# The Fiber Society Spring Meeting and Technical Conference 2017

**Next Generation Fibers for Smart Products** 

Aachen, Germany 17 – 19 May 2017

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## Wednesday, May 17

## Location: Conference Venue at SUPER C, Templergraben 57, Aachen

- 7:30 Registration and Continental Breakfast: 6th Floor Foyer
- 8:10 Welcoming Remarks, Business, and Announcements Room A

Thomas Gries, Conference Chair Laurence Schacher, Fiber Society President

8:20 Keynote Speaker: Thomas Gries, RWTH Aachen, Fibers and Textile Materials 4.0.

9:00

9:00 **Keynote Speaker:** Tae Jin Kang, Seoul National University, *Adaptive Protective System for Smart Textiles* 4 9:40

9:40 Break

## **Morning Session**

	Room A	Room B
	Session: Smart Polymers, Fibers, and Textiles	Session: Multimaterial Fibers
	Chair, Thomas Gries	Chair, Fabien Sorin
10:00	Smart Functions Observed on Polymer Gels 10	Multimaterial Fibers: Challenges and 20
	Toshihiro Hirai, Shinshu University	Opportunities
		Fabien Sorin, EPFL
10:25	Thermo-sensitive Nanofibers Based on Biobased 11	Multimaterial Fibers for Electromechanical Touch
	Materials	Sensing 21
	Aleksandra Miletic, University of Novi Sad	Alexis Page, EPFL
10:50	Stress-memory Filaments as Advanced Material for	Intermediate-Tg Phosphate and Tellurite Glasses
	Smart Compression Management 12	for Multimaterial Fiber Devices 22
	Harishkuma Narayana, Hong Kong Polytechnic	Sylvain Danto, University of Bordeaux
	University	
11:15	ECG Measurement via AgNW/PU Nanoweb 13	Multimaterial Porous Fibers 23
	Electrodes and Comparison with Ag/AgCl	Benjamin Grena, Massachusetts Institute of
	Electrodes	Technology
	Eugene Lee, Yonsei University	
11:40	PVDF Nanofibers Membrane Grown with Zinc 14	Microstructure Tailoring of Semiconducting 24
	Oxide (ZnO) Nanorods for Enhanced Wearable	Materials within High-performance Optoelectronic
	Sensing	Fibers
	Jintu Fan, Cornell University	Wei Yan, EPFL
12:05	CNTs in Fibres: The Influence of Dispersion on 15	Multimaterial Inorganic Optical Fibres and Sphere
	Conductivity	Breakup Experiments 25
	Merle Bischoff, Institut für Textiltechnik	Daniel Milanese, Politecnico di Torino-DISAT

12:30- 1:40	Lunch—6th Floor Foyer
1.40	•

## Afternoon Session

1:40- Plenary Speaker: Brit Maike Quandt, Empa, Soft Polymer Optical Fibers for Healthcare: Tailoring

2:10 Production and Properties of Photonic Textiles (Room A)

	Room A	B Room
	Session: Functional Fibers Chair, Thorsten Anders	Polymer Optical Fibers Chair, Marcus Beckers
2:10	Organic-Inorganic Hybrids for Functional Fiber Materials 28 Meifang Zhu, Donghua University	Materials for POF Production: Scattering and Transmission in Fiber Optics 38 Arne Schmidt, Evonik Performance Materials
2:35	Sputter Deposition of Silver onto Monofilament Yarns: Influence of Processing Parameters on Yarn Properties 29 Anne Schwarz-Pfeiffer, Hochschule Niederrhein	Smart Geosynthetics for Structural Health Monitoring Applications 39 Aleksander Wosniok, Federal Institute for Materials Research and Testing
3:00	Multifunctional Properties of Carbon Nanotube Fibres 30 Juan Carlos Fernández-Toribio, IMDEA Materials Institute	Application of Thermography for Process Control in the Production of Polymer Optical Fibers 40 Robert Evert, Institut für Hochfrequenztechnik
3:25	Development of Carbon Fiber-based Electrodes for Microbial Fuel Cells 31 Sascha Schriever, RWTH Aachen University	Demultiplexer in PMMA for POF Over WDM 41 Matthias Haupt, Harz University of Applied Sciences
3:50	Usage of Splittable Microfilament Yarns as Carpet Pile 32 Hatice Kübra Kaynak, Gaziantep University	POF-based Distributed Brillouin Sensing 42 Andy Schreier, Federal Institute for Materials Research and Testing
4:15	Intensity Relationships of CH <sub>2</sub> Bands (v, \delta) in FT-IR Spectra of Syndiotactic Polyacrylonitrile and the Calculation of Dipole Moment 35 Masatomo Minagawa, NPO Dream-Create- Laboratories sent for affiliations 9/5	Experimental Investigation of the Wavelength- dependent Far Field for Different Mode Groups in Step-Index Polymer Optical Fibers 43 Emmanuel Nkiwane, Technische Hochschule Nümberg
4:40	open	Overview of the POF Market 44 Peter Kröplin, Sojitz Europe plc
5:00– 7:00	Poster Session and Competition: Super C, 6th Floor	
8:00– 9:00	Guided Walking Tours Through Aachen: Meeting	Point at Tourist Information Center in Aachen

