The 23rd International Workshop on Electromagnetic Nondestructive Evaluation (ENDE2018)

eNDE 2018

NDE Laboratory Michigan State University

DETROIT MARRIOTT AT THE RENAISSANCE CENTER
DOWNTOWN DETROIT, MICHIGAN, USA

SEPTEMBER 9 - 13, 2018

Nondestructive Evaluation Laboratory

Michigan State University Founded 1855

The Composites iacmi Institute

JSM Japan Society of Maintenology

American Chemistry Council

The 23rd Electromagnetic Nondestructive Evaluation Workshop (ENDE2018) Program Summary

Location	Sunday	Monday	Tuesday	Wednesday	Thursday
		Cabot	*Mackinac*	*Mackinac*	
8:00a		Welcome	Keynote 3 (8:00 AM – 8:50 AM)		
8:30a		Keynote 1 (8:15 AM - 9:05 AM)	Break	Oral Session (8:30 AM - 9:50 AM)	
9:00a			Oral Session (9:05 AM - 10:05 AM)		Industry/Lab Tour 1 (9:00 AM - 11:30 AM)
9:30a		Keynote 2 (9:05 AM - 9:55 AM)			
10:00a		Break	Break	Break	
10:30a		Invited Talk (10:10 AM - 10:40 AM)	Oral Session (10:20 AM - 11:20 AM)	Oral Session (10:00 AM - 11:00 AM)	
11:00a				Break	
11:30a		Oral Session (10:40 AM - 12:00 AM)	Poster Session II *Room: Mackinac Foyer/Bridge* (11:20 AM - 12:20 PM)	Oral Session (11:20 AM - 12:00AM)	
12:00p		Lunch *Room: Forty-Two Degrees North* ISC meeting&lunch *Room: LaSalle B* (12:00 PM - 1:30 PM)	Lunch *Room: Nicolet* (12:20 PM - 1:20 PM)	Lunch *Room: Forty-Two Degrees North* (12:00 PM - 1:20 PM)	
12:30p					
1:00p					
1:30p		Oral Session (1:30 PM - 2:50 PM)	Oral Session (1:20 PM - 2:40 PM)	Oral Session (1:20 PM - 3:00 PM)	Industry/Lab Tour 2 (1:00 PM - 3:30 PM)
2:00p					
2:30p					
3:00p		Break	Break		
3:30p		Poster Session I *Room: Renaissance Foyer West* (3:00 PM - 4:10 PM)	Oral Session (2:50 PM - 4:10 PM)	Closing Ceremony (3:00 PM - 3:30PM)	
4:00p					
4:30p		Oral Session (4:10 PM - 5:10 PM)	Break		
5:00p			Oral Session (4:25 PM - 5:25 PM)		
5:30p					
6:00p	Welcome Reception *Forty-Two Degrees North* (6:00 PM)				
6:30p			Social Cocktail *Forty-Two Degrees North* (6:30 PM - 7:00 PM)		
7:00p					
7:30p			Banquet Student Poster Award Ceremony *Forty-Two Degrees North* (7:00 PM - 9:00 PM)		
8:00p					
8:30p					
9:00p					

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Welcome to the eNDE 2018 Workshop

The 23rd International Workshop on Electromagnetic Nondestructive Evaluation (ENDE2018) will be held on September 9-13, 2018, at the Detroit Marriott (the GM Renaissance Center) Hotel in Downtown Detroit, USA.

This year's technical sessions, student posters competition, industry exhibition and tour, and other special events will be coordinated by the NDE Laboratory (NDEL) at Michigan State University. We hope to provide a comprehensive and well-balanced program in theoretical and applied research of electromagnetic NDE (eNDE) methods. This workshop is intended to provide an international forum for the exchange of information on state-of-the-art technologies and development in：

- Advanced eNDE sensors and sensing systems
- Analytical and numerical modeling of eNDE
- Electromagnetics for aerospace materials
- Materials state awareness and characterization
- Advanced composite NDE methods
- Methodology in damage diagnosis and prognosis
- Inverse problems, data processing and big data applications
- Additive manufacturing and in-situ characterization
- Biomedical applications of eNDE

Through a range of technical and social activities, eNDE2018 will provide a unique opportunity to interact with the world's leading experts in electromagnetic NDE from academia, industry and government.

The international Electromagnetic Nondestructive Evaluation workshop, a.k.a. ENDE, has been held every year since 1995. Its aim is to bring together engineers and scientists from universities, research institutions, government and industry who are active in research, development and industrial applications of electromagnetic nondestructive evaluation.

The program is detailed next, make it your own and welcome you to join us in Downtown Detroit in 2018!

