Final Program of SMN2007

1-4 July 2007

Harbin Institute of Technology, Harbin, P. R. China

Organised by Harbin Institute of Technology (HIT)

General Chair: Shanyi Du

Co-Chairs: Anand K. Asundi Jinsong Leng

Welcome !

The organizing committee of the International Conference on Smart Materials and Nanotechnology welcomes you to this grand meeting. This unique conference offers many opportunities to communicate with colleagues from a variety of disciplines in universities, companies, factories, and governments from all over the world. As a premier event, this conference promises great excitement, inspiration and benefits. This conference, the first in what we hope will be a series that encompasses and bridges the rapidly evolving smart materials and the cutting edge nanotechnology for varied applications.

In the last decade, a wide range of novel smart materials have been produced for aerospace, transportation, telecommunications, and domestic applications. Meanwhile, nanotechnology is rapidly developed and it permits control of matter at the level of atoms and molecules which would form the building blocks of smart materials. Thus the combination of these two fields provides many advantages, realizes novel designs that could not be achieved in traditional engineering and offers greater opportunities as well as challenges.

The conference deals with the integration of smart materials and nanotechnology for applications ranging from bioengineering to photonics, with emphasis on the application in aerospace engineering. It also addresses and predicts novel developments in this field. It will discuss various topics including Shape-memory alloys and polymer, Electro-Active Polymer(EAP), Piezo-materials, Electro and magneto restrictive materials and fluids, Fibre optic sensor, MEMS sensors and actuators, thermo-electric materials, electro-chromic, photo-chromic and fluorescent and phosphorescent materials, nanocomposite and others.

There are 7 plenary speakers and 27 keynote speakers who were selected to inform and inspire the attendees. Roughly 290 papers, which are selected from about 700 papers will present in 35 Specialist sessions, 160 papers in General Sessions, and 130 papers in a Poster Session.

We would like to take this opportunity to thank the organizing committee, the cooperating organizations, the international scientific committee and every attendee, whose support, dedication, and cooperation make this event more exciting, inspiring and fruitful.

The organizing committee wishes that all participants enjoy the meeting and have a pleasant stay in Harbin! We hope all of you benefit from this conference and look forward to seeing you again in 2009!

Chair

Prof. Shanyi Du

Member of Chinese Academy of Engineering (CAE)

Harbin Institute of Technology

Co-Chair

Prof. Jinsong Leng

Harbin Institute of Technology

Co-Chair

Prof. Anand K. Asundi

SPIE Board of Directors

Nanyang Technological University

Daily Schedule, Morning

1 July	Monday 2 July	Tuesday 3 July	Thursday 4 July
Registration 8:30 am to 5:30 pm	8:30 to 8:45am Welcome to SMN 2007	8:30 to 9:25am **Plenary speech** **Russ Maguire** Boeing Commercial Airplane Co. *USA*	8:30 to 9:25am **Plenary speech** **Wolfgang Ecke** Institute for Physical High Technology,Jena *Germany*
	8:45 to 9:40 am **Plenary speech** **Ken P. Chong** National Science Foundation (NSF) USA	9:25 to 10:20 am **Plenary speech** **W. I. Milne** Univesity of Cambridge Tnompson Ave, Cambridge UK	9:25 to 10:20 am **Plenary speech** **Ji Su** NASA Langley Research Center, Hampton, USA
	9:40to9:50am Coffee break	10:20 to10:30 am Coffee break	10:20 to10:30 am Coffee break
	9:55 to 10:20am Invited lecture	10:35 to11:00am Invited lecture	10:35 to11:00am Invited lecture
	10:20 to10:35 am Speech2	11:00 to11:15am Speech 2	11:00 to11:15am Speech 2
	10:35 to10:50am Speech3	11:15 to11:30am Speech 3	11:15 to11:30am Speech 3
	10:50 to11:05am Speech4	11:30 to11:45am Speech 4	11:30 to11:45am Speech 4
	11:05 to11:20am Speech 5	11:45 to12:00am Speech 5	11:45 to12:00am Speech 5
	11:20 to11:35am Speech 6		
	11:35 to11:50am Speech 7		
	12:00am to 1:15 pm Lunch break	12:00am to 1:15pm Lunch break	12:00am to 1:15pm Lunch break

Daily Schedule, Afternoon

1 July	Monday 2 July	Tuesday 3 July	Thursday 4 July
Registration 8:30 am to 5:30 pm	1:15 to 2:15pm **Poster Session**	1:15 to 2:15pm **Poster Session**	Visit Harbin Aviation Industry Group (HAI) and Harbin Institute of Technology (HIT)
	2:15 to 3:10pm **Plenary speech** **Vijay K. Varadan** University of Arkansas *USA*	2:15 to 3:10pm **Plenary speech** **Lin Ye** The University of Sydney *Australia*	
	3:10 to 3:35 pm Invited lecture	3:10 to 3:35 pm Invited lecture	
	3:35 to 3:50pm Speech 2	3:35 to 3:50pm Speech 2	
	3:50 to 4:05pm Speech 3	3:50 to 4:05pm Speech 3	
	4:05 to 4:20 pm Speech 4	4:05 to 4:20 pm Speech 4	
	4:20 to 4:30pm Coffee break	4:20 to 4:30pm Coffee break	
	4:30 to 4:55pm Invited lecture	4:30 to 4:55pm Invited lecture	
	4:55 to 5:10pm Speech 2	4:55 to 5:10pm Speech 2	
	5:10 to 5:25pm Speech 3	5:10 to 5:25pm Speech 3	
	5:25 to 5:40pm Speech 4	5:25 to 5:40pm Speech 4	
	5:40 to5:55pm Speech 5	5:40 to5:55pm Speech 5	
	6:30 to 8:00pm Reception	6:30 to 8:00pm Dinner	6:30 to 8:00pm Banquet

Conference Schedule

		Room A	Room B	Room C	Room D	Room E
July 2 Monday	8:30 to 9:40am	**Plenary session**				
	9:55 to 12:00am	**Piezoelectric Materials(I)** (S01)	**MEMS Applications** (S02)	**Films** (S03)	**NSF Special Session** (S04)	**SHM(I)** (S05)
	1:15 to 2:15pm	***Poster Session***				
	2:15 to 3:10pm	**Plenary session**				
	3:10 to 4:20pm	**Actuators and Sensors(I)** (S06)	**Applications of SMA(I)** (S07)	**Nanomaterials(I)** (S08)	**Luminescent Materials** (S09)	**Membranes and Elastomers** (S10)
	4:30 to 5:55pm	**Actuators and Sensors(II)** (S11)	**Smart Material Applications(I)**(S12)	**Nanomaterials(II)** (S13)	**Smart Composites** (S14)	**Material Characteristics(I)** (S15)
July 3 Tuesday	8:30 to 10:20am	**Plenary session**				
	10:35 to 12:00am	**Morphing and Biology-Inspired Structures** (S16)	**Novel Sensors** (S17)	**Magnetic Materials** (S18)	**Fiber Optic Sensor Applications(I)** (S19)	**Shape Memory Polymer** (S20)
	1:15 to 2:15pm	***Poster Session***				
	2:15 to 3:10pm	**Plenary session**				
	3:10 to 4:20pm	**MR&ER Fluid Applications(I)** (S21)	**Nanocomposites** (S22)	**Piezoelectric Materials(II)** (S23)	**Fiber Optic Sensor Applications(II)** (S24)	**Analysis and Modeling** (S25)
	4:30 to 5:55pm	**Ferroelectrics** (S26)	**Applications of SMA(II)** (S27)	**Nanomaterial applications** (S28)	**Fiber Optical Sensors** (S29)	**SHM(II)** (S30)
July 4 Wednesday	8:30 to 10:20am	**Plenary session**				
	10:35 to 12:00pm	**Shape Memory Alloys** (S31)	**MR &ER Fluid Applications(II)** (S32)	**Smart Material Applications(II)** (S33)	**Photonics** (S34)	**Material Characteristics (II)** (S35)

Notice:

Plenary session

1. Nano Science and Engineering in Mechanics and Sensors..... 6423-001

Time: 8:45 to 9:40 am July 2, 2007

By Dr. **Ken P. Chong**

Engineering Advisor and Director, Mechanics and Materials, Directorate for Engineering National Science Foundation, Arlington, VA 22230, U.S.A.

***Biography*:** KEN P. CHONG, P.E., is the Engineering Advisor, and Director of Mechanics and Materials of the Engineering Directorate at National Science Foundation [NSF]. He was the Interim Division Director of Civil and Mechanical Systems in mid-2005. He earned M.A., M.S.E., Ph.D., in Mechanics from Princeton University, 1969. He specializes in solid-mechanics/materials, nano-mechanics, and structural-mechanics. He was a senior research engineer with the National Steel Corp. from 1969-1974. At NSF, he chaired of the Civil Infrastructure Systems Group that developed an initiative which is changing the university culture in systems approaches/integration. Before joining NSF in 1989 he has been a professor and he pioneered the R&D of sandwich-panels with cold-formed steel-facings and rigid-foamed cores. He developed new semi-circular fracture specimens for brittle materials and large sweet spot for tennis rackets. He has published 200 technical papers, authored 2 textbooks on mechanics and edited 10 books. Since 1987 he has been the editor of the Elsevier Journal of Thin-Walled Structures. He has given 40 keynote lectures, including the Mindlin and Sadowsky Lectures, received awards including the fellow of AAM, SEM and ASCE, Edmund Friedman Professional Recognition Award; Honorary Doctorate, Shanghai University; Outstanding Alumni Achievement Award of Taiwan National Cheng Kung University; Honorary Member, ASCE; NSF Distinguished Service Award.

***Abstract*:** Nanotechnology is the creation of new materials, devices and systems at the molecular level - phenomena associated with atomic and molecular interactions strongly influence macroscopic material properties [according to I. Aksay of Princeton]; with significantly improved mechanical, optical, chemical, electrical properties. In the 21st century, the transcendent technologies include nanotechnology, microelectronics, information technology and biotechnology as well as the enabling and supporting mechanical and civil infrastructure systems and materials, including sensors. These technologies are the primary drivers of the twenty first century and the new economy. Mechanics and materials are essential elements in all of the transcendent technologies. Research opportunities, education and challenges in mechanics and materials, including multi-scale modeling, nanomechanics, sensors, artificial nose, smart materials, self-healing materials, self-cleaning materials, carbon nano-tubes, bio-inspired materials, coatings, fire-resistant materials as well as other improved engineering and design of materials are to be presented and discussed.

