



53rd ICAT/5th IWPMA/75th JTTAS Joint Symposium

Nittany Lion Inn, State College, PA, USA

Final Agenda

Monday, October 6, 2008

ICAT Guided Tour in MRL/PSU Building & ATILA FEM Pre-Conference Tutorial

Organized by Micromechatronics Inc., State College, PA, USA

Table with 2 columns: Time and Activity. Activities include: Depart front of Nittany Lion Inn for MRL Building, Guided Tour of MRL Building, ATILA Seminar I (Room 250 MRL), Break, ATILA Seminar II (Room 250 MRL), and Depart from MRL Building for Nittany Lion Inn.

6:00 pm - 8:00 pm On-site Registration for Symposium
..... Nittany Lion Inn Lobby



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Nittany Lion Inn, State College, PA, USA

Tuesday, October 7, 2008

7:30 - 8:00 On-site Registration; Gathering and Refreshments

Plenary Session Ballroom C

Session Chair: Kenji Uchino

8:00 - 8:15 Welcome RemarksK. Uchino, Director of ICAT

8:15 - 8:45 All Attendants Self-Introduction

8:45 - 9:30 Piezoelectric Actuators 2008 - Key Factors for Commercialization
.....K. Uchino, Director of ICAT

9:30 - 10:00 Refreshment Break

10:00 - 10:25 Inv: Progress of Aerosol Deposition Method and Lamb Wave Resonance Type Optical
Micro-Scanner J. Akedo, AIST, Japan

10:30 - 10:55 Inv: Development and Applications of Linear Ultrasonic Motors.....
.....C. Zhao, Nanjing University of Aeronautics & Astronautics, China

11:00 - 11:25 Inv: Application of Compound Piezoelectric Transducers in Ultrasonic Motors.....
.....P. Vasiljev, Vilnius Pedagogical University, Lithuania

11:30 - 11:55 Inv: An Integrated Optical Auto-Focus System Driven by a Nut-type USM
..... T.Y. Zhou, Tsinghua University, China

12:00 - 13:00 Lunch Break.....Assembly Room

Session Chair: Seok Jin Yoon

13:00 - 13:25 Inv: Lead-Free Piezoceramic Multilayer Actuators J. Tani, Tohoku , Japan

13:30 - 13:55 Inv: Low Temperature Sintering of the (Na_{0.5}K_{0.5})NbO₃ Lead-free Piezoelectric Ceramics ..
..... S. Nahm, Korea University, Korea

14:00 - 14:25 Inv: High Coupling Thin Films of PZT-Based Ternary Perovskite Compounds for MEMS ..
.....K. Wasa, Kyoto University, Japan

14:30 - 14:55 Inv: Theoretical Analysis on the Influence of Boundary Constraints to the Electromechanical
Coupling of Piezoelectric Resonators.....W. Cao, Harbin Inst. Tech., China

15:00 - 15:30 Refreshment Break

15:30 - 15:55 Inv: Vibration Damping and Energy Harvesting by Piezo Elements and Shunted
Switching Networks J. Wallaschek, Leibniz, Universität Hannover, Germany

16:00 - 16:25 Inv: Development of New Iron-based Galfenol (Fe-Ga-X) Magnetostrictive Alloys and their
Applications for Smart Actuator/Sensor Technologies
.....Y. Furuya, Hirosaki University, Japan

16:30 - 16:55 Inv: Miniature Multi-Modal Mobile Sensor Nodes A. Ray, Penn State, USA