# Thursday, May 18

7:30 Registration and Continental Breakfast: 6th Floor Foyer

8:00 - Keynote Speaker: Azusa Inoue, Keio University, Status of GI POF Technology for Upcoming 4K/8K Era

8:40 (Room A)

8:40 Break

## **Morning Session**

	Room A	Room B	Room C
	Session: Fiber Characterization and Testing	Session: Polymer Optical Fibers Chair, Christian-Alexander Bunge	Nanofibers Chair, Ashwini Agrawal
	Chair, David Seveno		
9:00	Wettability of Carbon Fiber Tows 52 David Seveno, KU Leuven	Fabrication of Microstructured Polymer Optical Fibres for Sensing Joseba Zubia, University of the Basque Country 45	ZnO Nanorods-assisted 58 Carbonization of PAN Nanofibers Ashwini Agrawal, Indian Institute of Technology

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9:25	Effect of Boric Acid Addition to	Polymer Optical Fibers for Sensing	Electrospun Nanofiber-assisted
	Bulked Continuous Filaments	Applications: Ionizing Radiation	Hydrogel Thin Film on Shaped
	Polypropylene via Melt Spinning	Monitoring 46	Surfaces 59
	Method Used in Carpet 53	Pavol Stajanca, Bundesanstalt für	Yakup Aykut, Uludağ University
	Manufacturing for Flammability	Materialsforschung und-prüfung	
	Nazan Avcioğlu Kalebek,		
	Gaziantep University		
9:50	New Measurement Technology	Influence of Scattering 47	Application of Nanofibers for Dye
	for Evaluation of Transversal	Characteristics on the Angle and	Removal of Colored Wastewaters
	Interfiber Friction 54	Time-dependent Backscattered	Mohammad Ebrahim Olya,
	Anwar Shanwan (Artan	Power in Polymer Optical Fibers	Institute for Color Science and
	Sinoimeri), Université de Haute-	Martin Gehrke, Technische	Technology 60
	Alsace	Hochschule Nümberg	
10:15	Multiscale Investigation of Hair	Influence of the Impulse Rebound	Investigation of the Structural
	Fiber Surface Properties: Links	on Optical Strain Sensors Based on	Parameters in Electrospun Piezo
	Between Morphological and	Step-Index Polymer Optical Fibers	Nanofibers and Yarns 61
	Tribological Behavior 55	Thomas Becker, Technische	Maryam Yousefzadeh, Amirkabir
	Judith Wollbrett-Blitz, L'Oréal	Hochschule Nümberg 48	University of Technology
	Research and Innovation		
10:40	Intrinsic Traceability of High-	Low OH Tellurite Glasses for 49	open
	value Textiles Manufacturing	Nonlinear Optical Fibers and	
	Using Natural Fibres 56	Supercontinuum Generation	
	Steve Ranford, AgResearch	Beyond 3µm	
	Limited	Clément Strutynski, University of	
		Bordeaux	

