

# **Fiber Society 2018 Spring Conference**

Fibers and Textiles for Value Creation in  
Connected Industries

Tokyo, Japan  
12 - 14 June 2018

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## Day I – Tuesday, June 12

### Morning Session

9:00 Registration: 2nd Floor Foyer

	<b>Room FS-A, 5th Floor, Small Hall</b>
9:30	Welcome Remarks and Announcements <i>Takeshi Kikutani, Conference Chair</i> <i>Jintu Fan, President, The Fiber Society</i>
9:50	<b>Plenary Lecture:</b> Yoshiro Tajitsu, Kansai University <i>A New Wearable Sensor in the Shape of a Braided Cord</i> 3 Chair: Jintu Fan, Cornell University

#### 10:30 Break

	<b>Room FS-A</b> <b>5th Floor, Small Hall</b>	<b>Room FS-B</b> <b>2nd Floor, Tou-Gen (桃源)</b>
	<b>Session: Smart Polymers, Fibers, and Textiles</b> <i>Chair: Jonathan Chen, University of Texas-Austin</i>	<b>Session: Fundamentals of Fiber and Textile Science, Testing, and Characterization</b> <i>Chair: Chureerat Prahsarn, MTEC</i>
10:50	<b>Keynote:</b> <i>Recent Developments of Smart and Multifunctional Fibrous Materials and Clothing</i> 7 Jintu Fan, Cornell University	<b>Keynote:</b> <i>Quantitative Evaluation of Odour Retention on Different Fibre Types</i> 43 Xungai Wang, Deakin University
11:20	<i>Improved Electrical Conductivity of PU Nanofiber Web Coated with SWCNT/AgNW and Exploration as Textile Sensors</i> 8 Eugene Lee, Yonsei University	<i>Surface Functional Textile for Healthcare Application with Rechargeable Antibacterial Activity</i> 44 Zhentan Lu, Wuhan Textile University
11:40	<i>Wearable Fiber Organic Electrochemical Transistors for Biological Sensing</i> 9 Yuedan Wang, Wuhan Textile University	<i>Investigation of Fiber-based Influences on Bacterial Adherence</i> 45 Klas-Moritz Kossel, RWTH Aachen University
12:00	<i>Melt-spun Conductive Elastomeric Fibers for Smart Textiles: Implications for Bio-signal Recordings</i> 10 Ladan Eskandarian, Myant, Inc.	<i>Challenges from Wearable Technologies</i> 46 Ning Pan, University of California-Davis
12:20	<i>Open</i>	<i>Electrostatic Spinning—Spraying for Cell-laden Hybrid Membranes Mimicking the Native Blood Barrier</i> 47 Giuseppino Fortunato, Empa
	<b>Room FS-C</b> <b>2nd Floor, Fuku-Jyu (福寿)</b>	<b>Room FS-D</b> <b>2nd Floor, Hei-An (平安)</b>
	<b>Session: Sustainable Polymer Materials/Advanced Cellulose Fibers and Textiles</b> <i>Chair: Tadahisa Iwata, University of Tokyo</i>	<b>Session: Dyeing and Finishing/Design and Merchandising</b> <i>Chair: Kazumasa Hirogaki, University of Fukui</i>
10:50	<b>Keynote:</b> <i>Research Activities on Bio-based Fibers in Toray Industries, Inc.</i> 77 Yoshitaka Aranishi, Toray Industries, Inc.	<b>Keynote:</b> <i>Developing a Natural Dyeing Method for Obtaining Turkey Red Color</i> 91 Recep Karadag, Marmara University
11:20	<i>Cellulose Dissolution in Ionic Liquids: A Theoretical Study</i> 78 Takuya Uto, Kagoshima University	<i>Structural Change and Guest Release from Cyclodextrin Inclusion Complex Treated at Ultra-high Pressure</i> 92 Kenji Hisada, University of Fukui
11:40	<i>Highly Stiff Cellulose Fibers Spun from Liquid Crystalline Microcrystalline Cellulose Solutions Using DMSO as Co-solvent with an Ionic Liquid</i> 79 Chenchen Zhu, University of Bristol	<i>Adsorption of Acid Dye on Guanidine Groups Grafted Polyacrylonitrile Fibers</i> 93 Biao Wang, Donghua University
12:00	<i>Hierarchical Core-Sheath PPy@CNT/BC Macrofibers with High Electrochemical Performance for All-Solid-State Supercapacitors</i> 80 Shiyan Chen, Donghua University	<i>Development of Multifunctional Surfaces for Advanced Textile Applications</i> 94 Hatice İbili, Gaziantep University

