Welcome to the COMSOL Conference 2018

Join us October 22–24 at the SwissTech Convention Center. Over the course of three days, expand your skills in numerical simulation. Through a better understanding of multiphysics modeling and simulation applications, you will be better equipped and inspired to tackle your next design challenge.

Learn more about the COMSOL Conference and register today!
comsol.com/conference/registration/lausanne

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Conference schedule at a glance

5 KEYNOTE SPEAKERS
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Choose from over 40 minicourses and sponsored technical workshops

9 PANEL DISCUSSIONS
Start conversation in an interactive and educational setting

10 USER PRESENTATIONS
Learn from your colleagues in application specific sessions

16 POSTER SESSION
Meet the presenters and learn more about their research
# Schedule

## Monday, October 22

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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>10:00</td>
<td>Registration Opens, Coffee</td>
<td>Foyer Campus</td>
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<tr>
<td>10:45</td>
<td>Welcome to the COMSOL Conference</td>
<td>Auditorium A</td>
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<td>11:00</td>
<td>Minicourses and Workshop</td>
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<td></td>
<td><strong>Sponsored Workshop:</strong> HP Z Workstations &amp; COMSOL Multiphysics® — Because It Needs More Than Just Hardware</td>
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<td><strong>Sponsored Workshop:</strong> Synopsys Simpeware™: From 3D Images to Models</td>
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<td>12:00</td>
<td>Lunch</td>
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<td>13:00</td>
<td>Welcome Keynote</td>
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<td>14:00</td>
<td>Demo Stations, Exhibition, and Poster Sessions Open</td>
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<td>User Presentations</td>
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<td><strong>Acoustics 1</strong></td>
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<td><strong>CFD 1</strong></td>
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<td><strong>Chemical Reaction Engineering 1</strong></td>
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<td><strong>Electromagnetics 1: RF and Microwave</strong></td>
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<td><strong>Electromagnetics 2: Microscopy and Photonics</strong></td>
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<td><strong>Heat 1: General</strong></td>
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<td><strong>Manufacturing 1: Laser</strong></td>
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<td><strong>Structural Mechanics 1</strong></td>
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<td>Keynote Session</td>
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<td><strong>Thijs Defraeye, EMPA, Laboratory for Biomimetic Membranes and Textiles</strong></td>
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<td><strong>Adrien Charmetant, Nexans Research Center</strong></td>
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<td>16:30</td>
<td>Minicourses and Panel Discussion</td>
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<td><strong>Meshing</strong></td>
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<td><strong>Radiation and Ambient Conditions Modeling</strong></td>
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<td><strong>Turbulent and High Mach Number Flow</strong></td>
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<td><strong>Understanding the Stationary Solvers</strong></td>
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<td><strong>Wave Optics Modeling</strong></td>
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<td><strong>Panel Discussion:</strong> Modeling Strategies for Acoustics Simulations</td>
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<tr>
<td>17:30</td>
<td>Icebreaker Reception</td>
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## Tuesday, October 23

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<tr>
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<tr>
<td>8:00</td>
<td>Registration, Welcome Coffee</td>
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<td>Minicourses and Workshop</td>
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<td></td>
<td><strong>Introduction to the Application Builder</strong></td>
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<td><strong>Moisture Transport and Heat Transfer with Phase Change</strong></td>
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<td><strong>Resistive and Capacitive Devices</strong></td>
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<td><strong>Update Training: CAD and Meshing</strong></td>
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<td><strong>Understanding the Time-Dependent Solvers</strong></td>
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<td><strong>Update Training: Structural and Acoustics</strong></td>
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<td><strong>Andri Bezzola, Samsung Audio Lab</strong></td>
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<td><strong>David Enfrun, Kejako SA</strong></td>
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<td><strong>Acoustics 2: Multiphysics</strong></td>
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<td><strong>Building Physics 1</strong></td>
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<td><strong>CFD 2: Particle Tracing</strong></td>
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<td><strong>Electromagnetics 3: Multi-static Fields</strong></td>
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<td><strong>Heat 2: Multiphysics</strong></td>
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<td><strong>Manufacturing 2: Electrical</strong></td>
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<td><strong>Magnets, Coils, and Motors</strong></td>
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<td><strong>Optimization</strong></td>
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<td><strong>Structural Dynamics Modeling</strong></td>
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<td><strong>Update Training: Thermal</strong></td>
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<td><strong>Update Training: Solvers</strong></td>
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<td>User Presentations</td>
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<td><strong>Acoustics 3: Room Acoustics</strong></td>
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<td><strong>CFD 3: Turbulent Flow</strong></td>
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<td><strong>Chemical Reaction Engineering 2</strong></td>
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<td><strong>Electromagnetics 4: Induction</strong></td>
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<td><strong>Heat 3: Phase Change</strong></td>
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<td><strong>Porous Media Flow</strong></td>
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<td><strong>Automating Model Building Using Methods and the Application Builder</strong></td>
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<td><strong>Equation-Based Modeling</strong></td>
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<td><strong>Modeling Speakers, Microphones, and Other Transducers</strong></td>
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<td><strong>Postprocessing</strong></td>
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<td><strong>Update Training: Fluid and Chemical</strong></td>
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<td><strong>Panel Discussion:</strong> Power Electromagnetic Systems</td>
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<tr>
<td>16:30</td>
<td>Poster Session</td>
<td>Foyer Garden</td>
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<td>17:30</td>
<td>Vote: Favorite Poster</td>
<td>Foyer Campus, Auditorium A, 1A BC</td>
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<tr>
<td>18:00</td>
<td>Gala Dinner and Awards Ceremony</td>
<td>Auditorium B and Foyer Campus, Auditorium A, 1A BC</td>
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### ICEBREAKER RECEPTION
Monday, 17:30–19:00  
Foyer Campus  
Meet fellow COMSOL users at the Reception with Swiss cheese and wines degustation and enjoy the traditional Swiss folklore performance.

### EXHIBITION
Monday, 14:00 - Wednesday 13:00  
Foyer Campus  
Learn about exhibitors’ products and services.

### LUNCH
Monday, 12:00–13:00  
Tuesday, 12:00–13:00  
Wednesday, 12:00–13:00  
Foyer Campus  
Have lunch by the impressive world’s first solar window composed of dye-sensitive solar cells known as Graetzel cells.

### POSTER SESSION
Monday, 14:30–Wednesday 13:00  
Foyer Garden  
View more than 130 posters, meet the presenters and learn more about their research.

### GALA DINNER AND AWARDS CEREMONY
Tuesday, 18:00–20:00  
Auditorium B and Foyer Campus  
Celebrate the winners of the Best Poster and Best Paper awards and taste different food at this relaxed buffet-style dinner.

### POST-CONFERENCE GUIDED TOUR TO CERN
Wednesday, 14:15–19:45  
Thursday, 7:30–13:00  
Discover the full scale and wonder of CERN’s monumental experiments by attending our Post-Conference CERN Guided Tour. COMSOL provides the tour participants with a free bus transfer from/back to SwissTech Convention Center.

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**FLOOR PLAN**

SwissTech Convention Center

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**SCHEDULE**

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<tr>
<td>14:00</td>
<td>Conference Ends</td>
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<tr>
<td>14:15</td>
<td>Tour to CERN (for pre-registered applicants)</td>
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**COMMUNITY EVENTS**

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complex cable systems.

To further increase the cost-effectiveness and reliability of high-quality software for scientific computations through his company COMSOL.

Svante Littmarck is the president and CEO of COMSOL, Inc. He cofounded the COMSOL Group in 1986. In 2004, Littmarck received an honorary doctoral degree from the Royal Institute of Technology (KTH) in Stockholm, Sweden, for the development and international reach of high-quality software for scientific computations through his company COMSOL.

Nexans provides an extensive range of cable solutions to worldwide actors of the electricity value chain, from generation to consumption. Recent evolutions in the global electricity market, such as the targets for increasing the share of renewable energy and decreasing energy consumption, require further optimization of cable assets. This talk will present how combining heat transfer, electric field, magnetic field, and fluid dynamics calculations in COMSOL Multiphysics® opens new perspectives to further increase the cost-effectiveness and reliability of complex cable systems.

In this talk, I will share our latest modeling research on convective drying processes for soft cellular materials, such as fruits. I will show how multiscale modeling from the cellular scale up to the dryer scale can increase our understanding of what changes inside these exciting materials during drying. Furthermore, I will illustrate the importance and impact of a conjugate coupling of the moisture transport in the porous material to that in the turbulent airflow around it. Finally, I will discuss how we use modeling to optimize convective dehydration processes, such as solar and electrohydrodynamic drying.

An audio loudspeaker is inherently a multiphysics apparatus: It converts an electrical signal to acoustic waves by moving a structural membrane via an electromechanical voice coil. As the signal travels from the record medium to the human ear, coupled linear as well as nonlinear mechanisms influence the sound quality at every stage. Finite element simulations have become an indispensable tool for the design of high-quality transducers and sound systems under modern-day design and time constraints. I will present several case studies that illustrate how simulation, optimization, and specialized applications are enabling engineers at Samsung to develop world-class audio products.

In the field of ophthalmology, merges medical technology (medtech) and engineering expertise to address presbyopia with an antiaging mindset and to treat the gradual loss of visual accommodation. In this presentation, we are thrilled to illustrate our journey. We will show you how multiphysics simulation is a tool for developing an innovative solution and how it will eventually be part of the personalized antiaging solution for providing 20 years of comfortable near vision without reading glasses.
**MINICOURSES**

**CORE USAGE & THEORY**

**COMSOL MULTIPHYSICS® FOR NEW USERS**

**Monday, October 22, 11:00**

This minicourse is for those who are just starting out with COMSOL Multiphysics® or want a refresher on the graphical user interface (GUI) and modeling workflow. During this session, the fundamentals of using the COMSOL® software will be demonstrated.

**GEOMETRY MODELING AND CAD IMPORT**

**Monday, October 22, 11:00**

Whether you choose to construct a geometry in the COMSOL Desktop® or import it from a CAD file, this minicourse will demonstrate some useful tools. Did you know that COMSOL Multiphysics® can automatically generate the cross section of a solid object and you can use it for a 2D simulation? Or that you can directly import topographic data to create 3D objects? Generating a geometry is also about preparing selections for physics settings. By using the right selection tools, you can easily automate the modeling workflow, even when this involves simulations on widely different versions of a geometry. Attend this minicourse to see a demonstration of these techniques and more.