2. The role of nanotechnology and engineering in adaptive system in medicine ….....6423-006

Time: 2:05 to 3:00pm July 2, 2007

By Prof. **Vijay K. Varadan**

***Biography*:**Vijay K. Varadan is currently the Twenty-First Century Endowed Chair in Nano-and Bio-Technology and Medicine, and Distinguished Professor of Electrical Engineering and Distinguished Professor of Biomedical Engineering (College of Engineering) and Neurosurgery (College of Medicine) at University of Arkansas. He joined the University of Arkansas in January 2005 after serving on the faculty of Cornell University, Ohio State University and Pennsylvania State University for the past 32 years. He is also the Director of the Institute for Nano-, Micro-, and Neuro-Electronics, Sensors and Systems and the Director of the High Density Electronics Center. He has concentrated on the design and development of various electronic, acoustic and structural composites, smart materials, structures, and devices including sensors, transducers, Microelectromechanical Systems (MEMS), synthesis and large scale fabrication of carbon nanotubes, NanoElectroMechanical Systems (NEMS), microwave, acoustic and ultrasonic wave absorbers and filters. He has developed neurostimulator, wireless microsensors and systems for sensing and control of Parkinson's disease, epilepsy, glucose in the blood and Alzheimer's disease. He is also developing both silicon and organic based wireless sensor systems with RFID for human gait analysis and sleep disorders and various neurological disorders. He is an editor of the Journal of Wave-Materials Interaction and the Editor-in-Chief of the Journal of Smart Materials and Structures. He is an Associate Editor of the Journal of Microlithography, Microfabrication and Microsystem. He serves on the editorial board of International Journal of Computational Methods. He has published more than 500 journal papers and 13 books. He has 12 patents pertinent to conducting polymers, smart structures, smart antennas, phase shifters, carbon nanotubes, and implantable device for Parkinson's patients, MEMS accelerometers and gyroscopes. He is fellow of SPIE, ASME, Institute of Physics, Acoustical Society of America. He has many visiting professorship appointments in leading schools overseas.

Abstract: Nanotechnology has been broadly defined as the one for not only the creation of functional materials and devices as well as systems through control of matter at the scale of 1-100 nm, but also the exploitation of novel properties and phenomena at the same scale. Growing needs in the point-of-care (POC) that is an increasing market for improving patient's quality of life, are driving the development of nanotechnologies for diagnosis and treatment of various life threatening diseases. This paper addresses the recent development of nanodiagnostic sensors and nanotherapeutic devices with functionalized carbon nanotube and/or nanowire on a flexible organic thin film electronics to monitor and control of the three leading diseases namely 1) neurodegenerative diseases, 2) cardiovascular diseases, and 3) diabetes and metabolic diseases. The sensors developed include implantable and biocompatible devices, light weight wearable devices in wrist-watches, hats, shoes and clothes. The nanotherapeutics devices include nanobased drug delivery system. Many of these sensors are integrated with the wireless systems for the remote physiological monitoring. The author's research team has also developed a wireless neural probe using nanowires and nanotubes for monitoring and control of Parkinson's disease. Light weight and compact EEG, EOG and EMG monitoring system in a hat developed is capable of monitoring real time epileptic patients and patients with neurological and movement disorders using the Internet and cellular network. Physicians could be able to monitor these signals in real-time using portable computers or cell phones and will give early warning signal if these signals cross a pre-determined threshold level. Some of the nanotech based devices which are being developed are listed below:

a) Wireless EEG, EOG and EMG hat sensor using carbon nanotube and nanowire (instead of the traditional gold cup with silver chloride and wired configuration). This sensor network system is also being used for epilepsy patients and patients with movement disorder. The same wireless system is also applicable for cardiovascular diseases recording electrical activity of the heart that shows abnormal rhythms (arrhythmias or dysrythmias) and detects the heart muscle damage.

b) Wireless Smart vest integrated with GPS, internet of cellular network for physiological monitoring including EKG, respiration recording, temperature, etc,

c) Organic polymer based sensor: (which replaces the conventional bulky Doppler sonography) for measurement of blood flow, viscosity, oxygen, etc., to cerebral cortex

d) Sensor in the shoe, ankle foot, etc., for gait analysis and movement disorder

e) Lab-on-chip with functionalized nanostructures for diabetes and cardiovascular diseases

f) Nanotherapeutic and drug delivery systems

g) Implantable devices for monitoring and control of neurodegenerative diseases such as epilepsy and Parkinson's disease

Selected movies illustrating the applications of nanodevices to patients will be shown at the talk.

3. Next Generation Composites Opportunities for Commercial Aircraft…….6423-005

Time: 8:30 to 9:25am July 3, 2007
By Dr. **Russ Maguire**
Boeing Technical Fellow, Composites & Nanotechnology BCA 787 Technology
***Biography*:** Russ Maguire is a Boeing Technical Fellow specializing in composite materials and structures and currently responsible for global technology assessments for the Boeing Commercial 787 program.He is also a nanotechnology focal for the Boeing Phantom Works R&D organization and has managed a nanotechnology portfolio for the 787 advanced models.He joined Boeing in 1978 and has been in the field of composite materials and structures, supporting every major Boeing Commercial composite development program since then, most recently as part of the team that selected polymer composites for the 787 wing and fuselage.He is a member of the American Society of Composites, The European Society of Composites, the Chinese Society of Composites, the AIAA, and SAMPE where he is the Nanotechnology Committee co-leader.He has been an invited keynote speaker at composite conferences in U.S., Europe and China (Chongching, CJA 2005).He is an advisor to several academic, government and industrial nanotechnology initiatives, is on the Advisory Boards for composites and nanotechnology professional training at the U. Washington and the FAA Composites Center of Excellence, and is a member of the National Nanotechnology Initiative/Aerospace Industry Liaison group to the White House.Boeing Technical Fellow, Composites & Nanotechnology BCA 787 Technology

***Abstract*:** The 787 family is planned with three members. The first family member is the 787-8, which will enter service in 2008. It has a range of 8,000 nautical miles when configured with 250 passengers in a three-class configuration. The next family member, the 787-3, will be optimized for mid-range routes and enter service in mid-2010. And finally, the 787-9 in late 2010. It will be a stretch version of the 787-8. There are four key technologies that contribute to the 787's fuel efficiency advantage: engines, aerodynamics, systems, and materials – the composites.Because composites don't fatigue or corrode and because they are more damage resistant, the maintenance inspection intervals for the 787 can be spread out over more time. Other advantages include greater design flexibility, reduced manufacturing flow time, lower cabin altitude and lighter weight structure.The opportunities in polymeric composites to utilize nanotechnology to achieve improvements in electrical, thermal, acoustic, and mechanical functionalities, and the promise of overall multifunctionality, offers even greater new vistas of performance, efficiency and comfort

4. Carbon Nanotubes for Electronic Applications…….…… 6423-003

Time: 9:25 to 10:20am July 3, 2007
By Prof. **W.I.Milne**
Engineering Department Cambridge University Trumpington Street Cambridge CB2 1PZ
***Biography*:** Professor William I. Milne has been the Head of Electrical Engineering Division in the Department of Engineering, University of Cambridge, UK from Oct, 1999. He is a Fellow of the Royal Academy of Engineering, UK, and is distinguished for his research and collaborations that maintain the UK at the forefront of carbon and silicon based electronics in the world. His main research interests include the production and applications of amorphous and polycrystalline films and carbon nanotubes for use in both mechanical and electrical applications. He has published/co-published over 550 high quality papers in these areas.

***Abstract*:** Over the past several years Carbon Nanotubes (CNTs) have been touted as being one of the most promising material systems for future electronic applications. CNTs are a unique form of carbon filament/fibre in which sheets of sp2 bonded graphite with no surface broken bonds roll up to form tubes. Single wall CNTs can exhibit either metallic-like or semiconductor-like properties and multi-wall tubes exhibit metallic-like behaviour. Their future application in the electronics industry is based upon several unique properties which the CNTs possess, e.g. they have the highest thermal conductivity, they can exhibit ballistic electron transport and do not suffer from electron migration. However there are still major problems to be overcome before CNTs can be used in devices and circuits.This presentation will cover the growth, characterisation and potential electronic applications of both SWCNTs and MWCNTs and will attempt to provide a realistic appraisal of their future in the electronic industry.

5. Sensor Network for Damage Assessment in Composite Structure…….6423-007

Time: 2:15 to 3:10pm July 3, 2007
By Prof. Lin Ye
***Biography*:** Graduated with Bachelor of Engineering from Harbin Institute of Ship Engineering and Technology in 1982, Master of Engineering and PhD from Beijing Institute of Aeronautics and Astronautics in 1984 and 1987, respectively. Awarded the Alaxander von Humboldt fellowship for conducting advanced composite research at the Institute for Composite Materials Ltd at the University of Kaiserslautern from 1990 to 1992.Joined the University of Sydney as a Lecturer in 1992 and promoted to Senior Lecturer and Reader in 1995 and 1998 and a full Professor in 2002 at the School of Aerospace, Mechanical & Mechatronic Engineering. His major research interests are in the general areas of composites science and technology, smart materials and structures, nano-materials and nano-composites, structural integrity and durability.

***Abstract*:** Active sensor network embedded in or attached to composite structures have attracted intensive studies in recent years with potentials to online identify the structural damage quantitatively. Lamb wave-based damage identification techniques using active piezoelectric sensor network have been developed in the recent studies. Both forward and inverse analyses were applied in the approaches; the former is based on the triangulation using time-of-flight (ToF) of Lamb modes extracted from the sensor network, while the latter is based on data fusion using artificial neural network (ANN) with a concept of "Digital Damage Fingerprints" (DDFs). The approaches were applied to identify hole/delamination damage in beam and plate composite structures. The forward analysis can be effective in identifying the position of damage, while the inverse analysis has the capacity to provide the quantitative information for the damage including the position and geometry/severity.

6. Fiber-optic sensors for structural health monitoring of energy facilities.....6423-004

Time: 8:30 to 9:25am July 4, 2007
By Dr. **Wolfgang Ecke**
Institute for Physical High Technology,Jena *Germany*
Biography: Dr. Wolfgang Ecke, physicist and vice-head of Optical Micro Systems Department at the Institute for Physical High-Technology (IPHT) in Jena, Germany, has 20 years of experience in developing fiber-optic sensor components and systems, and in their application in geo-technique, aerospace, transport, and energy. Other activities include teaching Fiber Optics at Jena University of Applied Sciences, work as program chair of Optical Fiber Sensors and SPIE Smart Structures conferences.

***Abstract*:** The health monitoring tasks in many application fields of the energy sector ask in very particular for the specific advantages of fiber-optic sensor systems: full electrical isolation explosion-proof lightning safety embeddability of multiplexed sensor arrays in composites and structures. Requirements, design criteria, sensor system parameters, and results of field tests of fiber-optic Bragg grating sensor health monitoring systems will be reported for practical examples, which have been realized by IPHT Jena together with industrial partners:Electrical generators: temperature, strain, and vibration monitoring of current windings Wind turbine: load monitoring of rotor blades of world largest turbine Enercon E112 H2 storage/auto-motive: multi-purpose H2 vessel

integrity sensors - hydrogen leakage detection, strain, and temperature monitoring; liquid hydrogen filling level sensors Hydrogen fusion: structural and position monitoring of superconductive magnet coils.

7. Electrostrictive Polymers, Devices, and Applications……..……. 6423-008

Time: 9:25 to 10:20 am July 4, 2007

By Dr. **Ji Su**

***Biography*:** Dr. Ji Su is a Research Engineer at the Advanced Materials and Processing Branch, NASA Langley Research Center, Hampton, Virginia, USA. He received his Bachelor's degree in Polymeric Based Composite Materials from Harbin Civil Engineering Institute in 1982 and his Ph.D. in Materials Science and Engineering from Rutgers-The State University in 1995. Before he joined NASA Langley Research Center, he was a Senior Research Scientist at ICASE. His research areas include the development of high performance electroactive polymers (EAPs) and polymer composites, electroactive materials-based devices (sensors and actuators), and their applications in smart structures for aeronautics and aerospace technologies and in artificial muscles and biomimetic technologies. Dr. Su also develops nano-structured multifunctional composite materials. He have had more than 80 technical publications, 12 issued US and international patents, and six US and international patents pending. He has given more than 70 technical presentations including more than 25 invited and keynote presentations on EAP related materials and applications. He has also chaired and co-chaired more than 20 EAPs/smart materials and smart structures/systems conferences and conference sessions, contributed five book chapters, and co-edited a book. Dr. Su taught a short course on electroactive polymers and applications at SPIE Smart Structures and Materials Meetings in 2004 and 2005.

