



# ISNIT 2017

10<sup>th</sup> International Symposium on Nature-Inspired Technology

June 28-July 1, 2017

Jpark Island Resort & Waterpark, Cebu, Philippine

## Technical Program



The Executive Committee reserves the right to amend the program if necessary.

## ISNIT 2017 Program Schedule

### Wednesday, JUNE 28

- 16:00-19:00 **Conference registration and Check-in**
- 18:00-20:00 **Welcome Reception** (Triphora Room, Jpark Hotel)

### Thursday, JUNE 29

- 08:00-18:00 **Conference registration and Check-in** (Grand Ballroom Triton, Jpark Hotel)
- 08:50-09:10 **Opening Remarks**
- 09:10-09:55 **Plenary Presentation I**  
Shigeru Deguchi, *Japan Agency for Marine-Earth Science and Technology, Japan*
- 09:55-10:40 **Plenary Presentation II**  
Hyouk Ryeol Choi, *Sungkyunkwan University, Korea*
- 10:40-11:00 **Coffee Break**
- 11:00-11:45 **Plenary Presentation III**  
Haeshin Lee, *Korea Advanced Institute of Science and Technology, Korea*
- 11:45-12:30 **Plenary Presentation IV**  
Kurisawa Motoichi, *Institute of Bioengineering and Nanotechnology, Singapore*
- 12:30-14:00 **Lunch**
- 14:00-14:30 **Invited I**, Nature-Inspired Sensors and Actuators, Inkyu Park, *KAIST, Korea*
- 14:30-15:00 **Invited II**, Nature-Inspired Fluid Dynamics, Xu Hou, *Xiamen University, China*
- 15:00-15:30 **Invited III**, Nature-Inspired Surfaces and Structures, Syuji Fujii, *Osaka Institute of Technology*
- 15:30-16:00 **Invited IV**, Nature-Inspired Materials, Seung Woo Cho, *Yonsei University, Korea*
- 16:00-17:30 **Poster Session**
- 18:30-22:30 **Conference Banquet** (Outdoor)

### Friday, JUNE 30

- 08:30-10:30 **Session F1A** Nature-Inspired Robotics and Biomechanics      **Session F1B**, New Discovery for Smart and Fusion Technology
- 10:30-10:50 **Coffee Break**
- 10:50-12:30 **Session F2A**, Nature-Inspired Surfaces and Structures I      **Session F2B**, Nature-Inspired Materials I
- 12:30-14:00 **Lunch**
- 14:00-16:00 **Session F3A**, Nature-Inspired Fluid Dynamics      **Session F3B**, Nature-Inspired Sensors and Actuators
- 16:00-16:20 **Coffee Break**
- 16:20-18:00 **Session F4A**, Nature-Inspired Surfaces and Structures II      **Session F4B**, Nature-Inspired Materials II
- 18:30-22:00 **Informal Dinner for Committee & Invited Speakers**(Arirang, outside Jpark Hotel)

### Saturday, JULY 1st

- 09:00-12:00 Special session of research consortiums
- 12:00-12:30 Closing Remarks & Conference Adjourns

## Oral Presentations

**Oral Session (Plenary & Invited Speakers) – Thursday, JUNE 29 (09:00-16:00)**

**Poster Session - Thursday, JUNE 29 (16:00-17:30)**

**Oral Session F1A- Friday, JUNE 30 (08:30-10:30)      F1B- Friday, JUNE 30 (08:30-10:30)**

**F2A- Friday, JUNE 30 (10:50-12:30)      F2B- Friday, JUNE 30 (10:50-12:30)**

**F3A- Friday, JUNE 30 (14:00-16:00)      F3B- Friday, JUNE 30 (14:00-16:00)**

**F4A- Friday, JUNE 30 (16:20-18:00)      F4B- Friday, JUNE 30 (16:20-18:00)**

### **Oral Session: Thursday, June 29, 2017**

#### **Plenary Session 1 (09:10-10:40)**

**Session Chair:** Sang Joon Lee (POSTECH, Korea)

Plenary01    **Unlocking the potential of life below the waves**  
09:10-09:55    *Shigeru Deguchi, Japan Agency for Marine-Earth Science and Technology, Japan*

Plenary02    **Artificial Muscle Actuators for Mimicking Biological Muscles**  
09:55-10:40    *Hyouk Ryeol Choi, Sungkyunkwan University, Korea*

#### **Plenary Session 2 (11:00-12:30)**

**Session Chair:** Hyuneui Lim (KIMM, Korea)

Plenary03    **Poly(dopamine), the First Material-independent Surface Chemistry**  
11:00-11:45    *Haeshin Lee, KAIST, Korea*

Plenary04    **Green Tea Based-Nanomedicine for Cancer Therapy**  
11:45-12:30    *Kurisawa Motoichi, Institute of Bioengineering and Nanotechnology, Singapore*

#### **Invited Speaker Session (14:00-16:00)**

**Session Chair:** Atsushi Hozum (AIST, Japan)

Invited01    **A new route to the fabrication of heterogeneous metal oxide nanomaterial array with sea urchin like structures for integrated chemical sensors**  
14:00-14:30    *Inkyu Park, KAIST, Korea*

Invited02    **External stimuli-responsive liquid-based gating systems**  
14:30-15:00    *Xu Hou, Xiamen University, China*

Invited03    **Liquid marbles as a platform towards adhesive materials**  
15:00-15:30    *Syuji Fujii, Osaka Institute of Technology, Japan*

Invited04    **Bio-inspired Materials for Stem Cell Engineering and Reprogramming**  
15:30-16:00    *Seung Woo Cho, Yonsei University, Korea*