**MESHING**

**Monday, October 22, 16:30**

In this minicourse, we will walk you through the meshing techniques that are available to you in the COMSOL Multiphysics® software. We will introduce you to basic meshing concepts, such as how to tweak the meshing parameters for unstructured meshes. More advanced topics include working with swept meshes and creating mesh plots. You will also learn a useful technique for meshing imported CAD designs: How to hide small geometry features from the meshers.

**UNDERSTANDING THE STATIONARY SOLVERS**

**Monday, October 22, 16:30**

COMSOL Multiphysics® gives you precise control over the way in which your multiphysics models are solved. In this minicourse, we will cover the fundamental numerical techniques and underlying algorithms used for steady-state models and explain the reasons behind the default solver settings. Building upon this knowledge, you will learn various techniques for achieving or accelerating convergence of nonlinear multiphysics models.

**EQUATION-BASED MODELING**

**Tuesday, October 23, 8:30**

Partial differential equations (PDEs) constitute the mathematical foundation to describe the laws of nature. This minicourse will introduce you to the techniques for constructing your own linear or nonlinear PDE systems. You will also learn how to add ordinary differential equations (ODEs) and algebraic equations to your model.

**AUTOMATING MODEL BUILDING USING METHODS AND THE APPLICATION BUILDER**

**Tuesday, October 23, 15:30**

Learn how to use the Application Builder and the Method Editor to automate your model building, including setting up the geometry, material properties, loads, and boundary conditions; meshing; solving; and extracting data. You will learn how the Application Builder can be a powerful tool in your modeling process.

**ELECTRICAL & OPTICS**

**RF AND MICROWAVE MODELING**

**Monday, October 22, 11:00**

In this minicourse, we will cover the use of the RF Module for simulating Maxwell’s equations in the high-frequency electromagnetic wave regime. We will discuss applications in resonant cavity analysis, antenna modeling, transmission lines and waveguides, and scattering. Then, we will address the coupling of electromagnetic wave simulations to heat transfer, such as in RF heating.

**WAVE OPTICS MODELING**

**Monday, October 22, 16:30**

The Wave Optics Module offers both full-wave modeling of Maxwell’s equations and the beam envelope method. The beam envelope method is particularly useful for modeling optical waveguiding structures, where the field envelope varies slowly along the direction of propagation. This minicourse introduces the use of the beam envelope method and how it contrasts with full-wave models. Optical scattering from periodic structures, such as gratings, will also be covered.

**RESISTIVE AND CAPACITIVE DEVICES**

**Tuesday, October 23, 8:30**

In this minicourse, we will address the modeling of resistive and capacitive devices.
with the AC/DC Module. We will also cover the calculation of electric fields under steady-state, transient, and frequency-domain conditions, as well as the extraction of lumped parameters such as capacitance matrices. Applications include the modeling of resistive heating and sensor design.

**CHARGED PARTICLE TRACING**

*Tuesday, October 23, 13:00*

Learn how to use the Particle Tracing Module to compute the paths of ions and electrons in external electric and magnetic fields. The external fields can be entered as expressions or solved for using a different physics interface, then coupled to the Charged Particle Tracing interface. Typical applications include mass spectrometry, accelerator physics, ion optics, and etching. You will learn how to use a probabilistic approach to simulate the collisions between these ions or electrons and a rarefied background gas. We will also discuss the analysis of nonlaminar charged particle beams and self-consistent modeling of bidirectionally coupled particle-field interactions.

**MAGNETS, COILS, AND MOTORS**

*Tuesday, October 23, 13:00*

Magnetic fields arise due to magnets and the flow of current. In this minicourse, you will learn about using the AC/DC Module to model static, transient, and frequency-domain magnetic fields that arise around magnets and coils. We will introduce various ways of modeling magnetically permeable materials, motors, and generators.

**PLASMA MODELING**

*Wednesday, October 24, 08:30*

This course will introduce some of the most common types of plasmas, including inductively coupled, DC, microwave, and capacitively coupled plasmas. In addition to learning about the differences between each type of discharge, the minicourse will show how to set up a model of a capacitively coupled plasma using a revolutionary new method available in the Plasma Module.

**RAY OPTICS MODELING**

*Wednesday, October 24, 13:00*

In this minicourse, you will learn how to use the Ray Optics Module to trace rays of light and other high-frequency radiation through optically large systems. We will explain how to model ray propagation in homogeneous and graded-index media; analyze ray intensity and polarization; and apply boundary conditions including refraction, diffuse reflection, and specular reflection. We will discuss application areas including cameras, telescopes, laser focusing systems, spectrometers, and concentrated solar power systems. You will also learn how to apply the Ray Optics Module in a multiphysics context by considering structural and thermal effects.

**MECHANICAL & ACOUSTICS**

**STRUCTURAL MECHANICS AND MULTIPHYSICS**

*Monday, October 22, 11:00*

Many different physical phenomena are coupled to the deformation of solids. In this minicourse, you will get an overview of how to model fluid-structure interaction, thermal stresses and thermoelastic damping, electromechanical forces, magnetostriction, piezoelectricity, poroelasticity, and acoustic-structure interaction. The built-in multiphysics couplings are highlighted, together with examples of how to create your own couplings.

**STRUCTURAL DYNAMICS MODELING**

*Tuesday, October 23, 13:00*

In this minicourse, you will learn how to model problems within the field of structural dynamics. The course covers eigenfrequency analysis, frequency-domain analysis, time-domain analysis, and modal superposition. You will learn how to select appropriate and efficient methods. Damping models, nonlinearities, linearization, and prestressed analysis are other important topics. You will also get a brief overview of the Multibody Dynamics Module and Rotordynamics Module.

**MODELING SPEAKERS, MICROPHONES, AND OTHER TRANSUDERS**

*Tuesday, October 23, 15:30*

This minicourse is focused on modeling all kinds of transducers. The transduction from an electric signal to an acoustic signal, including the mechanical path, is a true multiphysics application. We will set up a simple model using the built-in multiphysics couplings and also look at other modeling techniques, like combining lumped models with FEM or BEM. The analysis can be done in the frequency domain or extended to the time domain, where nonlinear effects can be included. You will also learn about recent news and additions to the COMSOL Multiphysics® software relevant to the topic. Application areas include, but are not limited to, mobile devices, piezotransducers, loudspeakers, headsets, and speaker cabinets.

**FLUID & THERMAL**

**CONDUCTION AND CONVECTION**

*Monday, October 22, 11:00*

In this minicourse, you will learn about modeling conductive and convective heat transfer with COMSOL Multiphysics®, the Heat Transfer Module, the CFD Module, and the Subsurface Flow Module. Conductive heat transfer modeling addresses heat transfer through solids and can include heat transfer in thin layers, contact thermal resistance, and phase change. Convective heat transfer addresses heat transfer in solids and fluids. We will also address natural convection induced by buoyancy forces.

**LAMINAR AND MICROFLUIDIC FLOW**

*Monday, October 22, 11:00*

In this minicourse, we will cover the Microfluidics Module, which features custom interfaces for the simulation of microfluidic devices and rarefied gas flows. Single-phase flow capabilities include both Newtonian and non-Newtonian flow. Beyond its single-phase flow capabilities, this module also allows for two-phase flow simulations to capture surface tension forces, capillary forces, and Maranoni effects. Typical applications include lab-on-a-chip (LOC) devices, digital microfluidics, electrokinetic and magnetokinetic devices, inkjets, and vacuum systems.

**RADIATION AND AMBIENT CONDITIONS MODELING**

*Monday, October 22, 16:30*

Radiative heat transfer is one of the three types of heat transfer and plays a major role in many applications. During this session, we will focus on the features for modeling surface-to-surface radiation for gray surfaces or multiple spectral bands, such as solar and infrared radiation. We will discuss different examples in order to help identify cases where thermal radiation has to be accounted for. Defining ambient conditions is a key point in the model definition, especially when solar radiation is accounted for. Surface are also other cases. We will review the different means to define the ambient condition and how use them for conduction,
convection, and radiation in heat transfer models. Solar power systems. You will also learn how to apply the Ray Optics Module in a multiphysics context by considering structural and thermal effects.

**TURBULENT AND HIGH MACH NUMBER FLOW**

*Monday, October 22, 16:30*

Learn how to efficiently simulate incompressible and compressible turbulent flows in this CFD minicourse. The CFD Module allows for accurate multiphysics flow simulations, and to conjugate heat transfer with nonisothermal flow and fluid-structure interactions. We will also discuss physics interfaces for simulating flow in porous media, discrete and homogeneous two-phase flow, and flow in stirred vessels with rotating parts.

**MOISTURE TRANSPORT AND HEAT TRANSFER WITH PHASE CHANGE**

*Tuesday, October 23, 8:30*

Changes in the temperature of a material can lead to a change in material phase, from solid to liquid to gas. The evaporation and condensation of water are very common cases of phase change. This minicourse will introduce you to moisture transport and the transfer of mass and heat in reacting systems using the Chemical Reaction Engineering Module. We will address topics including homogeneous and surface reactions, diffusion and convection in diluted and concentrated solutions, and thermal effects on transport and reactions, and mass and heat transfer in heterogeneous catalysis.

**ELECTRODEPOSITION AND CORROSION**

*Wednesday, October 24, 8:30*

In this minicourse, you will learn how to define and solve problems in electrodeposition, corrosion protection, and corrosion studies. These systems all involve mass and charge transfer coupled to electrochemical reactions at deforming metal surfaces. We will look at two different approaches: one that treats the surface deformation as a variable and a second approach that treats the surface deformation with moving mesh. The most common type of study for these systems is the time-dependent study, but we will also briefly look at electrochemical impedance spectroscopy (EIS) studies.

**BATTERY MODELING**

*Wednesday, October 24, 13:00*

In this minicourse, you will learn to model batteries with a focus on lithium-ion batteries, including transport of ions, porous electrodes, and electrode reactions. You will also get an introduction to the corresponding couplings to heat transport for performing thermal simulations. We will address how to simulate various transient phenomena such as constant current–constant voltage (CCCV) charge/discharge cycling, electrochemical impedance spectroscopy (EIS), and capacity fade.

**PARTICLE TRACING IN FLUIDS**

*Wednesday, October 24, 8:30*

Lagrangian particle tracking is often used as a complement to Eulerian methods that solve for fluid flow fields. In this course, we will explain how to use the Particle Tracing Module to predict the motion of solid particles, droplets, and bubbles in a surrounding fluid. We will outline some of the myriad built-in forces included in the Particle Tracing for Fluid Flow interface, including lift, drag, electromagnetic, thermophoretic, and acoustophoretic forces. You will also learn how to accurately model particle dispersion in a turbulent flow.

