

INTERNATIONAL PAPER PHYSICS CONFERENCE 2024

30th September – 02nd October 2024
Wuppertal, Germany

Daily Scientific Program



BERGISCHE
UNIVERSITÄT
WUPPERTAL



TECHNISCHE
UNIVERSITÄT
DARMSTADT



Foto: Bergische Universität Wuppertal



Foto: Denise Harberger/Bergische Universität Wuppertal

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Schedule

Time	Monday Sept 30 th	Tuesday Oct 1 st	Wednesday Oct 2 nd
08:00	Registration + Welcome Coffee	Registration	Registration
08:30		Plenary	Contributed Sessions
09:00	Opening		
09:30	Plenary	Contributed Sessions	
10:00			
10:30		Coffee Break	Closing
11:00			Farewell Brunch
11:30	Contributed Sessions	Contributed Sessions	
12:00			
12:30	Lunch Break	Lunch Break	
13:00			
13:30		Contributed Sessions	
14:00	Contributed Sessions		
14:30		Plenary	
15:00	Coffee Break		
15:30		Coffee Break	
16:00	Contributed Sessions	Contributed Sessions	
16:30			
17:00			
17:30	Paper Physics Committee		
18:00			
18:30	Poster Session		
19:00	Welcome Reception	Conference Dinner	

Sessions

- S01 Measuring the mechanical response of fibers, paper, and board
- S02 Modeling the mechanical response of fibers, paper, and board
- S03 Moisture and temperature transport in paper and tissue
- S04 Pulp and paper engineering
- S05 Advances in new paper-based materials
- S06 Barriers and coatings
- S07 Paper as stochastic material
- S08 Structural performance of structures made from paper-based materials
- S09 Manufacturing and forming processes for paper-based materials and structures
- S10 Recyclability and recycling processes for pulp and paper
- S11 Energy saving and emission reduction methods
- S13 Paper chemistry and chemical engineering of lignocellulosics

Monday, 30th Sep. 2024

Opening H4	
09:00	Opening Ceremony

Plenary Lecture Room: H4, Chair: Markus Biesalski	
09:15	Spreading vs. Penetration – The fate of an ink drop on a paper surface Ulrich Hirn
10:00	New chemistries – New properties: Novel approaches to tailor-made papers Jürgen Rühle

S07 Room: H4, Chair: Johannes Neumann		S10 & S13 Room: H1, Chair: Samuel Schabel	
11:00		Towards sustainable paper recycling: A method for assessing the effects of non-wood fibers Summer Kochersperger	
11:20	Describing fiber orientation in paperboard using micro-CT scans and statistical analysis Greta Kloppenburg	Life cycle assessment of black liquor gasification and combustion process by simulation Zhuoran Zhang	
11:40	Modeling statistical fluctuations in paper on multiple scales Jan Mirco Pfeifer	Inkjet papers show delamination during microcomputed tomography investigation Robert Schennach	
12:00	Uncertainty quantification in multiscale simulation of fibre-based materials Rami Mansour	Potential of flow cytometry to detect microplastics and -stickies in paper recycling water Naryvone Souvannavong	

S02.1 Room: H4, Chair: Jaan-Willem Simon		S04 Room: H1, Chair: Markus Biesalski	
13:30	The mechanical behaviour of dry-formed materials - Modelling cellulose fibre materials with weak interactions Magdalena Kaplan	13:30	Characterisation and effects of micro- and nanoscale components and their impact on the efficiency of chemical additives Zahra Baneen
13:50	Modeling in-plane tensile properties of paperboard as function of gauge length using anisotropic damage mechanics and gaussian random fields John Nairn	13:50	Faster substitution with forest-based high yield energy-efficient packaging Hafizur Rahman
14:10	2D non-linear material behavior and failure of loaded paper and board structures in finite element calculations Robert Paetow	14:10	Correlation of near-infrared spectroscopy with wood species and lignin content Anka Klecina
14:30	Reduced order multiscale modeling of paperboard Gustav Boman	14:30	Energy optimization of pressure screen rotor via a cfd virtual test bench – best practice Christoph Feichtinger

