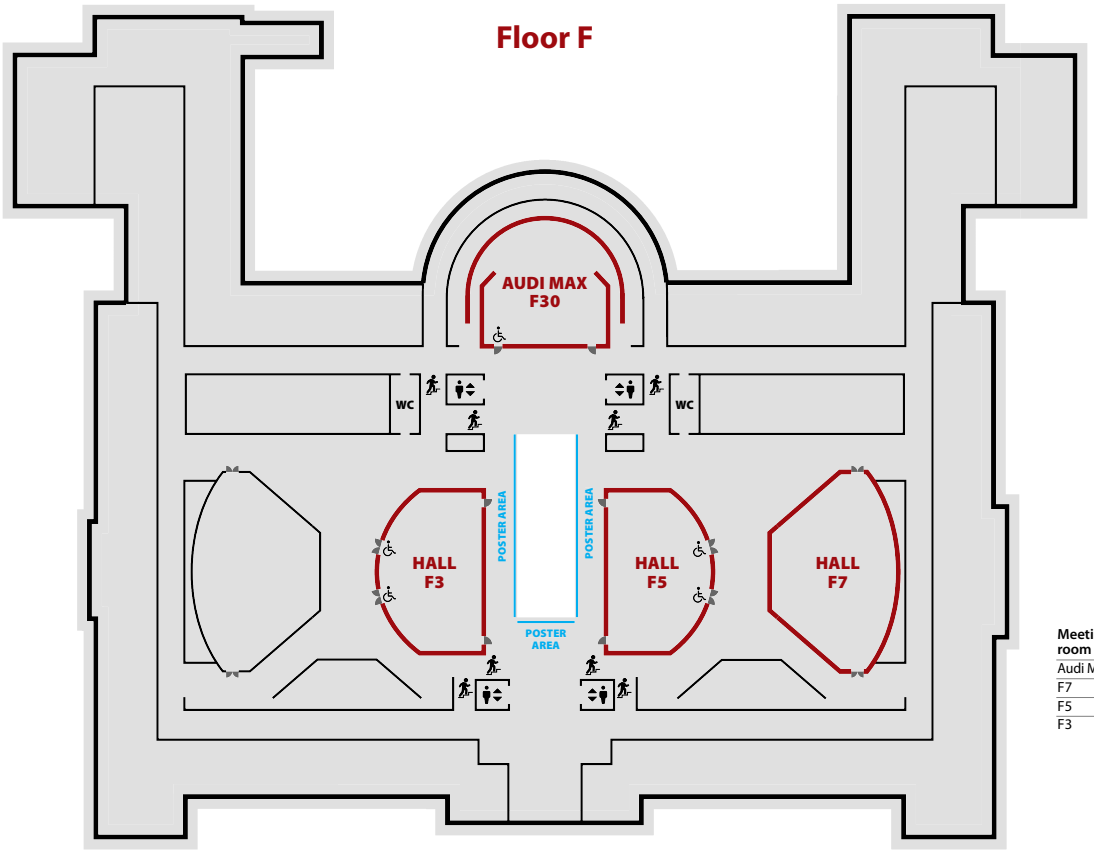
Meeting room	Capacity
E7	338
E3	243
E5	255