**POROUS MEDIA FLOW**

*Wednesday, October 24, 13:00*

Porous media surrounds us, whether it is the ground beneath us, paper products, filters, or even biological tissue. In this minicourse, we will explore flow and diffusion in porous media as well as how to treat partially saturated media. We will also cover coupled systems including linked free and porous flows; poroelasticity; and mass convection–diffusion in forced, gravity-fed, and density-driven flows.

**UPDATE TRAINING**

**CAD AND MESHING**

*Tuesday, October 23, 8:30*

In this minicourse, we will discuss and demonstrate recent additions to the functionality for creating and importing geometry and generating meshes in COMSOL Multiphysics®. We will cover topics such as the automatic removal of small details from geometry, using variable dependent size expressions for mesh generation, defining coordinate systems based on work planes and geometry orientations, setting up selections during the import of printed circuit board geometries, and more.

**STRUCTURAL AND ACOUSTICS**

*Tuesday, October 23, 8:30*

Attend this update training minicourse for a roundup of major news for acoustics and structural analysis.

**CHEMICAL**

**CHEMICAL REACTION ENGINEERING**

*Tuesday, October 23, 13:00*

In this minicourse, you will learn how to define chemical kinetics, thermodynamic properties, and transport properties for other modules for electromagnetics, structural, and fluid flow simulation.

**SOLVERS**

*Tuesday, October 23, 13:00*

In this update training minicourse, learn about news for the studies and solvers available in the COMSOL Multiphysics® software. We will go over upgrades to parametric sweeps, adaptation, model reduction, performance-enhancing functionalities, and more.

**FLUID AND CHEMICAL**

*Tuesday, October 23, 15:30*

Stay current with new modeling capabilities for fluid flow and chemical simulations through this update training minicourse.

**SPONSORED WORKSHOP**

**SYNOPSYS SIMPLEWARE™: FROM 3D IMAGES TO MODELS**

*By Synopsys*

*Tuesday, October 23, 8:30*

This minicourse demonstrates the ease of obtaining high-quality models from 3D image data in the Synopsys Simpleware™ software for use in the COMSOL Multiphysics® software. The workflow of processing 3D image data (e.g., from MRI, CT, Micro-CT, and FIB-SEM) to create models for life sciences, materials, and manufacturing applications will be outlined and demonstrated. Learn about the capabilities of the Simpleware™ software for image visualization, segmentation, analysis, and model generation. Examples will also be shown of workflows and case studies combining the Simpleware™ software and the COMSOL Multiphysics® software.

Simpleware is a trademark of Synopsys, Inc. in the U.S. and/or other countries.

**HP Z WORKSTATIONS & COMSOL MULTIPHYSICS® — BECAUSE IT NEEDS MORE THAN JUST HARDWARE**

*By HP*

*Monday, October 22, 11:00*

This minicourse will discuss the collaboration between HP and COMSOL in order to provide state-of-the-art workplaces and workflows to end users in multiphysics simulation.

HP Z Workstations can master very complex data and 3D images as required by the simulation industry. Besides, HP is supporting the newest trends of machine/deep learning and virtual reality. However, HP does not only focus on the hardware but collaborates actively with software vendors to ensure optimized performance. This is why HP is delighted to partner up with COMSOL in order to provide concrete proposals and benchmarking of COMSOL Multiphysics® on selected HP Z Workstations. The minicourse will provide simulation experts with guidance on how to select the best hardware for their purposes and optimize performance.
Simulation and modeling are becoming an integral part of development processes for power electromagnetic systems in the age of sustainable energy resources, electromobility, wireless charging, and the transformation of the electrical grid. Design optimization, protection, and control as well as the thermal management of electromagnetic converters; transducers; filters; and circuit breakers, bearings, and drive systems can benefit massively from the predictive power of multiphysics simulation. In this session, we will discuss current trends and new challenges in modeling EM systems with high voltages, high currents, or high power consumption.

Once an engineering design has been optimized by simulation and modeling, it is typically translated into a real-world object by material processing such as cutting, drilling, welding, texturing, grinding, and polishing as well as printing, sintering or molding. As those methods themselves constitute multiphysics processes, their inclusion in the simulation process brings new opportunities to the optimization of manufacturing. In this session, we will discuss how multiphysics simulation can help address design challenges encountered in materials processing and additive manufacturing.
These user presentations happen simultaneously, choose the ones that most interest you!

**ACOUSTICS**

**Monday, October 22, 14:00**

**Acoustic Modeling of a “Minute Repeater”**
S. Charron¹

¹Intermezzi ingénierie acoustique, Paris, France

**Development of a Wideband Steerable Acoustic Metasurface with COMSOL®**
H. Lissek¹, E. Rivet¹, T. Laurence¹, R. Fleury¹

¹Ecole Polytechnique Fédérale de Lausanne, Signal Processing Laboratory LTS2, Switzerland

**Simulation Absorption Curves on Acoustic Panel With Front Textiles ISO 354**
K. Sánchez Vibæk¹, S. Fernández Pedrón¹

¹Kvadrat Soft Cells A/S, Copenhagen, Nordhavn, Denmark

**CHEMICAL REACTION ENGINEERING**

**Monday, October 22, 14:00**

**Modeling Alpha-Galactosides Behavior during Cowpea Soaking-Cooking for Nutritional Optimization**
A. Briffaz¹, F. Coffignon², C. Mestres¹, P. Bohuon²

¹CIRAD, France
²Montpellier SupAgro, France

**Simulation of a Multicomponent Trace Gas Electric Swing Adsorption**
C. Geitner¹

¹Fraunhofer institute, Oberhausen, North Rhine-Westphalia, Germany

**ELECTROMAGNETICS 1: RF AND MICROWAVE**

**Monday, October 22, 14:00**

**Numerical Study of the Tuning, Pressure Sensitivity and Lorentz Force Detuning of SRF Crab Cavities**
E. Cano-Pleite¹, A. Amorim¹, J. S. Swieszek¹, K. Artoos¹, O. Capatina¹

¹European Organization for Nuclear Research (CERN), Geneva, Switzerland

**Microwave Assisted Vacuum Drying Processing: Magnetron vs Solid State. Case Study: Apple Drying**
C. Bianchi¹, R. Schmid¹, D. Frick¹

¹Gigatherm Mikrowellen AG, Switzerland

**RF Emission Spectra in Laser-Plasma Acceleration of Protons**
M. Seimetz²

²Instituto de Instrumentación para Imagen Molecular (ISIM), CSIC-Universitat Politècnica de València, Spain

**COMSOL® Simulation for Scanning Microwave Microscopic Experiments**
T. Le Quang³, D. Vasyukov¹, A. Buchter¹, J. Hoffmann¹, M. Zeier¹

³Eidgenössisches Institut für Metrologie (METAS), Switzerland

**ELECTROMAGNETICS 2: MICROSCOPY AND PHOTONICS**

**Monday, October 22, 14:00**

**THz-based Deflectors Using Optimized Antenna Design**
M. Hayati¹

¹University of Bern, Switzerland

**Join our Minicourse**

From 3D Images to Models
3D Image Visualization, Analysis and Model Generation

**Simpleware Software Solutions**

**From 3D Images to Models**

3D Image Visualization, Analysis and Model Generation

**October 23, 2018 @8.30 - 9.30**
### USER PRESENTATIONS

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<td>H. Cabrera¹, B. Zengin¹</td>
<td>Laboratory for Solid State Physics, ETH Zürich, Zürich, Switzerland</td>
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<td>Chiral Media Simulation in COMSOL®</td>
<td>E. Mohammadi¹, Y. Jahani¹, K. L. Tsankvakidís¹, H. Altug¹</td>
<td>EPFL University, Lausanne, Switzerland</td>
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<td>Interaction Using COMSOL® Multiphysics®</td>
<td>F. Wirth¹, K. Wegener¹</td>
<td>University of Helsinki, Helsinki, Finland</td>
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<td>Finite Element Prediction of Laser-Material Interaction Using COMSOL®</td>
<td>E.C. Chevallier², V. Brüyère², P. Namy²</td>
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<td>Two-Phase Flow Modeling of Metal Deposition</td>
<td>Y. A. Mayi¹, M. Dal¹, P. Peyre¹, M. Bellet¹, C. Metton¹, C. Moriconi¹, R. Fabbro¹</td>
<td>CEMEF Laboratory, UMR 7635 PSL Research University MINES ParisTech, Sophia Antipolis, France</td>
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<td>Building Physics 1</td>
<td>M. Brevegleri¹, B. Weber¹, C. Czaderski¹</td>
<td>EMPA - Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland</td>
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<td>Heat and Moisture Transport in Wooden Bearings of Monumental Buildings</td>
<td>H. Schellen¹, M. Siering¹, J. van Schijndel¹</td>
<td>DPA Cauberg-Huygen, The Netherlands</td>
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<td>Modeling of Airborne Transmission in Floor System Including Flanking Transmission</td>
<td>D. Bard¹, M. Kuster¹</td>
<td>3ASML, The Netherlands</td>
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<td>Manufacturing 1: Laser</td>
<td>T. Preney¹, P. Namy¹, J.-D. Wheeler¹</td>
<td>LTS2 - Acoustics Group, EPFL, Switzerland</td>
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<td>Thermo-Mechanical Modeling of Laser Beam Welding of Molybdenum</td>
<td>K.-H. Leitz¹</td>
<td>ETH Zurich, Institute of Machine Tools and Manufacturing, Zurich, Switzerland</td>
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<td>Additive Manufacturing of Metal Matrix Composites</td>
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<td>Multiphysics Simulation of a High Frequency Acoustic Microscope Lens</td>
<td>Q. Tommiska¹, J. Mäkinen¹, J. Hyvönen¹, A. Meriläinen¹, A. Salmi¹, E. Hæggström¹</td>
<td>Department of Physics, Division of Materials Physics, University of Helsinki, Helsinki, Finland</td>
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<td>Fully Symmetrical Single-Suspension Electrodynamic Loudspeaker Using a Halbach Array</td>
<td>T. Laurence¹, H. Lissek¹</td>
<td>LTS2 - Acoustics Group, EPFL, Switzerland</td>
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<td>Prediction of Thermoacoustic Instabilities in Combustion Systems - Application to a Simplified Model of a Domestic Boiler</td>
<td>D. Tonon¹</td>
<td>T4G Engineering GmbH, Switzerland</td>
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<td>Boundary Element Method Simulation of Tonal Noise from a Wind Turbine</td>
<td>B. Marmo¹</td>
<td>Xi Engineering Consultants, UK</td>
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<td>Electromagnetics 3: Quasi-Static Fields</td>
<td>M. E. Banda¹, D. Malek¹, J-P. Cambrombre¹</td>
<td>LAPLACE, Université de Toulouse, CNRS, INPT, UPS, France</td>
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<td>Partial Discharge Risk Under Charge Generation and Transport Effects</td>
<td>M. E. Banda¹, D. Malek¹, J-P. Cambrombre¹</td>
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**HEAT 1: GENERAL**