S01.1 Room: H4, Chair: Johannes Neumann		S09 Room: H1, Chair: Samuel Schabel	
15:30	Point load measurements on carton board packages and bulging Camilla Persson	15:30	CFD simulation of fiber transport and laydown in dry paper web laying using airlaid techniques Steffen Flaischlen
15:50	Transient deformation & swelling of paper by aqueous co-solvent solutions Sajjad Karimnejad	15:50	Numerical and experimental analysis of multi-layered paperboard forming Nicola Jessen
16:10	L-Crush test - A method for assessing the creasing and failure behavior of paper folding core structures Niklas Schäfer	16:10	In-situ process monitoring in deep-drawing of paper using partially transparent tools Cédric Brunk
16:30	Fibre distributions as a microscopic probe of pulping phenomena Kaarlo Niskanen	16:30	Piezoelectric paper development and applications Boris Stoeber

Paper Physics Committee HC.01.15	
17:30	Paper Physics Committee
Poster Session HD.-1.04	
18:30	Research on the drying methods and parameters during the drying process of pulp fiber Yuying Xiao
	Paper-based 3D cell culture with scaffold and fluid transport functions Lukas Neuenfeld
	Advanced paper-based materials for dry 3D forming Jarmo Kouko
	Barrier coatings made from lignin and fatty acids Enis Saritas
	Characterization of cellulose surfaces with white light interferometry Alessia Barzotti
	Universal method for predicting the formability of paper-based materials in deep drawing and hydroforming Benjamin Hiller
	Failure analysis and avoidance in corrugated board creasing using numerical prediction models Benjamin Hiller
	Study on tackiness and strength contribution of micro-stickies with the treatment of deposit control agents Long Zhu
	Investigation of capillary rise height under rotational conditions Patrick Galenschowski

Tuesday, 01st Oct. 2024

Plenary Lecture Room: H4, Chair: Jaan-Willem Simon	
08:30	3D structure characterization of filled paper based on X-ray CT analysis Wenhao Shen

S05 Room: H4, Chair: Johannes Neumann		S11 Room: H1, Chair: Markus Biesalski	
09:30	Novel foldable lightweight design structures Jarmo Kouko	09:30	Modelling and simulation of multi-phase flows inside a dryer section hood as part of a paper machine Johannes Lunewski
09:50	Advances in papermade materials for energy conversion processes Michael Rentzsch	09:50	Functional fillers for the reduction of carbon footprint of paper Thomas Staehrfeldt
10:10	Development of paper composites for aluminum-air batteries Joel Pawlak	10:10	

S03.1 Room: H4, Chair: Jaan-Willem Simon		S06 Room: H1, Chair: Markus Biesalski	
11:00	Limiting factors for microcomputed tomography monitoring of water transport through paper Victoria Haberl	11:00	Moisture performance of silica-paper hybrids in the hygroscopic range Naomi Bosse
11:20	Paper fibers beyond saturation: μ-CT analysis of prolonged structural changes Maximilian Fuchs	11:20	Experimental investigations into fold cracking of double-coated barrier dispersion coatings Janet Preston
11:40	Integrating reactive diffusion and swelling in cellulose-based porous media through physics-informed neural networks Alexandra Serebrennikova	11:40	Transparent plasticized cellulose nanocrystal films for high-performance barrier Naghmeh Nasiri
12:00	A numerical model for the transport and drying of solutions in thin porous media - Coffee-stain effect and solute ring formation Anton Darhuber	12:00	Effect of particle size in the properties of cellulose nanofiber/lignin particle composite Yasuaki Inoue

S03.2 Room: H4, Chair: Johannes Neumann	
13:30	A thermo-hygro-mechanical material model for paper and paperboard Nadir Kopic
13:50	Absorption in paper: Where is the water? (Part 1) Mark Martinez
14:10	Absorption in paper: Where is the water? (Part 2) Samuel Brown

Plenary Lecture Room: H4, Chair: Jaan-Willem Simon	
14:30	A multi-scale modelling-experimental approach to predict the degradation of (historical) paper Emanuela Bosco

S02.2 Room: H4, Chair: Jaan-Willem Simon	
16:00	An elasto-plastic material model for paper and paperboard at finite deformations Johannes Neumann
16:20	Assessment of paper curl predictions by two and three-dimensional fibre network models Ron Peerlings
16:40	A two-scale finite element model of paper materials based on a statistical physics microscale approach Mohadeseh Fallah