***Abstract*:** In recent years, a variety of electrostrictive polymers have been developed. These electrostrictive polymers usually offer significantly larger electrical field-induced strain than piezoelectric polymers. A relatively new electrostrictive graft elastomer (G-elastomer) developed at NASA Langley Research Center has demonstrated promising electromechanical properties. The properties include large electrical field-induced strain, high electromechanical output, and relatively high mechanical modulus. The elastomer is a two-component system that contains a flexible backbone chain and an electro-responsive polar grafted crystalline domain. This two-component system enables tailoring of the electromechanical performance by controlling the relative fraction of the components and the morphology. The investigation of the mechanism of electrostriction in the G-elastomer demonstrated that by controlling the morphology, a simultaneous increase in both the field-induced strain and the mechanical modulus is observed. Several types of electromechanical devices have been designed and fabricated using electrostrictive polymers. These devices have shown good performance and are promising for aerospace applications. This presentation will provide a review of electrostrictive polymers, devices, and potential applications for NASA missions.

Monday 2 July

Session 01
Room A
Mon. 9:55 to 11:45am
Piezoelectric Materials(I)

9:55 to 10:20am: **Piezoelectric Nanowires (Invited paper)**, Xingyuan (Scott) Mao, *University of Pittsburgh(USA)* ……..*6423-068*

10:20 to 10:45am: **Hydrothermal Synthesis of (K,Na)(Nb,Ta)O_3 Powder for Fabrication of Lead-Free Piezoelectric Ceramics (Invited paper)**, Kongjun Zhu[a], Jinhao Qiu[a, b], Zhaolei Meng[b], Koji Kajiyoshi[c], Kazumichi Yanagisawa[c], *[a]Tohoku University(Japan), [b]Nanjing University of Aeronautics and Astronautics(China), [c]Kochi University (Japan)*……..*6423-115*

10:45 to 11:00am: **Axial Load Transfer from a Piezoelectric Cylindrical Fiber into a Transversely Isotropic Elastic Matrix**, Y. Sapsathiarn[a], T. Senjuntichai[a], R.K.N.D. Rajapakse[b], *[a]Chulalongkorn Univ.(Thailand); [b]The Univ. of British Columbia(Canada)*……*6423-118*

11:00 to 11:15am: **Preparation and damping properties of PZT/acetylene carbon black/bromobutyl rubber composites,** Yingjie Qiao, Xiaohong Zhang, Xichuan Li, Xiang Wang, *Harbin Engineering University(China)*……..*6423-116*

11:15 to 11:30am: **Preparation and electrical properties of 1-3 PZT fiber/IPNs Piezoelectric composites**, Jie Liu, Dongyan Tang, Xuelian Wu, Yingjie Qiao, *Harbin Institute of Technol-ogy (China)*……..*6423-146*

11:30 to 11:45am: **Piezoelectric Vibration Damping of a Composite Beam by a Semi-Passive Method,** Hongli Ji[1], Jinhao Qiu[1,2] and Adrien Badel[2], *[1]Nanjing Univerisity of Aeronautics & Astronautics, [2] Tohoku University(Japan)*
……*6423-117*

Session 02
Room B
Mon. 9:55 to 11:40am
MEMS Applications

9:55 to 10:10am: **A Novel Hinged Micromachined High-g Piezoresistive Accelerometer with Wide Bandwidth1,**Kebin Fan, Bin Xiong, Lufeng Che, Yuelin Wang, *Chinese Academy of Sciences(China)*……*6423-132*

10:10 to 10:25am: **Geometric Effects on Thermoelastic Damping in MEMS Resonators and Filters,** Yunbo Yi, *University of Denver (USA)*…….…….. *6423-136*

10:25 to 10:40am: **A Bulk Micromachined Gyroscope with Improved Quality-factors at Atmospheric Pressure,** Weiping Chen. Hong Chen , Xiaowei Liu, Mingxue Huo, Xuebin Lu, Tian Han, Hao Wang, *Harbin Institute of Technology (China)*……..*6423-200*

10:40 to 10:55am: **Characterization of MEMS/NEMS,** Sen Han, *Veeco Instruments(USA)*……*6423-197*

10:55 to 11:10am: **Imaging and Interferometric measurements of MEMS sensors for smart structures using in-line digital holography,** Vijay Raj Singh[1], Gopalkrishna Hegde[2], Anand Asundi[1], *[1]Nanyang Technological University(Singapore), [2]Indian Institute of science(India)*……*6423-201*

11:10 to 11:25am: **Fabrication of 2D Spatially Addressable PDMS Stamps for Surface Patterning**, Quanguo He, Jianxin Tang, Libo Nie, Nongyue He, *Hunan University of Technology(China)* ……..*6423-202*

11:25 to 11:40 am: **MOEMS in Adaptive Aero-optics**, Yaping Zhang, Zhigang Fan, Jun Zhang**,** *HIT(China)*……6423-133

Session 03
Room C
Mon. 9:55 to 11:40am
Films

9:55 to 10:10am: **Nanocrystalline $Sr_{1-x}Ba_xBi_4Ti_4O_{15}$ Thin Films for Piezoelectric Pressure Sensor,** Muhamad Mat Salleh[a], Nor Azlian Abdul Manaf[a] , Muhammad Yahaya[b], *[a]Institute of Microengineering and Nanoelectronic (IMEN), [b]University Kebangsaan (Malaysia)* ……..*6423-057*

10:10 to 10:25am: **Modulated wrinkle patterns in a gold thin film deposited onto an elastomeric polymer,** Xiaoli Zhao, Shen Dong, Tao Sun, Yingchun Liang, *Harbin Institute of Technology (China)* ……..*6423-058*

10:25 to 10:40am: **Crystallization in amorphous low temperature PECVD SiNx thin films,** N. Jehanathan , M. Saunders, Y. Liu, J. Dell, *The University of Western Australia(Australia)* ……*6423-060*

10:40 to 10:55am: **Effects of process varibles on interfacial quality of laser cladding on aeroengine blade material GH4133,** Zheng Xiong[a,b], Guangxia Chen[a], Xiaoyan Zeng[a], *[a]Huazhong University of Science and Technology (China), [b] Naval University of Engineering (China)* ……..*6423-061*

10:55 to 11:10am: **Solvent-cast PCL films support the regeneration of NG108-15 nerve cells,** Mingzhu Sun, Giorgio Terenghi, Sandra Downes, *The University of Manchester (UK)* …….. *6423-062*

11:10 to 11:25am: **Spatial Filter Based on Azo-Dye-Doped Liquid Crystal Films,** Andy Ying - Guey Fuh, Tsung-Hsien Lin, *National Cheng Kung University (Taiwan, China)*……*6423-086*

11:25 to 11:40am: **Growth and ferromagnetism of thin iron films on silicon substrates,** A.S. Gouralnik, N.G. Galkin., *Institute for Automation and Control Processes(Russia)*…… *6423-182*

Monday 2 July

Session 04
Room D
Mon. 9:55 to 11:25am
NSF Special Session

9:55 to 10:10am: **Self-assembly of Rigid, Planar Organic Molecules into High Quality Nanowires: Fabrication, Characterization and Potential Applications in Nanodevices,** Max Yen[a], Ling Zang[b], Jincai Zhao[c], *[a]Southern Illinois University, [b]Southern Illinois University, [c]Chinese Academy of Sciences(China)* ……..*6423-063*

10:10 to 10:25am: **Extracting Friction Mechanisms from Nano-Sliding Experiments**, Y.F. Gao[ab], R.W. Carpick[c], G.M. Pharra[d], *[a] University of Tennessee(USA),[b] Oak Ridge National Lab(USA), [c] University of Pennsylvania(USA),[d]Oak Ridge National Lab(USA).*……..*6423-064*

10:25 to 10:40am: **Mechanical Behaviors of PECVD Dielectric Films for MEMS Applications**, Xin Zhang, *Boston University (USA)* ……..*6423-065*

10:40 to 10:55am: **Size-Dependent Receptor-Mediated Endocytosis,** Sulin Zhang, *University of Arkansas*……..*6423-066*

10:55 to 11:10am: **Brittle and Ductile Failure Mechanisms of Semiconductor Nanowires,** Wei Cai, Keonwook Kang, Christopher R. Weinberger, *Stanford University(USA)* …*6423-067*

11:10 to 11:25am: **Ultrasensitive Detection of Explosives with Organic Nanofibril Films**, Ling Zang[a], Max Yen[b], Jincai Zhao[c], *[a]Southern Illinois University, [b]Southern Illinois University, [c]Chinese Academy of Sciences(China)* ……..*6423-056*

Session 05
Room E
Mon. 9:55 to 11:50am
SHM(I)

9:55 to 10:20am: **Smart Aggregates: a Distributed Intelligent Multi-purpose Sensor Network (DIMSN) for Civil Structures (Invited paper)**, Dr. G. Song, Director, *University of Houston(USA).*……..*6423-029*

10:20 to 10:35am: **Smart nanocapsules used for bioassay of radiation damage in space,** Zhifei Dai, Meng Liu, Lei Xing, Yan Ma, *Harbin Institute of Technology(China).*…….. *6423-053*

10:35 to 10:50am: **Existing Bridge Structure Health Monitoring System Based on Optical Fiber Sensing Technology,** Desheng Jiang, Sheng LI, Liu Sheng-chun, *Wuhan University of Technology(China)* ……..*6423-106*

10:50 to 11:05am: **Carbon Nanotube Strain Sensors for Damage Detection and Monitoring in Composite Aerostructures,** J. Jin, X. Sun and M. Song , *Loughborough University(UK)*, G Zhou, *Loughborough University(UK).*……..*6423-104*

11:05 to 11:20am: **Crack Identification of a Rotating Shaft With Integrated Wireless Sensors,** F. Andrés Bejarano, Jia Yi, *University of Puerto Rico at Mayaguez(USA)* ……..*6423-090*

11:20 to 11:35am: **Structural Health monitoring of Composite Wind Blades by fiber bragg grating**, ZhanSheng Guo, Junqian Zhang, *Shanghai University(China).*……..*6423-125*

11:35 to 11:50 am: **Crack Monitoring in Concrete Structures Based on Piezoelectric Impedance Technique,** Dansheng Wang Hongping Zhu, *Huazhong University of Science and Technology*, (China)……..*6423-107*

Monday 2 July

Session 06
Room A
Mon. 3:10pm to 4:20pm
Actuators and Sensors(I)

3:10 to 3:35pm: **Electro-Active Paper for Biomimetic Actuator activated in low humidity condition (Invited paper),** Sung-Ryul Yun[1], Kyu Young Yun[1], Nayak Jyoti[1], Yi Chen[1], Heung Soo Kim[1], Li Jie Zhao[2], Jaehwan Kim[1], *[1]Inha University(South Korea), [2]Shenyang Institute of Aeronautical Engineering(China)*
……. *6423-070*

