



ORTA DOĐU TEKNİK ÜNİVERSİTESİ  
MIDDLE EAST TECHNICAL UNIVERSITY



## XIII European Conference on Constitutive Models for Rubbers



# **ECCMR**

**ISTANBUL** | European Conference  
2024 | 26-28 JUNE | on Constitutive Models  
for Rubbers

**June 26th – 28th 2024**  
**Istanbul, Swissotel the Bosphorus**

Organized with the Executive Support of



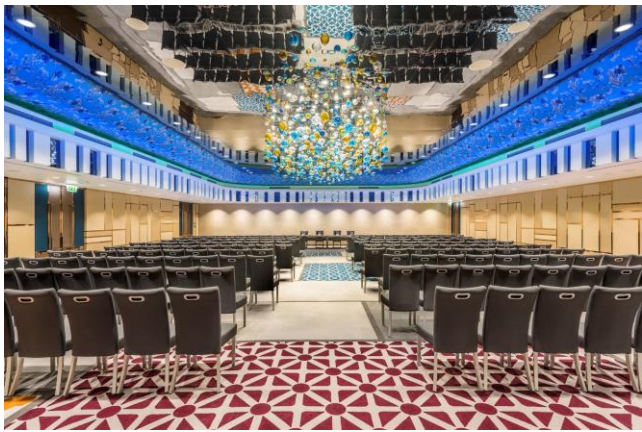
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**Neuchatel and Asuka Hall**

# Sessions

Constitutive models

Fatigue and Fracture

Experimental methods and characterization

Aging

Recyclable elastomer systems: design and modelling

Rheology and processing

Industrial applications

Advanced computational techniques for elastomers

Micro-structural investigations

Smart elastomer materials: applications and modelling

Keynote

FROM	TO	
		25 June 2024
17:00	19:30	REGISTRATION
17:30	19:30	WELCOMING RECEPTION
20:00		ECCMR ADVISORY BOARD MEETING DINNER

FROM	TO	26 June 2024	
08:00	09:00	REGISTRATION	
		Hall: ASUKA	
09:00	09:20	WELCOME SPEECH BUSFIELD James	
09:20	10:00	PLENARY LECTURE KALISKE Michael <i>Towards a digital twin of the tire</i>	
10:00	10:30	SEMI-PLENARY LECTURE BECKER Justin <i>Characterization and modelling of the compressible hyperelastic behaviour of polyurethane foams: influence of the density</i>	
10:30	11:00	COFFEE BREAK	
		Hall: ASUKA	
		Constitutive models Chair : KALISKE Michael	
11:00	11:20	JUHRE Daniel <i>Micromechanical modelling of the viscoelastic properties of filled elastomer blends</i>	
11:20	11:40	SCHÖNE Alexander <i>Constitutive modeling and FE-simulation of temperature dependent stator elastomers in positive displacement motors</i>	
11:40	12:00	MATSUDA Akihiro <i>Application of anisotropic hyperelastic model considering distributed fibers to artificial sports materials</i>	
12:00	12:20	YAĞIMLI Bülent Zener model in Kelvin-Voigt representation with multiplicative split of the deformation gradient	
12:20	12:40	USTA YAYLA Ayşe Constitutive modelling of amplitude dependent dynamic response of rubber-like materials	
12:40	14:00	LUNCH	
		Hall: ASUKA Chair: De LORENZIS Laura	Hall: NEUCHATEL Chair: MARCO Yann
		Constitutive models / Industrial applications	Aging
14:00	14:20	SCHNEIDER Patrick <i>A simple hyperelastic model for virtual product design</i>	TREIB Caroline <i>Evolution of crack depth in natural rubber due to ozone loading</i>
14:20	14:40	MOEINEDDIN Ahmad <i>Numerical and experimental investigations on rubber-snow interaction utilizing an elastoplastic snow model with implicit gradient damage enhancement</i>	KARI Leif <i>Torsional energy flow through a carbon black filled rubber isolator during physical ageing at room temperature</i>
14:40	15:00	BİÇER Berkay <i>Finite element analysis of elastomeric bearings under cyclic shear loading</i>	KADHAMBARIYIL Aravind <i>Quantifying the effect of thermal aging history and operational temperature on the fracture stress and bulk response of an EPDM rubber</i>
15:00	15:30	COFFEE BREAK	
		Hall: ASUKA Chair: JOHLITZ Michael	Hall: NEUCHATEL Chair: MARS William
		Experimental methods and characterization	Industrial applications
15:30	15:50	LOOS Klara <i>Frequency-domain analysis of elastomeric vibration isolators: experimental and numerical investigations under dynamic loading</i>	EBBOTT Thomas <i>Characterization and modeling of hyperelastic and crack growth behavior of thermoplastic vulcanizates (TPVs)</i>
15:50	16:10	LANG Andrej <i>Fundamental approach to build viscoelastic master curves for heterogeneous elastomer blends</i>	PATEL Ruhi <i>Finite element modelling for fatigue in polymer heart valves</i>
16:10	17:20	POSTER PITCH	
19:00	00:00	BOSPHORUS BOAT TOUR	