Committees

General Chair:

Yiming Deng	*Michigan State University, USA,* ***Chair***
Mahmoodul Haq	*Michigan State University, USA,* ***co-Chair***

Organizing Committee:

Lalita Udpa	*Michigan State University, USA*
Satish S. Udpa	*Michigan State University, USA*
Antonello Tamburrino	*Università degli Studi di Cassino, Italy/Michigan State University, USA*
Ming Han	*Michigan State University, USA*
Sunil Chakrapani	*Michigan State University, USA*

Sub-Committee Chair:

Ming Han	*Michigan State University, USA,* ***Publicity and Event Chair***
Sunil Chakrapani	*Michigan State University, USA,* ***Publication Chair***
Vivek T. Rathod	*Michigan State University, USA,* ***Poster Session and Award Chair***

Scientific Program Committee (alphabetical order)

Sunil Chakrapani	*Michigan State University, USA*
Matthew Cherry	*Air Force Research Laboratory, USA*
Xiaoyan Han	*Wayne State University, USA*
Yang Liu	*Schlumberger-Roll Research, USA*
Yongming Liu	*Arizona State University, USA*
Jiming Song	*Iowa State University, USA*
Antonello Tamburrino	*Università degli Studi di Cassino, Italy/Michigan State University, USA,* ***SPC Chair***
Junjun Xin	*ULC Robotics, USA*
Hao Zhang	*Colorado School of Mines, USA*

International Steering Committee (alphabetical order)

Sandor Bilicz	*Budapest University of Technology and Economics, Hungary*
Klara Capova	*University of Zilina, Slovakia*
Tomasz Chady	*West Pomeranian University of Technology, Poland*
Zhenmao Chen	*Xi'an Jiaotong University, China*
Reboud Christophe	*CEA LIST, France,* ***ISC Chair***
Yiming Deng	*Michigan State University, USA*
Fumio Kojima	*Kobe Universiity, Japan,*
Jinyi Lee	*Chosun University, South Korea*
Dominique Lesselier	*CNRS-CentraleSupélec-Univ. Paris-Sud, France*
Helena Geirinhas Ramos	*Instituto Superior Técnico Lisboa, Portugal*
B. Purna Chandra Rao	*Indira Gandhi Centre for Atomic Research, India*
João Marcos Alcoforado	*Federal University of Rio de Janeiro, Brazil*
Autur Ribeiro	*Instituto Superior Técnico Lisboa, Portugal*
Guglielmo Rubinacci	*Università di Napoli Federico II, Italy*
Sung-Jin Song	*Sungkyunkwan University, South Korea*
Klaus Szielasko	*Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren (IZFP), Germany*
Toshiyuki Takagi	*Tohoku University, Japan*
Antonello Tamburrino	*Università degli Studi di Cassino, Italy/Michigan State University, USA*
Theodoros Theodoulidis	*University of Western Macedonia, Greece*
GuiYun Tian	*Newcastle University, UK*
Lalita Udpa	*Michigan State University, USA*
Satish S. Udpa	*Michigan State University, USA*
Noritaka Yusa	*Tohoku University, Japan*

Keynote Talks

1. Electromagnetic NDE and the US Air Force: an Overview

Eric Lindgren, U.S. Air Force Research Laboratory

NDT Lead, Materials State Awareness Branch, Materials and Manufacturing Directorate, Air Force Research Laboratory, USA

David Smith, U.S. Air Force Research Laboratory

Deputy Branch Chief, Materials State Awareness Branch, Materials and Manufacturing Directorate, Air Force Research Laboratory, USA

2. U.S. Army TARDEC NDE Efforts

David Gorsich, *Chief Scientist, U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC), USA*

3. The Potential of Voluntary Information Sharing and Non-Destructive Evaluation for Pipeline Safety

Sherry Borener, *Chief Data Officer and Senior Research Advisor, Pipeline and Hazardous Materials Safety Administration (PHMSA), USA*

Invited Talks

Innovation in a Regulated Space

Joshua Arnold, R&D Program Manager, PHMSA, U.S. Department of Transportation

R&D Program Manager, *General Engineer, Office of Pipeline Safety, Department of Transportation, Washington, DC, USA*

Sunday (Sep 9, 2018)

6:00 PM **Welcome Reception:** *Forty-Two Degrees North*

Monday (Sep 10, 2018)

7:45 AM - 8:00 AM File Upload

8:00 AM - 8:15 AM Welcome

Keynotes: *Cabot*

Moderator: Satish S. Udpa

8:15 AM - 9:05 AM Keynote 1
Electromagnetic NDE and the US Air Force: An Overview
Dr. Eric Lindgren, U.S. Air Force Research Laboratory
Capt. David Smith, U.S. Air Force Research Laboratory

9:05 AM - 9:55 AM Keynote 2
U.S.Army TARDEC NDE Efforts
Dr. David Gorsich, U.S. Army, TARDEC

9:55 AM-10:10 AM Coffee Break

Technical Sessions: *Cabot*

Oral Session: Methodology in damage diagnosis and prognosis

Session Chairs: Hao Zhang (CSM, USA) and Joshua Arnold (DOT, USA)

10:10 AM-10:40 AM Invited Talk
Innovation in a Regulated Space
Joshua Arnold, R&D Program Manager, PHMSA, U.S. Department of Transportation

10:40 AM-11:00 AM (1987)
Confidence Evaluation of Eddy Current Signal Classification by Automated Systems
Portia Banerjee, Lalita Udpa, Satish Udpa and Jim Benson, SGT Inc., NASA Ames Research Center, Moffett Field, CA, 94035, USA

11:00 AM-11:20 AM (1932)
A multi-parameter POD analysis of eddy current testing for the

detection of corrosions
Noritaka Yusa, Hidetoshi Hashizume, Tohoku University, Japan

11:20 AM-11:40 AM (1981)
Bayesian Statistics Applied to the Nondestructive Evaluation for the POD and Classification of Flaws
H.G. Ramos, Prashanth Baskaran, A. L. Ribeiro, Universidade de Lisboa, Portugal