### **Oral Session : Friday, June 30, 2017**

#### **F1A- Nature-Inspired Robotics and Biomechanics (08:30-10:30)**

**Session Chairs:** Jung Kim (KAIST) / Yoonhyuk Kim (KyungHee University)

F1A01        **A bio-inspired climbing robot with flexible pads and claws**  
08:30-08:50    *Aihong Ji, and Zhihui Zhao (Nanjing University of Aeronautics and Astronautics, China)*

F1A02        **Morphology and Mechanical Properties of Leaf-cutting Ants Vibration Organs (Atta cephalotes)**  
08:50-09:10    *Guang Yao (Beihang University, China)*

F1A03        **Utilization of wearable motion capture technology for sport activities**  
09:10-09:30    *Yoon Hyuk Kim (Kyung Hee University, Korea)*

F1A04        **Design of Bionic Parallel Mechanical Legs Based on Characteristics of Heavy Load Smooth Motion of Ostrich Hind Limbs**  
09:30-09:50    *Rui Zhang, Haijin Wan, Dianlei Han, Lei Ling, Guoyu Li, and Jianqiao Li (Jilin University, China)*

F1A05        **Tactile sensor design for human-like object exploration**  
09:50-10:10    *Yunjo Kim, Hwayeong Jeong, Wonseok Shin, and Jung Kim (KAIST, Korea)*

F1A06        **A Milli-Scale Multi-Modal Robot that Can Jump and Crawl**  
10:10-10:30    *Gwang-Pil Jung (Seoul National University of Science and Technology, Korea), and Kyu-Jin Cho (Seoul National University, Korea)*

#### **F1B- New Discovery for Smart and Fusion Technology (08:30-10:30)**

**Session Chairs:** Jungyul Park (Sogang University) / Yuji Hirai (Chitose Institute of Sci & Tech)

F1B01        **Biomimetic reverse electrodialysis based nanofluidic power generator with multiple cells**  
08:30-08:50    *Cong Wang (Sogang University, Korea), Eunpyo Choi (Chonnam National University, Korea), and Jungyul Park (Sogang University, Korea)*

F1B02        **Serendipity-Oriented Bio-TRIZ Database for Sustainable Lifestyle**  
08:50-09:10    *Toru Kobayashi (Graduate School of Engineering, and Nagasaki University, Japan)*

F1B03        **Surface analysis of a firebrat, *Thermobia domestica***

09:10-09:30 Yuji Hirai, Naoto Okuda, and Masatsugu Shimomura (Chitose Institute of Science and Technology, Japan)

F1B04 **Analysis on global trends of social implementation of biomimetics technology and other emerging technology based on intellectual property perspective**  
09:30-09:50 Ryo Kohsaka (Tohoku University, Japan), Yoshinori Fujihira (Muroran Institute of Technology, Japan), and Yuta Uchiyama (Tohoku University, Japan)

F1B05 **Revisit the human hair hygrometer by making hair resonators**  
09:50-10:10 Yeowon Yoon, Seokbeom Kim, Bora Lee (Sogang University, Korea), Thomas Thundat (University of Alberta, Canada), and Jungchul Lee (Sogang University, Korea)

F1B06 **Soft textile actuators using loop patterns**  
10:10-10:30 Min-Woo Han, Jongha Yu, and Sung-Hoon Ahn (Seoul National University, Korea)

### F2A- Nature-Inspired Surfaces and Structures I (10:50-12:20)

**Session Chairs:** Hoon-Eui Jeong (UNIST) / Syuji Fuji (Osaka Institute of Tech) / Huawei Chen (Beihang University)

F2A01 **(Invited) Bioinspired wettability-controlled surfaces with gradient micro- and nanostructures**  
10:50-11:20 Yongmei Zheng (Beihang University, China)

F2A02 **Biomimetic thermochromic coatings**  
11:20-11:40 Yi Long (Nanyang Technological University, Singapore)

F2A03 **A new coating process by biomimetic approach in structural color of jewel beetle**  
11:40-12:00 Hiroshi Fudouzi (National Institute for Materials Science, Japan)

F2A04 **Controlled- Release System Based on Mussel-Inspired Chemistry and Their Applications in Agriculture**  
12:00-12:20 Xin Jia, Zhiyuan Ma, and Wenbo Sheng (Shihezi University, China)

### F2B- Nature-Inspired Materials I (10:50-12:30)

**Session Chairs:** Haeshin Lee (KAIST) / Michinari Kohri (Chiba University)

F2B01 **(Invited) Bioinspired hydrogels: strong, tough, lubricious or astringent**  
10:50-11:20 Feng Zhou (Lanzhou Institute of Chemical Physics, China)

F2B02 **(Invited) Boric acid and the control of polydopamine growth in solution and on surfaces**  
11:20-11:50 Vincent BALL (Université de Strasbourg, France)

F2B03 **(Invited) Bio-inspired Stretchable Electrodes**  
11:50-12:10 Zijian Zheng (Hong Kong Polytechnic University, Hong Kong), Haoli Zhang (Lanzhou University, Lanzhou, China)

F2B04 **Mussel-inspired hemostatic needles for normal and impaired bleeding**  
12:10-12:30 Mikyung Shin, and Haeshin Lee (KAIST, Korea)

### F3A- Nature-Inspired Fluid Dynamics (14:00-16:10)

**Session Chairs:** Hyungmin Park (Seoul National University) / Xu Hou (Xiamen University)

F3A01 **(Invited) Tree-Inspired Fluid Mechanics for Engineering Aspects**  
14:00-14:30 Jinkee Lee (Sungkyunkwan University, Korea)

F3A02 **Spontaneous Desalination by Capillarity Ion Concentration Polarization**  
14:30-14:50 Hyomin Lee, Sungmin Park, Junsuk Kim, Yeonsu Jung, Ho-Young Kim, and Sung Jae Kim (Seoul National University, Korea)