E33.1	Speakers preview room
E33.3	ESB 2025 Secretariat
E33.5	Quiet room

Floor E0 – mezzanine

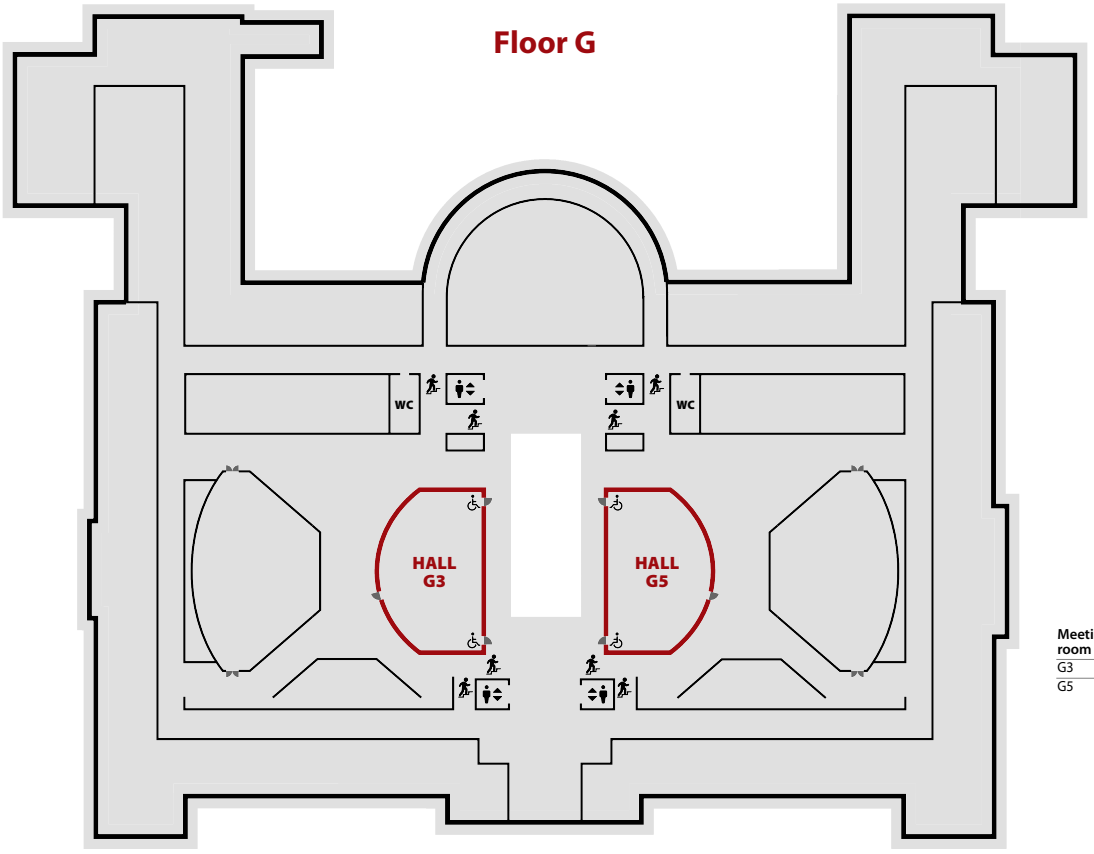


Floor F



Meeting room	Capacity
Audi Max F30	422
F7	338
F5	274
F3	274

Floor G



Meeting room	Capacity
G3	289
G5	283

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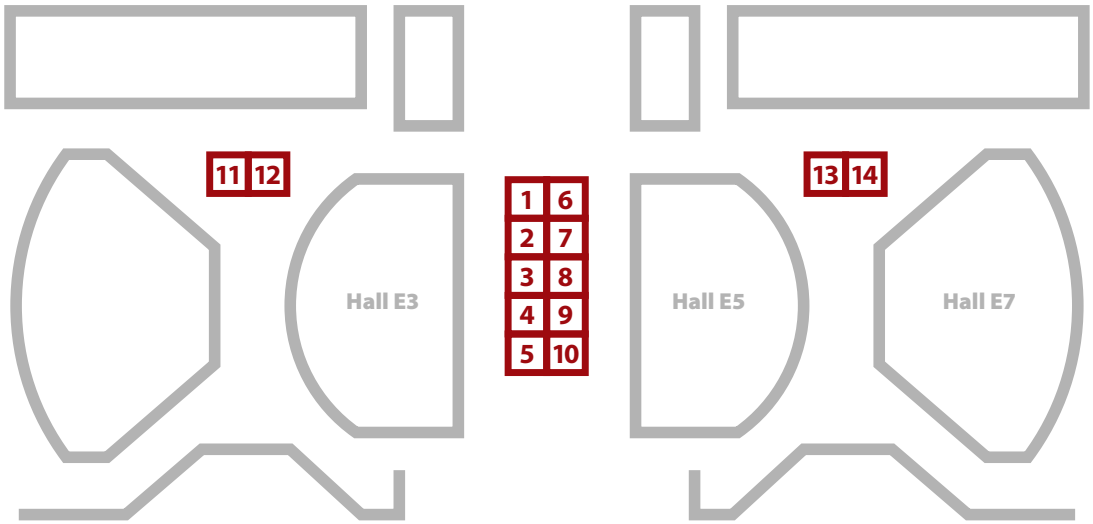

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Stand 5
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Stand 6
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Stand 7
European Society of Biomechanics
www.esbiomech.org

The European Society of Biomechanics was founded in 1976 at a meeting in Brussels of 20 scientists from 11 countries. Our goal is to encourage research, disseminate knowledge and promote progress in Biomechanics. It is now the largest Biomechanics society in Europe with over 1500 members.