3:35 to 3:50pm: **CP Actuator based on Chemically-deposited Polypyrrole and PU based Solid Polymer Electrolyte Working in Air,** Hwa Jeong Choi, Hyun-Ok Lim, and Nam-Ju Jo**,** *Pusan National University(Korea)*……..*6423-183*

3:50 to 4:05pm: **Hydrogen Sensors using Semiconductor Tin Dioxide Nanobelts,** Jim P. Zheng, *Florida A&M University and Florida State University(USA),* Lenwood L. Fields, *Corning Inc. (USA),* Yi Cheng, Peng Xiong, *Florida State University (USA)* ……...*6423-088*

4:05 to 4:20pm: **A novel stable and high-sensitivity fiber strain sensor based on optical,** H.B.Song, K. Nonaka, *Kochi University of Technology(Japan).*……..*6423-153*

Session 07
Room B
Mon. 3:10pm to 4:20pm
Applications of SMA(I)

3:10 to 3:35pm: **Gradient Heat Treatment for Proportional Control of NiTi, (Invited paper)** Yinong Liu[1], Abdus Samad Mahmud[1],Tae-hyun Nam[2], Yufeng Zheng[3] and Li Li[3], *[1]The University of Western Australia(Australia),[2]Gyeongsang National University(Korea), [3]Harbin Engineering University(China)*
……. *6423-076*

3:35 to 3:50pm: **Superelastic Behavior of Shape Memory Alloy Wires for Seismic Engineering Application: Theory and Experiment**, Hui Qian [a], Hongnan Li [a], Gangbing Song [b], *[a]Dalian University of Technology(China),[b]University of Houston (USA)*
…….*6423-078*

3:50 to 4:05pm: **Bioactivating modification of titanium-nickel shape memory alloy,** Chuanjun Huang, Yibing Xie, Limin Zhou and Haitao Huang, T*he Hong Kong Polytechnic University (China)* ……*6423-080*

4:05 to 4:20pm: **A study on the actuaction behavior of shape memory alloys under tension-torsion combined loading,** Jong-Ha Chung, Hyun-Chul Kim, Jung-Ju Lee, *Korea Advanced Institute of Science and Technology(South Korea).....6423-081*

Session 08
Room C
Mon. 3:10pm to 4:05pm
Nanomaterials(I)

3:10 to 3:35pm: **Molecular Dynamics Simulation of Indentation of Nanostructured Metallic Multilayers (Invited paper)**, Jing Zhang, *University of Alaska Fairbanks(USA).*……*6423-096*

3:35 to 3:50pm:**Effect of multi-walled carbon nanotubes (MWNTs) on the vibration-reduction behavior of cement,** Zhongdong Duan, Jianlin Luo,*Harbin Institute of Technology (China).*……..*6423-158*

3:50 to 4:05pm: **Synthesis of Carbon Nanomaterials by Atmospheric Microplasma**, Qin Zou, *Kochi University of Techno-logy(Japan).*……*6423-160*

Monday 2 July

Session 09
Room D
Mon. 3:10pm to 4:20pm
Luminescent Materials

3:10 to 3:35pm: **Emission from Cleaved Indium Phosphide (InP) (Invited paper),** Dongguang Li, *Edith Cowan University (AUSTRALIA)*.....*6423-030*

3:35 to 3:50pm: **Luminescent Properties of Cadmium Telluride Films Prepared by Molecular Beam Epitaxy**, Zhe Chuan Feng**,** *National Taiwan University (Taiwan, China)* *6423-031*

3:50 to 4:05pm: **Luminescent Properties of YAG Fluoride Single Crystals,** Zhe Chuan Feng [1], S. Ray Bullock[2], Siou-Cheng Lien [3a], T. R. Yang [3a], Weijie Lu[3b], [1&3a]*National Taiwan University(Taiwan, China),* [2] *Grambling State University(USA),* [3b] *Fisk University (USA)* *6423-032*

4:05 to 4:20pm: **Time-Resolved Photoluminescence Study of InN Grown on Si(111)**, D. J. Jang, G. T. Lin, C. L Hsiao, L. W. Tu, M.E. Lee [1], *National Sun Yat-sen University (Taiwan, China),* [1] *National Kaoshiung Normal University(Taiwan, China)*..... *6423-033*

Session 10
Room E
Mon. 3:10pm to 4:20pm
Membranes and Elastomers

3:10 to 3:35pm: **Smart Membranes for Aerospace Applications (Invited paper),** H. Baier, L. Datashvili, M. Rapp, *Institute of Lightweight Structures (Germany)*.....*6423-083*

3:35 to 3:50pm: **Ionic Polymer-Metal Composite Actuators Employing Sulfonated Poly (styrene-ethylene-butylene-styrene) as Ionic-Exchange Membranes,** Xuanlun Wang[a], Il-Kwon Oh[a], Jun Lu[a], Jinhun Ju[b], Sun-Woo Lee[b], [a]*Chonnam National University(Republic of Korea),* [b]*Chonnam National University(Republic of Korea)* *6423-046*

3:50 to 4:05pm: **Light-induced Bending and Smart Control of Photochromic Liquid Crystal Elastomers,** Lihua Jin, Yan Yan, Yongzhong Huo, *Fudan University(China)*.....*6423-113*

4:05 to 4:20pm:
ram kandasamy,ganesan natarajan, mechanical engineering department, iitmadras,chennai-36(India)
.....*6423-120*

Monday 2 July

Session 11
Room A
Mon. 4:30pm to 5:40pm
Actuators and Sensors(II)

4:30 to 4:55pm: **Wireless Sensing and Control (Invited paper),** Yang Wang[a], Jerome P. Lynch[b], Kincho H. Law[a], [a]*Stanford University(USA),* [b]*University of Michigan (USA)*……*6423-043*

4:55pm to 5:10pm: **Microstructure Effects on Proton Conductivity in EVOH based Ionic polymer-metal composites Actuator,** Lijun Dai[a], Lei Li[b], Chunxiu Ma[b], Yujun Zhang[b], [a]*Harbin University of Commerce(China),* [b]*Harbin University of Science and Technology(China)*……*6423-047*

5:10 to 5:25pm: **A Valveless Micropump Driven by Differential SMA Actuator,** Liuke Xia, Fengxiang Wang, Jun Lu, Chao Ge, Xinjie Wu, *Shenyang University of Technology(China).. 6423-048*

5:25 to 5:40pm: **Application study on giant-magneostrictive actuator for driving segmented mirrors of very large astronomical telescope**, Bintang Yang[1], Dehua Yang[2], [1] *Shanghai Jiao Tong University(China),* [2]*Chinese Academy of Sciences(China)*……*6423-180*

Session 12
Room B
Mon. 4:30pm to 5:55pm
Smart Material Applications(I)

4:30 to 4:55pm: **Development of Smart composites for Infrastructure Application (Invited paper)**, Alan kin-tak Lau, *The Hong Kong Polytechnic University(China)*…….. *6423-025*

4:55pm to 5:10pm: **Semi-active Control of Highway Bridges with Pounding Effect by Using Magnetorheological Dampers under Earthquake Excitations,** Anxin Guo, Zhongjun Lia, Hui Lia, *Harbin Institute of Technology(China)* ……..*6423-213*

5:10 to 5:25pm: **The Dispersing Result of SWCNTs Treated by Coupling and Dispersing Agents in Fiber Reinforced Polymer Composites,** Lu Yuan, Yan Zhao, Yuexin Duan, Fengxia Guan, *Beihang University (China)* ……*6423-037*

5:25 to 5:40pm: **Numerical Study of Wave Propagation and Reflection in a Layered Piezoelectric Cylinder,** H. Bai, *Lakehead University (Canada).*……..*6423-148*

5:40 to 5:55pm: **Active Vibration Suppression of Flexible Spacecraft Using Smart Materials during Attitude Maneuver,** Qinglei Hu[1,2], Lihua Xie[1] and Guangfu Ma[2], [1]*Nanyang Technological University(Singapore),* [2]*Harbin Institute of Technology(China).*……..6423-073

Session 13
Room C
Mon. 4:30pm to 5:40pm
Nanomaterials(II)

4:30 to 4:55pm: **Recent Results in Multiscale Simulation of UNCD Responses and Bio-Nano Interaction (Invited paper),** Zhen Chen[a], Luming Shen[b], Yong Gan[a], [a]*University of Missouri(USA),* [b] *Monash University(Australia)*……..*6423-126*

4:55pm to 5:10pm: **Fracture Toughness and Fatigue Behavior of CNT-Reinforced Epoxy-Matrix Composites,** Zhenghan Zhang, Shihying He, N. Yu, *Yuan Ze University(Taiwan, China)..6423-042*

5:10 to 5:25pm: **Properties and Applications of Nanostructural Materials ,** Bin Chen, *SETI Institute NASA Ames Research Center* ……*6423-097*

5:25 to 5:40pm: **The study of the thermal stability of composite microcapsules in corporated with nano carbon tubes(NCTs),** Qingwen Song,Yi Li,Marcus Yeung,Jianwei Xing, *Hongkong Polytechnic University(Hong Kong)* ……*6423-157*

Monday 2 July

Session 14
Room D
Mon. 4:30pm to 5:55pm
Smart Composites

4:30 to 4:55pm: **Evaluating damage in smart composite laminates using embedded EFPI strain sensors (Invited paper),** G. Zhou, L.M. Sim, *Loughborough University(UK)….6423-164*

4:55pm to 5:10pm: **The High velocity Impact Loading on Symmetrical and Woven Hybrid Composite Laminates ,** Martin Ming Jin, David H Nash, William M Banks, *University of Strathclyde(United Kingdom)……..…..….6423-127*

5:10 to 5:25pm: **Development of Smart Hybrid Carbon Fiber Reinforced Polymers,** Caiqian Yang, Zhishen Wu, *Ibaraki University(Japan)……..…..…..6423-194*

5:25 to 5:40pm: **Feasibility on Fiber Orientation on Unidirectional CFRP Composite Laminates Using Nondestructive Evaluation Techniques,** In-Young Yang, Ji-Hoon Kim, Cheon-Seok Cha, Kil-Sung Lee, *Chosun Univ.(Korea),* David K. Hsu, *Iowa State Univ.(USA),* Kwang-Hee Im,*Woosuk Univ.(Korea)…….…..6423-217*

5:40 to 5:55pm: **I-V Characteristic and Mechanism of Carbon Black Filled Epoxy Resin Matrix Composites,** Xiaoyong Ji, Hui Li, Jinping Ou, *Harbin Institute of Technology(China)….6423-16*

Session 15
Room E
Mon. 4:30pm to 5:55pm
Material Characteristics(I)

4:30 to 4:55pm: **Mechanical behavior of nano grained metals - smaller is stronger, even smaller may be softer (Invited paper),** Taher Saif, *University of Illinois at Urbana-Champaign ……..6423-038*

4:55pm to 5:10pm: **Phase Change Material at the Cold/Hot Sides of Thermoelectric Cooler for Temperature Control,** Xiaoqun Wang, Jun Xu, Fang Zhang, Shanyi Du, *Harbin Institute of Technology(China)……..6423-041*

5:10 to 5:25pm: **Effect of Molding Condition on Mechanical Properties during Joining of GMT-Sheet,** Jin-Woo Kim[a], Dong-Gi Lee[b], *[a]Chosun University Graduate School(Korea), [b] Chosun University(Korea)…….. 6423-134*