F3A03 **3D micro-scale modeling of shark denticles and prototype for fluid control**  
14:50-15:10 Mariko Miyazaki (Hitachi, Ltd., Japan), Yuji Hirai (Chitose Institute of Science and Technology, Japan), Hiroshi Mariya (Hitachi, Ltd., Japan), Masatsugu Shimomura (Chitose Institute of Science and Technology, Japan), Akihiro Miyauchi (Hitachi, and Ltd., Japan)

F3A04 **Flow structures around a flexible oscillating caudal-fin model for maximum thrust**  
15:10-15:30 Hyungmin Park (Seoul National University, Korea), Yong-Jai Park (Sun Moon University, Korea), Boogeon Lee, Kyu-Jin Cho, and Haecheon Choi (Seoul National University, Korea)

F3A05 **Formation of oil nanodroplets in hot compressed water inspired by deep-sea environment**  
15:30-15:50 Satoshi Okada (Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Japan)

F3A06 **Sustaining the drag reduction effect with hydrophobicity**  
15:50-16:10 Haibao Hu (Northwestern Polytechnical University, China)

### F3B- Nature-Inspired Sensors and Actuators (14:00-16:00)

**Session Chairs:** Byung Yang Lee (Korea University) / Mamiko Ozaki (Kobe University)

F3B01 **(Invited) Nature-Inspired Sensors to Express Gustatory and Olfactory Senses**  
14:00-14:30 Kiyoshi Toko (Kyushu University, Japan)

F3B02 **Structural Colors based on Biomimetic Supramolecular Films and Their Applications**  
14:30-15:00 Byung Yang Lee (Korea University, Korea)

F3B03 **Chemical difference detector in the olfactory sensor of ant**  
15:00-15:20 Mamiko Ozaki (Kobe University, Japan)

F3B04 **Bio-inspired slip sensors with microstructure enhanced sensitivity**  
15:20-15:40 Yonggang Jiang (Beihang University, China)

F3B05 **Nanoscale easy tear process for ultra-fast responsive VOCs sensors**  
15:40-16:00 *Hyungkwan Chang, and Jungyul Park (Sogang university, Korea)*

#### **F4A- Nature-Inspired Surfaces and Structures II (16:20-17:50)**

**Session Chairs:** Hoon-Eui Jeong (UNIST) / Syuji Fuji (Osaka Institute of Tech) / Huawei Chen (Beihang University)

F4A01 **(Invited) Beyond Biological-Surface Functionalities of “Self-lubricating Organogels : SLUGs”**  
16:20-16:50 *ATSUSHI HOZUMI (AIST, Japan)*

F4A02 **Bio-inspired Strong Boundary Friction Surface Based on the Toe Pad of Tree Frog**  
16:50-17:10 *Liwen Zhang, Huawei Chen, Pengfei Zhang, and Deyuan Zhang (Beihang University, China)*

F4A03 **Nature-inspired thermo-responsive multifunctional membrane**  
17:10-17:30 *Hyejeong Kim, Kiwoong Kim, and Sang Joon Lee (Pohang University of Science and Technology (POSTECH), Korea)*

F4A04 **Vertical alignment of gold nanorods through the immobilization onto DNA grafted substrates**  
17:30-17:50 *Hideyuki Mitomo (Hokkaido University, Japan), Satoshi Nakamura (Hokkaido University, Japan), Miho Aizawa (Tokyo Institute of Technology, Japan), Yasutaka Matsuo, Kenichi Niikura (Hokkaido University, Japan), Atsushi Shishido (Tokyo Institute of Technology, Japan), and Kuniharu Ijiro (Hokkaido University, Japan)*

#### **F4B- Nature-Inspired Materials II (16:20-18:00)**

**Session Chairs:** Haeshin Lee (KAIST) / Michinari Kohri (Chiba University)

F4B01 **(Invited) Marine mussel Inspired Fluorescent Nanoparticles for Theragnosis**  
16:20-16:50 *Sung Young Park, Young Kwang Kim, and Zihnil Adha Islamy Mazrad (Korea National University of Transportation, Korea)*

F4B02 **(Invited) Foldedures: Unprecedented 3D Organic Molecular Architectures**  
16:50-17:20 *Hee-Seung Lee (KAIST, Korea)*

F4B03 **Structural color materials from melanin-like particles inspired by bird feathers**  
17:20-17:40 *Michinari Kohri, Ayaka Kawamura (Chiba University, Japan), and Gen Morimoto (Yamashina Institute for Ornithology, Japan)*

F4B04 **NATURE-INSPIRED SURFACE LIGAND TOWARDS DYNAMIC NANOPARTICLE ASSEMBLY FOR BIOMEDICAL APPLICATIONS**  
17:40-18:00 *Daishun Ling (Zhejiang University, China)*

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## **Poster Session: 16:00 – 17:30, Thursday, JUNE 29, 2017**

#### **T1P Nature-Inspired Robotics and Biomechanics**

T1P01 **Quadruped Wall/Ceiling Climbing Robot with Superhydrophobic Surface Manufactured using 3D Printing**  
*Hangil Ko, Hoon Yi, and Hoon Eui Jeong (UNIST, Korea)*

T1P02 **Research in the Motion Simulation and Experiment of Bionic Mechanical Foot Based on Postures of Ostrich Foot Travelling on Sand**  
*Rui Zhang, Lei Ling, Dianlei Han, Haijin Wan, Guoyu Li, and Jianqiao Li (Jilin University, China)*

T1P03 **Research on Cushioning Energy-saving and Active Anti-subsidence Bionic Mechanical Foot**  
*Rui Zhang, Dianlei Han, Lei Ling, Guoyu Li, Haijin Wan, Jianqiao Li (Key Laboratory of bionic Engineering, and Ministry of Education, Jilin University, China)*