18:00 - 20:00 Reception Ballroom D-E



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Wednesday, October 8, 2008

7:30 - 8:00 On-site Registration; Gathering and Refreshments

Concurrent Session Ultrasonic Motors I Ballroom A-B

Session Chair: Chunsheng Zhao

- 8:00 - 8:25 Inv: **Ultrasonic Piezo Motors Operating at 2.8 Volts**..... D. Piazza, New Scale Tech, USA
- 8:30 - 8:55 Inv: **Equivalent Circuitry Modeling for Mixed-Mode Excitation Type Ultrasonic Motors**.....
..... B. Koc, Samsung Electro-Mechanics, Korea
- 9:00 - 9:25 Inv: **Piezoelectric Motors based on the d_{15} Effect - Overview**.....
..... P. Hagedorn, TU Darmstadt, Germany
- 9:30 - 10:00 Refreshment Break
Poster and Company Exhibition Set-up in Ballroom C
- 10:00 - 10:15 **Development of New Type Linear Piezoelectric Actuator using Traveling Wave**.....
..... D. Mazeika, Vilnius Gediminas Tech University, Lithuania
- 10:15 - 10:30 **Design and Construction of the "Cymbal" Type Linear Ultrasonic Motor**.....
..... Y. Shi, NUAA, China
- 10:30 - 10:45 **A Thin Type Ultrasonic Motor for Mobile Phone Auto Focus Module**.....
..... C.Lu, Zhejiang University, China
- 10:45 - 11:00 **Prospects of Ultrasonic Motors for Medical Device Applications**.....
..... Y. Ming, Shanghai Jiaotong University, China
- 11:00 - 11:15 **A Novel Motor Concept Based on Piezoelectric Bending Actuators**.....
..... M. Klubal, University of Paderborn, Germany
- 11:15 - 11:30 **Dynamic Simulation of a Rod-shape USM Based on the Bending Modes**.....
..... Z. Li, NUAA, China
- 11:30 - 11:45 **Study on Ellipse Motion of a Cylinder Type 3-DOF Ultrasonic Motor**.....
..... Z. Li, Suzhou Vocational University, China
- 11:45 - 12:00 **Control of Omni-directional Piezoelectric Actuator System**..... W.S Jung, KIST, Korea
- 12:00 - 13:00 Lunch Break..... Assembly Room

Energy Harvester/Generator Ballroom A-B

Session Chair: Aydin Dogan

- 13:00 - 13:25 **Designing with Piezoelectric Energy Harvesting Systems**..... K. Uchino, Penn State, USA
- 13:30 - 13:55 Inv: **Cantilever Piezoelectric Energy Harvester for USN Self-Powering**.....
..... C-Y Kang, KIST, Korea
- 14:00 - 14:15 **Measurements of Generating Characteristic of a Piezoelectric Generator which has the
Cymbal Structure**..... H. Jun, Changwon National University, Korea
- 14:15 - 14:30 **A Novel Spiral Type MEMS Power Generator with Shear Mode Piezoelectric Thick Film**...
..... H-C Song, KIST, Korea



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14:30 - 14:45 Piezoelectric Energy Harvesting Technology Based on MSP 430.....
.....T. Zhang, South China Agricultural University, China

14:45 - 15:15 Refreshment Break

Poster/Exhibition Ballroom C

15:15 - 17:00 Poster and Company Exhibition

Session Chair: Sung-Gap Lee

Exhibitor's Presentations

- 15:15 - 15:20 Nihon Ceratec
- 15:20 - 15:25 Micromechatronics Inc
- 15:25 - 15:430 Noliac
- 15:30 - 15:35 QorTek
- 15:35 - 15:40 Cedrat
- 15:40 - 15:45 New Scale Tech
- 15:45 - 15:50 Trek, Inc.

*The posters and exhibits will be moved for the evening and returned in the morning. Please remove any equipment that you do not wish to have moved.

16:00 - 17:00 WPMA Board MeetingBallroom C

18:00 - 20:00 Dinner Banquet Nittany Lion Inn Boardroom
[Wine service is sponsored by Nihon Ceratec Japan]