Wednesday, 02nd Oct. 2024

	S01.2 Room: H4, Chair: Jaan-Willem Simon	S03.3 Room: H1, Chair: Samuel Schabel
08:30	On the design of corrugated boards: a new FEM modeling and experimental validation Ricardo Fitas	High contrast analysis of cellulose nanofibril film structure and barrier properties Hans Cainglet
08:50	Effects of in-plane loading on out-of-plane delamination of paper-board Anders Biel	Tomographic investigation of liquid distribution in partly-saturated fibre networks under different strain states Patrick Wegele
09:10	High strain-rate tensile testing of planar cellulose fibre networks Georg Baumann	Moisture transport and swelling in paper sheets: a strategy based on a multi-phase flow approach Carlos Rojas Vega
09:30	Enhancing practicality in evaluating out-of-plane shear behavior of paperboards using a refined split double cantilever beam Mohammad Ebrahimijamal	Paper curl at different time scales: seconds, minutes, weeks Alexander Maaß
09:50	Mechanics of reverse-side crease cracking of paperboard Joel Panek	Web structural changes that occur in paper towels upon the imbibation of water Steven Keller
10:10	The influence of structural buckling on the compressive strength of paperboard structures as illustrated with the ring crush test Douglas Coffin	

	Closing H4
10:30	Closing Ceremony

10:45	Farewell Brunch Foyer HC
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Conference Venue

HC

Foto: Bergische Universität Wuppertal

Registration at the Foyer

HC

Foto: Sebastian Jarych

FoyerDaily Coffee and Lunch Breaks,
Welcome Reception**HA**

Foto: Sebastian Jarych

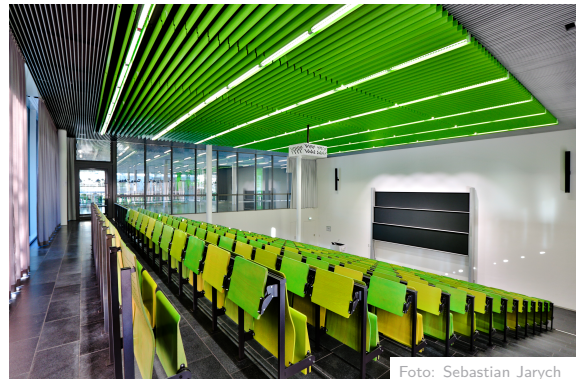
Lecture hall **H1****HC**

Foto: Sebastian Jarych

Lecture hall **H4****Alte Papierfabrik**

Foto: Alte Papierfabrik

Conference Dinner

Site maps

The conference will be held at Campus Haspel of the University of Wuppertal. Plenary Lectures and Contributed Sessions will take place in the lecture rooms H1 and H4 in Buildings HA and HC, respectively. Lunch and Coffee Breaks, the Registration, as well as the Welcome Reception, will be hosted in the Foyer of Building HC, offering attendees a welcoming area to network and relax between sessions. If the weather is favorable, the Welcome Reception will be held outside in the courtyard between Buildings HD and HC. This area also provides access to the room for the Poster Session. Additionally, the Paper Physics Committee meeting will be held in Building HC on Floor 01.