12:20	<i>Preparation of Highly Stretchable Elastomeric Composites Reinforced with Well-defined Nanofiber Network of Bacterial Cellulose</i> Keita Sakakibara, Kyoto University	<i>Parameters Affecting the Electrospinning Process with Flame Retardant Agent</i> Bilgen Kapar, Gaziantep University	81	95
12:40–13:50	Lunch: Rooms FS-B and FS-C 13:00–13:30 Lunch Seminar, Room FS-B, Presented by Rigaku Corporation <i>3D Observation and Analysis of <math>\mu\text{m}</math> Fiber Composites by X-ray Microscopy</i> Yoshihiko Takeda, X-ray Research Laboratory, Rigaku Corporation			

### Afternoon Session

Room FS-A 5th Floor, Small Hall				
13:50	<b>Plenary Lecture:</b> Sanjay Rastogi, Maastricht University <i>Unprecedented Physical and Mechanical Properties of Solvent-free Processed Tapes and Films of Ultra-high Molecular Weight Polyethylene</i> Chair: Takeshi Kikutani, Tokyo Institute of Technology		4	
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<b>Session: Smart Polymers, Fibers, and Textiles</b> Chair: Bipin Kumar, Indian Institute of Technology Deli		<b>Session: Fiber Manufacturing and Characterization</b> Chair: Thomas Gries, RWTH Aachen University		
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15:30	<i>Application of Carbon Nanomaterial to Biodevice for Biofuel Cell with Carbon Binding, Peptide-fused Enzyme</i> Shin-ichiro Suye, University of Fukui	13	<i>Study on High-resolution, On-line Diameter Measurement of PET Fiber in High-speed, Melt-spinning Process</i> Young Chan Choi, Korea Institute of Industrial Technology	107
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	<b>Room FS-C</b> <b>2nd Floor, Fuku-Jyu (福寿)</b>	<b>Room FS-D</b> <b>2nd Floor, Hei-An (平安)</b>
	<b>Session: Sustainable Polymer Materials/Advanced Cellulose Fibers and Textiles</b> <i>Chair: Yutaka Kawahara, Gunma University</i>	<b>Session: Dyeing and Finishing/Design and Merchandising</b> <i>Chair: Recep Karadag, Marmara University</i>
14:50	<i>Effects of a Biobased Filler on the Crystallization Behaviors of Poly(L-lactic acid)</i> 82 Amit Kumar Pandey, Kyoto Institute of Technology	<i>Structural Coloration of Textile Controlling Structure of Colloidal Crystal Array on Fiber and Textile</i> 96 Kazumasa Hirogaki, University of Fukui
15:10	<i>Forcibly Spinning of Bombyx mori Silkworm Silk Ended in Complete Failure</i> 83 Yutaka Kawahara, Gunma University	<i>Development of a New Outdoor Sport Shirt Using a Thermal Manikin Under Different Climatic Conditions</i> 97 Maria José Abreu, University of Minho (for André Catarino)
15:30	<i>Fabrication and Characterization of Transparent, Flexible, and Water-insoluble, Non-mulberry Silk Fibroin Films</i> 84 Kelvin O. Mosefi, Tokyo University of Agriculture and Technology	<i>Colorful Fluorine-free Superhydrophobic Polyester Fabric Developed via Disperse Dyeing Process</i> 100 Ji-Hyun Oh, Seoul National University
15:50	<i>Structural Change and Its Effect on the Mechanical Property of Silk Induced by Tensile Deformation</i> 85 Taiyo Yoshioka, National Agriculture and Food Research Organization	<i>Safer Hair Dyeing by Using Biobased Materials: Techniques, Dyeability, and Protection Effect</i> 101 Hidekazu Yasunaga, Kyoto Institute of Technology