T1P04 **The mandible of *Cyllorhynchites ursulus***  
*Eunok Lee (National Institute of Ecology, Korea)*

T1P05 **Caterpillar-like segment robot climbing on vertical surfaces**  
*Il-Hwan Han, Seung-Hyeop Hyun, and Seung-Yop Lee (Sogang University, Korea)*

T1P06 **SMA Spring-based Stiffness Tunable Design for MRI-guided Neurosurgical Robot**  
*Yeongjin Kim (Incheon National University, Korea), Bummo Ahn (Korea Institute of Industrial Technology, Korea), Hyosang Lee, Sangjoon J. Kim, and Jung Kim (Korea Advanced Institute of Science and Technology, Korea)*

T1P07 **A comparison of catheter steering sensitivity by the number of holes through nature inspired**  
*Dae Eun Moon, Jung Ho Kim, Jae Hyun Woo, and Hong Seok Lim (Dongguk University, Korea)*

T1P08 **Quasi-ordered scattering structure implemented with ZnO nanostructures**  
*Geon Hwee Kim, Geunbae Lim (POSTECH, Korea), and Taechang An (Andong National University, Korea)*

T1P09 **A water driving micro robot with a biomimetic lotus leaf structure**  
*Young Chan Choi, Soon Yeol Kwon, Dong Geon Jung, Jun Yeop Lee, Sun Young Kwon, and Seong Ho Kong (Kyungpook National University, Korea)*

T1P10 **Latency makes more motion sickness when using head mounted display**  
*Hyeob Choi, Eun Kang Lee, Junhyeok Park, Myeong Sub Kim (KAIST, Korea), Yongwoo Yi (Samsung Display Research Center, Korea), and Sukyung Park (KAIST, Korea)*

- T1P11 **Development of an ankle spasticity assessment device based on human ankle joint motions**  
Wonseok Shin, Junghoon Park, and Jung Kim (KAIST, Korea)
- T1P12 **Anatomical Screw Guiding Plate for Safe MIS Sustentacular Screw Fixation**  
YeonSoo Lee (Catholic University of Daegu, Korea)
- T1P13 **In vivo mechanical data acquisition for realistic haptic feel in shoulder arthroscopic surgery simulator**  
Sanghoon Chae, Hyung-Soon Park (Korea Advanced Institute of Science and Technology, Korea)
- T1P14 **Mechanical analysis and experimental verification of geckos attachment with low preloading and rapid detachment**  
Zhouyi Wang, Qijun Jiang (Institute of Bio-inspired Structure and Surface Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China), Weidong Chen (State Key Laboratory of Mechanics and Control of Mechanical Structures, Nanjing University of Aeronautics and Astronautics, Nanjing, China), Zhendong Dai (College of Astronautics, Nanjing University of Aeronautics and Astronautics, Nanjing, China)

#### T2P New Discovery for Smart and Fusion Technology

- T2P01 **Electrotaxis investigation of C.elegans on a controlled electric field in a microfluidic channel**  
Sunhee Yoon, Tae-Joon Jeon, and Sun Min Kim (Inha University, Korea)
- T2P02 **Micro check valve integrated magnetically actuated micropump for implantable drug delivery**  
Cong Wang, Jin-seong Kim, and Jungyul Park (Sogang University, Korea)
- T2P03 **Study on press molding method of magnesium engine cover using high frequency induction heater**  
Hur Kwang Ho, and Kim Jung Ho (Gyeongbuk Hybrid Technology Institute, Korea)
- T2P04 **Study of heat dissipation characteristics through heat transfer analysis of magnesium engine cover**  
JUNGHOO KIM, and KWANGHO HUR (Gyeongbuk Hybrid Technology Institute, Korea)
- T2P05 **Fabrication of micro-channels using WNM and its evaluation of micro-channel guided vascularization in biomimetic hydrogels**  
Jaeyeon Lee (Korea University, Korea), Se-Hwan Lee, Young-sam Cho (Wonkwang University, Korea), and Yongdo Park (Korea University, Korea)
- T2P06 **Smart process for preparing ceria film at environmental friendly conditions**  
Yuta Kubota, Tetsuo Kishi, Tetsuji Yano, and Nobuhiro Matsushita (Tokyo Institute of Technology, Japan)
- T2P07 **Experimental study of dispensing a cluster of alginate**  
Duck-Gyu Lee, Sang Hyun Ahn, Wan-Doon Kim, and Junhee Lee (Korea Institute of Machinery & Materials, Korea)

- T2P08 **A Study on an Air Compression System That Fused the Smart Grid IT Technology and the Redundant Startup Panel Technology**  
Jae-Hwan SON (DAEGU MECHATRONICS&MATERIALS INSTITUTE, Korea), Dong-Hyun CHO (DAEJIN UNIVERSITY, Korea), Chul-Woo Park (DAEGU MECHATRONICS&MATERIALS INSTITUTE, Korea), Jung-Hoon LEE (KUNYOUNG MACHINERY CO., LTD, Korea), and Ho-Chul SHIN (SIGNAL PROCESSING & RESEARCH, Korea)
- T2P09 **Development of sustainable nature-inspired Naturoids to reduce the environmental risks**  
Wandoo Kim, Hyunee Lim, Youngdo Jung, Duck-Gyu Lee, Seung-Chul Park (Korea Institute of Machinery & Materials, Korea), Jae Chun Choe, Yikweon Jang (Ewha Womans University, Korea), Sang Joon Lee (Center for Biofluid and Biomimic Research, POSTECH, Korea), HoonEui Jeong (UNIST, Korea), and Jinkee Lee (Sungkyunkwan University, Korea)
- T2P10 **Speed control of treadmill to mimic patient's intention improves prefrontal activity and walking symmetry in post-stroke**  
Keonyoung Oh, Seong-Jin Hong (Korea Advanced Institute of Science and Technology, Korea), Won-Seok Kim, Ji-Hong Park, Nam-Jong Paik (Seoul National University Bundang Hospital, Korea), Hyung-Soon Park (Korea Advanced Institute of Science and Technology, Korea)