5:25 to 5:40pm: **Gas sensing properties of nanocrystalline metal oxide powders prepared by sol-gel method,** M. Nasseri M. H. Majles Ara, *Teacher Training University(Iran) …..……6423-101*

5:40 to 5:55pm: **A Study on Cooling Characteristics of Clathrate Compound as Low Temperature Latent Heat Storage Material ,** Chang Oh Kim, Jin Heung Kim, Nak Kyu Chung, *Chosun University(Republic of Korea) ……..……..6423-040*

Tuesday 3 July

Session 16
Room A
Tues. 10:35am to 12:10am
Morphing and Biology-Inspired Structures

10:35 to 11:00am: **Wind Tunnel Tests for a Flapping Wing Model with Changeable Camber Using Macro-Fiber Composite Actuators(Invited paper),** Jae-Hung Han, Dae-Kwan Kim, *Korea Advanced Institute of Science and Technology (Republic of Korea),* Ki-Jung Kwon, *Korea Aerospace Research Institute(Republic of Korea)*……..*6423-020*

11:00 to 11:25am: **Adaptive Structures for Fixed and Rotary Wing Aircraft (Invited paper),** Willi E. Martin[1], Peter Jänker[1], Markus Siemetzki[1], Valentin Klöppel[2], Heinz Hansen[3], [1]*EADS Corporate Research Centre(Germany),*[2]*Eurocopter German y(Germany),* [3]*Airbus Germany(Germany)*…….*6423-084*

11:25 to 11:40am: I**nvestigation on adaptive wing structure base on shape memory polymer (SMP) composite hinge,** Yuemin Yu, Jinsong Leng , *Harbin Institute of Technology(China)* ……*6423-072*

11:40 to 11:55am: **Wing Chamber Control Architectures based on SMA: Numerical Investigations**, Silvestro Barbarino[a], Salvatore Ameduri[b], Rosario Pecora[a], [a]*Univ. of Naples "Federico II"(Italy),* [b] *Italian Aerospace Research Centre (CIRA)(Italy)*…..*6423-077*

11:55 to 12:10am: **The Design of An SMA-Driven Flexible Bionic Fin with Complex Control Surface**, Shiwu Zhang, Yonghua Zhang, Zhen Han, Qin Yan, Jie Yang, *University of Science and Technology of China(China)*……..*6423-071*

Session 17
Room B
Tues. 10:35am to 12:00am
Novel Sensors

10:35 to 11:00am: **Self-sensing composites (Invited paper),** L Wang, S Malik, D Harris and G F Fernando, *University of Birmingham (UK)*……*6423-103*

11:00 to 11:15am: **The electric-field analyse and design of the sensor in international voltage transducer,** Weihong Bi, Feng Liu, Jian Wang, *Yanshan university(China)*……..*6423-110*

11:15 to 11:30am: **Optical fiber biosensor based on multiple total internal reflections in heterodyne interferometry,** Shinn-Fwu Wang, Jyh-Shyan Chiu, Ming-Jen Wang, *Ching Yun University (Taiwan, China)*…….*6423-114*

11:30 to 11:45am: **DNA electrochemical biosensor of methylene blue as the hybridization indicator,** Jimei Zhang[a], Wei Tong[b], Zhao Dai[a], Shichao Xu[a], Ning Guo[a], Xiang Wang[a], [a]*Tianjin Polytechnic University(China),* [b]*Tianjin Armed Forces Medical College(China)*……*6423-087*

11:45 to 12:00am: **PVA/PNIPA Thermosensitive Fibers,** Feng Xia, Chen Li, Leilei Ju, *Tianjin Polytechnic University (China)* …….. …….*6423-112*

Session 18
Room C
Tues. 10:35am to 12:00am
Magnetic Materials

10:35 to 11:00am: **Magnetostriction of oriented and single crystals in Fe-Ga magnetostrictive alloys (Invited paper),** Chengbao Jiang, Jinghua Liu, Huibin Xu, *Beijing University of Aeronautics and Astronautics (China)*……..*6423-177*

11:00 to 11:15am: **Magnetization and magnetostriction ($Tb_{0.36}Dy_{0.64})_{1-x}Ho_xFe_{1.95}$ alloys,** Hongbo Zhang, Chengbao Jiang, Huibin Xu, *Beijing University of Aeronautics and Astronautics (China)*…….*6423-181*

11:15 to 11:30am: **Influence of Ambient Temperature and Magnetic Field on Damping Behavior of Fe-13Cr-2.5Mo Alloy,** Yonggang Xu [1/2], Ning Li [2], Baoluo Shen [2], Hongxing Hua[1], [1]*Shanghai Jiao Tong University(China),* [2]*Sichuan University (China).* ……..*6423-218*

11:30 to 11:45am: **Magnetostrictive Properties of Polymer-bonded Terfenol-D Composites,** C. Rodríguez[1], A. Barrio[2], I. Orue[2], J.L.Vilas[1], J.M. Barandiarán[2], M.L. Fdez –Gubieda[2], L.M. Leon[1]. Jose maria Cuevas, [1]*Departamento de Química Física,* [2]*Departamento de Electricidad, Universidad del País Vasco(Spain)* *6423-054*

11:45 to 12:00am: **Principle and Experiment Research of Magnetic-elastic Stress Sensor Based on Magneto-elastic Effect,** Jianshan. Jiang[1, 2] and Shanglian.Huang[2] and Weimin.Chen[2, 1] *Chongqing Jiaotong University(China),* [2]*Education Ministry of China Chongqing University(China)*.....*6423-178*

Tuesday 3 July

Session 19
Room D
Tues. 10:35am to 11:50am
Fiber Optic Sensor Applications(I)

10:35 to 10:50am: **Leakage detection of oil pipeline using distributed fiber optic sensor,** Song Shan, Li Wang, Jinfeng Zhou, *Beijing University of Technology(China)*.....6423-184

10:50 to 11:05am: **Research on temperature sensor using light speed slowdown method in an inner interfering optical fiber,** Jin Dan, Zheng Gang, Yanmin Li, Mengchao Li, *University of Shanghai for Science and Technology(China)*.....6423-185

11:05 to 11:20am: **Influence of polarization controller to the precision position of the Leakage in optical fiber sensor systems,** Wentao Sun, Lijun Hang, Shuyang Hu, Bin Wu, Yanrong Song, *Beijing University of Technology(China)*.....6423-186

11:20 to 11:35am: **Acid etched micro-cavities in optical fibres,** V R Machavaram, R A Badcock and G F Fernando, *University of Birmingham(UK)*..... 6423-187

Session 20
Room E
Tues. 10:35am to 12:00am
Shape Memory Polymer

10:35 to 11:00am: **Water-responsive programmable shape memory polymer devices(Invited paper),** W. M. Huang, N. Liu and S.J. Phee, *Nanyan Technological University(Singapore)*
.....6423-171

11:00 to 11:15am: **Study on Shape Recovery Speed of Styrene-based SMP Composites with Different Thermal Activation Methods,** Xuelian Wu, Jinsong Leng, Dawei Zhang, Haibao Lv, Xin Lan, *Harbin Institute of Technology(China)*
.....6423-176

11:15 to 11:30am: **New Polyalkene Based Shape Memory Polymers,** J. Alonso[1], J.M. Cuevas[2], J.R. Dios[2], J.L. Vilas[1], L.M. León[1], [1]*Universidad del País Vasco/EHU(Spain),* [2]*Gaiker Centro Tecnológico(Spain)*.....6423-173

11:30 to 11:45am: **Electro-Activated Styrene-based Shape Memory Polymer Nanocomposite Filled with Multi-walled Carbon Nanotubes,** Haibao Lv, Jinsong Leng, Xin Lan, Shanyi Du, *Harbin Institute of Technology(China)*.....6423-175

11:45 to 12:00am: **Study on mechanism of shape memory effect of Poly（D,L-lactide）/hydroxyapatite nanocomposites,** *Xiaotong Zheng, Shaobing Zhou, Southwest Jiaotong University(China)*
.....6423-172

Tuesday 3 July

Session 21
Room A
Tues. 3:10pm to 4:20pm
MR&ER Fluid Applications(I)

3:10 to 3:35pm: **Developing Electrically Controllable Smart Liquids (Invited paper),** Yu Qiao, Alice Han, Lance A. Operhall, *UCSD(USA)…….6423-050*

3:35 to 3:50pm: **Residual Vibration Suppression of Flexible Manipulators Using ER Adaptive Structures**, Huanqing Tang, Kexiang Wei, Yingchun Liu, Hong You, *Hunan Institute of Engineering(China)…… 6423-022*

3:50 to 4:05pm: **Properties of Clutch using Thixotropic MR Fluid with Surfactants**, Shinzo Takata, Kenjiro Hosoo, Yoshimasa Inoue, Ryoichi Hanaoka, Tadashi Fukami, Kazuo Shima, *Kanazawa Institute of Technology(Japan)……..6423-023*

4:05 to 4:20pm: **Nonlinear Characteristics Of Vibration Isolating System For Magneto-rheological Damper,** Zhaowang Xia[a], Xiandong Liu[a], Shaopu Yang[b], Yingchun Shan[a], [a] *Beijing University of Aeronautics and Astronautics,* [b] *Shijiazhuang Railway Institute(China) ……..6423-212*

Session 22
Room B
Tues. 3:10 pm to 4:20pm
Nanocomposites

3:10 to 3:35pm: **Reactive Nano-Epoxy Matrix and the UHMWPE Fiber Composites for Cosmic Radiation Shielding (Invited paper),** Weihong Zhong[a] and Jack Miller[b], [a] *North Dakota State University (USA),* [b]*Lawrence Berkeley National Laboratory (USA) ……..6423-034*

3:35 to 3:50pm: **Electrochemical capacitance behavior of nickel oxide loaded titania nanotubes composite,** Yibing Xie, Chuanjun Huang, Limin Zhou, Haitao Huang, Jian Lu, *The Hong Kong Polytechnic University (China) ……6423-035*

3:50 to 4:05pm: **Electroactive Response of Mesoporous Silica and Its Nanocomposites with Conducting Polymers**, Fei F. Fang, Hyoung J. Choi, Wha S. Ahn, *Inha Univ. (Korea)…… 6423-036*

4:05 to 4:20pm: **Molecular Mechanics Simulation on the Nanoin-dentation on POSS Nanocomposite,** Fanlin Zeng, Yi Sun, Yu Zhou, Jun Li, *Harbin Institute of Technology(China)..6423-163*

Session 23
Room C
Tues. 3:10 pm to 4:20pm
Piezoelectric Materials(II)

3:10 to 3:35pm: **Effective Electromechanical Properties of 1-3 Piezoelectric Composites: Effects of Polarization Orientation and Aspect Ratio(Invited paper),** Christian N. Della and Dongwei Shu, *School of Mechanical and Aerospace Engineering(Singapore) ……6423-144*

3:35 to 3:50pm: **Motion Characteristics of A Rotary Piezo Impact Drive Mechanism,** Nan Jiang[a, b], Jun-biao Liu[a], Tao Tao[a, b], Li Han[a], [a]*Institute of Electrical Engineering(China),* [b]*Graduate University of Chinese Academy of Sciences (China)…...6423-199*

3:50 to 4:05pm: **A 3.2 MHz Phased Array Probe Using PMNPT Single Crystal for Medical Imaging,** H. Lia, *The Hong Kong Polytechnic University(Hong Kong)…….6423-150*