Stand 8 & 9
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Our presentations:

8 July, 2:15pm
Advancements in Biomechanics session:
ARTIDIS®company presentation

9 July, 8:30am
Probing the nanomechanical properties of invasive lobular carcinoma (ILC): A physics-based approach

9 July, 1:15pm
Computational and experimental insights into the nanomechanical signature of bladder cancer formation

Our poster sessions:

7 July, 12:45pm - 1:30pm, Poster session C1, Foyer EO South

- Bridging physics and clinical practice: Advancing breast cancer diagnosis and treatment with nanomechanics
- Uncovering NSCLC biomechanics: Advancing diagnosis and early recurrence detection with AFM
- Nanomechanical signatures as predictive biomarkers for combined low-dose radiation and immunotherapy in lung adenocarcinoma

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6.-9. July 2025

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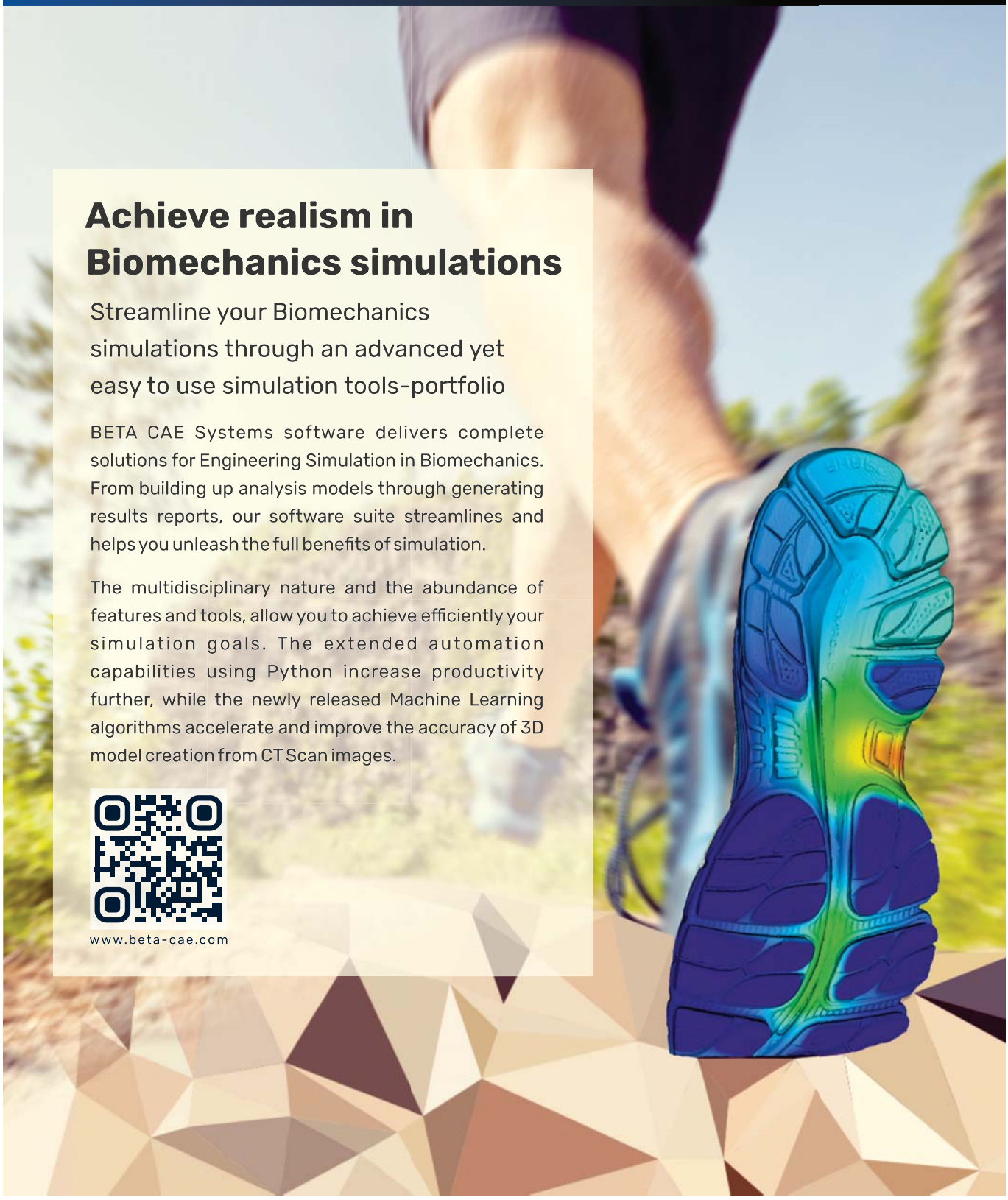