#### T3P Nature-Inspired Surfaces and Structures

- T3P01 **In vitro wound healing model based on a nano-patterned surface integrated microfluidic device**  
Insu Lee, Dae Gyu Kim, Tae-Joon Jeon, and Sun Min Kim (Inha University, Korea)
- T3P02 **Flexible Magnetic Field-Responsive Pillar Arrays for Remote and Precise Droplet Manipulation**  
Hangil Ko, Minho Seong, Insol Hwang, Hyun-Ha Park, and Hoon Eui Jeong (Ulsan National Institute of Science and Technology (UNIST), Korea)
- T3P03 **Bioinspired mushroom-shaped micro array fabrication using soft nanocomposite for high temperature adhesive application**  
Minho Seong, Hoon Yi, Hangil Ko, Joosung Lee, Kahyun Sun, and Hoon Eui Jeong (UNIST, Korea)
- T3P04 **Efficient and precise fabrication of bioinspired dry adhesive microstructures**  
Hoon Yi, Minsu Kang, Sanghyun Lee, Hangil Ko, and Hoon Eui Jeong (UNIST, Korea)
- T3P05 **Artificial peristome for unidirectional liquids spreading**  
Pengfei Zhang, Huawei Chen, Guang Liu, Liwen Zhang, and Deyuan Zhang (Beihang University, China)
- T3P06 **Polymer brushes with multiple functionalities inspired by fish skin**  
Tomoya Sato, Chihiro Urata, Matt. W England, Liming Wang (National Institute of Advanced Industrial Science and Technology (AIST), Japan), and ATSUSHI HOZUMI (AIST,

Japan)

- T3P07 **Time scales and dimensionality of wetting transitions on butterfly wing inspired micro-cavity surfaces**  
*Prashant Pendyala, Hong Nam Kim (Korea Institute of Science and Technology, Korea), Harpreet S Grewal (Shiv Nadar University, India), Il-Joo Cho, and Eui-Sung Yoon (Korea Institute of Science and Technology, Korea)*
- T3P08 **Effect of capillary forces on tribology of lotus and mushroom inspired pillar patterned surfaces**  
*Prashant Pendyala, Hong Nam Kim (Korea Institute of Science and Technology, Korea), Harpreet S Grewal (Shiv Nadar University, India), Il-Joo Cho, and Eui-Sung Yoon (Korea Institute of Science and Technology, Korea)*
- T3P09 **Fabrication of nano structured surfaces and their application**  
*JONGJOO RHA, and Eunwook Jeong (KIMS, Korea)*
- T3P10 **Analysis of Drop Wetting on Micro Patterned Surface for Super hydrophobic Property**  
*Ji Hoon Lee, and Seungmo Kim (KOREATECH, Korea)*
- T3P11 **Adhesion Control of Polymeric Dry Adhesives using Partial Wrinkle Generation Method**  
*Seongmin Kang (Chungnam National University, Korea)*
- T3P12 **Dynamic Wettability on Vibrating Ultra-Thin Membrane**  
*Kyoung-Su Park, and Hue Ha (Gachon university, Korea)*
- T3P13 **Development of a Portable Electrospinning System for a Biomedical Application**  
*Hyunwoo Lee, Sung Uk Hong, Chan Park, Hyun Suk Jung, and Seong Jin Cho (Chungnam National University, Korea)*
- T3P14 **Nature-Inspired Antireflective Convex Lens with Nanopillars on Curved Surface**  
*Seungchul Park, and Hyuneui Lim (KIMM, Korea)*
- T3P15 **Fabrication of superoleophobic surfaces with hierarchical microcubic/nanowire structures on aluminum**  
*Wonshik Kwak, and Woonbong Hwang (POSTECH, Korea)*
- T3P16 **Nature-Inspired Water Harvesting**  
*Hyuneui Lim (Korea Institute of Machinery and Materials, Korea)*
- T3P17 **Thermally Reduced Graphene Oxide Membrane mimicking Aquaporin structure**  
*Jongwoon Kim, and Chang-Soo Han (Korea University, Korea)*
- T3P18 **A Highly Flexible Superoleophobic Surface on a Polymer Film Based on Multi-scale Nanostructures and An Adhesion-enhanced Polydopamine Coating**  
*Handong Cho, Jonghyeon Jeong, and Woonbong Hwang (Pohang University of Science of Technology, Korea)*
- T3P19 **Simple fabrication of a superhydrophobic aluminum surface with polymerized HDFs**  
*Jin-Young Park, and Woonbong Hwang (POSTECH, Korea)*