FROM	TO	27 June 2024	
		Hall: ASUKA Chair: DAL Hüsni	
08:30	09:10	PLENARY LECTURE De LORENZIS Laura <i>Automated discovery of hyperelastic material models</i>	
09:10	09:40	SEMI-PLENARY LECTURE BUSFIELD James <i>Modelling cavitation phenomenon in elastomers</i>	
09:40	10:00	AÇAN Alp Kağan <i>A data-driven constitutive model for compressible polymeric foams</i>	
10:00	10:30	COFFEE BREAK / Poster Session	
		Hall: ASUKA Chair: MARANO Claudia	
		Fatigue and fracture	
10:30	10:50	TSUNODA Katsuhiko <i>Rupture mode transition of strain induced crystallizing rubber</i>	
10:50	11:10	DENORA Isabella <i>Is J-integral at crack onset an intrinsic property of filled elastomers? Experimental testing and finite element modelling for fracture toughness evaluation</i>	
11:10	11:30	HANNE Niklas <i>Influence of strain induced crystallisation on the dynamic crack propagation resistivity of NR vulcanisates</i>	
11:30	11:50	AÇIKGÖZ Kemal <i>A Stochastic Phase-Field Approach for Ductile-Like Fracture of Rubber-Like Materials</i>	
11:50	12:10	PANG Yong <i>Soft cellular solids inspired by marine mussel plaques: scaling of the mechanical properties</i>	
12:10	12:30	LUO ROBERT <i>A rubber damage criterion with three principal components for antivibration fatigue design</i>	
12:30	13:50	LUNCH	
		Hall: ASUKA Chair: MARS William	Hall: NEUCHATEL Chair: KARI Leif
		Fatigue and fracture / Aging / Recyclable elastomer systems: design and modelling	Advanced computational techniques for elastomers
13:50	14:10	KLAUKE Rainer <i>Analysis of the durability damage scenarios of air spring sleeves with axial reinforcements based on computer tomography and digital image processing</i>	EL MASRI Samir <i>A hybrid meta-FEM approach for numerical computation of wear parameters</i>
14:10	14:30	HECZKO Jan <i>Time homogenization in modelling of rubber damage and ageing</i>	PORNHAGEN Dan <i>Comparison of different methods for implementing material stiffness in the context of hyperelasticity in terms of principal stretches</i>
14:30	14:50	DUNCAN Aaron <i>Novel approach to modelling chemical stress relaxation using finite element analysis</i>	SERBEST ALİ KAMİL <i>A design method for developing rubber anti-vibration mounts for high frequency applications in EV suspension systems</i>
14:50	15:10	CANDAU Nicolas <i>Rubber wastes as enhancers of the strain induced crystallization and elastocaloric properties of natural rubber</i>	BERGER Thomas <i>Influence of the tire production process on its driving characteristics</i>
15:10	15:40	COFFEE BREAK / Poster Session	
		Hall: ASUKA Chair: HOSSAIN Mokarram	
		Recyclable elastomer systems: design and modelling	
15:40	16:00	DOĞAN Fatih <i>The Effect of Sunflower Oil on The Tread of Passenger Tyres</i>	
16:00	18:00	DOLMABAÇE PALACE VISIT	
19:00	23:00	GALA DINNER	



FROM	TO	28 June 2024	
		Hall: ASUKA Chair: MARCO Yann	
08:30	09:10	PLENARY LECTURE HOSSAIN Mokarram <i>Recent advances in magneto-active polymers: experiments, modelling and simulations</i>	
09:10	09:40	SEMI-PLENARY LECTURE TADA Toshio <i>Influence of structural flaw on stress concentration of rubber vulcanizates</i>	
09:40	10:00	MEIER Jens <i>Viscoelastic effects within the sound reflection of elastomer attenuation layers</i>	
10:00	10:30	COFFEE BREAK	
		Hall: ASUKA Chair: JOHLITZ Michael	
		Experimental methods and characterization	
10:30	10:50	KHIÊM Vu Ngoc <i>A comprehensive exploration of strain-induced crystallization through surface calorimetry and thermodynamics analysis</i>	
10:50	11:10	GOEGELEIN Christoph <i>Strain-hardening of HNBR and its similarities to NR</i>	
11:10	11:30	URAYAMA Kenji <i>Exploring non-uniform strain-induced crystallization around a stationary crack tip in natural rubber</i>	
11:30	11:50	LE BIHAN Anthony <i>Better understanding of mechanically induced crystallization in filled natural rubber</i>	
11:50	12:10	STOCEK Radek <i>A detailed study of the effect of cyclic loading on the coefficient of thermal expansion of reinforced styrene-butadiene rubber as a function of different types and loading of carbon black.</i>	
12:10	13:30	LUNCH	
		Hall: ASUKA Chair: HOSSAIN Mokarram	Hall: NEUCHATEL Chair: BUSFIELD James
		Micro-structural investigations / Industrial applications	Experimental methods
13:30	13:50	WULF Hans <i>Predicting the effect of carbon black blends on compound properties by using a micro-structural simulation program</i>	KOLIOLIOS Evangelos <i>Adhesive properties of tyre tread smear wear and its link to transfer layer deposition to road surfaces</i>
13:50	14:10	TARRACH Lena <i>Development of a mesoscopic model for reinforcement in filled and strain-crystallizing elastomer networks</i>	TRAN Huu Nam <i>Effects of loading conditions, temperature, and magnetic field on the dynamic compressive behavior of an isotropic magnetorheological elastomer</i>
14:10	14:30	SKOGLUND Marcel <i>Service life estimation of axial air spring sleeves</i>	
14:30	15:00	COFFEE BREAK	
15:00	15:20	CLOSING / ECCMR 2026 PRESENTATION	