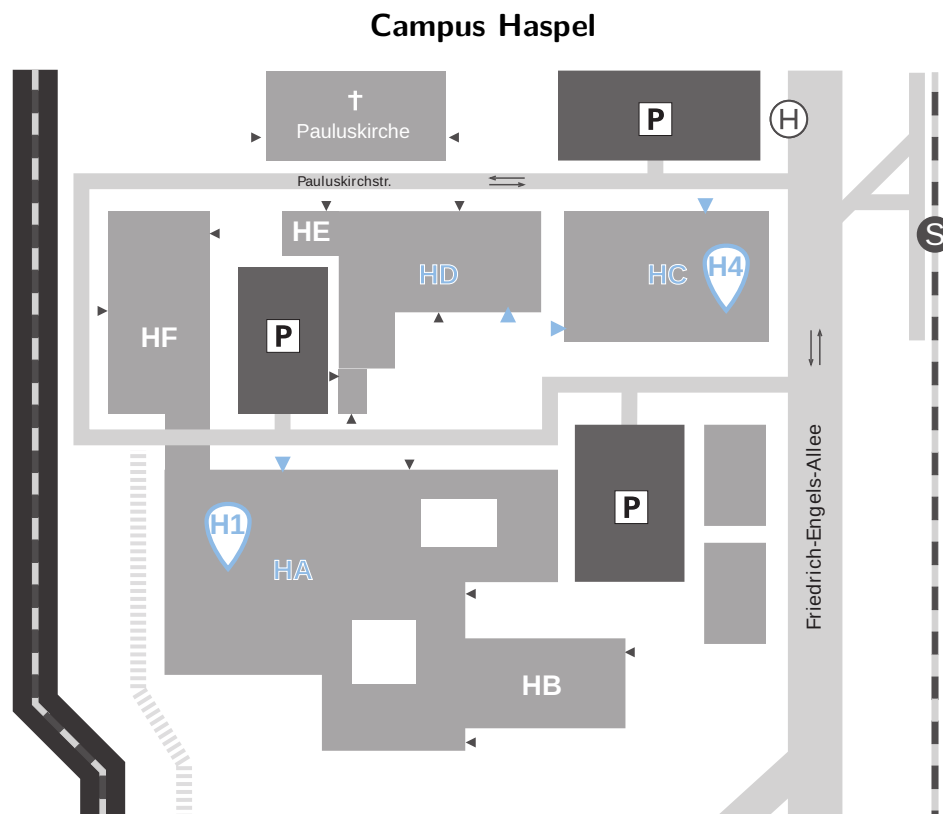
For the Conference Dinner, we are pleased to invite you to the historic Alte Papierfabrik, a beautifully restored former paper mill that offers a unique and elegant setting for an evening of fine dining and continued conversations.