- T3P20 **Super-hydrophilic/-hydrophobic surfaces fabrication for enhanced corrosion resistance on steel**  
*Byungrak Park, and Woonbong Hwang (POSTECH, Korea)*
- T3P21 **Precisely controlled vertical silicon nanowires for biologically inspired photonics**  
*Il-Suk Kang, Dong-Eun Yoo, Dong-Wook Lee (National Nanofab Center, KAIST, Korea), and Young Min Song (Gwangju Institute of Science and Technology, Korea)*
- T3P22 **A new coating process by biomimetic approach in structural color of jewel beetle**  
*Hiroshi Fudouzi (National Institute for Materials Science, Japan)*
- T3P23 **Generation of morphological wrinkle patterns using multi-step out-of-plane stretching method**  
*Sanghu Park (Pusan National University, Korea), and Xin Li (Pusan National University, Korea)*
- T3P24 **Optimization of heat exchanger manifold topology**  
*Seonghun Park (Pusan National University, Korea), and Hanjong Kim*
- T3P25 **High-speed fabrication of seamless nanogratings by continuous mechanical nanoinscribing**  
*Seungjo Lee, Dong Kyo Oh, Jae Hyuk Lee, Jeong Dae Kim, Kangeun Yoo, Jiyeop Kim, Minho Na, Ju Hyun Ahn, Dong Ha Kim, Won Seok Lee, Kang Min Jee, Youn Kyou Lee, and Jong G. Ok (Seoul National University of Science and Technology, Korea)*
- T3P26 **Adhesive Interaction between Cypris Larva and Marine Biofouling Brush Surface**  
*Motoyasu Kobayashi (Kogakuin University, Japan)*
- T3P27 **Template-based nanolithography for plasmonic nanostructures**  
*Dukhyun Choi (Kyung Hee University, Korea), Yong Tae Park (Myongji University, Korea), Sangmin Lee (Chung-Ang University, Korea), and Dongsu Kim (KITECH, Korea)*
- T3P28 **Fabrication of nano sand bed for molecular separation inspired by sand-gravel bars along rivers in nature**  
*NguyenThi Phuong, Eunju Yeo, Jeong Hwan Kim, Kwanoh Kim, Doo-Sun Choi, Kyung-Hyun Whang, Yeong-Eun Yoo, and Jae Sung Yoon (Korea Institute of Machinery and Materials (KIMM), Korea)*
- T3P29 **Fabrication of lamellae nanostructures using thin films deposition for structural color realization**  
*Jeong Hwan Kim, Jik-Han Jeong, Kwanoh Kim, Doo-Sun Choi, Kyung-Hyun Whang (Korea Institute of Machinery and Materials, Korea), Jae Sung Yoon (Korea Institute of Machinery and Materials (KIMM), Korea), and Yeong-Eun Yoo (Korea Institute of Machinery and Materials, Korea)*
- T3P30 **Enhanced mechanical properties of self-polymerized polydopamine coated recycled PLA filament used in 3D printer**  
*Xing Guan Zhao, Dongoh Lee, Namsu Kim (Konkuk University, Korea)*

T3P31 **FE Analysis of Three-layered biomimetic skin pad for prosthetic Hands**  
*Si-Hwan Heo, Chelgyu Kim, Dong Hyun Kim, Hyung-Soon Park (Korea Advanced Institute of Science and Technology, Korea)*

T3P32 **Antifouling effects of self-assembled honeycomb-structured porous surfaces against barnacles**  
*Takayuki MUROSAKI (Asahikawa Medical University, Japan), Yasuyuki NOGATA (Central Research Institute of Electric Power Industry, Japan), Yuji Hirai, and Masatsugu SHIMOMURA (Chitose Institute of Science and Technology, Japan)*

#### **T4P Nature-Inspired Materials**

T4P01 **A Study on Vibration Characteristics by Gear Transmission Error of the Differential Planetary Gear for a Concrete Mixer Truck Mixer Gearbox**  
*Myung Ho Bae, Tae Yeol Bae(Changwon Moonsung University, Korea), Dang Ju Kim (Dai Ho Hydraulics Co., Ltd., Korea), and Jong Moon Lee (Bu Won Road Tec. Co. Ltd., Korea)*

T4P02 **Insect cuticle mimetic nano-shell enhancing high vacuum tolerance**  
*Hong Park, and Haeshin Lee (KAIST, Korea)*

T4P03 **3D-bioprinting using mussel-inspired adhesive material**  
*Daiheon Lee, and Haeshin Lee (KAIST, Korea)*

T4P04 **Mussel-Inspired Immobilization of CsWO<sub>3</sub> in Continuous Flow Microreactors as NIR-Mediated Antibacterial Based Photothermal Agents**  
*Young Kwang Kim, Zihnil Adha Islamy Mazrad, Sangkug Lee, Sung Young Park, (Korea national University of Transportation, Korea)*

T4P05 **Spider silk formation inspired micro wire with strong and controllable properties**  
*Woong Kim, Gyudo Lee, Minwoo Kim, Joohyung Park, and Jinsung Park (Korea University, Korea)*

T4P06 **Visible Light Driven photocatalyst synthesis by simple method with Dopamine for N-doped carbon core/shell TiO<sub>2</sub>**  
*Ari Chae, Sung Young Park, and Insik In (Korea national University of Transportation, Korea)*

T4P07 **Patterning of Microparticles and Cells Using Acoustic Waves**  
*Chanryeol Rhyou, Byungjun Kang, Junki Baek, Donyoung Kang, Seunghee Oh, Seonggyu Lee, and Hyungsuk Lee (Yonsei University, Korea)*

T4P08 **Plant Polyphenol-derived Surface Coating for Enhanced Osteogenesis**  
*Jung Seung Lee, Jong Seung Lee (Yonsei University, Korea), Min Suk Lee, Hee Seok Yang (Dankook University, Korea), Haeshin Lee (Korea Advanced Institute of Science and Technology (KAIST), Korea), and Seung-Woo Cho (Yonsei University, Korea)*

#### **T5P Nature-Inspired Fluid Dynamics**

T5P01 **Drag reduction in turbulent pipe and channel flows over superhydrophobic surfaces**  
*Hyung Jae Lim, Jae Hwa Lee and Joo Ha Kim(UNIST, Korea)*

T5P02 **Numerical and hydraulic model study on seawater intrusion in coastal aquifer**  
*Woo-Dong Lee, Young-Jae Yoo, and Dong-Soo Hur (Gyeongsang National University, Korea)*

T5P03 **Fabrication of biomimetic artificial leaf to develop fluid pump**  
*Minki Lee, Hosub Lim, and Jinkee Lee (Sungkyunkwan University, Korea)*