**16:10 Break**

	<b>Session: Sustainable Polymer Materials/Advanced Cellulose Fibers and Textiles</b> <i>Chair: Chenchen Zhu, University of Bristol</i>	<b>Session: Carbon Fibers and Advanced Composite Materials</b> <i>Chair: Dong Wang, Wuhan Textile University</i>
16:30	<b>Keynote:</b> <i>High-performance, Bio-based Plastics Synthesized from Natural and Unnatural Polysaccharides</i> 86 Tadahisa Iwata, University of Tokyo	<b>Keynote:</b> <i>Consideration of the Impregnation Process of Polymer Melt to Carbon Fiber Bundle by Steady-state Viscoelastic Flow Simulation</i> 121 Shuichi Tanoue, University of Fukui
17:00	<i>Development of Thermostable Polymers from Plant-derived Aromatic Hydroxy Acids</i> 87 Daisuke Ishii, University of Tokyo	<i>Improvements in Determination of Carbon Fibre Strength Distribution Using Automation and Statistical Data Analysis</i> 122 Faisal Islam, MINES ParisTech
17:20	<i>Utilization of Plant Biomass as Valuable Materials via Sustainable Process</i> 88 Kazuhiro Shikinaka, National Institute of Advanced Industrial Science and Technology	<i>Strength Reduction in Liquids and Its Application in Defect Analysis for Carbon Fibers</i> 125 Masatoshi Shioya, Tokyo Institute of Technology
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**18:20 Buses load from Tower Hall Funabori to banquet venue (1st floor, Exhibition Hall)**

**19:30 Banquet (Hotel Gajoen Tokyo; 3-minute walk from Meguro Station)**

**21:30 Buses load from banquet venue for return to conference venue or major stations**

## Day II – Wednesday, June 13

### Morning Session

9:00 Registration

	<b>Room FS-B</b> 2nd Floor, Tou-Gen (桃源)	<b>Room FS-C</b> 2nd Floor, Fuku-Jyu (福寿)	<b>Room FS-E</b> 3rd Floor
	<b>Session: Smart Polymers, Fibers, and Textiles</b> <i>Chair: Mari Inoue, Kobe University</i>	<b>Session: Fundamentals of Fiber and Textile Science, Testing, and Characterization</b> <i>Chair: Sachiko Sukigara, Kyoto Institute of Technology</i>	<b>Session: Fundamentals of Polymer Material: Synthesis, Polymerization, Characterization, and Its Physics</b> <i>Chair: Toyoaki Hirata, University of Fukui</i>
9:20	<i>Mechanical and Electrical Properties of Graphene-coated Polyurethane Nanofiber Webs as a Strain Gauge</i> Eunji Jang, Yonsei University 22	<i>Effect of Vapor Permeability and Aperture of Outdoor Parka and Environmental Velocity on Evaporative Heat Transfer and Ventilation Rate Using Sweating Thermal Manikin and Tracer Gas Methods</i> Yayoi Satsumoto, Yokohama National University 48	<i>Syntheses and Wettability of Poly(fluoroalkyl (meth)acrylate)s with Carbamate Linker</i> Yi Liu, Guizhou Normal College 137
9:40	<i>Proton Conductive Polymer Nanofiber Framework: Fabrication and Application to Polymer Electrolyte Fuel Cells</i> Manabu Tanaka, Tokyo Metropolitan University 23	<i>Determination of Total Comfort of Sport Caps Using Wear Trials</i> Maria José Abreu, University of Minho 49	<i>Polymer Hybrid Membranes for CO<sub>2</sub> Capture</i> Shinji Kanehashi, Tokyo University of Agriculture and Technology 138
10:00	<i>Waterborne Fabrication of Fluoride-free, Magnetic, Superhydrophobic Fabrics</i> Sida Fu, Deakin University 24	<i>Evaluation Parameters for Friction Properties of Woven Fabrics by Rotational Dragging with Tactile Sensor</i> Toshiyasu Kinari, Kanazawa University 52	<i>Facile Fabrication of Poly(glycidyl methacrylate)-b-polystyrene Functional Nanofibers Under Shearing Field</i> Wenwen Wang, Wuhan Textile University 139