11:40 AM-12:00 PM (1994)
Multimodal Sensor Fusion for Automated Pipe Threat Detection
Hao Zhang, Yiming Deng, Department of Computer Science, Colorado School of Mines, USA

12:00 PM - 1:30 PM Lunch: *Forty-Two Degrees North*
ISC meeting and lunch: *LaSalle B*

Oral Session: Advanced eNDE sensors and sensing systems (a)

Session Chairs: Toshiyuki Takagi (Tohoku University, Japan) and Guiyun Tian (Newcastle University, UK)

1:30 PM - 1:50 PM (1926)
Frequency-band-selecting pulsed eddy current testing method for the detection of a certain depth range of defects
Shejuan Xie, Ying Zhao, Hongen Chen, Zhenmao Chen, Tetsuya Uchimoto, Toshiyuki Takagi, Xi'an Jiaotong University, China

1:50 PM - 2:10 PM (1963)
Quantitative Evaluation of Subsurface Corrosion in Conductive Structures via Gradient-field Pulsed Eddy Current Technique
Shutting Ren, Yong Li, Bei Yan, Yi Wang, Zhenmao Chen, School of Aerospace, Xi'an Jiaotong University, China

2:10 PM - 2:30 PM (1990)
Investigation of Time Reversal Imaging for Ground Penetrating Radar
Saptarshi Mukherjee, Christina MORENCY, Lawrence Livermore National Laboratory, Livermore, CA, USA

2:30 PM - 2:50 PM (1925)
High-Resolution Large-Scale TMR Sensor Array for Magnetic Field Imaging
Chaofeng Ye, Yang Wang, Yu Tao, ShanghaiTech University, China

2:50 PM – 3:00 PM Coffee Break

3:00 PM – 4:10 PM **Poster Session I: Student Poster Competition with 3 minutes talk**
(Session Chairs: Vivek Rathod, MSU, USA)
Room: *Renaissance Foyer West*

Oral Session: Advanced composite *NDE*

Session Chairs: Lalita Udpa (MSU, USA) and Saptarshi Mukherjee (LLNL, USA)

4:10 PM - 4:30 PM (1957)
Nondestructive inspection of peeling in adhesive joint of FRP/Al by using electromagnetic pulse acoustic testing method
Hiroyuki Kosukegawa, Mitsuo Hashimoto, Ryoichi Urayama, Toshiyuki Takagi, Tohoku University, Japan

4:30 PM - 4:50 PM (1991)
Microwave Time Reversal Imaging Using Frequency Domain Measurements for NDE of Metal Composite Joints
Saptarshi Mukherjee, John James Doroshewitz, Srijan Datta, Antonello Tamburrino and Lalita Udpa, Lawrence Livermore National Laboratory, Livermore, CA, USA

4:50 PM - 5:10 PM (1949)
Feature Extraction from Compressed Measurement in Waveguide Imaging Systems
Chaoqing Tang, Guiyun Tian, Newcastle University, UK

Tuesday (Sep 11, 2018)

7:45 AM - 8:00 AM File Upload

Keynotes: *Mackinac*

Moderator: Lalita Udpa

8:00 AM – 8:50 AM Keynote 3
The Potential of Voluntary Information Sharing and Non-Destructive Evaluation for Pipeline Safety
Dr. Sherry Borener, Chief Data Officer and Senior Research Advisor – (PHMSA)

8:50 AM – 9:05 AM Coffee Break

Technical Sessions: *Mackinac*

Oral Session: Advanced eNDE sensors and sensing systems (b)

Session Chairs: Christophe Reboud (CEA, France) and Noritaka Yusa (Tohoku University, Japan)

9:05 AM - 9:25 AM (1975)
Sub-surface Crack Detection in Aluminum Multi-Layer Structures Using ECT with Planar Coil GMR and TMR Sensors
H.G. Ramos**,** D. J. Pasadas, **A. L. Ribeiro**, Universidade de Lisboa, Portugal

9:25 AM - 9:45 AM (1982)
Novel phase-based feedback control for constant height mode operation in scanning near-field microwave microscopy
V. Subramanian, C. H. Joseph, Indian Institute of Technology, India

9:45 AM-10:05 AM (1986)
Crack Evaluation of Titanium Alloy Using ECT with High Sensitivity Magnetic Sensor
Dongfeng He**, Zhi Wang**, Masahiro Kusano, Satoshi Kishimoto, Makoto Watanabe, Research Center for Structural Materials, National Institute for Materials Science, Tsukuba, Japan

10:05 AM-10:20 AM Coffee Break

Oral Session: Materials state awareness and characterization

Session Chairs: Tetsuya Uchimoto (Tohoku University, Japan) and Yiming Deng (MSU, USA)

10:20 AM-10:40 AM (1983)
Mechanism Study of Eddy Current Magnetic Signature of Plastic Strain

in Low Carbon Steels
Tetsuya Uchimoto, Takanori Matsumoto, Toshiyuki Takagi, Gerd Dobmann, Shinji Oozono, Hideki Yuya, Institute of Fluid Science, Tohoku University, Japan - Germany

10:40 AM-11:00 AM (1993)
Inspection and Characterization of Multilayer Materials Using Thermographic Signal Reconstruction
Steven Shepard, Maria F. Beemer, Thermal Wave Imaging, Inc., USA

11:00 AM-11:20 AM (1941)
Comparison of Stress-Detection Resolution of Metal Magnetic Memory Signals
Hongmei Li, Fuchen Zhang, Yu Wang, Ranran Huang, Beifang University of Nationalities, China