Monday, October 22, 14:00

- Optimum Insulation Thickness Distribution for Heat Loss Uniformity from Heated Corrugated Pipes
  - R. Bouridi¹
  - Kuwait University, Kuwait

**COMSOL® Application to Estimate 3D Blast Furnace Hearth Wear Using Thermocouple Measurements**

- Y. Kaymak¹, T. Hauck¹, J. Mernitz¹, R. Lin¹, H. Rausch²
  - VDEh-Betriebsforschungsinstitut GmbH, Düsseldorf, NW, Germany
  - ArcelorMittal Eisenhüttenstadt GmbH, Eisenhüttenstadt, BB, Germany
  - AG der Dillingen Hüttenerwerke, Dillingen, HL, Germany

**Simulation of an Aerodynamic Furnace for High Temperature Thermodynamic Data Acquisition**

- J.M. Borgard¹, A. Quaini¹, L. Soldi¹, E. Lizon¹, T. Alpettaz¹
  - 1Department of Physics, Division of Materials Physics, University of Helsinki, Helsinki, Finland
  - 2Centre des Matériaux, UMR 7633 MINES ParisTech, Evry, France

**Nanoscale Heat Transfer and Phonon Hydrodynamics**

- A. Beardo¹
  - Universitat Autònoma de Barcelona, Barcelona, Spain

**MANUFACTURING 1: LASER**

Monday, October 22, 14:00

- Thermo-Mechanical Modeling of Laser Beam Welding of Molybdenum
  - K.-H. Leitz¹
  - 1Plansee SE, Reutte, Austria

- Additive Manufacturing of Metal Matrix Composites
  - F. Wirth¹, K. Wegener¹
  - 1ETH Zurich, Institute of Machine Tools and Manufacturing, Zurich, Switzerland

- Finite Element Prediction of Laser-Material Interaction Using COMSOL Multiphysics®
  - E.C. Chevallier², V. Brüyère², P. Namy²
  - 1SIMTEC, Grenoble, France

**ACOUSTICS 2: MULTIPHYSICS**

Tuesday, October 23, 11:00

- Multiphysics Simulation of a High Frequency Acoustic Microscope Lens
  - Q. Tommiska¹, J. Mäkinen¹, J. Hyvönen¹, A. Meriläinen¹, A. Salmi¹, E. Hæggström¹
  - 1Department of Physics, Division of Materials Physics, University of Helsinki, Helsinki, Finland

- Boundary Arbitary Lagrangian-Eulerian and Deformable Boundary Perturbation Method
  - J. Rivero-Rodríguez¹, B. Scheid¹
  - 1Université Libre de Bruxelles, Brussels, Belgium

**BUILDING PHYSICS 1**

Tuesday, October 23, 11:00

- Solar Radiation Effects on the Epoxy Adhesive Temperature Used to Bond CFRP to Concrete Beams
  - M. Brevegleri¹, B. Weber¹, C. Czaderski¹
  - EMPA - Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland

- Heat and Moisture Transport in Wooden Bearings of Monumental Buildings
  - H. Schellen¹, M. Siering¹, J. van Schijndel¹
  - DPA Cauberg-Huygen, The Netherlands

- Modeling of Airborne Transmission in Floor System Including Flanking Transmission
  - D. Bard¹, M. Kuster¹
  - 3Kuster + Partner AG, Switzerland

- Mazar’s Damage Model for Masonry Structures: a Case Study on an Italian Church
  - M. Morì¹, A. De Falco¹, G. Sevieri²
  - 1Università di Pisa, Italy
  - 2Università di Firenze, Italy

**CFD 2: PARTICLE TRACING**

Tuesday, October 23, 11:00

- Virtual Prototyping of UV-LED Based Point-of-Use Water Disinfection Unit
  - P. V. Christensen¹, P. Juul²
  - 1Virtual Water Technology, Silkeborg, Denmark
  - 2Liqtech Systems, Hobro, Denmark

- Numerical Study of the Gas-Powder Flow from Coaxial Nozzles in Laser Metal Deposition
  - E. Ferreira¹, M. Dal¹, P. Peyre¹, C. Colin¹, G. Marion¹, D. Courapied¹, B. Macquaire¹
  - 1PIMM Laboratory, UMR 8006 ENSAM – CNRS – CNAM, Paris, France
  - 2Centre des Matériaux, UMR 7633 MINES ParisTech, Evry, France
  - 3Safran, Paris, France

- Experimental and Modeling Study of the Filtering Capacity of Green Wall Species
  - T. Ysebaert¹, S. Demys¹, G. Walpot¹
  - 1University of Antwerp, Belgium

- Adaptive Mesh Refinement: Quantitative Computation of a Rising Bubble Using COMSOL Multiphysics®
  - T. Preney¹, P. Namy¹, J.-D. Wheeler¹
  - 1SIMTEC, Grenoble, France

- Electromagnetics 3: Quasi-Static Fields
  - Tuesday, October 23, 11:00
  - Partial Discharge Risk Under Charge Generation and Transport Effects
    - M. E. Banda¹, D. Malek¹, J-P. Cambrombre¹
  - 1LAPLACE, Université de Toulouse, CNRS, INPT, UPS, France
### USER PRESENTATIONS

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<td>K. Neumann, J. Moeller, L. Kuehnel, A. Rennings, N. Benson, R. Schmechtig, D. Erni</td>
<td>General and Theoretical Electrical Engineering (ATE), University of Duisburg-Essen, and CENIDE – Center for Nanointegration Duisburg-Essen, Duisburg, Germany 1Institute for Nanostructures and Technology (NST), University of Duisburg-Essen, and CENIDE – Center for Nanointegration Duisburg-Essen, Duisburg, Germany</td>
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<td>Analysis of Heat Transfer From Human Body and Effect of Clothing Surface on Heat Transfer Mechanism</td>
<td>A. Psikuta, A. Joshi, M-A. Bueno, S. Annaheim, R. M. Rossi</td>
<td>1Empa, Swiss Federal Laboratories for Materials Science and Technology, St. Gallen, Switzerland 2Université de Haute Alsace, Laboratoire de Physique et Mécanique Textiles (LPMT EA 4365), Mulhouse, France</td>
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<td>Modeling of Pound Cake Baking Behavior in Continuous Flow</td>
<td>M. Khodeir, O. Rouaud, V. Jury, P. Le-Bail</td>
<td>1ESIEE Amiens, France 2UPJV-LTI, France 3IRF-M2R, France 4CRM Group, France</td>
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<td>2D and 3D Simulation on Thermal Flow Around the Human Body</td>
<td>A. Psikuta, J. Xu, J. Li, S. Annaheim, R. M. Rossi</td>
<td>1Empa, Swiss Federal Laboratories for Materials Science and Technology, Laboratory for Biomimetic Membranes and Textiles, St. Gallen, Switzerland 2Protective Clothing Research Center, College of Fashion and Design, Donghua University, Shanghai, China</td>
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<td>Multiphysics Model for Thermal Management of Packaged Mid-IR Laser</td>
<td>G. Spinola Durante</td>
<td>1CSEM SA, Switzerland</td>
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<td>Modeling of Substrate Plate Preheating to Predict Efficiency in the Electron Beam Melting Process</td>
<td>M. Michatz, S. Janson, G. Schlick, I. Kühne, A. Frey</td>
<td>1University of Applied Science, Faculty of Mechanical Engineering, Augsburg, Germany; Fraunhofer Research Institution for Casting, Composite and Processing Technology IGCV, Augsburg, Germany 2iwb Application Center Augsburg part of the Technical University of Munich (TUM), Augsburg, Germany 3Fraunhofer Research Institute for Casting, Composite and Processing Technology IGCV, Augsburg, Germany 4Heilbronn University, Faculty of Technology and Economics, Künzelsau, Germany 5University of Applied Science, Faculty of Electrical Engineering, Augsburg, Germany</td>
</tr>
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<td>Simulation-Based Analysis of a Microstructuring Process for Bolt Surfaces with Increased Friction</td>
<td>I. Schaarschmidt, M. Hackert-Oschätzchen, G. Meichsner, M. Zinecker, P. Steinert, A. Schubert</td>
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<td>Free Surface Deformation of the Weld Pool in Orbital Narrow Gap GTA Welding</td>
<td>S. Morville, V. Bruyere, P. Namy</td>
<td>1Technical Center FRAMATOME, Le Creusot, France 2SIMTEC, Grenoble, France</td>
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<td>Design of a Mechanical Resonant Station to Free Jammed Micro-Mechanisms</td>
<td>L. Spicci</td>
<td>1Everywave srl, Italy</td>
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<td>Chewing Mechanisms Investigated Using Finite Element Modeling (FEM) for Two Soft Cereal Foods</td>
<td>M. Assad-Bustillos, S. Guessasma, A.L. Reguerre, G. Della-Valle</td>
<td>1INRA, Nantes, France</td>
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<td>Determination of Constitutive Properties Using DIC-Displacement Data and U-FEM</td>
<td>A. Alisha, R. Bourir, J. Considine</td>
<td>1Kuwait University, Kuwait 2Forest Products Laboratory, Madison, WI, US</td>
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<td>Decomposition of Fundamental Lamb Wave Modes in Complex Metal Structures Using COMSOL Multiphysics</td>
<td>M. Harbi, R. Malaeb, E. Mahfoud</td>
<td>1Department of Mechanical Engineering, American University of Beirut, Lebanon</td>
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USER PRESENTATIONS

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ACOUSTICS 3: ROOM ACOUSTICS
Tuesday, October 23, 14:00

Investigation on Quiet Zones Created by Remote Impedance Control
T. Laurence¹, R. Boulandet¹, H. Lissek¹