### 10:20 Break

	<b>Room FS-B</b> 2nd Floor, Tou-Gen (桃源)	<b>Room FS-C</b> 2nd Floor, Fuku-Jyu (福寿)	<b>Room FS-E</b> 3rd Floor
	<b>Session: Smart Polymers, Fibers, and Textiles</b> <i>Chair: Christophe Daniel, Università Degli Studi di Salerno</i>	<b>Session: Fundamentals of Fiber and Textile Science, Testing, and Characterization</b> <i>Chair: Xungai Wang, Deakin University</i>	<b>Session: Fundamentals of Polymer Material: Synthesis, Polymerization, Characterization, and Its Physics</b> <i>Chair: Shinji Kanehashi, Tokyo University of Agriculture and Technology</i>
10:40	<i>Highly Air-permeable, Directional, Water-transport Cotton Fabrics</i> Hongxia Wang, Deakin University 27	<i>Effect of Different Processing Technique and Softener Treatments on the Surface Friction of Cotton Fabric</i> Ateeq ur Rehman, National Textile University 53	<i>Photonic Films of Block Copolymers Comprising a Main-chain Liquid Crystalline Central Segment Connected to Amorphous Segments at Both Ends</i> Masatoshi Tokita, Tokyo Institute of Technology 140
11:00	<i>Melt Spinning of Novel, Luminescent, Polypropylene-shaped Fibers</i> Chureerat Prahsarn, MTEC 30	<i>Optical Properties of Cashmere Fabrics</i> Sachiko Sukigara, Kyoto Institute of Technology 54	<i>Regularity of Spherical Microdomain Ordering in a Triblock Copolymer Ultrathin Film</i> Rasha A. H. Bayomi, Kyoto Institute of Technology 141
11:20	<i>Clothing Pressure of Elastic Socks: Measurement and Prediction Calculation</i> Mari Inoue, Kobe University 31	<i>Unique Multiple Melting Behavior of High-speed Melt Spun Polylactide Fibers</i> Midori Takasaki, Kyoto Institute of Technology 55	<i>Effect of Alkyl Chain Length of Fatty Acids on Adsorbed Layer Formation of the Acids and Local Viscosity at Metal/Fluid Interface</i> Toyoaki Hirata, University of Fukui 142

11:40	<i>Open</i>	<i>Fabrication of Gradient Structure in Melt Spun Polymer Blend Fibers</i> Long Chen, Donghua University 56	<i>Fully Return-to-Nature Polymer Research for Sustainability of Resources</i> 143 Seong Hun Kim, Hanyang University
<b>Room FS-P (1st Floor, Exhibition Hall)</b>			
12:00–13:20	<b>Poster Session</b> <b>Obligation Time: Odd Numbered 12:00–12:40; Even Numbered 12:40–13:20</b>		
13:20–15:00	Lunch: Rooms FS-B and FS-C 13:30–14:00 Lunch Seminar, Room FS-B, Presented by JASCO Corporation <i>Investigation of Residual Stress Distribution by Laser Raman Microscopy in Fiber Materials with Various Production Conditions</i> Wataru Takarada, Toyko Institute of Technology		