T5P04 **Dynamics of imbibition of liquid through paper fibers with intra-fiber pores**  
*Sooyoung Chang, Jaedeok Seo, Seokbin Hong (Sogang University, Korea), Duck-Gyu Lee (Korea Institute of Machinery and Materials, Korea), and Wonjung Kim (Sogang University, Korea)*

T5P05 **Bio-Inspired Flexible Microchannels**  
*Songyue Chen, and Xu Hou (Xiamen University, China)*

T5P06 **Bubble impact on parallel arranged fibers**  
*Ryeol Park, and Wonjung Kim (Sogang University, Korea)*

T5P07 **Evolution of contact area on rubbing ice surface in hydrodynamic regime**  
*Changho Yun, Hyungseok Kim, Dongjo Kim, Minwook Jung, and Ho-Young Kim (Seoul national university, Korea)*

T5P08 **Ballistic energy conversion by microdroplets**  
*Yanbo Xie (Northwestern Polytechnical University, China)*

T5P09 **Water tunnel by continuous bubble at water-oil interface**  
*Jaebum Park, and Ho-Young Kim (Seoul National University, Korea)*

T5P10 **Preparation of microspheres using 512 channel geometrical passive breakup microfluidic device**  
*Chul Min Kim, Gym Man Kim (Kyungpook National University, Korea), Jin Ho Choi (Gumi University, Korea), and Han Byul Lee (Kyungpook National University, Korea)*

T5P11 **Fabrication of microfluidic device having an embedded membrane with pore array**  
*Jong Wook Kim, Chul Min Kim, Gyu Man Kim (Kyungpook National University, Korea), Jin Ho Choi (Gumi University, Korea), and Han Byul Lee (Kyungpook National University, Korea)*

#### **T6P Nature-Inspired Sensors and Actuators**

T6P01 **Bio-mimetic and multimodal nanoporous cantilever sensor for high sensitive detection and discrimination**  
*Minwoo Kim, Woong Kim, Joohyung Park, Seongjae Jo, Woochang Kim, Chihyun Kim, and Jinsung Park (Korea University, Korea)*

T6P02 **Colorimetric opal film based on humidity-dependent color change of a longhorn beetle *Tmesisternus Isabellae***

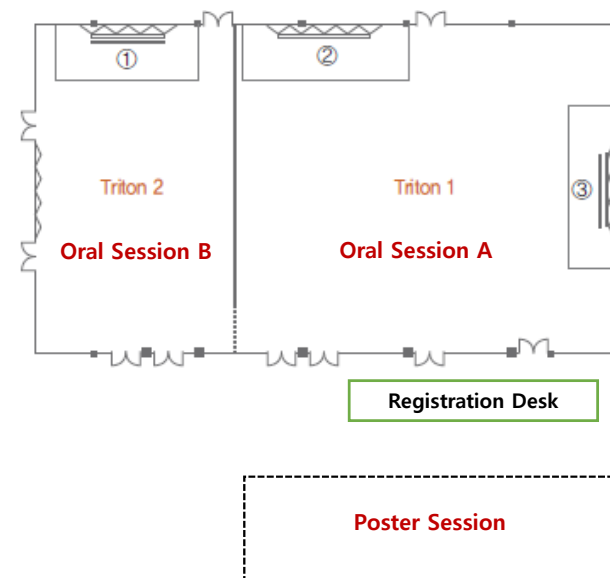
Han-Bok SEO, Eunae Park, and Seung-Yop LEE (Sogang University, Korea)

- T6P03 **Biomimetic tactile sensor**  
Youngdo Jung (Korea Institute of Machinery and Materials, Korea)
- T6P04 **Patchable temperature sensor mimicking transient receptor potential ion-channel**  
Jung-Soo Kim, Kyung-Yong Chun, and Chang-Soo Han (Korea University, Korea)
- T6P05 **Peptide Nanowire-based Biomimetic Structural Color Production and Their Applications**  
Gyuyeob Oh, Gyu Yeol Park, Wonbin Song, Hyun Soo Kim, Do Hoon Lee, and Byung Yang Lee (Korea University, Korea)
- T6P06 **Self-assembled color in structured cellulose nanocrystal-based colorimetric sensors**  
Hyun Soo Kim, Ye Rim Lee, Hyungho Kwon, Taewan Kim, Gyuyeob Oh (Korea Univ., Korea), Byung Yang Lee (Korea University, Korea)
- T6P07 **Crack-inspired nanofluidic nanowire synthesis and bio-/chemical nanosensor application**  
Taesung KIM, and Dong-Joo KIM (Ulsan National Institute of Science and Technology (UNIST), Korea)
- T6P08 **Facile fabrication of flexible and scalable three-dimensional plasmonic nanoarchitectures by roll-to-roll nanoimprinting along with angled metal deposition**  
Jung-Sub Wi (Korea Research Institute of standards and Science, Korea), Seungjo Lee, Dong Kyo Oh (Seoul National University of Science and technology, Korea), Kyu-Tae Lee (University of Illinois at Urbana-Champaign, United States), Inkyu Park (KAIST, Korea), Sung Ho Lee, Moonkyu Kwak (Kyungpook National University, Korea), Jae Hyuk Lee, Jung Dae Kim, and Jong G. Ok (Seoul National University of Science and Technology, Korea)
- T6P09 **Improvement of Bitterness Membrane of Taste Sensor for Medicine**  
Xiao Wu, Hideya Onitake, Zhiqin Huang, Yusuke Tahara, Kiyoshi Toko (Kyushu University, Japan), and Hidekazu Ikezaki (Intelligent Sensor Technology, Inc., Japan)
- T6P10 **A novel triboelectric nanogenerator for self-powered sensor applications**  
Jingui Qian, Dong-Su Kim, and Dong-Weon Lee (Chonnam national university, Korea)
- T6P11 **A study on the reliability of pressure sensor suitable for Shock environment**  
Kyung Eun Park, Jae Heon Park, Kyung Hee Park, and Hyang Duck Cho (A-technology.co., and ltd., Korea)
- T6P12 **Mimicking the self-burial behavior of erodium seed using highly concentrated poly(N-isopropylacrylamide) gel**  
Andrew Choi, Wonkyoung Kim, and Dong Sung Kim (Pohang University of Science and Technology, Korea)
- T6P13 **A Control Strategy for Electro-Magneto-Mechanical System Based on Virtual System Model**  
Hongyoun Kim, and YoungJun Kim (Yoosung Industry Machine corp., Korea)