¹LT52 - Acoustics Group, EPFL, Switzerland

Acoustic metamaterial: from conception to auralization
C. Lagarrigue, D. Lecoq

Metacoustic - www.metacoustic.com, Le Mans, France

A Simulation Test Bench for Decay Times in Room Acoustics
R. Magalotti², V. Cardinali¹

²B&C Speakers S.p.A., Bagno a Ripoli (FI), Italy

Sound Field Reconstruction in Low-Frequency Room Acoustics: A Benchmark Study with Simulation
T. Pham Vu¹, E. Rivet¹, H. Lissek¹

¹Signal processing laboratory LT52, EPFL, Lausanne, Switzerland

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BIOENGINEERING 1
Tuesday, October 23, 14:00

Model of the Cardiac Defibrillation Induced by an Implantable Defibrillator in the Body
I. Rattalino¹, D. Harman², S. Luke³, Philippe Young²

²Simpleware Product Group at Synopsys (Northern Europe) Ltd

Simulation of Acoustically Excited Membrane Waves on an Eye
J. Mäkinen¹, D. Veira Canle¹, T. Ylitalo¹, K. Keim¹, A. Gonçalves¹, C. Guiducci¹

¹École Polytechnique Fédérale de Lausanne - D-MATL, ETH Zürich, Switzerland

Trapping of Single-Cells Within 3D Electrokinetic Cages
K. Keim¹, A. Goncalves¹, C. Guiducci¹

¹École Polytechnique Fédérale de Lausanne - Laboratory of Life Sciences Electronics (Guiducci Lab), Lausanne, Switzerland

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CHEMICAL REACTION ENGINEERING 2
Tuesday, October 23, 14:00

CFD Modeling of a Laboratory-Scale Setup for Thermochemical Materials Performance Analysis
S. Salvati¹, N. Vasile¹, F. Carosiò², G. Saracco², A. Fina²

¹Center for Sustainable Future Technologies, Politecnico di Torino, Italy

Controlling the Deposition Regime in Close-Proximity Spatial Atomic Layer Deposition with COMSOL®
C. Masse de la Huerta¹, V. Nguyen¹, J.-M. Dedulle¹, D. Bellet¹, C. Jiménez¹, D. Muñoz-Rojas¹

¹Univ Grenoble Alpes, CNRS, GEPEA, UMR 6144, Nantes, France

Water Vapor Transmission Through Bagging Materials for Composite Processes
A. Haeberle¹, A. Herrmann¹, P. Fideu²

²Faserinstitut Bremen e.V., Bremen, Germany

Modeling Gate-Tunable Ionic Transport Using Atomically Thin Patterned Graphene Membrane
C.-J. Shih¹, T. Tian¹, R. Wyss¹, K. Yazda¹, H. G. Park³

³D-MAVT, ETH Zürich, Switzerland

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ELECTROMAGNETICS 4: INDUCTION
Tuesday, October 23, 14:00

Use of COMSOL® AC/DC Module to Model a EM Sensor Deployed to Monitor Steel Transformation
J. Shen¹, W. Jacobs¹, L. Zhou¹, P. Hunt¹, C. Davis¹

¹Advanced Steel Research Centre, WMG, University of Warwick, Coventry, UK

Simulation of Quench Behaviour of the 11 T Superconducting Dipole for HL-LHC
M. Mentink¹, B. Achmann¹, L. Bortot¹, M. Maciejewski¹, Marco Prioli¹, E. Ravaoli¹, E. Stubberud¹, A. Verweij¹

¹CERN, Switzerland

Electromagnetic Design of an RF-Coil Transceiver for NQR-Based Explosive Detection
P. Farantatos¹, J. Barras¹, I. Poplett¹, P. Kosmas¹

¹King’s College London, UK

Modeling of High-Speed PCB-Interconnects, Vias and Connectors for the Estimation of Si-Losses
A. K. Palit¹

¹ZF-Lemförder Electronic GmbH (ZF- Friedrichshafen AG), Group, Germany

HEAT 3: PHASE CHANGE
Tuesday, October 23, 14:00

Modeling Water Immersion Thawing of Raw Tuna Fishes
S. Curet¹, O. Rouaud¹, J.M. Bonny², L. Mazuel¹

¹ONIRIS, CNRS, GEPEA, UMR 6144, Nantes, France

Modeling Approach to Facilitate Thermal Energy Management with Phase Change Materials (PCM)
D. Rubinetti¹, D. A. Weiss¹, A. Chaudhuri³, D. Kranidiotis³

¹Institute of Thermal and Fluid-Engineering, University of Applied Sciences and Arts Northwestern Switzerland

²Department of Civil Engineering and Energy Technology, Oslo Metropolitan University, Norway

Using COMSOL Multiphysics® to Simulate Heat Exchanger Fouling by Heterogeneous Barite Crystallisation
F. Cazenave¹, F. Couture¹, P. Bernada¹, J-P. Serin¹

¹Univ Pau & Pays Adour / E2S UPPA, Laboratoire de Thermique, Energetique et Procedes - IPRA, Clermont-Ferrand, France

Numerical Solution of Nonlinear PDEs Exhibiting Soft Bifurcations
A. Boulibitch³

³IEE S.A. Luxembourg
### POROUS MEDIA FLOW
**Tuesday, October 23, 14:00**

Groundwater Flow in the Fractured System Surrounding a Nuclear Waste Repository  
D. Sampietro¹, A. Sáinz-García¹, E. Abarca¹, J. Moliner², H. von Schenck², O. Wessely²  
¹Amphos 21 Consulting S.L., Spain  
²Swedish Nuclear Fuel and Waste Management Company, Sweden

#### Tunable Flat-Plate Absorber Design for Active Sound Absorption
R. Boulantet¹, K. O. Bjornsson¹, H. Lissek²  
¹Ecole Polytechnique Fédérale de Lausanne, Switzerland

### BIOBIOENGINEERING 2
**Wednesday, October 24, 11:00**

Optimizing Elastomeric Mechanical Cell Stretching Device  
A-J. Mäki¹, J. Kreutzer¹, P. Kallio¹  
¹BioMediTech Institute and Faculty of Biomedical Sciences and Engineering, Tampere University of Technology, Tampere, Finland

#### Characterization of Biochemical and Physical Parameters of a Skin Equivalent in a Two-Organ-Chip
H-H. Hsu¹, K. Schimek², G. Lindnder³, J. Jan Kornet¹, Moritz Boehme¹, Uwe Marx¹, Ralf Pörtner¹  
¹Institute of Bioprocess- and Biosystems Engineering, Hamburg, Germany  
²Department of Biotechnology, Berlin, Germany and TissUse GmbH, Berlin, Germany  
³TissUse GmbH, Berlin, Germany

#### Magnetic Fields for Cell Cultures Suspended in a Perturbed Diamagnetic Medium
P. Ferrada¹, G. Serrano², C. M. Ostojic², A. Maureira², M. Zapata², E. Fuentealba¹  
¹Centro de Desarrollo Energético Antofagasta, Universidad de Antofagasta, Antofagasta, Chile  
²Laboratorio de Biotecnología Algal y Sustentabilidad, Universidad de Antofagasta, Antofagasta, Chile

#### Electrodeposition of 3D Nickel Microcomponents: Simulation Assisted Synthesis
P. Schürch¹, L. Pethö¹, J. Schwiedrzik¹, J. Michler¹, L. Philippe¹  
¹Empa Thun, Switzerland

### BUILDING PHYSICS 2
**Wednesday, October 24, 11:00**

A Model of Concrete Carbonation Using COMSOL Multiphysics³  
B. Chine¹, R. Cuevas², R. Jimenez¹, A. Rodriguez¹  
¹Costa Rica Institute of Technology, School of Materials Science and Engineering, Cartago, Costa Rica  
²Costa Rica Institute of Technology, School of Construction Engineering, Cartago, Costa Rica

#### Alternative Implementation of a Porous Media Model for Simulating Drying of Heated Concrete
B. Weber¹  
¹Empa - Swiss Federal Laboratories for Materials Testing and Research, Duebendorf, Switzerland

#### Mechanical Damage Models for Concrete
M. Lavíňa¹, A. Idíri²  
¹Amphos 21 Consulting S.L., Barcelona, Spain

### ACOUSTICS 4: MULTIPHYSICS
**Wednesday, October 24, 11:00**

Numerical Modeling of Viscous Damping for Acoustic Resonances of Suspended Microparticles  
T. Baasch¹, J. Funkhauser¹, J. Dual¹  
¹ETH Zurich, Zurich, Switzerland

#### Acoustic Upside-Down Levitator with a Solid Sample
L. Holitzner¹, E. G. Lierke²  
¹Paul Scherrer Institut (PSI), Villigen PSI, Switzerland  
²tec5 AG, Oberursel, Germany

#### Ultrasound Pressure Field of a Resonating Piezoelectric Membrane with Three Excitation Electrodes
V. Tzanov¹, E. Ledesma¹, F. Torres¹, N. Barniol¹  
¹Universitat Autonoma de Barcelona, Spain

### ELECTROCHEMISTRY
**Wednesday, October 24, 11:00**

Influence of a Porous Corrosion Product Layer on the Corrosion Phenomenon of Carbon Steel Pipelines  
M. Mohamed-Saïd¹, P. Namy¹  
¹SIMTEC, Grenoble, France

#### Electrodeposition of 3D Nickel Microcomponents: Simulation Assisted Synthesis
P. Schürch¹, L. Pethö¹, J. Schwiedrzik¹, J. Michler¹, L. Philippe¹  
¹Empa Thun, Switzerland

#### Advanced Particle-Based 3D Modeling of Fuel Cell Electrodes
A. Bertei¹, V. Yuft², F. Tariq², N.P. Brandon²  
¹University of Pisa, Pisa, Italy  
²Imperial College London, London, UK

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USER PRESENTATIONS

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**Electromagnetics 5: Forces and Motion**
**Wednesday, October 24, 11:00**

**Transient Modeling of a Fluorine Electrolysis Cell Using COMSOL Multiphysics®**
E. Oosthuizen¹, P. L. Crouse¹
¹University of Pretoria, Pretoria, South Africa

**Design and Simulation of Cyclotron Magnet Using COMSOL Multiphysics®**
F. Alrumayyan¹, A. Hendy¹, H. Kassim¹
¹King Faisal Specialist Hospital and Research Centre, Saudi Arabia
²King Saud University, Saudi Arabia