## 10:40 **Break**

	Session: Smart Polymers, Fibers, and Textiles Chair, Martin Harnisch	Session: Biobased Materials Chair, Gunnar Seide	Session Biomedical Applications Chair, Buket Demir
11:05	Characterization of Heat 16 Storage Properties of Textiles Incorporating Phase Change Materials by Means of Heat Release Tester WATson Martin Harnisch, Hohenstein Institut für Textilinnovation	Development of Biobased Self- 64 reinforced Polymer Composites Thomas Köhler, RWTH Aachen University	N-halamine Technology for 68 Antimicrobial Wound Dressings Buket Demir, Auburn University
11:30	AgNW-treated PU Nanoweb/ PDMS Composites as Wearable Strain Sensors for Monitoring Joint Flexion 17 Inhwan Kim, Yonsei University	Tailored Fiber-reinforced Gelatin Hydrogels for Biocomposite 65 Printing Christopher Anderson, Philadelphia University	Development of Novel Coextruded and Wet Spun Fibers for Medical Applications 69 Klas-Moritz Kossel, RWTH Aachen University
11:55	open	Cellulose Aerogel Fibres for Thermal Encapsulation of Diesel Hybrid Engines 66 Jens Mroszczok, RWTH Aachen University	Interaction of Material and Structural Elasticity in a Small Calibre Vascular Graft 70 Alexander Löwen, RWTH Aachen University

12:20	Lunch 6th Floor Forces
-1:40	Lunch—6th Floor Foyer

1:40- Plenary Speaker: Gunnar Seide, Aachen-Maastricht Institute for Biobased Materials (AMIBM), Biobased
 2:10 Materials: Challenges of Applications and Process Development (Room A)

	Room A	Room B	Room C
	Session: Yarns and Fabrics: Processes, Structures, and Properties Chair, Laurence Schacher	Session: Modeling and Simulation of Textiles and Processes Chair, David Breen	Session: Composites Chair, Wilhelm Steinmann
2:10	Examining the Effects of Fiber Types and Fabric Tightness on Bursting Strength of Circular Knit Fabrics Produced from Vortex Yarns 72 Seval Uyanık, Gaziantep University	An Optimized Yarn Geometric Model for Knitted Material Simulation 92 David Breen, Drexel University	Enhanced Damping of Carbon Fiber-reinforced Composites by Novel Liquid-Core Fibers 100 Rudolf Hufenus, Empa
2:35	An Investigation of Performance Properties of Warp Knitted Carpets 75 Züleya Değirmenci, Gaziantep University	Modeling Approaches for 3D Woven Composites: Potential and Limitations 93 Mohamed Saleh, University of Sheffield	A Novel Automated Method for Manufacturing New Semi-finished Photo Composites 101 Anwar Shanwan, Université de Haute-Alsace
3:00	Emissivity Characterization of Different Stainless Steel Textiles in the Infrared Range 76 Maria Cristina Larciprete, Sapienza Università di Roma	Internal Structure of the Bundle Manufactured by Friction Method Jung Ho Lim, Kyung Hee 94 University	Metal Composite Yarn Production with Commingling Technique and Properties of Textile Surfaces Obtained from These Yarns 102 İlkan Özkan, Çukurova University
3:25	How Nonwovens Avoid the Shrink? 77 Amit Rawal, Indian Institute of Technology-Delhi	Effect of Staple Length on the Sliver Dynamics in Roller Drafting 95 You Huh, Kyunghee University	Strategies for Improving 103 Durability of Vegetable Fiber- reinforced, Cement-based Composites Mònica Ardanuy, Universitat Politècnica de Catalunya
3:50	Effects of the Laundering Process on Dimensional Properties of Lacoste Fabrics Made from Modal/Combed Cotton-blended Yarns 78 Ebru Çoruh, Gaziantep University	Modeling of the Mechanical 96 Properties of Cotton Fibers Wafa Mahjoub, Université de Haute-Alsace	Basalt Fiber as Technical Textile Material 104 Ertan Özgür, University of Çukurova
4:15	Antibacterial Activity of Nonwoven Cleaning Materials Treated with Silver Nanoparticles after Newly Developed Repeated Washing Process 79 Emel Çinçik, Erciyes University	open	open

6:00-6:30 Reception: Alter Ballsaal, Kurhausstraße 1, Aachen (5 minute walk or bus station: Aachen,

Bushof) 6:30 Banquet

**Music: German Classics** 

# Friday, May 19

7:30 Continental Breakfast: 6th Floor Foyer

8:00- **Keynote Speaker:** Yves-Simon Gloy, RWTH Aachen, *Digitalization in the Textile Industry* (Room A) **8** 