11:20 AM-12:20 PM **Poster Session II**
(Session Chairs: Vivek Rathod, MSU, USA)
Room: *Mackinac Foyer/Bridge*

12:20 PM - 1:20 PM Lunch: *Nicolet*

Oral Session: Electromagnetics for aerospace materials

Session Chairs: Matthew Cherry (AFRL, USA) and Zhenmao Chen (XJTU, China)

1:20 PM - 1:40 PM (1964)
Rotating Eddy Current Probe with Magnetoresistive Sensor Arrays for Inspection of Multilayer Structures
Lalita Udpa, Zhiyi Su, Anders Rosell, Chaofeng Ye, Oleksii Karpenko, Satish Udpa, Antonello Tamburrino, Michigan State University, USA

1:40 PM - 2:00 PM (1960)
Computational Parametric Studies of Conformal Eddy Current Probes
Matthew Cherry, Alex Brown, Nicholas Miller, AFRL, USA

2:00 PM - 2:20 PM (1961)
Modeling of Microtexture-Induced Noise in the Eddy Current Response of Two-Phase Titanium Alloys
Matthew Cherry, Laura Homa, Daniel Sparkman, Adam Pilchak, AFRL, USA

2:20 PM - 2:40 PM (1944)
Model-Based Inversion of Eddy Current Data for Classification and Characterization of Planar and Volumetric Discontinuities
Eric B. Shell, John C. Aldrin, Erin K. Oneida, Harold A. Sabbagh, Elias Sabbagh, R. Kim Murphy, Alisha L. Hutson, Siamack Mazdiyasni, Matt Cherry, KBRwyle, USA

2:40 PM – 2:50 PM Coffee Break

2:50 PM – 3:10 PM (1947)

Statistical Inversion of Eddy Current Measurements of Cracks in Titanium
Laura Homa, Matt Cherry, John Aldrin, University of Dayton Research Institute, USA

3:10 PM – 3:30 PM (1962)
Progress and Challenges of Model-based Inverse Methods for Sizing Cracks in Multilayer Bolt-holt Eddy Current (BHEC) Inspections
John C. Aldrin, Mark Keiser, Doyle Motes, David S. Forsyth, Harold A. Sabbagh, Elias Sabbagh, R. Kim Murphy, Ryan Mooers, Christine Henry, Eric A. Lindgren, Computational Tools, Gurnee, USA

3:30 PM - 3:50 PM (1929)
Electromagnetic Characterization of Advanced Composites by Voxel-Based Inverse Methods
Harold A. Sabbagh, R. Kim Murphy, Elias H. Sabbagh, Russell Wincheski, Victor Technologies, LLC, USA

3:50 PM - 4:10 PM (1931)
Electromagnetic Multiscale Models with Applications to Bolt-Hole Eddy-Current Problems
Harold Sabbagh, R. Kim Murphy, Elias Sabbagh, John Aldrin, Victor Technologies, LLC, USA

4:10 PM - 4:25 PM Coffee Break

Oral Session: Hybrid NDE

Session Chairs: Sunil Chakrapani (MSU, USA)

4:25 PM - 4:45 PM (1972)
Data processing method for thickness measurement using electromagnetic acoustic resonance
Toshiyuki Takagi, Hongjun Sun, Ryoichi Urayama, Tetsuya Uchimoto, Lalita Udpa, Institute of Fluid Science, Tohoku University, Japan

4:45 PM - 5:05 PM (1970)
Identification of Defect Profiles for Steel Samples using EMAT based Measurement System
Fumio Kojima, Naoyuki Kubota, Toshiyuki Takagi, Kobe University, Japan

5:05 PM - 5:25 PM (1953)
The Effect of Size on The Quantitative Estimation of Defect Depth in Composite Structures Using Sonic IR NDE
Omar Obeidat, Qiuye Yu, Xiaoyan Han, Wayne State University, USA

Banquet: *Forty-Two Degrees North*

6:30 PM – 7:00 PM	Social Cocktail
7:00 PM – 9:00 PM	Banquet and Award Ceremony

Wednesday (Sep 12, 2018)

8:00 AM - 8:30 AM File Upload

Technical Sessions: *Mackinac*

Oral Session: Advanced eNDE sensors and sensing systems (c)

Session Chairs: Oleksii Karpenko (MSU, USA)

8:30 AM-8:50 AM (1974)
Nondestructive Testing Using TE Mode Microwaves in the Light of Long-range Pipe Inspection
Takuya Katagiri, Guanren Chen, Noritaka Yusa, Hidetoshi Hashizume, Tohoku University, Japan

8:50 AM-9:10 AM (1965)
Protaper Next - Endodontic Rotary Instrument Eddy Current Nondestructive Evaluation
Milan Smetana, Klara Capova, Peter Palcek, Patricia Hanusova, Faculty of Electrical Engineering, University of Zilina, Slovak Republic, Slovakia

9:10 AM - 9:30 AM (1956)
Free Space Microwave NDE of Aerospace Dielectric Composites
Balamurugan Sivaprakasam, Jayaram Kizhekke Pakkathillam, Krishna amurthy C. V, Kavitha Arunachalam, Department of Engineering Design, IIT Madras, India