4:05 to 4:20pm: **Piezoelectricity in PANI filled Nylon 11,** S. A. Pande, *Visvesvaraya National Institute of Technology ……...6423-147*

Tuesday 3 July

Session 24
Room D
Tues. 3:10pm to 3:55pm
Fiber Optic Sensor Applications(II)

3:10 to 3:25pm: **Active Wavelength Demodulation of Fiber Grating Sensors Using Hybrid Optical Bistability in Fiber Fabry-Perot**, Guohui Lv [a,b], Jinping OU[a,c], Huiying Wang [b], Shaohua Shang [b], Chao Yang [b], Chuandi Li [b], Hongan Ye[b], *[a]Harbin Institute of Technology(China), [b]Heilongjiang University(China), [c]Dalian University of technology(China)……..……6423-122*

3:25 to 3:40pm: **Fiber Michelson Sensors Signal Processing by Using of Optical Bistable Device in Frequency Domain,** Guohui Lv [a,b], Jinping OU[a,c], Huiying Wang [b], Shaohua Shang [b], Chao Yang [b], Chuandi Li [b], Hongan Ye [b], *[a]Harbin Institute of Technology, Harbin(China), [b]Heilongjiang University(China), [c]Dalian University of technology(China)…….6423-123*

3:40 to 3:55pm: **Simultaneous measurement of temperature and strain based on multi-core fiber gratings,** Weimin Sun, Haili Jiang, Cong Zhang, Zhihai Liu, Fuqiang Jiang, Libo Yuan, *Harbin Engineering University(China)…….6423-124*

Session 25
Room E
Tues. 3:10pm to 4:10pm
Analysis and Modeling

3:10 to 3:25pm: **Analysis on dynamics and frequency of ICPF Actuated Tortoise-like Flexible Micro-Robot,** Lin Nie [a,] Desheng Li[a] , Shuxiang Guo [b] , *[a]Beijing University of Technology(CHINA), [b]Kagawa University(Japan) ……...6423-045*

3:25 to 3:40pm: **Design and Control of a Topology Optimal Compliant Microgripper,** Shyh-Chour Huang and Dian-Yong Lin, *National Kaohsiung University of Applied Sciences (Taiwan, China) ……6423-085*

3:40 to 3:55pm: **Kinematic Control Model for Light Weighting Mechanism of Excavator Attached to Rotary Working Device**, Sangsik Lee[a], Choongho Lee[b],Youngtae Cho [b], and Kwanghee Im [c], *[a]Sung Kyun Kwan Univ.(Korea), [b]Jeonju Univ.(Korea), [c]Woosuk Univ.(Korea)…….. 6423-135*

3:55 to 4:10pm: **Thermal and Electrical Performance of α-Si Microbolometer Focal Plane Arrays,** Lianjun Sun, Benkang Chang, Junju Zhang, Yunsheng Qian, Yafeng Qiu, *Nanjing University of Science &Technology(China) …….6423-111*

Tuesday 3 July

Session 26
Room A
Tues. 4:30 to 5:15pm
Ferroelectrics

4:30 to4:45pm: **DC field Dependent Dielectric Properties of BaZrxTi1-xO3 Relaxor Ferroelectric Ceramics,** Shanming Ke, *Northwestern Polytechnical University(China),* Haitao Huang, Huiqing Fan, H.L.W. Chan, L.M. Zhou**,** *The Hong Kong Polytechnic University(China)…….. 6423-027*

4:45 to 5:00pm: **A Novel PEG-assisted Route to Synthesize the Perovskite PNN-PT Powders and Ceramics,** Ye Yin, Shuhui Yu, Haitao Huang, Limin Zhou, *The Hong Kong Polytechnic University(Hong Kong)……..6423-170*

5:00 to 5:15pm: **Domain Studies of the Relaxor Ferroelectric Single Crystal PMN-xPT by Temperature-dependant Piezoresponse Force Microscopy**, Jiyan Dai**,** *The Hong Kong Polytechnic University(China)…….. 6423-026*

Session 27
Room B
Tues. 4:30 to 5:55pm
Applications of SMA(II)

4:30 to 4: 55 pm: **Two-way shape memory coil springs: design, actuation and stability (Invited paper),** X.T. Zu , Z.G. Wang , *University of Electronic Science and Technology of China(China) ……. 6423-137*

4:55 to 5:10pm: **Study on Structure and Control Strategy of MSMA Actuators,** Fengxiang Wang, Chao Ge, Jun Lu, Liuke Xia, *Shenyang University of Technology(China)…….... 6423-138*
.
5:10 to 5:25pm: **Frequency Response Analysis of Shape Memory Alloy Actuators**, Y. H. Teh, R. Featherstone, *Australian National University(Australia) ……..6423-140*

5:25 to 5:40pm: **Ti-content dependence of shape memory characteristics of Ti-Ni-Cu alloy ribbons,** Jung-min Nam[1], Hyun-gon Kim[1], Gyu-bong Cho[1], Yeon-wook Kim[2], Tae-hyun Nam[1], *[1]Gyeongsang National University(Korea), [2] Keimyung University(Korea)…….. 6423-141*

5:40 to 5:55pm: **Effect of Transformation Volume Contraction on the Indentation Hardness of Shape Memory Alloys,** Wenyi Yan[a], Qingping Sun[b] and Hong-Yuan Liu[c] , *[a]Deakin University (Australia); [b] Kong University of Science and Technology(China); [c]The University of Sydney(Australia)……..6423-142*

Session 28
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Tues. 4:30 to 5:55pm
Nanomaterial applications

4:30 to 4: 55 pm: **Fabracation of 0.675PMN-0.325PT textured piezoceramics by template grain growth technique (Invited paper),** Kechao Zhou, *Central South Univsity(China)… 6423-019*

4:55 to 5:10pm: **Study of Formaldehyde Photocatalytic Degradation Using Nano TiO**, Huili Yu Kaili Zhang, Carole Rossi *Ocean University of China(China), LAAS-CNRS(France) ……..….6423-192*

5:10 to 5:25pm: **The Influence of Doping Concentration on Temperature Characteristics of Polysilicon Nanofilms**, Xiaowei Liu[a], Huiyan Pan[a], Rongyan Chuai[a, b], Xilian Wang[a], Jinfeng Li[a], *[a]Harbin Institute of Technology(China); [b]Shenyang University of Technology(China)…….6423-198*

5:25 to 5:40pm: **In vitro multiple shooting from the nodal explants of Boerhaavia diffusa L. using Biopreserver-First report,** M.VARADARAJAN, *A.V.C College……..…....6423-131*

5:40 to 5:55pm: **ZnO-coated Ga_2O_3 nanostructures,** Hyoun Woo Kim and Seung Hyun Shim, *Inha University (Republic of Korea) ……...6423-098*

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Fiber Optical Sensors

4:30 to 4: 55 pm: **Fiber Optic Sensors-Based Intelligent Coal Mines (Invited paper),** Tongyu Liu, *Shandong Academy of Science(China)*……..*6423-099*

4:55 to 5:10pm: **Soil Deformation Measurement Method on Optic Fiber Sensor,** Jun Yang, Zhihai Liu, Ai Zhou,Libo Yuan, *Harbin Engineering University(China)*……..*6423-151*

5:10 to 5:25pm: **Portable D-type Optical fiber sensor based on SPR effect in temperature detection,** Ming-Hung Chiu, Po-Chin Chiu, *National Formosa University (Taiwan, China)* ……..*6423-152*

5:25 to 5:40pm: **Fibre optic sensor design for chemical process and environmental monitoring,** R Mahendran, D Harris, L Wang, V R Machavarem,R Chen, *University of Birmingham (UK)* ……*6423-154*

5:40 to 5:55pm: **Study on In-Line Fiber-Optic Sensor using Near-Infrared Spectroscopy,** Hong Wang, Pengyu Cheng, *South China University of Technology(China)*…….*6423-155*

Session 30
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Tues. 4:30 to 5:55pm
SHM(II)

4:30 to 4: 55 pm: **Smart materials and smart civil infrastructures (Invited paper),** Jinping Ou and Hui Li, *Harbin Institute of Technology (China)*……..*6423-189*

4:55 to 5:10pm: **Preparation and characterization of self-healing poly(urea-formaldehyde) microcapsules,** Haiyan Li,Rongguo Wang, Wenbo Liu, Huanying Hao, *Harbin Institute of Technology(China)*……..*6423-165*

5:10 to 5:25pm: **Study on Coating Class Damage Degree by Use Cycle of Gas Turbine Blade Coating,** Choul Jun Choi[a], Jae Yoel Kim[b], [a] *Graduate School of Chosun University(South Korea),* [b]*Chosun University(South Korea)*……..*6423-167*

5:25 to 5:40pm: **Nature Defect Evaluation of Laser Welded Thin Plate using Laser Guide Wave** , Kyung Seok Song, *Chosun University (South Korea)*……..*6423-168*

5:40 to 5:55pm: **Airborne Ultrasonic Inspection in Carbon/Carbon Composite Materials,** In-Young Yang[1], Young-Hun Kim[2], Je-Woong Park[3],David K. Hsu[4] and Kwang-Hee Im[5], [1]*Chosun University (Korea),* [2]*Mokpo National Univ.(Korea),* [3]*Chosun University(Korea),* [4]*Iowa State University(USA),*[5]*Woosuk University(Korea)*……..*6423-108*

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Session 31
Room A
Wed. 10:35am to 12:00am
Shape Memory Alloys

10:35 to 11:00am: **Damping capacity of TiNi-based shape memory alloys (Invited paper),** L.J. Rong, H.C. Jiang, *Chinese Academy of Sciences (China)*……..*6423-203*

11:00 to 11:15am: **TEM Study of Pre-strain's Effect on Shape Recovery Character in an Fe-Mn-Si-Cr-Ni Shape Memory Alloy,** Zhixia Qiao[a], Nanju Gu[b], Fenping Ou[a], *[a]Tianjin University of Commerce, [b]Hebei University of Technology(China)…6423-204*

11:15 to 11:30am: **Fretting behavior of NiTi shape memory alloys on human bones in simulation body fluid,** Yan Yin, Yangtao Xu, Tiandong Xia, *Lanzhou University of Technology (China)* ……..*6423-205*

11:30 to 11:45am: **Transformation behavior and shape memory characteristics of Ti-(45-x)Ni-5Cu-xV alloys,** Ju-young Choi[a], Tae-hyun Nam[a], Eunsoo Choi[b], Baik-soon Cho[c], Young-soo Chung [d], *[a]Gyeongsang National University, [b]Korea Railroad Research Institute, [c]Inje University, [d]Joongang University(Korea)* ……..*6423-207*

11:45 to 12:00am: **Effects of Pd addition on the transformation temperature in Fe-Pt shape memory alloys,** G. S.Yang, J. K. Lee ,W.Y. Jang , *Chosun University,* J.I.Lee, *Chungju National University (Korea)* ……*6423-214*

Session 32
Room B
Wed. 10:35am to 12:00am
MR &ER Fluid Applications(II)

10:35 to 11:00am: **Tactile display based on smart fluids (Invited paper),** Yanju Liu [a], Rob Davidson[b], Paul Taylor[b], *[a]Harbin Institute of Technology (China), [b]University of Newcastle upon Tyne(UK)*……*6423-109*

11:00 to 11:15am: **Magnetorheological Response of Polymer Coated Carbonyl Iron Microspheres,** Min S. Kim, Bong J. Park, Hyoung J. Choi, *Inha University(Korea)* ……..*6423-208*