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Wednesday, October 8, 2008

7:30 - 8:00 On-site Registration; Gathering and Refreshments

Concurrent Session
Material I Ballroom D-E

Session Chair: Sahn Nahm

- 8:00 - 8:25 Inv: High Performance Lead-free Piezoelectric Materials by Domain Wall Engineering
.....S. Wada, University of Yamanashi, Japan
- 8:30 - 8:55 Inv: High Performance Piezoelectric PMN-PZT Single Crystals for Actuator and Transducer
Applications H-Y Lee, Sunmoon University, Korea
- 9:00 - 9:25 Inv: Lead-Free Piezoelectric Thick Films by Aerosol-Deposition.....
.....J. Ryu, Korea Institute of Materials Science, Korea
- 9:30 - 10:00 Refreshment Break
Poster and Company Exhibition Set-up in Ballroom C
- 10:00 - 10:15 Microstructure and Piezoelectric Properties of the CuO-Added
(Na_{0.5}K_{0.5})(Nb_{0.97}Sb_{0.03})O₃ Lead- Free Piezoelectric Ceramics
..... H-Y Park, Korea University, Korea
- 10:15 - 10:30 Effect of CuO on the Sintering and Piezoelectric Properties of
0.95(Na_{0.5}K_{0.5})NbO₃-0.05SrTiO₃ Lead-Free Piezoelectric Ceramics
..... I-T Seo, Korea University, Korea
- 10:30 - 10:45 Piezoelectric and Ferroelectric Properties of 1-x(Bi_{0.5}Na_{0.5-y})TiO₃-x(Bi_{0.5}K_{0.5})TiO₃
Ceramics with Na Non-stoichiometryH.G. Yeo, Changwon National University, Korea
- 10:45 - 11:00 The Effect of K/Na Ratio on the Structures and the Properties in (Na,K)NbO₃-Based
CeramicsJ. H. Cho, KICET, Korea
- 11:00 - 11:15 Dielectric and Piezoelectric Properties of Lead-Free **(Bi_{0.5} K_{0.475} Li_x)TiO₃** Ceramics
.....H.M. Lee, Changwon National University, Korea
- 11:15 - 11:30 Sintering Behavior, Phase Transition, and Piezoelectric Properties of Lead-Free
(Na,K)NbO₃ Based CeramicsC. Ahn, Virginia Tech, USA
- 11:30 - 11:45 Driving Characteristics of Rosen-type Piezoelectric Transformer using
Pb (Mn_{1/3}Nb_{2/3})O₃-Pb(Ni_{1/3}Nb_{2/3})O₃-Pb(Zr_{0.48}Ti_{0.52}) Ceramics
..... D.S. Paik, Semyung Univ, Korea
- 12:00 - 13:00 Lunch Break.....Assembly Room

Drive/Control

Ballroom D-E

Session Chair: Alfredo Vazquez Carazo

- 13:00 - 13:25 Functionally Integrated Compact Piezoresonant Drives R. Bird, QorTek, USA.....
- 13:30 - 13:55 On the Need of Adaptive Frequency Steps in Measuring and Simulating Frequency
Responses of Piezoelectric Systems....A. Renner, Leibniz University Hannover, Germany
- 14:00 - 14:31 5A Design of Control System for Ultrasonic Motor Based on Host and Slave Computer



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- 14:15 - 14:30 T. Zhang, South China Agricultural University, China
A Push-Pull Driving of the Thin-Type Ultrasonic Motor Using Microcontroller.....
- 14:30 - 14:45 S. Jeong, Changwon National University, Korea
The Testing System of Ultrasonic Motors Based on LabVIEW.....
- T. Zhang, South China Agricultural University, China
- 14:45 - 15:15 **Refreshment Break**

Poster/Exhibition Ballroom C

- 15:15 - 17:00 **Poster and Company Exhibition**

Session Chair: Sung-Gap Lee

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- 16:00 - 17:00 **IWPMA Board Meeting**.....**Ballroom C**
- 18:00 - 20:00 **Dinner Banquet**..... **Nittany Lion Inn Boardroom**
[Wine service is sponsored by Nihon Ceratec Japan]



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Thursday, October 9, 2008

7:30 - 8:00 On-site Registration; Gathering and Refreshments

Concurrent Session
Ultrasonic Motors II Ballroom A

Session Chair: Tobias Hemsel

- 8:00 - 8:25 Inv: Piezoelectric Actuators in KIST.....S-J Yoon, KIST, Korea
- 8:30 - 8:55 Inv: Stepping Piezoelectric Actuators..... F. Claeysen, Cedrat Technologies, France
- 9:00 - 9:25 Introduction to Ultrasonic Motors and Stages by Ceratec T. Ezaki, Ceratec, Inc., USA