9:30 AM - 9:50 AM (1942)
Focal Plane Characterization of Spot Focusing Horn Antennas for Free Space Microwave Dielectric NDE
Jayaram Kizhekke Pakkathillam, Balamurugan T Sivaprakasam, Jayaprakash Poojali, Nitheesh M Nair, Parasuraman Swaminathan, C V Krishnamurthy, Kavitha Arunachalam, Institute Postdoc, Department of Engineering Design, IIT Madras, India

9:50 AM – 10:00 AM Coffee Break

Oral Session: Inverse problems, data processing and big data applications

Session Chairs: Antonello Tamburrino (UNICAS, Italy) and Satish Udpa (MSU, USA)

10:00 AM–10:20 AM (1976)
Supervised Learning Strategy for Non-Iterative Crack Characterization Around Fastener Site
Roberto Miorelli, Anastassios Skarlatos, Christophe Reboud, CEA LIST, CEA Saclay, France

10:20 AM-10:40 AM (1988)
Monotonicity of Transfer Functions in Time Domain Eddy Current Imaging
Zhiyi Su, Salvatore Ventre, Lalita Udpa, Antonello Tamburrino, Michigan State university, USA.

10:40 AM-11:00 AM (1955)
Low-Rank Approximations in Sensitivity Analysis applied to Electromagnetic Nondestructive Evaluation
Sándor Bilicz, Arnold Bingler, Budapest University of Technology and Economics, Hungary

11:00 AM-11:20 AM Coffee Break

11:20 AM-11:40 AM (1936)
Inverse Analysis of Surface Cracks from Signals of Laser Induced Thermography
Jinxing Qiu, Cuixiang Pei, Haochen Liu, Zhenmao Chen, Xi'an Jiaotong University, China

11:40 AM-12:00 PM (1933)
Modeling of Barkhausen Noise for Two-Phase Ferromagnetic Materials Based on Ising Model and Double Boltzmann Function
Zhi Wang, Cunfu He，Xiucheng Liu, Bin Wu, Beijing University of Technology, China

12:00 PM - 1:20 PM Lunch: *Forty-Two Degrees North*

Oral Session: Analytical and numerical modeling of eNDE

Session Chairs: Roberto Miorelli (CEA, France)

1:20 PM-1:40 PM (1977)
Semi-Analytical Modelling of Induction Thermography for Inspection of Delaminated Planar Pieces
Christophe Reboud, Almpion Ratsakou, Anastassios Skarlatos, Dominique Lesselier, CEA, LIST, CEA Saclay, 91191 Gif-sur-Yvette, France

1:40 PM – 2:00 PM (1958)
Modeling and Experimental Magnetic Incremental Permeability Non-Destructive Evaluation Of 12 Cr-Mo-W-V Creep Test Samples
Bhaawan Gupta, Benjamin Ducharne, Tetsuya Uchimoto, Gael Sebald, ELyTMaX UMI 3757, CNRS, Universite de Lyon,Tohoku University, International Joint Unit, Sendai, Japan

2:00 PM – 2:20 PM (1959)
Phenomenologic Model for Incremental Permeability Micro - Magnetic Nondestructive Testing Technique

Benjamin Ducharne, Bhaawan Gupta, Gael Sebald, Tetsuya Uchimoto, LGEF, INSA Lyon, France

2:20 PM - 2:40 PM (1992)

Efficient Numerical Modeling for The Electromagnetic Scattering from Dielectric Objects

Antonello Tamburrino, Antea Perrotta, Antonio Maffucci, Salvatore Ventre and Lalita Udpa, DIEI, Università di Cassino e del Lazio Meridionale, Italy/ECE, Michigan State university, USA.

2:40 PM - 3:00 PM (1989)

Reduced Vector Potential Formulation with Dirichlet-To-Neumann Boundary Condition for Eddy Current Problems

Anton Efremov, Salvatore Ventre, Lalita Udpa and Antonello Tamburrino, Nondestructive Evaluation Laboratory, Michigan State University, MI, USA

3:00 PM – 3:30 PM Closing Ceremony: *Mackinac*

Thursday (Sep 13, 2018)

Industrial Facilities Tour:

9:00 AM - 11:30 AM	Industry/Lab Tour 1
1:00 PM - 3:30 PM	Industry/Lab Tour 2

Poster Sessions: *Ontario West*

Session Chair: Vivek T. Rathod (NDEL, MSU)

(1943) [Student]
Study of the Effect of Transducer Size on Energy Consumption in Defects Using Sonic Infrared Imaging
Qiuye Yu, Omar Obeidat, Xiaoyan Han, Wayne State University, USA

(1954) [Student]
Development of thickness gauging method for pipe wall thinning inspection with Point Focusing EMAT
Akitoshi Tezuka, Hongjun Sun, Ryoichi Urayama, Tetsuya Uchimoto, Toshiyuki Takagi, Graduate school of Engineering, Tohoku University, Japan

(1966) [Student]
Development of Electromagnetic Non-Destructive Testing on Polymer-Ionic Liquid Composite Coating for Corrosion Protection
Lucas Ollivier-Lamarque, Tetsuya Uchimoto, Nicholas Mary, Sebastien Livi, Tohoku University Graduate School of Engineering, Japan

(1967) [Student]
A Wall-thinning Measuring Method Based on Magnetic Permeability of Steel Pipes
Zhiyang Deng, Rongbiao Wang, Rui Liu, Yihua Kang, Huazhong University of Science and Technology, China