11:15 to 11:30am: **Multiobjective Evolutionary Optimization Design of Vehicle Magnetorheological Fluid Damper,** Q. Zhao, Y. Wang, *Northeast Forestry University(China)*……..*6423-210*

11:30 to 11:45am: **Experimental Study of Response Time of Magnetorheological Fluid Damper,** Xinchun Guan[a], Pengfei Guo [a], Chaofu Bian[a], Jinping Ou[a,b], *[a]Harbin Institute of Technology, [b] Dalian University of Technology(China)* ……..*6423-211*

11:45 to 12:00am: **Experimental Investigation on Electrorheological Fluid Rheology and Dielectric Properties,** Y. Sun, M. Thomas and J. Masounave, *École de technologie supérieure(Canada)* ……*6423-021*

Session 33
Room C
Wed. 10:35am to 12:00am
Smart Material Applications(II)

10:35 to 11:00am: **Development of Smart Structural Material Systems by Innovative Design and Processing (Invited paper),** Hiroshi Asanuma,*Chiba University(Japan)*……..*6423-191*

11:00 to 11:15am: **Design, Manufacture and Evaluation of Bending Control of Carbon/Epoxy Composite Beams with Embedded SMA Wires,** G. Zhou, *Loughborough University(UK)*……..*6423-195*

11:15 to 11:30am: **Thermal Analysis for Thermal Smart Structure of Composite Material with TEC,** Cheng Xianli, Deng Zhongmin, *Beijing University of Aeronautics and Astronautics (China)*……..*6423-196*

11:30 to 11:45am: **Synthesis and characterization of melamine-urea-formaldehyde microcapsules containing ENB-based self-healing agents"**Xing Liu, Xia Sheng, Michael R. Kessler, Jong Keun Lee, *Kumoh National Institute of Technology(Korea)*……*6423-166*

Wednesday 4 July

Session 34
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Photonics

10:35 to 11:00am: **Enhanced diffraction in cholesteric liquid crystal gratings(Invited paper),** [a]I-Min Jiang, [b]Wen-Chi Hung, [b]Wood-Hi Cheng, [c]Ming-Shan Tsai, *[a]National Sun Yat-sen University(Taiwan, China), [b]National Sun Yat-sen University(Taiwan, China), [c]National Chiayi University(Taiwan, China)……6423-121*

11:00 to 11:15am: **A Superlattice Infrared Photodetector Integrated with Multiple Quantum Wells to Improve the Performance,** S. H. Lin[a], J. H. Lu[a], Y. C. Wang[a], C. H. Kuan[a], J. Y. Feng[b], T. S. Lay[b], C. W. Yang[c], S. L. Tu[c], *[a] National Taiwan University, [b]National Sun Yat-Sen University(Taiwan, China), [c] Opto Tech Corporation (Taiwan, China)……..6423-095*

11:15 to 11:30am: **Optical response property of photo-heat sensitive microcapsule,** Xiaowei Li, Nan Zhang, Weidong Lai, Shuxu Sun, Wenli Wang, *Hebei University(China)….. 6423-093*

11:30 to 11:45am: **Reversible photoswitchable chiral azo liquid crystals,** Quan Li, Lisa Green, Xiaoli Zhou, Julie Kim, Lanfang Li, *Kent State University(USA) ……..6423-094*

Session 35
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Wed. 10:35am to 11:50am
Material Characteristics (II)

10:35 to 10:50am: **Microstucture and superelasticity of NiS/Ti-Ni composite electrode,** Han-sung Kim[1], Gyu-bong Cho[1], Yinong-Liu[2], Tae-hyun Nam[1], *[1]Gyeongsang National University (Korea),[2]University of Western Australia(Australia) ……6423-028*

10:50 to 11:05am: **The Influence of Ca/P Ratio on the Properties of Hydroxyapatite Bioceramics,** S. Ramesh[1], C. Y. Tan[2], M. Hamdi[2], I. Sopyan[3], W. D. Teng[4], *University Tenaga Nasional, [2]University Malaya, [3]International Islamic University Malaysia, [4]Ceramics Technology Group(Malaysia)…… 6423-055*

11:05 to 11:20am: **Characterization of Mechanical properties and Microstructure of Pressureless Sintered TiB_2-B_4C Composite,** H.R. Baharvandi[a], A.M. Hadian[b], H. Abdizadeh[b] & N. Ehsani[a], *[a]Malek Ashtar University of Technology(Iran), [b]University of Tehran(Iran)……6423-130*

11:20 to 11:35am: **Mechanical Properties of Ti50Ni50-xCux(x=20, 30) Shape Memory Alloy Strips Produced by Melt Overflow,** Yeon-wook Kim[a] and Tae-hyun Nam[b], *[a]Keimyung University (Korea), [b]Gyeongsang National University(Korea)……..6423-082*

11:35 to 11:50: **Bioactive Porous Ceramics via Polymeric Sponge Method: The Effect of Preparation Conditions on Physical Properties,** I. Sopyan, International Islamic University Malaysia (Malaysia); J. Kaur, Malaysia University of Science and Technology(Malaysia); S. Ramesh, University Tenaga Nasional (Malaysia); M. Hamdi, University Malaya (Malaysia); W. D. Teng, Ceramics Technology Group(Malaysia) *6423-039*

Monday 2 July – Posters

The following posters will be displayed in the Poster board all day(Monday). Poster authors will be able to set up their papers between 8:30 to 9:00am. Authors will be present for discussion from 1:15 to 2:15pm. The size of the poster board is 1.2 ×1.2 meters. Authors can take their papers away after 5:00pm.

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Design and Characteristics of Piezoelectric Actuator with Single Neuron Adaptive PID Controller for the Grating Tiling
Wang Bin,Graduate School of the Chinese Academy of Sciences(China), Yong Wang, Jifeng Zu, Jianqiang Zhu, Shanghai *Institute of Optics and Fine Mechanics(China)*

6423-233
Research of the High Performance Low Temperature Vortex Street Flowmeter
Gao Fang, Chen Yang, Zhenpeng Zhang, *Beijing University of Aeronautics and Astronautics(China)*, Weiguo Geng, *The 101 st Research Inst. (China)*

6423-234
A Displacement Generate Control Strategy for Active Vibration Isolation System with Piezoelectric Actuator
Zhang Tao, Zeng Taiying, Huang Hongbiao, Zhao Fangfang, Graduate School of the Chinese Academy of Sciences (China), Zhu Jianqiang, Shanghai Institute of Optics and Fine Mechanics(China)

6423-235
Analysis of Laminated Composite Piezoelectric Rectangular Plates with 1:2:4 internal resonances
Zhigang Yao, Wei Zhang, Lihua Chen, *Beijing University of Technology(China)*

6423-236
Strain and Temperature Sensing Behavior of Textile Structures Made of Stainless Steel Continuous Filament Yarns
Bin Yang, XiaoMing Tao, *The Hong Kong Polytechnic University(Hong Kong)*, Jiayang Cai, *Zhejiang Sci-Tech University(China)*, TongXi Yu, *Hong Kong University of Science and Technology(Hong Kong)*

6423-237
Research on the Model and the Characteristics of Piezoelectric Smart Active Member for Vibration Control of Space Flexible Structure
Guangqing Wang, Zhejiang, *Gongshang University (China)*, Jifeng Guo, *Zhejiang University(China)*

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Stable Reliability Analysis of Truss Structure Affixed Piezoelectric Patches on The Surface
Hai An, Weiguang An, Dan Zhang, *Harbin Engineering University(China)*

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Microstructure and Properties of $MoSi_2$ Intermetallic Reinforced and Toughening by Carbon Nanotube
Yingjie Qiao, Xiaohong Zhang, Shuangquan Fang, *Harbin Engineering University(China)*,Changqing Hong,*Harbin Institute of Technology(China)*

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Semi-active Control of Curved Bridge using Piezoelectric Friction Dampers under multi-component multi-support earthquake
Wei Quan, Hongnan Li, *Dalian University of Technology(China)*

6423-241
Numerical analysis and program design of multilayered beam with embedded multi-piezoelectric actuators
Wang Jianguo,Ding Genfang, Qin Yan, Hefei University of Technology(China)

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Piezoelectric activity and thermal stability of cellular fluorocarbon films
Xiaoqing Zhang, G. M. Sessler, *Darmstadt University of Technology(Germany)*, Jinfeng Huang, Zhongfu Xia, *Tongji University(China)*

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A novel tool of cell puncturing
Changhai Ru, Xihua Wang, *Harbin Engineering University(China)*, ShuXiang Guo,*Kagawa University Graduate School of Engineering(Japan)*

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Shape memory effect and magnetic properties of Co-Fe ferromagnetic shape memory alloys
Yunqing Ma, Cuiping Wang, Xingjun Liu, *Xiamen University (China)*

6423-245
Microstructure and Wear Performance of the Coating Formed by Microarc Oxidation on NiTi Shape Memory Alloy
Xuetong Sun, Chengxin Lin, Huichen Zhang, *Dalian Maritime University (China)*

6423-246
The Microstructure and Transformation Behavior of $Mn_{50+x}Ni_{25}Ga_{25-x}$ (x=0, 3, 5, 6) Ferromagnetic Shape Memory Alloys
Jie Zhang, Wei. Cai, *Harbin Institute of Technology (China)*

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Laser irradiation and machining characteristics of TiNiCu shape memory alloys thin films
Z.G. Wang, X.T. Zu, X.P. Li, X. Xiang, *University of Electronic Science and Technology of China(China)*, X.D. Yuan, W.G. Zheng, *China Academy of Engineering Physics(China)*, Y.Q. Fu, *University of Cambridge(UK)*

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Static Analysis of Functionally Graded Piezoelectric Annular Sectorial Plates
G. J. Nie, Z. Zhong, *Tongji University (China)*

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Shape memory effect of poly (glycerol sebcate)
Liu Lili, Cai Wei, *Harbin Institute of Technology(China)*

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Internal friction of a new ingredient heterogeneous shape memory composite
Tingyong Xing,Yanjun Zheng, Lishan Cui, *University of Petroleum(China)*

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Thermoresponsive Shape Memory of Terpolymer Hydrogels
Chen Li, Han Yongliang, Yu Xiao, *Tianjin Polytechnic University(China)*

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Effects of Heat Treatment on Shape-setting and Non-linear Mechanical Properties of Nitinol Stent
Liu Xiaopeng, Wang Yinong, Qi Min, Yang Dazhi, *Dalian University of Technology(China)*

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Effect of Rotation Speed on Transformation Behavior in Ti-48at%Ni Shape Memory Alloy Melt-spun Ribbon
Xing Hongyan, *Tianjin University of Science and Technology(China)*, KIM Hee Young, MIYAZAKI Shuichi, *University of Tsukuba(Japan)*

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Microstructure and Shape Recovery Characteristics in a TIG-welded Fe-Mn-Si-Cr-Ni Shape Memory Alloy
Qiao Zhixia, Liu Yongchang, Tianjin University(China), Wang Dongai, Dahai Xia, *Tianjin University of Commerce(China)*

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Temperature memory effect of martensite and R-phase transformation in TiNi-based shape memory alloys (thin films)
X.T. Zu, Z.G. Wang, *University of Electronic Science and Technology of China(China)*, Y.Q. Fu, *University of Cambridge(UK)*