### Afternoon Session

	<b>Room FS-B</b> 2nd Floor, Tou-Gen (桃源)	<b>Room FS-C</b> 2nd Floor, Fuku-Jyu (福寿)	<b>Room FS-E</b> 3rd Floor
	<b>Session: Smart Polymers, Fibers, and Textiles</b> <i>Chair: Rudolf Hufenus, Empa</i>	<b>Session: Fundamentals of Fiber and Textile Science, Testing, and Characterization</b> <i>Chair: Konstantin Kornev, Clemson University</i>	<b>Session: Carbon Fibers and Advanced Composite Materials</b> <i>Chair: Gajanan Bhat, University of Georgia</i>
15:00	<i>Syndiotactic Polystyrene Fibers with Nanoporous Crystalline Phases: An Efficient Material for Sorption of Volatile Organic Pollutants</i> 32 Christophe Daniel, Università Degli Studi di Salerno	<i>Will Polyolefin and Polytetrafluoroethylene Filaments Become the Next Generation Filter Materials?</i> 57 Kyung-Ju Choi, Clean & Science	<i>The Effects of Interfacial Adhesion for Mechanical Properties of CFRTPs Made with Polyamide 6</i> 127 Toshihira Irisawa, Nagoya University
15:20	<i>Optical and Mechanical Properties of PA/PET Blend Fibers for Artificial Hair with Different Major Components</i> 33 Shunsuke Sato, Aderans Co., Ltd.	<i>Influence of Polymer Grade, Process Parameters, and Capillary Modification on the Shape Factor of Noncircular Cross-section Fibers</i> 58 Inga Noll, RWTH Aachen University	<i>Highly Transparent PVA-co-PE Nanofiber/Epoxy Film</i> 128 Dong Wang, Wuhan Textile University
15:40	<i>Improvement of Aerosol Oil-mist Filtration Performance Through Superoleophobic Treatment of Fibrous Filters</i> 34 Xin Wei, Deakin University	<i>Effect of Curvature on Wetting and Dewetting of Complexly Shaped Fibers</i> 61 Konstantin Kornev, Clemson University	<i>Ionic Liquid-based Electrolytes Containing Inorganic Nanofibers for Quasisolid Energy Devices</i> 129 Hidetoshi Matsumoto, Tokyo Institute of Technology
16:00	<i>Anti-Tuberculosis Nanofibrous Membrane</i> 37 Varol Intasanta, NANOTEC	<i>Numerical Simulation of Melt Spinning Process Incorporating Crystallization Characteristic of Polypropylene in Super Cooling Conditions</i> 62 Yasuhiko Otsuki, Prime Polymer Co., Ltd.	<i>Preparation of Few-layer Graphene Using Ionic Liquid as Green Media and Its Application in Polymer Composite and Fibers</i> 130 Ye Chen, Donghua University

**16:20 Break**



	<b>Session: Smart Polymers, Fibers, and Textiles</b> <i>Chair: Varol Intasanta, NANOTEC</i>	<b>Session: Fundamentals of Fiber and Textile Science, Testing, and Characterization</b> <i>Chair: Jinlian Hu, Hong Kong Polytechnic</i>	<b>Session: Carbon Fibers and Advanced Composite Materials</b> <i>Chair: Shuichi Tanoue, University of Fukui</i>
16:40	<i>Multifunctional Liquid-core Fibers</i> Rudolf Hufenus, Empa 38	<i>Smart and Safe Chemical Protective Clothing</i> 63 Eugenija Strazdiene, Vilnius University of Applied Science	<i>On the Development of Sustainable Composites Reinforced with High-performance Regenerated Cellulose Fibers</i> 131 Chenchen Zhu, University of Bristol (for Anastasia Koutsomitopoulou)
17:00	<i>Irradiated Hydrogel Fibers Responsive to Moisture</i> 39 Bin Fei, Hong Kong Polytechnic University	<i>Washing and Wearing Processes Effects on Soldiers Uniforms: Friction Sound Characterization</i> 64 Floriane Leclinche, Université de Haute-Alsace	<i>Inducing the Crystallization in Cotton Cellulose Ion Gel Films for Enhanced Mechanical Properties</i> 132 Muhammad Abdul Haq, Kagoshima University
17:20	<i>Preparation and Thermo-responsive Properties of Temperature-Sensitive-Gel(TSG)/Polymer Functional Films</i> 40 Jin Gong, Yamagata University	<i>Blocked</i>	<i>Antibacterial Nano-crystalline Cellulose modified with N-halamine/Quaternary Ammonium Salts</i> 133 Xuehong Ren, Jiangnan University
17:40	<i>Open</i>	<i>Blocked</i>	<i>Hydrogel Surface Functionalization of Cotton to Improve Wound Dressing Applicability</i> 134 Maria José Abreu, University of Minho (for Graça Soares)
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18:30	<b>SFSTJ Annual Meeting and Social Gathering with The Fiber Society</b>		