(1980) [Student]
Evaluation of Phase Transition of Hydrogen Charged Austenitic Stainless Steels Using Eddy Current Testing
Hiroki Yamamoto, Tetsuya Uchimoto, Toshiyuki Takagi, Bai An, Takashi Iijima, Tohoku University, Japan

(1995) [Student]
Fiber Length Estimation using Image Analysis
Vignesh Muthuramalingam, Vivek T. Rathod, Lalita Udpa and Yiming Deng, NIT- Karnataka

(1996) [Student]
Parametric Study of Electromagnet Designs for A Biological Switch Circuit Using an Electromagnetic Perceptive Gene
Thomas Sereseroz, Basti Bharath Shenoy**,** Alexander Farnum, Tyler VanBuren, Zhiyi Su, Lalita Udpa, Yiming Deng, Galit Pelled, and Assaf Gilad, Nondestructive Evaluation Laboratory, Michigan State University, USA

(1997) [Student]
High-speed Fusion Inspection Using Pulsed Eddy Current and Magnetic Flux Leakage
Guanyu Piao, Jingbo Guo, Yiming Deng, Department of Electrical Engineering, Tsinghua University, China/Michigan State University, USA

(1998) [Student]
Encircling Rotating Current Probe for Stainless Steel Tube Inspection
Swathi Ramesh M, Zhiyi Su, Chaofeng Ye, Kavitha A, Satish Udpa and Lalita Udpa, Nondestructive Evaluation Laboratory, Michigan State University, USA/Department of Engineering Design, IIT-Madras.

(1999) [Student]
A Variable-Length Many-Objective Optimization Approach in Image Segmentation Problems
Xuhui Huang, Yiming Deng, Michigan State University, USA

(2000) [Student]
Process Modeling of Induction Heating for Reversible Nanocomposite Adhesive Applications
Saratchandra Kundurthi, Suhail Hyder Vattathurvalappil, Rajendra Prasath Palanisamy, Mahmoodul Haq, Michigan State University, USA

(1938)
Double Frequency Alternating Electromagnetic Field for Inspection of Inner and Outer Cracks in Aluminum Tubes
Xinan Yuan, Wei Li, Guoming Chen, China University of Petroleum (East China), China

(1939)
Identification of clustered cracks by alternating current field measurement technique
Jiuhao Ge, Wei Li, Xiaokang Yin, Guoming Chen, China University of Petroleum, China

(1946)
Pulsed Alternating Current Field Measurement for Detection of Cracks in Aluminum Alloy Tubes
Wei Li, Guoming Chen, Jian Liu, China University of Petroleum (East China), China

(1948)
Cracks Detection in Heat Exchanger Tubes by Eddy Current Testing Using Computational Simulation
João Rebello, Joaquim Smiderle, Monica P. Arenas, Gabriela Pereira, Federal University of Rio de Janeiro, Brazil
(1950)
Monte Carlo Based Assessment of Model-Based Eddy Current Inversion for a Plate
Mengbao Fan, Binghua Cao, Genlong Wu, School of Mechatronic Engineering, China University of Mining and Technology, China

(1951)
Pre-stack migration applied to synthetic GPR data of track slab based on waveguide inversion
Xiaoting Xiao, Guiyun Tian, Bin Gao, University of Electronic Science and Technology of China, China

(1952)
Research on Magnetic Flux Leakage Testing Method for Weld Seam of ERW Pipes Based on Dual Point Differential Principle of TMR Probes
Jian Tang, Yihua Kang, Erlong Li, Rongbiao Wang, School of Mechanical Science and Engineering, Huazhong University of Science and Technology, Wuhan, China

(1968)
A Large Lift-off Magnetic Field Leakage Testing Method Based on Eddy Current Probes
Rongbiao Wang, Zhiyang Deng, Rui Liu, Yihua Kang, Huazhong University of Science and Technology, China

(1971)
3D Crack Profile Reconstruction Based on Particle Swarm Optimization Method
Milan Smetana, Klara Capova, Lukas Behun, Faculty of Electrical Engineering, University of Zilina, Slovak Republic, Europe, Slovakia

(1973)
Hall Effect Measurement for Surface Stress Evaluation
Daigo Kosaka, Polytechnic University, Tokyo, Japan

(1978)
Fast Models for The Solution of The Non-Linear Induction Problem in Planar Specimens with Application to Material Evaluation Processes
Anastassios Skarlatos, Theodoros Theodoulidis, Roberto Miorelli, Christophe Reboud, Nikolaos Poulakis, CEA, LIST, CEA Saclay, 91191 Gif-sur-Yvette, France
(1979)
Efficient Modelling of Steam-Generator Tube Inspection In The Support-Plate Region Using The X-Probe By Exploiting The Symmetry of The Structure
Anastassios Skarlatos, Christophe Reboud, CEA, LIST, CEA Saclay, 91191 Gif-sur-Yvette, France
(1984)
The Preliminary Research on the Array Probe with Bobbin Transmit and Pancake Receive for Inspection of Heat Transfer Tube
Pan Qi, Hongyan Cui, Zhenguan Xiao, Nuclear Power Operation Technology Corporation, LTD, China
(1985)
Crack Identification of Deep Region Electromagnetic Thermal Pattern Learning
Bin Gao, Yingchun Wu, Jue Hu, Jian Zhao, Guiyun Tian, School of Automation Engineering, University of Electronic Science and Technology of China, China

Hotel Information

Venue

Detroit Marriott at the Renaissance Center

ENDE2018 Reception and Banquet

(Forty-two Degrees North)

ENDE2018 Riverfront Walk

Accommodation

Technical Meeting Room

Detroit Marriott Guest Room

Address:

400 Renaissance Dr, Renaissance Center, Detroit, MI 48243, USA

Contact:

+1 313-568-8000

Detroit and Local Attractions

Get out & Enjoy Detroit!

eNDE2018 at Marriott Detroit Renaissance Center offers a great spot for:

Transportation

Our ENDE2018 Conference venue is close to the International Detroit Metro Airport (DTW), which is one of the largest air hubs in the country.