- 9:30 - 10:00 Refreshment Break

- 10:00 - 10:15 Modeling of Piezoelectric Stick-Slip Motors ...M. Hunstig, University of Paderborn, Germany
- 10:15 - 10:30 Modeling of a Lead Screw Linear Ultrasonic MotorW. Huang, NUAA, China
- 10:30 - 10:45 Contact Mechanics of an Ultrasonic Motor with Intermittent Contact Behavior Including Surface Roughness Effects..... J. Twiefel, Leibniz Universitat Hannover, Germany
- 10:45 - 11:00 Towards Novel Ultrasonic Motors: Combining High Speed, Accuracy and Wear Resistance M. Houben, Katholieke University Leuven, Belgium
- 11:00 - 11:15 Study on Vibration Friction Coefficient..... Y. Chen, Tsinghua University, China
- 11:15 - 11:30 Research on a New Type of Linear Motor with Piezoelectric Stack W. Huang, NUAA, China
- 11:30 - 11:45 A Linear Ultrasonic Motor Using a Quadrate Plate Transducer J. Jin, NUAA, China
- 11:45 - 12:00 Synchronized Driving of Multi-Stator Ultrasonic Motor..... T. Zhang, South China Agriculture University, China

- 12:00 - 13:00 Lunch Break..... Ballroom D-E

- Poster/Exhibition Clean-up- All posters must be removed by this time.Ballroom C

Ultrasonic Applications Ballroom A

Session Chair: Burhanettin Koc

- 13:00 - 13:25 Inv: Compact Ultra-High Voltage Supply Achieved Using Piezoelectric Transformers A. Vazquez Carazo, Micromechatronics, USA
- 13:30 - 13:55 Piezoelectric Devices for Neurosurgery and Needle-less Drug Delivery S-H Park, Micromechatronics, USA
- 14:00 - 14:15 Development of an Ultrasonic Brake with Powder Metallurgy.....C. Zhu, NUAA, China
- 14:15 - 14:30 Analytical and Numerical Study on Near-Field Acoustic Levitation Force in Gas Squeeze Films..... J. Li, Shanghai Jiao Tong University, China
- 14:30 - 14:45 Piezoelectric Pump with a Cymbal Actuator..... S-G Lee, Gyoengsang National University, Korea
- 14:45 - 15:00 Development of a High Performance Piezoelectric Squeeze Film Acoustic Levitation System for a Non-contact Rotary Bearing J. Wallaschek, Leibniz, Universität Hannover, Germany

- 15:00 - 15:30 Refreshment Break



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Ultrasonic Motors III Ballroom A

Session Chair: Chong-Yun Kang

15:30 - 15:45	Effect of Hardness of Frictional Materials on Properties of Ultrasonic Motors	Q. Ding, NUAA, China
15:45 - 16:00	An Efficient Approach to Optimize the Vibration Mode of Ultrasonic Motors	Z. Li, NUAA, China
16:00 - 16:15	Research on Pre-Pressure of Ultrasonic Motors Flexible Rotor under Low Temperature Condition	W. Zheng, NUAA, China
16:15 - 16:30	Structure Design Method for a Bar-Structured Linear Ultrasonic Motor	Z. Yao, NUAA, China
16:45 - 17:00	Closing Remarks in Ballroom B	K. Uchino