## Information

### ➤ Grand Ballroom (Triton) : ISNIT2017 Oral Presentation

(2<sup>nd</sup> floor between C and D buildings)





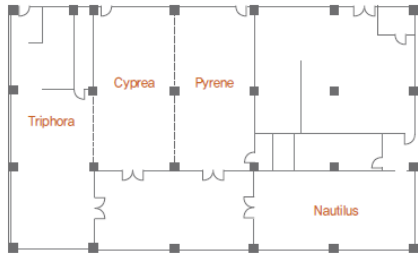
➤ Banquet (June 30, Thursday)

Outdoor (swimming pool area)



➤ Welcome Reception (June 29, Wednesday)

- Triphora Room (2<sup>nd</sup> floor of D-building)



➤ Lunch (June 29 & 30, 12:30-14:00)

You can choose any set menu of three (Korean, Chinese, Fusion) restaurants

- Korean Restaurant "MARU" : max 140 people



**SET MENU**

ABALONE PORRIDGE  
6가지 반찬  
6 KINDS OF SIDE DISHES

**Main Dish Choice 1~4**

**1. 소갈비찜 KALBI JIM**

Marinated beef short rib stew

**2. 김치제육볶음 KIMCHI & JEYUK BOKUM**

Sauteed marinated sliced spicy pork with Kimchi

**3. 해물낙지볶음 HAE MUL NAKJI BOKUM**

Seafood with spicy octopus

**4. 갈비탕 KALBI TANG**

Beef short rib soup with rice noodles

**오늘의 스프 (주방장 추천)**

CHEF'S SOUP OF THE DAY

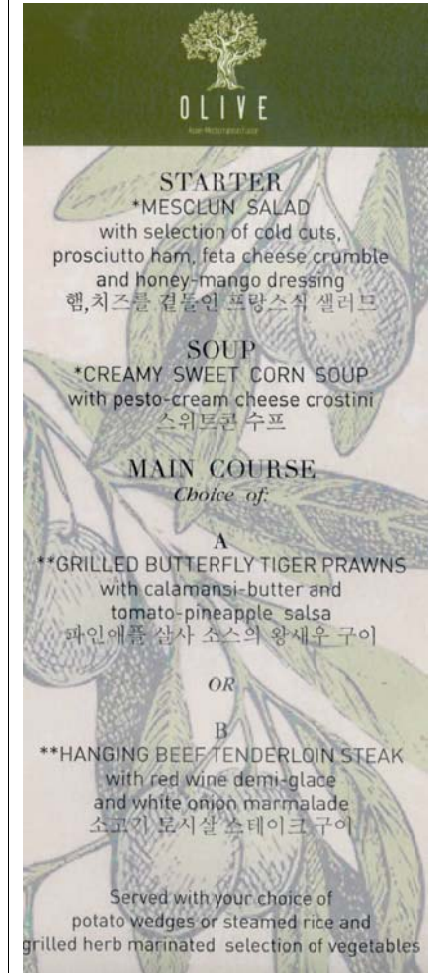
공기밥

STEAMED RICE

후식

DESSERT

- Fusion-Food Restaurant "Olive" max 110 people



■ Chinese Restaurant “Ching Hai” : max 100 people + 8 rooms



CHINESE RESTAURANT

**SET A**

**APPETIZER**

川式口水雞

Chilled Poached Chicken in Szechuan Sauce

시추안 식 찬 닭고기요리

Or

粵式汾酒牛腩

Chilled Beef Shank in Cantonese Style

광동식 소고기 사태요리

**SOUP**

養生藥膳嫩雞湯

Double Boiled Chinese Health Herbal Chicken Soup

진한 한방육수 닭고기수프

**MAIN COURSE**

韓式咕嚕肉

Sweet and Sour Pork Korean Style

탕수육

韓式燒酒燻五花肉片

Wok Fried Delicious Slice Pork Belly with Soju

광동식 돼지삼겹살 볶음요리

涼拌田園時令菜

Mix Seasonal Vegetables Salad

야채요리

清湯海鮮麵

Seafood's Noodles Soup

해산물 국수

**DESSERT**

芒果西米露

Chilled Peach Puree with Sago

복숭아 푸레와 사고

**SET B**

**APPETIZER**

蒙古香辣牛肚

Chilled Tasty Beef Tripe in Mongolia Style

몽골리안식 소 천엽볶음

Or

白雲酸甜蹄筋

Chilled Pork Knuckles with Sour Sweet Sauce

시추안식 돈 족발요리

**SOUP**

蟹黃雙菇羹

Braised Crabmeat & CrabStick with Assorted Mushroom Soup

게살, 버섯수프

**MAIN COURSE**

古法豆豉炒雞塊

Sauteed Fresh Chicken with Fragrant Black Bean Sauce

검정콩소스의 닭고기요리

乾燒酸辣蝦

Braised Prawn with Chili Sauce

칠리 새우

涼拌田園時令菜

Mix Seasonal Vegetables Salad

야채요리

韓式炸醬麵

Jja Jang Myun

자장면

**DESSERT**

冰沙西米紅豆沙

Chilled Red Bean with Sago

단팥 과 사고