**ELT M4 Adaptive Mirror Actuator: Magnetic Optimization and Future Developments**
C. Del Vecchio¹, R. Biasi¹, D. Gallieni¹, A. Riccardi¹
¹National Institute for Astrophysics - Arcetri Astrophysical Observatory - Firenze, Italy
²Microgate Spa - Bolzano, Italy
³ADS International Srl - Valmadonna (LC), Italy

**Simulation of Thermal Breakdown in a Multi-Layered Stack of Dielectric Elastomers**
L. R. Madsen¹, O. Hassager¹, A. L. Skov¹
¹Danish Polymer Centre, DTU Chemical Engineering, Lyngby, Denmark

**Analysis of the Behavior in a Squirrel Cage Motor under Electrical Internal Fault**
D. A. Aguilar Arévalo¹, H. D. Puin Avila¹, H. E. Ortiz Suárez¹
¹Universidad Distrital Francisco José de Caldas, Bogota, Colombia

**Manufacturing 3: General**
**Wednesday, October 24, 11:00**

**Thermal Simulation of a Heat Pipe Tempered Injection Mould Tool**
S. Kartelmeyer¹, C. Jaroschek¹, L. Fromme¹, V. Hüttemann¹, E. Moritzer²
¹University of Applied Sciences Bielefeld, Department of Engineering Sciences and Mathematics, Bielefeld, Germany
²Paderborn University, Department of Plastics Engineering (KTP), Paderborn, Germany

**Multiphysics Simulation of the Material State in Single-Screw Extruder**
S. Yan¹, H. Zeizinger¹
¹Polymertechnology Powertrain, Daimler AG, Stuttgart, Germany

**2D Simulation of Crimping Process for Electric Vehicle Battery Charge Cable**
O. Ozgonenel¹, O. Bostan², S. Guzel²
¹Ondokuz Mayis University, Samsun, Turkey
²DE-KA, Kocaeli, Turkey

**Plasma and MHD**
**Wednesday, October 24, 11:00**

**Transient Simulation of the Removal Process in Plasma Electrolytic Polishing of Stainless Steel**
I. Danilov¹, M. Hackert-Oschätzchen¹, I. Schaarschmidt¹, M. Zinecker¹, A. Schubert¹
¹Professorship Micromanufacturing Technology, Chemnitz University of Technology, Chemnitz, Germany

**Finite Element Simulation of Impulse Arc Discharge**
A. Chusov¹, E. Rodikova¹, M. Pinchuk², Y. Murashov³, Vladimir Frolov³, Dmitriy Ivanov³
¹Streamer Electric Inc., St. Petersburg, Russia
²Institute for Electrophysics and Electrical Power, St. Petersburg, Russia
³St. Petersburg Polytechnical University, Russia

**Simulation of CVD Process in a Reactor**
A. Kulkarni¹, F. Mumme¹, V. Frettloh¹
¹Gemeinnützige KIMW Forschungs-GmbH, Lüdenscheid, NRW, Germany
Spatial Dynamics of Insecticide Resistance in Mosquitoes
O. Richter
¹University of Technology Braunschweig, Germany

Computational Modeling of Drug Release from an Ocular Iontophoretic Drug Delivery Device
J. Naghipoor1, N. Jaafary², T. Rabczuk¹
¹Institute of Structural Mechanics, Bauhaus University of Weimar, Weimar, Germany
²Augenärzte am Meer, Wilhelmshaven, Germany

Design and Implementation of SF6 Gas Insulated Medium Voltage Instrument Transformer
O. Ozgonenel¹, B. Cepken², B. Cilsal²
¹Ondokuz Mayis University, Samsun, Turkey
²ESITAS, Istanbul, Turkey

Easy Teaching of Numerical Simulation of Welding with COMSOL®
I. Tomashchuk¹, R. Sallamand², J.-P. Chateau-Cornu³
¹Laboratoire Interdisciplinaire Carnot de Bourgogne, Université de Bourgogne-Franche-Comté, Le Creusot, France
²COMSOL Multiphysics GmbH, Goettingen, Germany
³Center for Nanointegration Duisburg-Essen (CENIDE), University of Duisburg-Essen, Germany

COMSOL Multiphysics® Contribution to the Current Knowledge of the Proton Mass
M. Schuh¹
¹Max-Planck-Institut für Quantenoptik, Garching, Germany

3D-Printed Microfluidic Chip System for Dielectrophoretic Manipulation of Colloids
I. Kuehne¹, N. Philippin¹, M. Michatz¹, A. Frey¹
¹Heilbronn University of Applied Science, Kuenzelsau, Germany

COMSOL Multiphysics® Models as the Design Guidance in the Selected Transport Phenomena Problems
S. Spotar¹
¹University of Pisa, Pisa, Italy

Empirical Verification of COMSOL® - Simulation of Resonance Frequency of an Archimedean Spiral Coil
M. P. Adams¹, K. P. Koch¹
¹Hochschule Trier, Trier, Rhineland Palatinate, Germany

Adaptive Mesh Refinement: Quantitative Computation of a Rising Bubble Using COMSOL Multiphysics®
T. Preney¹, P. Nanny¹, J.-D. Wheeler¹
¹SIMTEC, Grenoble, France

Simulation of an Electrically Heated Carbon Fibre Fabric
L. Fromme¹, H. Funke¹, J. Stückemann¹, P. Tschöke¹
¹Bielefeld University of Applied Sciences, Faculty of Engineering and Mathematics, Bielefeld, Germany

Numerical Optimization of Active Heat Sinks Considering Restrictions of Selective Laser Melting
F. Lange¹, C. Hein¹, C. Emmelmann¹
¹Fraunhofer Institute for Production Technologies IAPT, Hamburg, Germany

Reducing Loudspeaker Systems Panel Vibrations
D. Cinanni¹
¹ASK Industries Spa, subject to direction and coordination of JVCKENWOOD Corporation, Italy

Study of the Optical Field Scattering Enhancement on a 2D Rough Surface Using COMSOL Multiphysics®
P. de Carvalho Gomes¹, P. Goldberg Oppenheimer¹
¹School of Chemical Engineering, University of Birmingham, UK

Iterative Electric Potential Adjustment of Damaged Naval Vessels Using the Onboard ICCP-System
C. Thie¹, K. Neumann¹, C. Broecheler¹, F. Ludwar¹, A. Remnings¹, J. Doose¹, D. Emm¹
¹General and Theoretical Electrical Engineering – Center for Nanointegration Duisburg-Essen, Duissburg, Germany
²Technical Center for Ships and Naval Weapons, Naval Technology and Research (WTD 71), Eckernförde, Germany

Numerical Prototyping of Locally Heated Digital Microfluidic Devices
C. Ozen¹, G. Sathyanarayanan¹, S. Cito¹, T. Sikane¹
¹Faculty of Pharmacy, Drug Research Programme, University of Helsinki, Helsinki, Finland
²Department of Mechanical Engineering, Covrigi University, Traragona, Spain

Phase Field Modeling of Phase Separation and Dendrite Growth
A. Berteli¹, A. Lamorgese¹, R. Mouri¹, B. Tellini¹
¹University of Pisa, Pisa, Italy

Experimental Setup to Investigate the Liquid Water Content in Snow
A. Coulin¹
¹SLF Davos, ETH Zurich, Switzerland

Design of an AC Transformer in the MHz Range
D. Martinet¹, Ch. Ellert¹
¹University of Applied Sciences Western Switzerland (HES-SO Valais-Wallis), Institute of Systems Engineering, Sion, Switzerland

Optimization of Static Magnetic Fields for Neutron Science
M. Schneider¹
¹SwissNeutronics AG, Klingnau, Switzerland

Magneto-Mechanical-Thermal Couplings for the Pulsed Magnetic Technology with Single-Turn Coils
O. Maloberti¹, P. Sansen¹, D. Jouaffre¹, D. Haye²
¹ESIEE Amiens, France
²PFT Innovatech, France

Electromagnetic Analysis of Flat Spiral Coils Fed by a Current Pulse at Medium Frequency
O. Maloberti¹, P. Sansen¹, O. Mansouri¹, D. Jouaffre¹, D. Haye²
¹ESIEE Amiens, France
²PFT Innovatech, France

Integrating Geological Structures into 3D Numerical Groundwater Flow Models
S. Scheidler¹, B. Anders¹, H. Dressmann¹, P. Huggenberger¹
¹University of Basel, Department of Environmental Sciences, Applied and Environmental Geology (AUG), Basel, Switzerland

Characterization of an Open GTEM Cell with the COMSOL Multiphysics® Software
A. De Vita¹, R. Gaffoglio², B. Sacco³
¹RAI - Radiotelevisione Italiana, Italy
²Polito, Italy

Modeling Convective Heat Transfer in the Porous Active Layer of an Alpine Rock Glacier
J. Wicky¹, M. Scherer¹, Ch. Hauck³
¹Alpine Cryosphere and Geomorphology Group, University of Fribourg, Switzerland

Developing the A-V Magnetic and Electric Fields Formulation for 3D Models in Transient States
O. Maloberti¹
¹ESIEE Amiens, France

Modeling and Experimental Evaluation of Structured Powder Dissolution
H. Teichmann¹, N. Ruprecht¹, R. Kohlus¹
¹University of Hohenheim, Stuttgart, Germany

Simulating Approaches for Heating Process in Continuous Furnaces
G. Petrone¹, R. Sinatra¹, C. Barbagallo¹
¹BE CAE & Test, Italy

Eigenfrequency-App for University Laboratory Educations
A. Frey¹, R. Grossmann¹, T. Koch¹, I. Kuehne³
¹University of Applied Science, Faculty of Electrical Engineering, Augsburg, Germany
²COMSOL Multiphysics GmbH, Goettingen, Germany
³Heilbronn University of Applied Science, Kuenzelsau, Germany

Investigation of a Silicon Etching Process with COMSOL®
D. Kray¹, L. Leis¹
¹University of Applied Sciences Offenburg, Germany

PIR Sensor Modeling and Simulation Using COMSOL Multiphysics® and its Ray Optics Module
M. Maaspuro¹
¹School of Electrical Engineering, Aalto University, Finland
Application for Construction and Numerical Analysis of New Melting Elements
L. Streha1, S. Kovač2, D. Janc3
1ETI d.o.o., Izlaje, Slovenia

Pore-Scale Modeling of Immiscible Two-Phase Flow in Predominantly 2D Microfluidic Porous Domains
A. Dollari1, A. Yiotsis1, A. Zarikos2, N. Karadimitriou2, S.M. Hassanizadeh2
1Environmental Research Laboratory, NCSR "Demokritos", Athens, Greece
2Environmental Hydrogeochemistry Group, Utrecht University, The Netherlands