8:40

8:40 Break

	Room A	Room B	Room C
	Session: Reinforcing Structures Chair, Yves-Simon Gloy	Session: Fiber Formation, Structure, and Properties Chair, Takeshi Kikutani	Yarns and Fabrics: Processes, Structures, and Properties Chair, Janice R. Gerde
9:00	Characterization of Warp-knitted Reinforcing Fabrics and Cement-based Composites: Influence of Yarn and Stitch Types on Mechanical Performance 106 Till Quadflieg, RWTH Aachen University	Crystallization and Melting 116 Behaviors of Polypropylene Blend Fibers Consisting of High and Low Stereo-regularity Components Takeshi Kikutani, Tokyo Institute of Technology	Tactile Feeling of Textiles: A 80 Comparative Study Between Textiles Attributes of France, Portugal, and Brazil Maria José Abreu, Minho University
9:25	In-plane Permeability Characterization of Reinforcing Fabrics Based on Radial Flow Experiments: Comparative Studies 109 Ewald Fauster, Montanuniversität Leoben	Tungsten Wire Fabrics Used in 117 Tungsten Fibre-reinforced Composites Philipp Huber, RWTH Aachen University	Determination of the Heat 81 Dissipation of Sport Bras Using Thermal Manikin and Thermography André Catarino, Minho University Sent a second set 7/20
9:50	Investigation of the Production of Hollow Carbon Fibres 112 Robert Brüll, RWTH Aachen University	Numerical Analysis of Non-steady State Melt-blowing Process Based on a Particle Method 118 Wataru Takarada, Tokyo Institute of Technology	A Study to Improve Drying 84 Property of Towel Fabrics Sait Yilönü, Çukurova University
10:15	Analysis of Ceramic Fibre Processing with Braiding Machines for Two- and Three- dimensional Reinforcement Structures 113 Lisa Papenbreer, RWTH Aachen University	Strength Improvement of 119 Polypropylene Fine Fibers by Increasing Beta-crystal Content Kyung-Ju Choi, Clean & Science, Ltd.	3D Knitting Using Large Circular Knitting Machines 85 Kristina Simonis, RWTH Aachen University
10:40	open	Wet-spinning of Silk Fibroin-based Conductive Core-Sheath Fiber 120 Bin Fei, Hong Kong Polytechnic University	The Measurement of Textile's 86 Warm-Cool Feeling Lexi Tu, Donghua University
11:05	open	open	Radiant Heat-protective 87 Performance of Fabrics Used in Firefighters' Clothing: A Scientific Study Sumit Mandal, Empa

11:30 **Break** 

	Open	Session: Fiber Formation, Structure, and Properties cont'd	Yarns and Fabrics: Processes, Structures, and Properties cont'd
11:40	open	The Evolution and Formation 121 Mechanism of Gradient Structure During Melt Spinning of Blend Fiber Dan Pan, Donghua University	Airflow Characteristics During Rotor Spun Composite Yarn Spinning Process 88 Ruihua Yang, Jiangnan University
12:05	open	Spinnability of Polyacrylonitrile Solution Research Based on Dry- Jet Wet Spinning Dynamics Simulation 122 Jianning Wang, Donghua University	Twisting Robustness in the Ring Spinning System with Single Friction-belt False-twister 89 Rong Yin, Hong Kong Polytechnic University
12:30	open	Increase of the Adhesion Property of CFRP and CFRTP Materials and Preparation of New FRP Using Modified Fiber 123 Hitoshi Kanazawa, Fukushima University	Development and Characterization of a New 3D, Nonwoven, Pleated Shockproof Product Inserted in Clothing for Body Protection 90 Abdelbaki Djerboua, ENSISA
12:55	open	Grafting β-cyclodextrin on Cotton Fabric 124 Malihe Nazi, Standard Research Institute	open

#### 1:20 **CONFERENCE CLOSES**

1:25- Snack

1:45

1:45- Buses Load from Super C to ITA

2:15

2:15- Tour of Research Facilities at ITA, RWTH Aachen University

3:45

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#### **Poster Session**

Wednesday, May 17, 5:00 p.m.-7:00 p.m., Super C, 6th Floor Foyer

Presenter Title

Run Wen Design of Freestyle Machine Embroidery 126

Alenka Ojstršek Flame Retardant Activity of Fabrics Based on Aluminosilicate Coatings 127

Pınar Duru Baykal Determining the Effect of Different Washing Types on Tear Strength of Denim Fabrics 128