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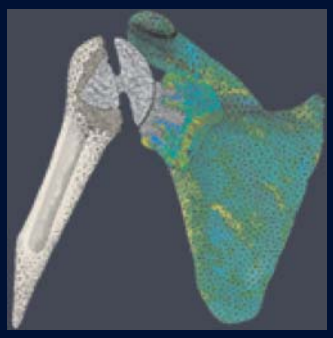
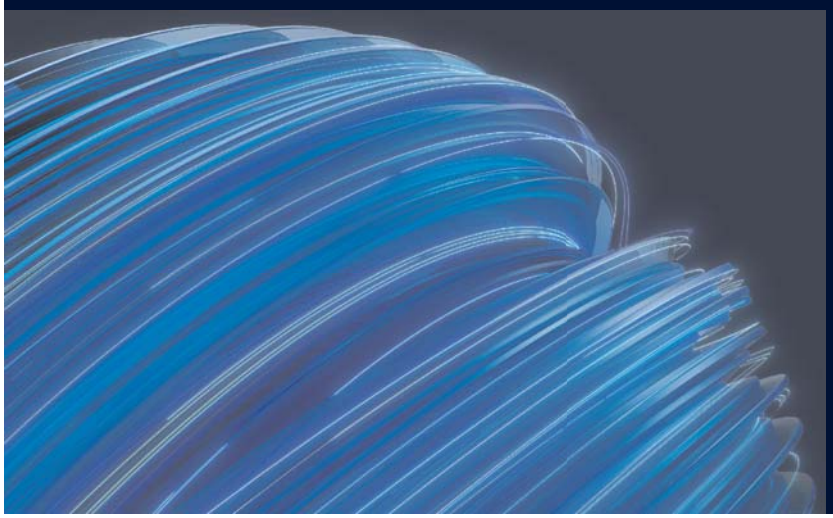


Hard Tissue Biomechanics

Soft Tissue Biomechanics

Personalized Device Design

Anatomical Measurements



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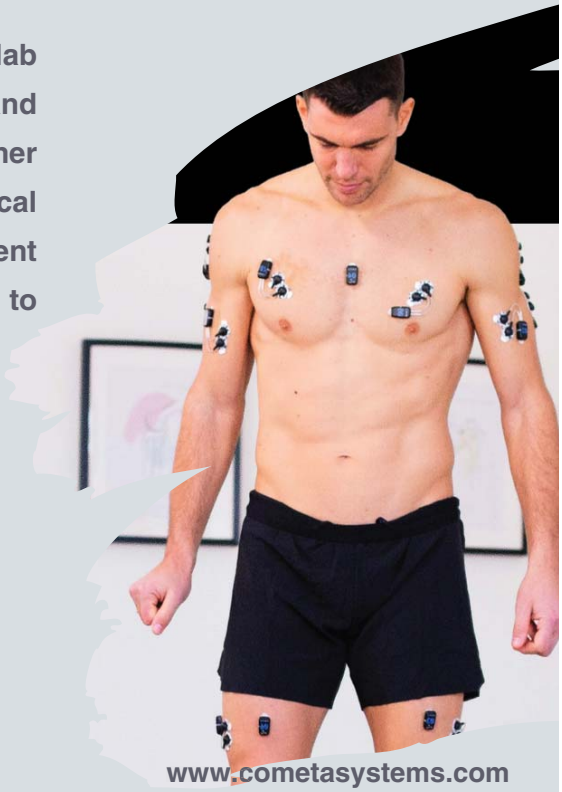