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Thursday, October 9, 2008

7:30 - 8:00 On-site Registration; Gathering and Refreshments

Concurrent Session Piezo Actuator/Sensor Ballroom B

Session Chair: Carsten Schuh

- 8:00 - 8:25 Inv: Piezoelectric Bending Actuators: Aspects of Modeling T. Steinkopff, Siemens AG, Germany
- 8:30 - 8:55 Inv: Piezoelectric Multilayer Triaxial Accelerometer C. Mangeot, Noliac Motion, Denmark
- 9:00 - 9:25 Inv: Ultrasonic Viscosity Sensors using Lead-Free Piezoelectric Resonators for Lubricant Oil Management..... J-S Lee, University of Ulsan, Korea
- 9:30 - 10:00 Refreshment Break
- 10:00 - 10:15 Multifunctional Micro Manipulator S. Tuncdemir, Penn State, USA
- 10:15 - 10:30 A Linear Multiple-degree-of-freedom Ultrasonic Motor using CuO Doped $(K_{0.5}Na_{0.5})NbO_3$ -LiNbO₃ Lead-free Piezoelectric Ceramics..... Y. Yang, NUAA, China
- 10:30 - 10:45 Performance of Strain-Amplified Piezoelectric Multilayer Actuator Coupled to a Dual Hinge Mechanism..... S-J Jeong, KERI, Korea
- 10:45 - 11:00 Present Situation and Classification of Piezoelectric Pumps Jianhui Zhang, NUAA, China
- 11:00 - 11:15 A Piezoelectric-Driven Micro Dispenser Head for Functional Liquid Droplet Generation... Y.B. Ham, Korea Inst of Machinery and Materials, Korea
- 11:15 - 11:30 Smart Miniaturized Piezo-Actuator Development for Deformable Mirrors..... E. Uzgur, University of the West of Scotland, UK
- 11:30 - 11:45 Ultrasonic Extension Sensing for Adaptive Optics..... E. Uzgur, University of the West of Scotland, UK
- 11:45 - 12:00 Image Stabilizer System Using a Piezoelectric Lobster Actuator..... Ryan Lee, Sunnytec Electronics, Taiwan
- 12:00 - 13:00 Lunch Break..... Ballroom D-E
- Poster/Exhibition Clean-up- All posters must be removed by this time. Ballroom C

Material II Ballroom B

Session Chair: Kiyotaka Wasa

- 13:00 - 13:25 Inv: Preparation and Piezoelectric Properties of Lead Zirconate Titanate Thick Films for Micro Devices T. Iijima, AIST, Japan
- 13:30 - 13:55 Inv: Solid State Gyro Sensors A. Dogan, Anadolu University, Turkey
- 14:00 - 14:15 Microstructure and Piezoelectric Properties of $(Na_{0.5}K_{0.5})NbO_3$ -LiSbO₃ Ceramics with Excess-Alkali Oxide C.I Cheon, Hoseo University, Korea
- 14:15 - 14:30 Piezoelectric Properties of Modified $(K,Na)NbO_3$ for Hard Lead-free Materials.....



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		J. B. Lim, Penn State, USA
14:30	-	14:45	Effect of Bi₂O₃ and Fe₂O₃ co-addition on the Low Temperature Sinterability and Piezoelectric Performance of Pb(Mg_{1/3}Nb_{2/3})O₃-Pb(Zr,Ti)O₃ Ceramics.....
			..... L. Qian, NUAA, China
14:45	-	15:00	Study on High Frequency Ultrasound Probe Piezoelectric Film Deposited by Aerosol Deposition Method
			..... A. Endo, AIST, Japan
15:00	-	15:30	Refreshment Break
			High Power Piezoelectrics Ballroom B
			Session Chair:
15:30	-	16:00	High Power Piezoelectric Components..... K. Uchino, Penn State, USA
16:00	-	16:15	High Power Piezoelectric Characterization System (HiPoCs Ver 2)
			..... S. Ural, Penn State, USA
16:15	-	16:30	Loss Characteristics of Piezoelectric PZT Ceramics and PMN-PT Single Crystals
			..... A. Rajapurkar, Penn State, USA
16:30	-	16:45	Derivation of Quality Factors of a Piezoelectric Resonator under Various Modes
			..... Y. Zhuang, Penn State, USA
16:45	-	17:00	Closing Remarks in Ballroom B..... K. Uchino

Friday, October 10, 2008

Optional Excursion to Lancaster, PA

8:00 am	.....	Depart from front of Nittany Lion Inn
	.....	Deliver luggage to Hilton Garden Inn
11:00 am	.....	Arrive at Amish Farm, Lancaster, PA
1-2 pm	.....	Lunch
2:00 pm	.....	Outlet shopping in Lancaster
5:00 pm	.....	Depart Lancaster, PA
8:00 pm	.....	Arrive front of Hilton Garden Inn, State College
	.....	End at Nittany Lion Inn