Belkis Zervent Ünal The Effects of Abrasion Process on Water Repellency Performance of Upholstery Fabrics 129

Yurong Yan Micro- and Nanoscale Polyester-based Hybrid Acoustic Insulation Materials 130

Darinka Fakin Preparation of Polyamide 6/Zeolite Composite Filaments 131

Maryam Yousefzadeh Photo-Catalysis Properties of Electrospun Ceramic TiO<sub>2</sub> Nanofibers with Different Structures 132

and Morphologies

Benjamin Mohr Potential of POF Sensors for Structural Health Monitoring of Fiber Composites 133

Fumei Wang Dual-beard Algorithm for Fiber Length Histogram 134
Lin Zhou A Study of 3D Auxetic Textile Reinforced Composite 135

Wing Sum Ng Negative Poison's Ratio Behavior and Pore Characteristics of Woven Fabric Made of Auxetic 136 Plied Yarn Under Tension Guangbiao Xu Tensile Property of PTFE Under Different Conditions 137 Xiaohuan Ji Synthesis of Monodisperse and Porous Ag Nanoparticles/Polystyrene Microcomposite Particles 138 by Seeded Suspension Polymerization Jong Sung Kim Investigation on Air Suction Phenomenon for a Rotating Flyer Tobias Schlüter Polymer Blends for Textile and Composite Applications 140 PU Nanoweb Transmission Lines Coated with Non-oxidized Graphene for Smart Clothing 141 Eunji Jang Emel Ceyhun Sabır Textile Energy Storage 142 Nils Gerstein Recyclability of Carbon Fiber-reinforced Concrete Structures 143 Mario Löhrer Interactive Learning Systems for Textile Technology 144 Gözdem Dittel Tailored, Warp-knitted Reinforcing Textiles for Construction Applications 145 Merle Bischoff Development of an "Anti-bug" Bicomponent Fibre Alan Grice Modeling Dynamic Fiber Behavior in a Meltblowing Die Utilizing FSI Jiaojiao Shang Fabrication of Ultrasensitive CO<sub>2</sub>-responsive Nanofibers via Post-polymerization Modification 150 for the Visual Detection of CO<sub>2</sub> Kai Hou A Novel Dynamic-Crosslinking-Spinning Technology for Fabrication of Hydrogel Fibers Musa Akdere Cribellate Spiders: A Biomimetic Inspiration for Processing and Handling Nanofibers Maria José Abreu PVC-based Synthetic Leather with Thermal Comfort for Automobile Applications 153 Inhwan Kim Comparative Analysis of Wearable Respiration Sensors Based on PU Nanoweb/PDMS Treated 154 with AgNWs and PPv Kang Chen Insight into the Relationship Between Creep Behavior and Structure of Polyester Industrial 155 Sascha Schriever Economical and Technical Investigation on the Recycling of Polyacrylonitrile(PAN)-containing 156 Waste André Catarino Shape Memory Alloys Applications on Weft Knitted Fabrics: Toward a Compression Sock for 157 Venous Disease Malihe Nazi Identification of Specific Animal Hair Fibers Using Forensic Science Maximilian Kemper Storefactory—Customizable In-store Textile Production Itxaso Parola Double-doped Polymer Optical Fibers for Fluorescent Fiber Applications 162 A New Shape Factor Method for Profiled Polyester Fibers Inga Noll Chung Hee Park Influence of Alkaline Treatment on Surface Roughness and Wetting Property for 164 Hydrophobized Silk Fabrics 165 Wan-Gyu Hahm Analysis of PET Fiber Deformation in High-speed Melt Spinning by Using 2-way On-line Diameter Measurements Jan Kallweit Nanoparticle Modified Polymer Melts and the Theory of Similarity 166 Jeanette Ortega Prediction of Yarn Properties by Inline Measurement and Numerical Modeling 167 Georgi Gogoladze Stability of Basalt Fibers in the Alkaline Environment 168 Riada Meyer Investigation of the Spinnability of Polymers with a High-speed Rheometer Milad Asadi A Study in Flame Retardancy of Flavonolignans Composition in Polypropylene Filaments 170 Modification of Chemically Stable Polymeric Materials 90: Increase of the Adhesion Property of 171 Hitoshi Kanazawa

Chemically Stable Polymeric Materials and Preparation of New FRP Using Modified Fiber