Skoot Shuttle Service *(30-minute ride each way)*

- Schedule:

DTW airport to **ENDE2018 venue**:

Sunday through Tuesday: every 1.5 hours between 8 AM and 10 PM

Wednesday through Saturday: every 1.5 hours between 11 AM and 10 PM

ENDE2018 venue to **DTW airport:**

4:00 AM, 5:30 AM, 7:00AM, 8:30 AM, 10:00 AM, 12:00 PM, 1:30 PM, 3:00 PM, 4:30 Pm, 6:00 PM, 7:30 PM, 9:00 PM

- Shuttle/Bus Pick-up & Drop-off:

Location: **Motor Lobby entrance** of the Detroit Marriott at the Renaissance Center, on the map below marked by a blue star.

Time: **20 minutes prior** to published pick-up times and depart immediately after dropping off is complete. And two large buses or shuttles can stage at any given time outside of the Motor Lobby before departure.

Notice: If there are more than 2 buses utilized for your group, these additional buses or shuttles will need to wait at the staging area on the **West side of the road** with the vehicle facing the Renaissance Center (next to the parking garage), on the map below marked by a red star.

Staging Area: please ensure the schedule is approved by your Event Manager who will work with GM to determine whether this area is available.

Overnight Bus Parking: please reach out to your Event Manager to provide potential options throughout the city.

- Reservations:

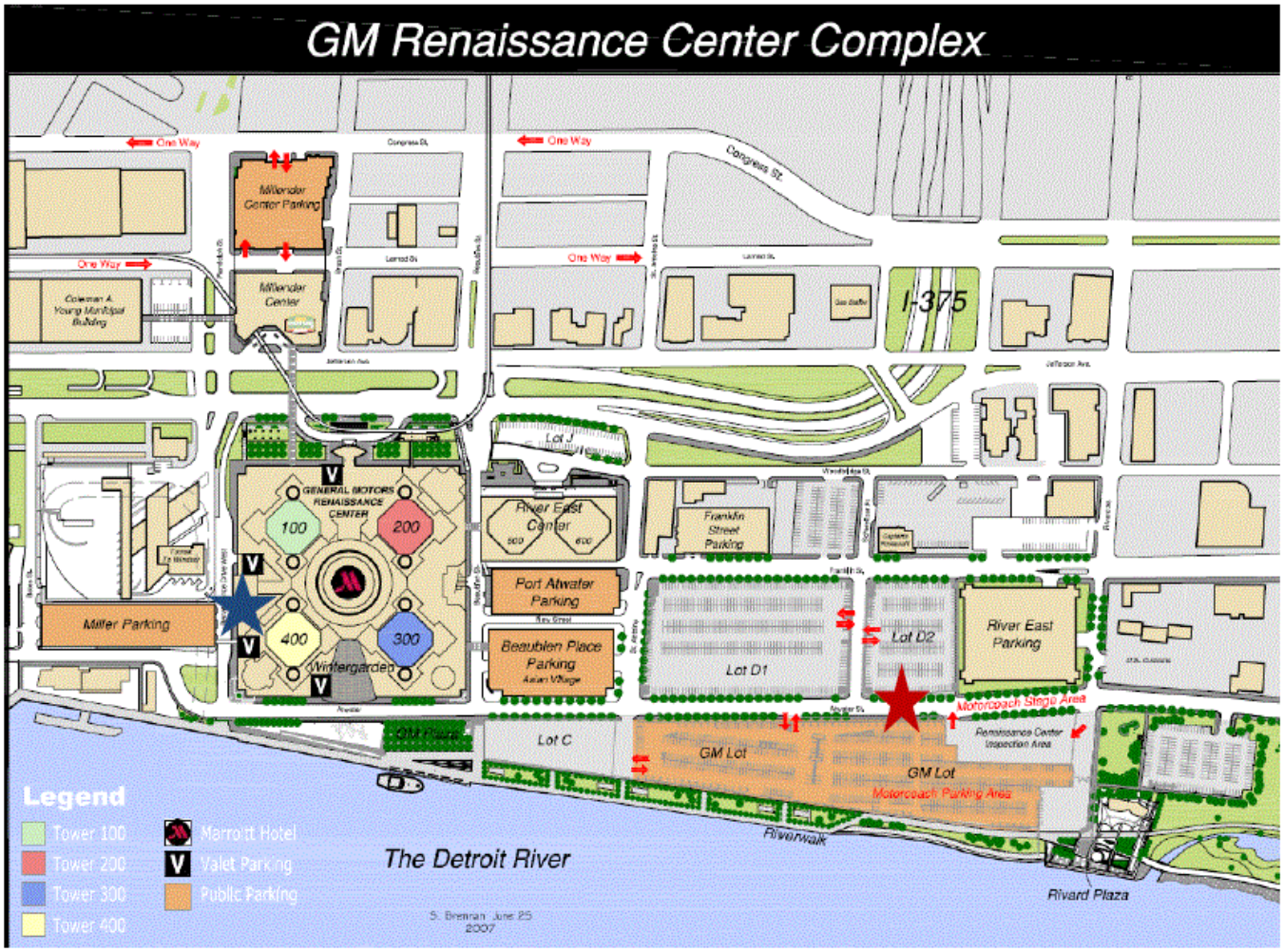
email: support@rideskoot.com

phone: 313-230-2331

- Map:

Motor coach Staging Area

Marriott Motor Lobby – Hotel Main Entrance



Other available Method:

- Taxi

Cabs that accept credit cards and vans are not always available.