Campus Haspel

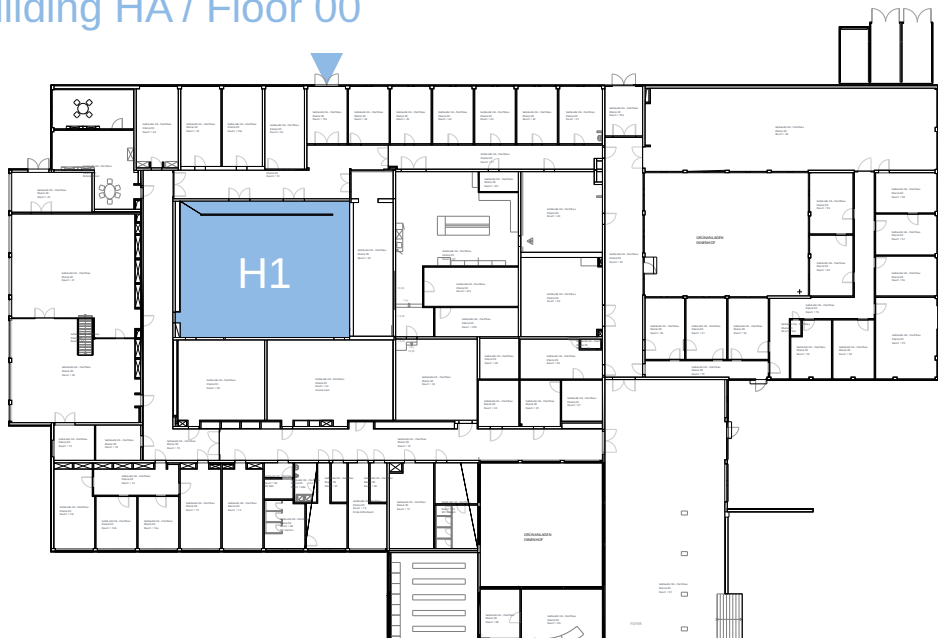
Pauluskirchstr. 7
42285 Wuppertal

Alte Papierfabrik

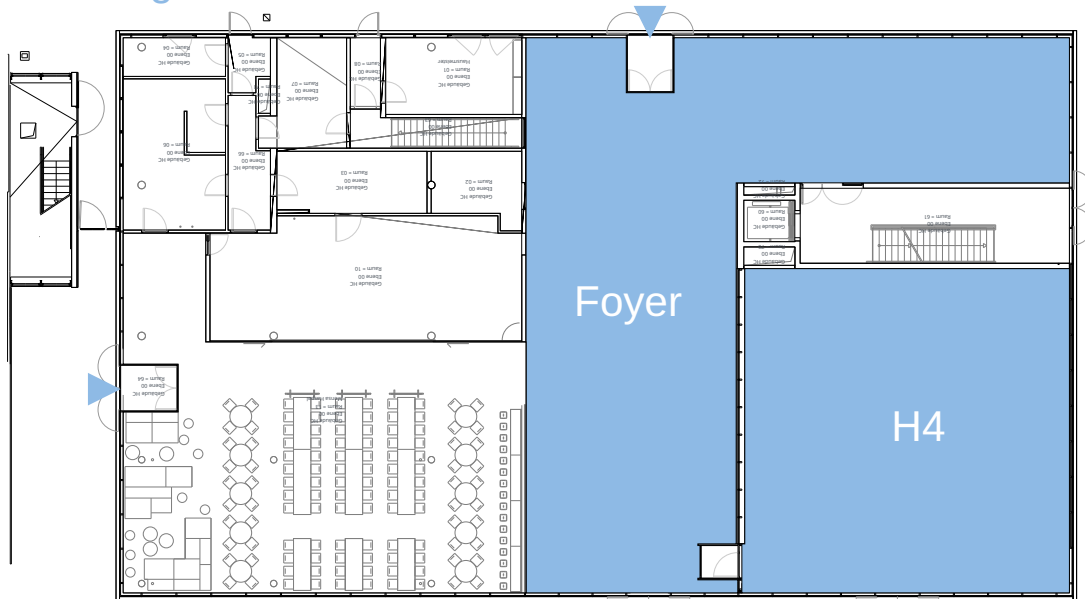
Friedrich-Ebert-Str. 130
42117 Wuppertal



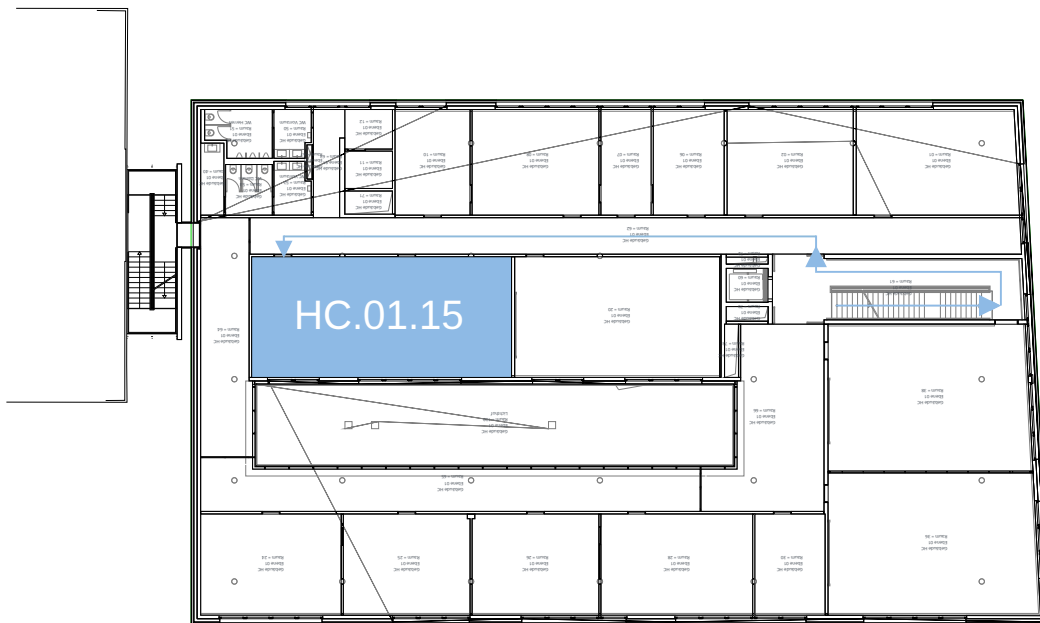
Building HA / Floor 00



Building HC / Floor 00



Building HC/ Floor 01



Building HD / Ground Floor