Numerical Study of Membrane Polarization for a Network of Connected Pores
N. Rezaii1, A. Hördt1
1Braunschweig University of Technology, Institute for Geophysics and Extraterrestrial Physics, Braunschweig, Germany

Modeling of Electrodynamic in High Temperature Superconducting Magnets with COMSOL Multiphysics®
L. Bertot1, M. Mentink1, D. Janc1, L. Strehar1, S. Kovač1, D. Janc1
1Department of Physics, IST, Technical University of Denmark, Copenhagen, Denmark

Methodology to Assess the Impact of Electrochemical Model Parameters Based on Design of Experiments
L. Ocá1, E. Miguel1, L. Otągai1, A. Villaverde1, U. Iraola1
1CINaM, Université de la Méditerranée, Aix Marseille Université, France

Solid Hydrogen Extrusion Modeling
N. Luchier1, S. Michaux1, D. Chatain1
1Department of Mechanical Engineering, Technical University of Denmark, Lyngby, Denmark

To a Fluidic Diode for Biomedical Application
A. Slam1, V. Tishkova2, R. Grossier2, M. Lagaize2, A. Slami1, 2, V. Tishkova2, R. Grossier2, M. Lagaize2, A. Slami1
1DRF/INAC/SBT, CEA-Université Grenoble Alpes, Grenoble, France
2SIMTEC, Grenoble, France

Photonic and Numerical Study of Loudspeaker Diaphragm Geometry
A. Cabrera1, B. Zengin2
1Laboratory for Solid State Physics, ETH Zürich, Zürich, Switzerland
2Department of Physics, Istanbul Technical University, Turkey

Thermo-electric Generators with Air/Water Cooling and Novel Metamaterial Components
D. Buna1, D. Tafone1, L. Hohxa1
1Ramapo College of NJ, USA

COMSOL Multiphysics® Bio-Cellular Tunneling Model
E. Lacatus1
1Politechnic University of Bucharest, Romania

Graphene-Assisted Lipid Bilayer: A Synthetic Cell Model
E. Lacatus1
1Politechnic University of Bucharest, Romania

A Study of HV Capacitor Series Element Failure
C. Mackinnon1, B. Stewart1
1University of Strathclyde, Glasgow, UK

Homogenization of Fiber Composite Material Properties: An Adaptive Multi-physics Implementation
J. Stol1, P. Fideu2, A. Herrmann1
1Faserinstitut Bremen e.V., Bremen, Germany
2Airbus Operations GmbH, Hamburg, Germany

Improving the Performance of Instant-Fit Earpieces by Making Use of FE-Analyses
D. Stauske1, S. Kahms1
1Institute of Dynamics and Vibration Research, Hannover, Lower Saxony, Germany

Numerical Investigation of Electrolyte Flow in a Multi-Cathode System for Electrochemical Machining
M. Penzel1, I. Schaarschmidt1, M. Hackert-Oschätzchen1, A. Schubert1
1Professorship Micromanufacturing Technology, Chemnitz University of Technology, Chemnitz, Germany

Multiphysics Modeling of a Fluorine Production Cell
J. Vukasin1, P. Namy2, J. Sanchez-Marcano3
1Orano Cycle, HRP BP 16, Pierrelatte, France
2SIMTEC, Grenoble, France
3Institut Européen des Membranes – UMR 5635 - Université de Montpellier, Montpellier, France

Advanced Loudspeaker Calculator – an Example of COMSOL® Apps Utilization
F. Malbos1, M. K. Bogdanski2, M. Strauss3
1Harman France, VPDT, Paris, France
2Harman International, VPDT, Straubing,Germany

Using COMSOL® for the Development of the UK’s Second Hyperloop Prototype
A. Jocas1, I. C. H. Chan1, A. Malekos1, H. P. Chan1
1The University of Edinburgh, UK

Frequency Dependent UEP Signatures of Naval Vessels Modeled by a Current Dipole
C. Broehlner1, Ch. Thiél1, A. Rennings1, F. Ludwar2, J. Doose1, D. Erni3
1General and Theoretical Electrical Engineering (ATE), University of Duisburg-Essen, and CENIDE- Center for Nanointegration Duisburg-Essen, Duisburg, Germany
2Technical Center for Ships and Naval Weapons, Naval Technology and Research (WTD71), Eckernförde, Germany

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Join us on Thursday evening at 16:30 to meet the authors. Don’t forget to vote for your favorite poster!
Simulation of Lattice Structures in Orthopedic Corsets
W. Rieder¹
¹Switzerland Innovation Park Biel-Bienne, Switzerland

Batteries for Electric Vehicles – Cathode Microstructure Design
J. Wegener¹, V. Glavas¹, A. Latz²
¹Volkswagen AG, Wolfsburg, Germany
²Institute of Engineering Thermodynamics, German Aerospace Center (DLR), Stuttgart, Germany; Institute of Electrochemistry, University of Ulm, Ulm, Germany

Hygrothermal Evaluation of Timber Building Envelope Exposed to Future Climate Changes
S. Ameri¹, N. Rüther¹
¹Fraunhofer Institute for Wood Research, Wilhelm-Klauditz-Institut, Braunschweig, Lower Saxony, Germany

Multiscale and Multiphysics Modeling of an Adaptive Material for Sound Absorption
T. G. Zielinski¹, K. C. Opiela¹
¹Institute of Fundamental Technological Research of the Polish Academy of Sciences, Warsaw, Poland

Hot Cracking in Nb–Si Alloys
I. Y. Fernando¹
¹University of Leicester, Leicester, UK

The Numerical Challenges in Multiphysical Modeling of Laser Welding with ALE
I. Tomashchuk¹, I. Bendaoud¹, J.-M. Jouvard¹, P. Sallaml¹
¹Laboratoire Interdisciplinaire Carnot de Bourgogne, Université de Bourgogne-Franche-Comté, Le Creusot, France

J-Integral Evaluation for Through Silicon Vias
R. Coppeta¹, C. Hartler¹, J. Siegert¹
¹ams AG, Premstaetten, Austria

Numerical Approaches to Modeling of WGM Resonator and Waveguide Coupling
N. M. Kondratiev¹
¹Russian Quantum Center (RQC), Skolkovo, Moscow, Russia

Acoustic Modeling of a "Minute Repeater" Church Structures: a Case Study on an Italian Church
S. Charron¹
¹Intermezzi ingénierie acoustique, Paris, France

COMSOL® Application to Estimate 3D Blast Furnace Hearth Wear Using Thermocouple Measurements
Y. Kaymak¹, T. Hauck¹, J. Mernitz², R. Lin³, H. Rausch³
¹VDEh-Betriebsforschungsinstitut GmbH, Düsseldorf, NW, Germany
²ArcelorMittal Eisenhüttenstadt GmbH, Eisenhüttenstadt, BB, Germany
³AG der Dillinger Hüttenwerke, Dillingen, SL, Germany

Microwave Assisted Vacuum Drying Processing: Magnetron vs Solid State. Case Study: Apple Drying
C. Blanchi¹, R. Schmid¹, D. Frick¹
¹Gigatherm Mikrowellen AG, Switzerland

Asymmetric Cell-to-Cell Interfaces: Challenges of Mass and Heat Transport in Lithium-Ion Batteries
S. Sallamand¹, I. Tomashchuk¹, I. Bendaoud², J.-M. Jouvard¹, P. Sallaml¹
¹Laboratoire Interdisciplinaire Carnot de Bourgogne, Université de Bourgogne-Franche-Comté, Le Creusot, France
²Laboratoire de Mécanique et Génie Civil, Université de Montpellier, France

COMSOL® Simulation of Flash Lamp Fabrication
P. Nakate¹, D. Lahaye¹, C. Vuik¹, M. T Alice²
¹EPFL - EPFLoop, Lausanne, Switzerland
²Università di Firenze, Italy

2D Simulation of Crimping Process for Electric Vehicle Battery Charge Cable
O. Ozgonenel¹, O. Bostan², S. Guzel³
¹Gigatherm Mikrowellen AG, Switzerland
²Grupo Tragsa – SEPI, Spain
³Tecnológico de Monterrey – Celaya, Mexico

A Computational App for a Proper Evaluation of the Irrigation Effect Over the Aquifers
D. Sampaio¹, J. Molinero¹, E. Fernández²
¹University of Applied Sciences Bielefeld, Germany
²University of Northampton, UK

COMSOL® Simulation of Laser-Excited Surface Acoustic Waves Travelling on a Steel Hemisphere Shell
J. Mäkinen¹, D. Veira Canle¹, D. Veira Canle¹, R. Blomqvist¹, J. Mäkinen¹, D. Veira Canle¹, D. Veira Canle¹, R. Blomqvist¹
¹École Polytechnique Fédérale de Lausanne - Laboratory of Life Sciences Electronics (Guiducci Lab), Lausanne, Switzerland

Hydrophobic Surface Design in Lithographic Lithography
P. Sallamand¹, I. Tomashchuk¹, I. Bendaoud², J.-M. Jouvard¹, P. Sallaml¹
¹Laboratoire Interdisciplinaire Carnot de Bourgogne, Université de Bourgogne-Franche-Comté, Le Creusot, France
²Laboratoire de Mécanique et Génie Civil, Université de Montpellier, France

Simulation of Laser Welding with ALE
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Development of a Mathematical Model for an Anode Baking Process with COMSOL Multiphysics®
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Detailed Axial Symmetrical Model of Large-Scale Underground Thermal Energy Storage
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Thermal Simulation of a Heat Pipe Tempered Injection Mould Tool
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Simulation of Ultra-Deep Water Oilfield Structures
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Simulation of Integrated Sensors Based on Cold Atom Technology
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Modeling the Hyperloop with COMSOL®: on the Design of the EPFLoop Pressurized Capsule
Z. Sajó¹, L. Benedetti¹, N. Riva¹
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Modeling the Hyperloop with COMSOL®: on the Aerodynamics Design of the EPFLoop Capsule
N. Riva¹, L. Benedetti¹, Z. Sajó¹
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COMSOL® Simulation of Flash Lamp Annealing for Battery Electrodes Fabrication
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Fatigue Assessment of Welded Pipelines in Ultra-Deep Water
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Acoustic Modeling of Laser Welding with ALE
I. Tomashchuk¹, I. Bendaoud¹, J.-M. Jouvard¹, P. Sallaml¹
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Simulation of Laser-Excited Surface Acoustic Waves Travelling on a Steel Hemisphere Shell
J. Mäkinen¹, D. Veira Canle¹, R. Blomqvist¹, J. Mäkinen¹, D. Veira Canle¹, R. Blomqvist¹
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Numerical Approaches to Modeling of WGM Resonator and Waveguide Coupling
N. M. Kondratiev¹
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Solar Active Plaster for the Renovation of Existing Buildings
S. Malz¹
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Chiral Media Simulation in COMSOL®
E. Mohammadi¹, Y. Jahanî¹, K. L. Tsakmakidis¹, H. Altug¹
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Simulation of Thermal Breakdown in a Multi-Layered Stack of Dielectric Elastomers
L. R. Madsen¹, O. Hassager¹, A. L. Skov¹
¹Danish Polymer Centre, DTU Chemical Engineering, Lyngby, Denmark