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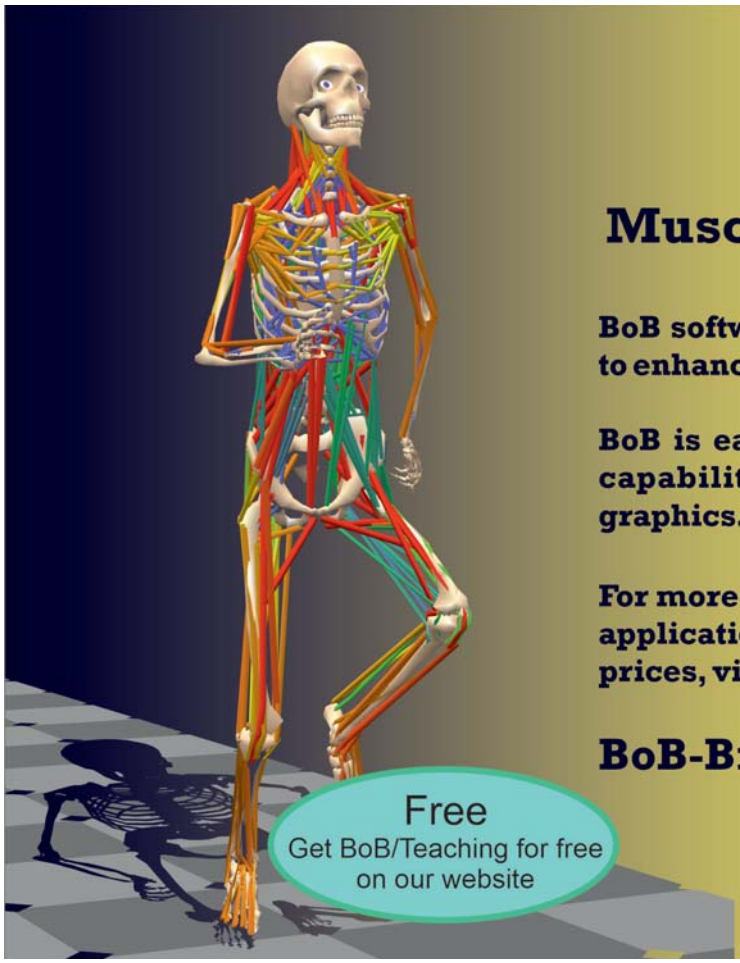

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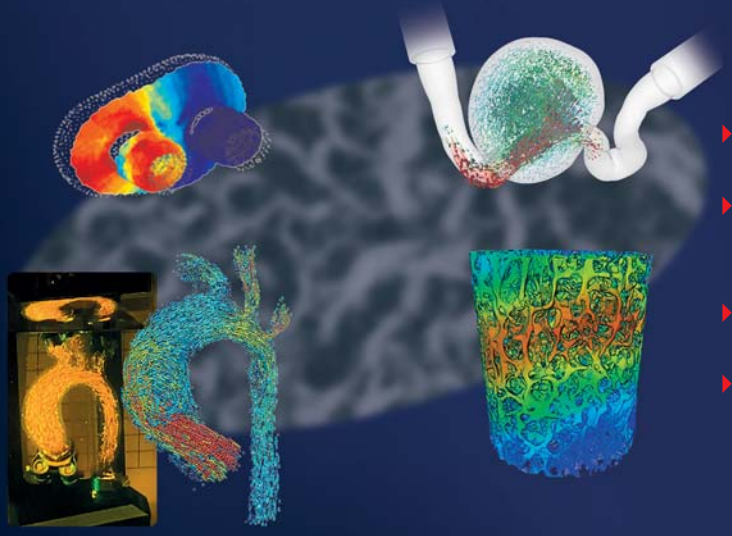

- Resolve complex fluid networks with full volume Lagrangian Particle Tracking (LPT)
- Measure surface strain of thin tissues, films, or samples in solution via Digital Image Correlation (DIC)
- Quantify flow-structure coupling effects using Fluid-Structure Interaction analysis (FSI)
- Use Digital Volume Correlation (DVC) to examine the internal deformation of biomaterials

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