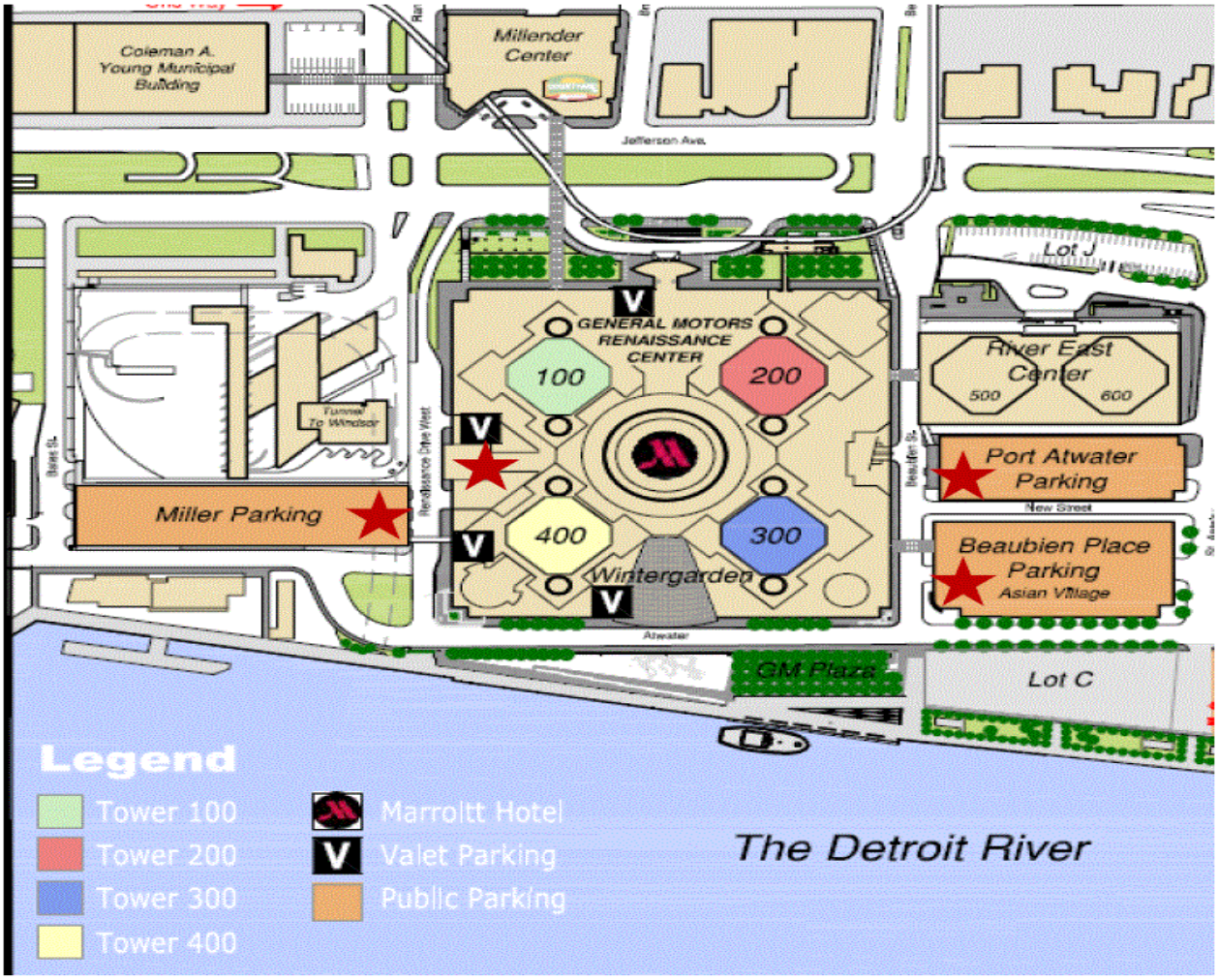
- Uber

Avaialbe through UBER Application on your mobile phone.

- Driving

GPS destination address: 400 Renaissance Dr, Renaissance Center, Detroit, MI 48243

Parking Map:


Coleman A. Young Municipal Building
Millender Center
Jefferson Ave.
Lot J
GENERAL MOTORS RENAISSANCE CENTER
100
200
400
300
Wintergarden
River East Center
500
600
Port Atwater Parking
New Street
Beaubien Place Parking
Asian Village
Miller Parking
Tunnel To Windsor
Renaissance Drive West
Beaubien St.
Atwater
GM Plaza
Lot C
The Detroit River
Legend
Tower 100
Tower 200
Tower 300
Tower 400
Marroltt Hotel
Valet Parking
Public Parking