Trapping of Single-Cells Within 3D Electrokinetic Cages
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Mazar’s Damage Model for Masonry Structures: a Case Study on an Italian Church
M. Morî¹, A. De Falco¹, G. Sevieri¹
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²Università di Firenze, Italy

COMSOL® Application to Estimate 3D Blast Furnace Hearth Wear Using Thermocouple Measurements
Y. Kaymak¹, T. Hauck¹, J. Mernitz², R. Lin³, H. Rausch³
¹VDEh-Betriebsforschungsinstitut GmbH, Düsseldorf, NW, Germany
²ArcelorMittal Eisenhüttenstadt GmbH, Eisenhüttenstadt, BB, Germany
³AG der Dillinger Hüttenwerke, Dillingen, SL, Germany

Microwave Assisted Vacuum Drying Processing: Magnetron vs Solid State. Case Study: Apple Drying
C. Blanchi¹, R. Schmidt¹, D. Frick¹
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Acoustic Modeling of a "Minute Repeater" Church Structures: a Case Study on an Italian Church
S. Charron¹
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Transient Simulation of the Removal Process in Plasma Electrolytic Polishing of Stainless Steel
I. Danilov¹, H. Hackert-Oschätzchen¹, I. Schaarschmidt¹, M. Zinecker¹, A. Schubert¹
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Thermal Simulation of a Heat Pipe Tempered Injection Mould Tool
S. Karltepian¹, C. Jaroschek¹, L. Fromme¹, V. Hüttemann¹, E. Moritzer²
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²Paderborn University, Department of Plastics Engineering (KTP), Paderborn, Germany

POSTER SESSION

Join us on Thursday evening at 16:30 to meet the authors. Don’t forget to vote for your favorite poster!
Influence of a Porous Corrosion Product Layer on the Corrosion Phenomenon of Carbon Steel Pipelines
M. Mohamed-Salih¹, P. Namy³
¹SIMTEC, Grenoble, France

Multiphysics Approach to Sediment Transport in Shallow Water
E. Holzbecher¹, A. Hadidi¹
¹German Univ. of Technology in Oman

Mechanical Damage Models for Concrete
M. Lavina², A. Idarti¹
²Amphos 21 Consulting S.L., Barcelona, Spain

Simulation of CVD Process in a Reactor
A. Kulkarni¹, F. Mumme¹, V. Frettö³
Gesellschaft für wissenschaftliche Vermittlung und Forschung mbH, Münster, Germany

COMSOL® Application Builder Lets End-Users Harness the Power of Numerical Modeling and Simulation
J. Speyer³, A. Maurer¹, D. Enfrun¹, R. Rozsyn°
³MNCM/HES-SO, Geneva, Switzerland

Controlling the Deposition Regime in Close-Proximity Spatial Atomic Layer Deposition with COMSOL®
C. Masse de la Huerta¹, V. Nguyen¹, J.-M. Dedulle¹, D. Bellet¹, J. M. Jiménez¹, D. Muñoz-Rojas¹
¹Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, Grenoble, France

Multiphysics Simulation of the Material State in Single-Screw Extruder
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Modeling of Random Nanostructures Based on SEM Images and Analysis of Resulting RF-Performance
K. Neumann¹, J. Moeller¹, L. Kuehnel², A. Hadidi¹, N. Benson², R. Schmechel², D. Erni¹
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Simulation of an Aerodynamic Furnace for High Temperature Thermodynamic Data Acquisition
J.M. Borgard¹, A. Quaini¹, L. Soldi¹, E. Lizon¹, T. Alpettaz¹
¹CEA Saclay, Plan les ouates, Switzerland

Optimum Insulation Thickness Distribution for Heat Loss Uniformity from Heated Corrugated Pipes
R. Bourisli¹
¹Kuwait University, Kuwait

Energy Harvesting in a Fluid Flow Using Piezoelectric Materials
M. Curatolo¹, M. La Rosa¹, P. Prestininzi¹
¹Roma Tre University, Rome, Italy

Ultrasonic Pressure Field of a Resonating Piezoelectric Membrane with Three Excitation Electrodes
V. Tzanov¹, E. Lesedesa¹, F. Torres¹, N. Barniol¹
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Finite Element Prediction of Laser-Material Interaction Using COMSOL Multiphysics®
E.C. Chevallier¹, V. Bruyère¹, P. Namy³
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Acoustic Upside-Down Levitator with a Solid Sample
L. Holitznér¹, E. G. Lierke¹
¹Paul Scherrer Institut (PSI), Villigen PSI, Switzerland

Modeling Gate-Tunable Ionic Transport Using Atomsically Thin Patterned Graphene Membrane
C.-J. Shi¹, T. Tian¹, R. Wyss¹, K. Hazda¹, H. G. Park¹
¹D-MAT, ETH Zürich, Switzerland

Modeling Water Immersion Thawing of Raw Tuna Fishes
S. Curet¹, O. Rouaudi¹, J.M. Bonny², L. Mazuel²
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Nanoscale Heat Transfer and Phonon Hydrodynamics
A. Beardo¹
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Magnetic Fields for Cell Cultures Suspended in a Perturbed Diamagnetic Medium
P. Ferrada¹, G. Serrano¹, C. M. Ostojcic¹, A. Maureira², J. M. Zapa², E. Fuenlealba¹
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Simulation-Based Analysis of a Microstreaming Process for Bolt Surfaces with Increased Friction
I. Schaarschmidt¹, M. Hackert-Oschätzchen¹, G. Meichsner¹, M. Zinecker¹, P. Steinert1, A. Schuber ¹, ²
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Groundwater Flow in the Fractured System Surrounding a Nuclear Waste Repository
D. Sampietro¹, A. Sáinz-García¹, E. Abascal¹, J. Molinero¹, H. von Schenck¹, C. Wessel¹
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A Black-Oil Model for Primary and Secondary Oil-Recovery in Stratified Petroleum Reservoirs
A. Dollari¹, Ch. Chatzichristos¹, A. Yiotsis¹
¹National Center for Scientific Research Demokritos, Greece

Multiphysics Model for Thermal Management of Packaged Mid-IR Laser
G. Spinola Durante¹
¹CSEM SA, Switzerland

Two-Phase Flow Modeling of Metal Vaporisation under Static Laser Shot Using a Double ALE Method
Y. A. Majli¹, M. Dal¹, P. Peyre¹, M. Bellet¹, C. Metton¹, C. Moriconi¹, R. Fabbro²
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Numerical Study of the Gas-Powder Flow from Coaxial Nozzles in Laser Metal Deposition
E. Ferreira¹, M. Dal¹, P. Peyre¹, C. Colin¹, G. Marion¹, D. Courapiéd³, B. Macquaire³
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Electromagnetic Design of an RF-Coil Transceiver for NQR-Based Explosive Detection
F. Farantatos¹, J. Barras¹, I. Poplett¹, P. Kosmas³
³University of Helsinki, Helsinki, Finland

RF Emission Spectra in Laser-Plasma Acceleration of Protons
M. Seimetz²
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Ultrasonic Power Delivery Through a Steel Wall - Water Interface
P. Molanen¹, A. Salmi¹, H. Haggström¹
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When Precise Numerical Predictions Come to the Rescue of Liquid Lubrication
J.-D. Wheeler¹, V. Bruyère¹, P. Namy³
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Modeling the Hyperloop with COMSOL®: on the Mechanical Design of the EPFLoop Capsule
L. Benedetti¹, Z. Sajól¹, N. Riva¹
¹EPFL - EPFLoop, Lausanne, Switzerland

Numerical Study of the Tuning, Pressure Sensitivity and Lorentz Force Detuning of SRF Crab Cavities
E. Cano-Pleite¹, A. Amorim¹, . S. Swieszek¹, K. Artoos¹, O. Capatina³
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Additive Manufacturing of Metal Matrix Composites
F. Wirth³, K. Wegener³
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Electrodeposition of 3D Nickel Microcomponents: Simulation Assisted Synthesis
P. Schürch¹, L. Pethö¹, J. Schwiedrzik¹, J. Michler³, L. Philippe³
³Empa Thun, Switzerland

Optimization for Improving Efficiency on Membrane Reactor for WGS Reaction
D.Y. Shin, T.E. Kim, J.Y. Lee
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Simulation as Various Operating Condition for High Temperature Magnesium Hydride Reactors
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Modeling of Airborne Transmission in Floor System Including Flanking Transmission
D. Bard¹, M. Kuster¹
¹Kuster + Partner AG, Switzerland

Experimental and Modeling Study of the Filtering Capacity of Green Wall Species
T. Ysebaert¹, S. Denys¹, G. Walpot¹
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Boundary Arbitrary Lagrangian-Eulerian and Deformable Boundary Perturbation Method
J. Rivero-Rodriguez¹, B. Scheid¹
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Decomposition of Fundamental Lamb Wave Modes in Complex Metal Structures Using COMSOL Multiphysics®
M. Harb¹, R. Malaeb³, E. Mahfoud³
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Acoustic metamaterial: from conception to auralization
C. Lagarrigue, D. Lecoq
Metacoustic - www.metacoustic.com, Le Mans, France

Mobile, Fast and Cost-Effective Diagnostic System for Clinical Analyses – Simulation of Bead Movement in Magnetic Field
S. Reitz
Fraunhofer Institute for Integrated Circuits IIS, Division Engineering of Adaptive Systems EAS, Dresden, Germany

Design of Radio-Frequency Ablation Catheter
R. Kapuganti
HCL Technologies, Chennai, India

Design of Blood Warmer Medical Device
R. Kapuganti, A. Sivakumar
HCL Technologies, Chennai, India