### Day III – Thursday, June 14

9:00 Registration

	<b>Room FS-B</b> 2nd Floor, Tou-Gen (桃源)	<b>Room FS-F</b> 2nd Floor, Hou-Rai (蓬莱)	<b>Room FS-E</b> 3rd Floor
	<b>Session: Fiber Manufacturing and Characterization</b> <i>Chair: Caroline Schauer, Drexel University</i>	<b>Session: Fundamentals of Fiber and Textile Science, Testing, and Characterization</b> <i>Chair: Guowen Song, Iowa State University</i>	<b>Session: Fundamentals of Polymer Material: Synthesis, Polymerization, Characterization, and Its Physics</b> <i>Chair: Dominique Adolphe, ENSISA</i>
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9:50	<i>Yarn and Fabric Performances in a Modified Ring Spinning System</i> Rong Yin, Hong Kong Polytechnic University 113	<i>Fabric Drape Model Considering Shear and Bending</i> 68 Liu Yang, Shinshu University	<i>Derivation of Statistical Principle: Explaining the Heating Rate Dependence of Degradation Temperature of Ziegler-Natta Poly(styrene)</i> 145 Masatomo Minagawa, NPO, Dream-Create-Laboratories
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<b>10:50 Break</b>			
	<b>Session: Fiber Manufacturing and Characterization</b> <i>Chair: Moon Suh, North Carolina State University</i>	<b>Session: Fundamentals of Fiber and Textile Science, Testing, and Characterization</b> <i>Chair: Laurence Schacher, ENSISA</i>	<b>Session: Fundamentals of Polymer Material: Synthesis, Polymerization, Characterization, and Its Physics</b> <i>Chair: Yuris Dzenis, University of Nebraska-Lincoln</i>
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11:30	<i>Polymer Nanofiber-based Filter Media with Tailored Three-dimensional Structure High-efficient Air Filtration Through Suspension Drying Techniques</i> 117 Ke Liu, Wuhan Textile University	<i>Testing Method for the Evaluation of Flammability of Meta-aramid Blended Yarns</i> 72 Jie Feng, Hong Kong Polytechnic University	<i>Microspheres with Dimple Morphology of Poly(p-oxyferuloyl) Prepared by Reaction-induced Phase Separation</i> 151 Hironori Atarashi, Okayama University
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12:30	<b>Poster Award Ceremony and Closing Remarks</b>		
12:50	<b>Conference Concludes</b>		

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## Poster Session

**Wednesday, June 13 — Room FS-P, Exhibition Hall, First Floor**

### Fundamentals of Polymer Materials: Synthesis, Polymerization, Characterization, and Its Physics

Chao-Hung Cheng	<i>Ultra Small-angle X-ray Scattering Analysis of Block Copolymer-grafted Silica Nanoparticle Hybrid Films Under Mechanical Deformation</i> 157
Soroush Mehdizadeh	<i>Effect of Spacer Geometry on Reverse Electrodialysis (RED) Resistance</i> 158
Chung Hee Park	<i>Electric Heating Performance and Superhydrophobicity of Cotton Fabric In-situ Polymerized with Pyrrole Using Binary Oxidants</i> 159
Masahiro Yasukawa	<i>Performance and Efficiency Comparison Between Pressure-retarded Osmosis and Reverse Electrodialysis</i> 160
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Saeko Harada	<i>Characterization of Cation-exchange Membranes Prepared by Ion-track Graft Polymerization</i>	162
Tsuyoshi Saito	<i>Preparation and Characterization of PVA-based Charge Mosaic Membranes Prepared by Polymer Coating</i> (for Yuriko Kakihana)	163

### **Fundamentals of Fiber and Textile Science, Testing, and Characterization**

Fumiya Sakakibara	<i>Polymer Alloy of Polybutylene Terephthalate and Polyrotaxane and Its Physical Properties</i>	164
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Klas-Moritz Kossel	<i>Textile Production Theory for Digital Applications in Fiber Production and Processing</i> (for Daniel Buecher)	170
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