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A novel NiTiNb shape memory alloys with high yield strength and high damping capacity
Fu Xiao, Xinqing Zhao, Huibin Xu, *Beijing University of Aeronautics and Astronautics(China)*,Lijian Rong, *Chinese Academy of Science(China)*

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Tapering fiber gratings and its applications in SHM
Weimin Sun, Zong Zhang, Haili Jiang, Chunying Guan,*Harbin Engineering University(China)*

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Strain gradient effects in piezoelectrics and ferroelectrics
Wenhui Ma,*Shantou University(China)*

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Design on Waveguide Coupler for Integrated Optical Gyroscope Based on SOI
Lishuang Feng, Guanglong Wang, Huilan Liu, Guanglei Xu, Huaiyong Yu,*Beijing University of Aeronautics and Astronautics(China)*

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Study on the preparation and structural performance of polyaniline/PP conductive fiber
Zhang hong, Dalian Institute of Light Industry (China), *Dalian University of Technology(China)*

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Effect of highly birefringence fibers on fiber optic gyroscope
Ying Li, Xinglin Chen, Shenmin Song, *Harbin Institute of Technology(China)*

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Critical Bending Fiber Optic Sensor with Cascaded Structure for Feedback Control of Flexible Hinge Stage
Jianhuan Zhang, Zhiwei Yuan, Pinchun Kang, *Xiamen University(China)*

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Investigation on Simultaneous Measurement of Strain and Temperature Based on Hybrid FBG/EFPI Sensor
Jingyun Dai, Wentao Zhang, *Chinese Academy of Sciences(China)*, Baochen Sun, Yanliang Du, *Shijiazhuang Railway Institute(China)*

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Investigation of strain and temperature dependance of fluorescence lifetime of rare-earth doped fibers
Haili Jiang, Weimin Sun, Cong Zhang, *Harbin Engineering University(China)*

6423-268
Fiber Bragg Grating Strain System with Temperature Compensation
Cui Zhang, DeSheng Jiang, LiXin Wang, *Wuhan University of Technology(China)*

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Synthesis and optical properties of photoactive azo-containing banana-shaped liquid crystal

Yuanming Huang, *Shantou University(China)*

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Research of FBG strain sensors based on light speed modulating method
Yanmin Li, mengchao Li, Gang Zheng, Songlin Zhuang, *University of Shanghai for Science and Technology(China)*

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Monitoring and controlling manufacturing for composite using Fiber Bragg grating
Haitao Zhao, Boming Zhang, Zhanjun Wu, Dianfu Wang, *Harbin Institute of Technology(China)*, Shuhua MO, *Heilongjiang Institute of Technology(China)*

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FBG based intelligent sensor and structure for electric power system
Yuan Yao, *Wuhan University(China)*,Benshun Yi, *Central China Normal University(China)*, Jinsheng Xiao, *Physical Engineering and Optics University Laval(Canada)*

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Comparison of several strain transfer theory calculation methods of the embedded FBG strain sensors
Li Sun, Dezhi Liang, *Shenyang Jian Zhu University(China)*, Hongnan Li, *Dalian University of Technology(China)*

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Photoelectron Characteristic of Silver Halide Microcrystals Adsorbing Dye after Illuminated
Rongxiang. Z, Jixian. Z, Weidong. L, Yanxia. H, Xiuhong. D, Li. H, Xiaowei. L, *Hebei University (China)*

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Love Wave in Graded Half-space with Homogeneous Layer
Hong Zhu, Jiecai Han, Yumin Zhang, *Harbin Institute of Technology(China)*, Ligang Zhang, Bingzheng Gai, *Harbin Institute of Technology(China)*

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Study of Fiber Bragg Grating Monitoring Technique and its Application in Bridge Reinforcement
ZhiGang Ren, Zhean Lu, MingYuan Zhang, ErLei Wang,*Wuhan University of Technology(China)*

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Fiber grating sensor demodulation system
Weihong Bi, Lin Li,*Yanshan university(China)*

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Experimental study on compressive damage processes for 3-D braided composites by acoustic emission
Yan Shi, Linzhi Wu, Yuguo Sun, Shanyi Du, *Harbin Institute of Technology(China)*

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Analysis and numerical simulation of influencing factors on polymer melt filling in micro injection molding

Jian Zhuang, Minjie Wang, Tongmin Yu, *Dalian University of Technology(China)*

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The theoretical and experimental study on the porous silicon based optical sensor
Lexin Zhang, Ran Zhang, Zhiquan Li, *Yanshan University(China)*

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Reliability Analysis of Electric Breakdown for Piezoelectric Ceramic
Binsheng Wang, Weiguang An, *Harbin Engineering University(China)*

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Spectral finite element modeling of beams treated with active constrained layer damping with consideration of thickness deformation
Miao Wang, Guang Meng, *Shanghai Jiao Tong University(China)*

6423-283
Optical characteristics of SiO_2-TiO_2 strip waveguides fabricated by laser direct writing
Aikui Li , Zemin Wang , Jiajun Liu , Xiaoyan Zeng, *Huazhong University of Science and Technology(China)*

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Characteristics of Bending according to Stacking Sequence for Hybrid Circular Members
Ji Hoon Kim, In Young Yang, *Chosun University(Korea)*, Kwang Hee Im, *Woosuk University(Korea)*,

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Crashworthiness of Aluminum/CFRP Hybrid Member with Various Stacking Condition
Kil Sung Lee, Cheon Seok Cha, In Young Yang, *Chosun University(Korea)*

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Synthesis of Co doped pyramidal ZnO nanorods by solution growth technique.
M. K. Patra, K. Manzoor, M. Manoth, S. R. Vadera, T. R. N. Kutty, N.Kumar, *Indian Institute of Science(India)*

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Development of Stewart Platforms for Active Vibration Isolation and Precision Pointing
Lei Liu , Benli Wang, Pingping Wang, *Harbin Institute of Technology(China)*

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Rheokinetic evaluation of self-healing agents polymerized by Grubbs catalyst embedded in various thermosetting systems
Xing Liu, Kumoh, National Institute of Technology(Korea); Xia Sheng, Michael R. Kessler, Iowa State University(Korea); Jong Keun Lee, Kumoh National Institute of Technology(Korea)

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Experimental Investigation of Smart FRP-concrete composite beams with embedded FBG Sensors
Yanlei Wang, Zhi Zhou, *Harbin Institute of Technology (China)*, Jinping Ou, *Dalian University of Technology(China)*

6423-291
Surface morphology and reflectivity of TiNi thin films
Y. C. Lei, W. Cai, L.C. Zhao, *Harbin Institute of Technology(China)*, X. An, L.X. Gao, *Heilongjiang University(China)*

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Research on Dynamic Characteristics of a Magnetorheological Damper with Decoupling Mechanism
Tu Fengchen, Chen Zhaobo, Jiao Yinghou, Li Hua, *Harbin Institute of Technology(China)*

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Application of Magnetorheological Fluid Squeeze Film Dampers in Ultrahigh Speed Grinding
Yu Tianbao, Gong Yadong, Liang Shuang, Cai Guangqi, Wang Wanshan, *Northeast University(China)*

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Uniformity Design of Magnetic Field of Magnetostrictive Actuator
Xin chun Guan, Pengfei Guo, Jin ping Ou, *Harbin Institute of Technology(China)*

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Actuator based on sulfonated comb copolymer of poly (ethylene-co-vinyl alcohol) grafted by poly (ethylene glycol)
Guifen Gong, Lei Li, Yujun Zhang, *Harbin University of Science and Technology(China)*

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The technology and analog calculation of the three-dimensional colloidal crystal growth on the end face of optical fiber
Haitao Yan, Ming Wang, YiXian Ge, *Nanjing Normal University(China)*

6423-297
Mechanical Properties and Morphology of Organic Silicon/Polyurethane IPNs Prepared by Sol-gel Method

Dongyan Tang, Yifei Zhang, *Harbin Institute of Technology(China)*, Yingjie Qiao, *Harbin Engineering University(China)*

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The Granularity and Penetrability Property of Microcapsule Synthesized with Interfacial Polymerization Technique
LI Xiaowei, Lai Weidong, Zhang Nan, Sun Shuxu, Fu Guangsheng, *Hebei University(China)*

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Actuators based on Polyurethanes with Different Types of Polyol
HyunOk Lim, Geong Mi Bark, NamJu Jo, Pusan National University(Korea)

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Research and Application Of Remote Control & Monitoring In Smart Structure
YaoHe Liu, JianMin Xiong, *Hubei University of Technology(China)*

6423-301
Numerical analysis and program design of multilayered beam with embedded multi-piezoelectric actuators
Jianguo Wang, Genfang Ding, Yan Qin, *Hefei University of Technology(China)*

6423-302
Tensile Test of Membrane Materials Using Digital Image Correlation Method
W. Sun, *National Univ of Singapore(Singapore)*, X.Y. He, X.Ming, L.Bin, *Southeast Univ(China)*

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Developing Smart Liquids
Yu Qiao, Alice Han, Lance A. Operhall, UCSD, *La Jolla(USA)*

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Preparation, Structure and Properties of $Bi(Mg_{1/2}Ti_{1/2})$-$PbTiO_3$ Ceramics
Shuhui Yu, Limin Zhou, YinYe, Haitao Huang, *Hong Kong Polytechnic University(Hong Kong)*

6423-307
An Approach to Modeling and Control for Smart Structure Active Vibration Control
Zhenkai Guo, Jianqin Mao, *Beijing University of Aeronautics & Astronautics(China)*

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Investigation on Dynamic Properties of Terfenol-D Actuators
Wenmei Huang, Ying Sun, Ling Weng, Shuying Cao, Bowen Wang, *Hebei University of Technology(China)*

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The symplectic method of electric and elastic problems
Bian Wenfeng, Jia Baoxian, Harbin Institute of Technology(China), Wang Biao, *Sun Yat-Sen University(China)*

6423-310
Analysis on Mechanical Behavior of Concrete Filled Bidirectional FRP Tube
Feng Yu, Ditao Niu, Ping Wu, Nan Zhao, *Xi'an University of Architecture and Technology(China)*

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Bearing Capacity of FRP-Confined Concrete Column Subjected to Axial Compression
Feng Yu, Ditao Niu, Ping Wu, *Xi'an University of Architecture and Technology(China)*

Tuesday, 3 July

The following posters will be displayed in the Poster board all day (Tuesday). Poster authors will be able to set up their papers between 8:30 to 9:00am. Authors will be present for discussion from 1:15 to 2:15pm. The size of the poster board is 1.2×1.2 meters. Authors can take their papers away after 5:00pm.

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Novel Health Baseline Based on Symmetrical Principle for Structural Heath Monitoring and Damage Identification
PEI Qiang, Dalian University(China), GUO Xun, Tao Xiaxin, *Harbin Institute of Technology(China)*

6423-313
Condition Health Monitoring of Composite Wound Pressure Vessels Using Fiber Bragg Gratings
Xiaojing Zhang, Shanghai Jiao Tong University(China), Boming Zhang, Zhanjun Wu, *Harbin Institute of Technology (China)*

6423-314
Application of Acoustic Emission Technique in Diagnostics of Early Rolling Bearing Faults
Rujiang Hao, *Shijiazhuang Railway Institute(China)*, Fulei Chu,*Tsinghua University(China)*

6423-315
Research on A New SMA Self-adaptive Damper
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