



2019 QNDE

46th Annual Review of Progress in
Quantitative Nondestructive Evaluation

CONFERENCE

July 14 – 18, 2019

EXHIBITION

July 15 – 18, 2019

Red Lion Hotel on the River,
Portland, OR

Program

event.asme.org/QNDE

The American Society of Mechanical Engineers®
ASME®

ASME
SETTING THE STANDARD

Contents

WELCOME.....	3
AT-A-GLANCE.....	5
KEYNOTE SPEAKERS.....	8
TECHNICAL SESSIONS.....	11
AUTHORS INDEX.....	40
ORGANIZING COMMITTEE.....	59
TRACK/SESSION CHAIR ORGANIZERS.....	60
ADVERTISEMENTS.....	62
NOTES.....	70
HOTEL FLOOR PLANS.....	72
SURVEY.....	73



Welcome

WELCOME TO THE 46TH ANNUAL QNDE CONFERENCE!

Please find important information regarding the Conference including the Conference Mobile App:

1. **Registration Packet** includes your name badge, a pocket schedule, meal tickets, and drink tickets for evening events. *Please bring your tickets – they are required for entrance to events.* Your name badge is also your admission for conference-sponsored social events and is required to be displayed throughout the conference and associated events.

For those who purchased Companion Packages those event tickets including drink tickets are included as well.

In addition you will find a schedule at a glance that includes a map of the Red Lion Hotel and a summary technical schedule.

2. The full conference program is posted to the conference website here: <https://event.asme.org/QNDE> under the Announcements section. There will not be a printed program this year.
3. There will be a conference app which includes all information from the conference program and is accessible from either your smart phone, laptop or tablet. For pre-registrants instructions were emailed for download of the app. Instructions are also included in this document.
4. Program changes and other announcements will be sent out each day via the app and also posted to the conference website either on the homepage or in the program section. <https://event.asme.org/QNDE/Program/#/QNDE2019?dbclick=1>
5. Conference area Wifi: **Network name: QNDE / Password: QNDE2019**
6. Sleeping room Wifi: Basic wifi is included with your sleeping rooms. No password is necessary. The front desk can provide additional information if necessary on check in.
7. The Welcome Reception will be held on the River Deck from 6:00pm – 7:30pm on Sunday, July 14.
8. The Conference Banquet will be held in the Grand Ballroom East from 6:00pm – 8:00pm on Tuesday, July 16.
9. Continental Breakfast will be served daily M-Th from 7:30am – 8:15am in the Grand Ballroom West, Salon 2, Main Level.

10. Lunch will be served daily M-Th from 12:10pm – 1:00pm in the Grand Ballroom East, Main Level.
11. All Technical Sessions will be held on the Lower Level. All meals, breaks, exhibits, posters, and registration will be held on the Main Level.
12. The QNDE Office will be in the Jantzen Room on the Lower Level and are happy to assist you this week. Please come by between the hours of 9:00am – 3:00pm Monday – Thursday. Also staff will be at the registration desk to assist you. All staff may be located at/near the registration desk during peak times.
13. The registration desk will be located in the pre-function area of the Grand Ballroom, Main Level and will be open Sunday from 3:00pm to 6:00pm and Monday – Tuesday from 7:00am to 2:00pm. Wednesday – Thursday from 10:00am – 12:00pm. At other times please come to the conference office for assistance.
14. The Workshop and Conference Surveys are located on the Conference Mobile App. We will have hard copies at the conference office if needed.

DOWNLOADING THE APP – STEP BY STEP

1. Go your app store. Search for **CrowdCompass AttendeeHub** and install it.

Note: If you are using a Blackberry, Windows phone, an Android version older than 6.0, or iOS older than version 10, you will need to use the web version of the app found here:

<https://crowd.cc/qnde2019>

2. After installing, the AttendeeHub icon will appear on your home screen.
3. Search the AttendeeHub for **QNDE2019** and download it.
4. Tap the name of the event to open it.

LOGGING IN

1. Enter your first and last name where prompted, then tap Next. Enter an email address where you'd like your verification email sent, then tap Next one more time.
2. Retrieve your four-digit verification code from your email.
3. Enter the code in the app.

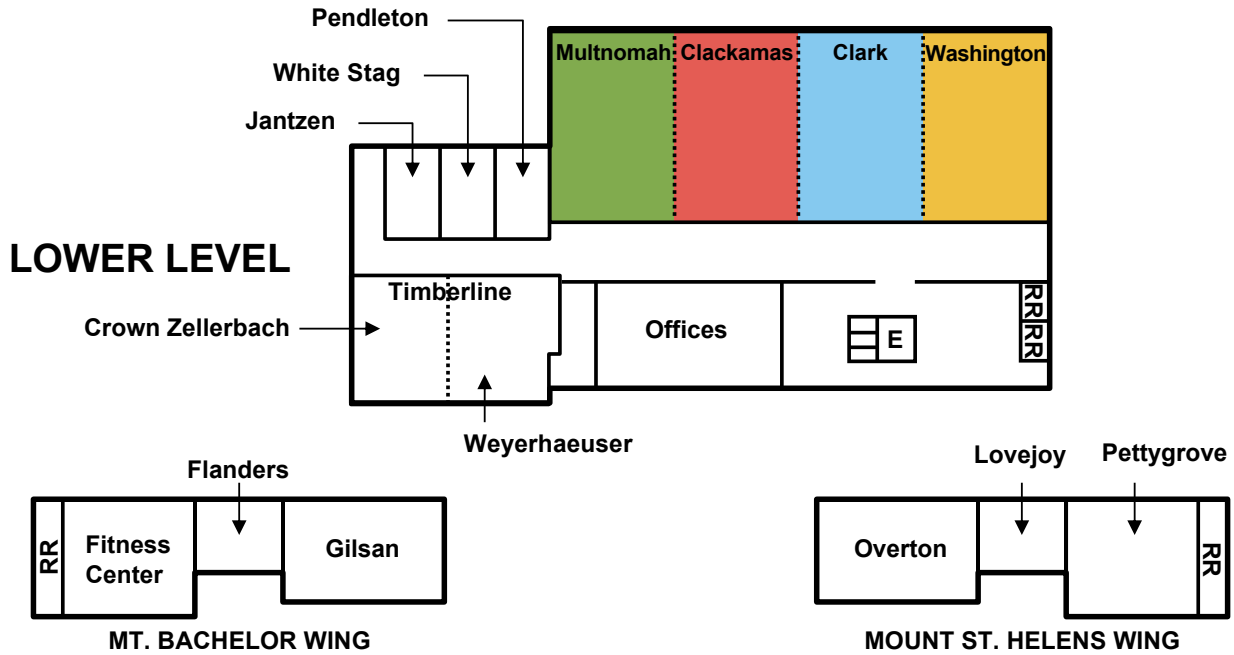
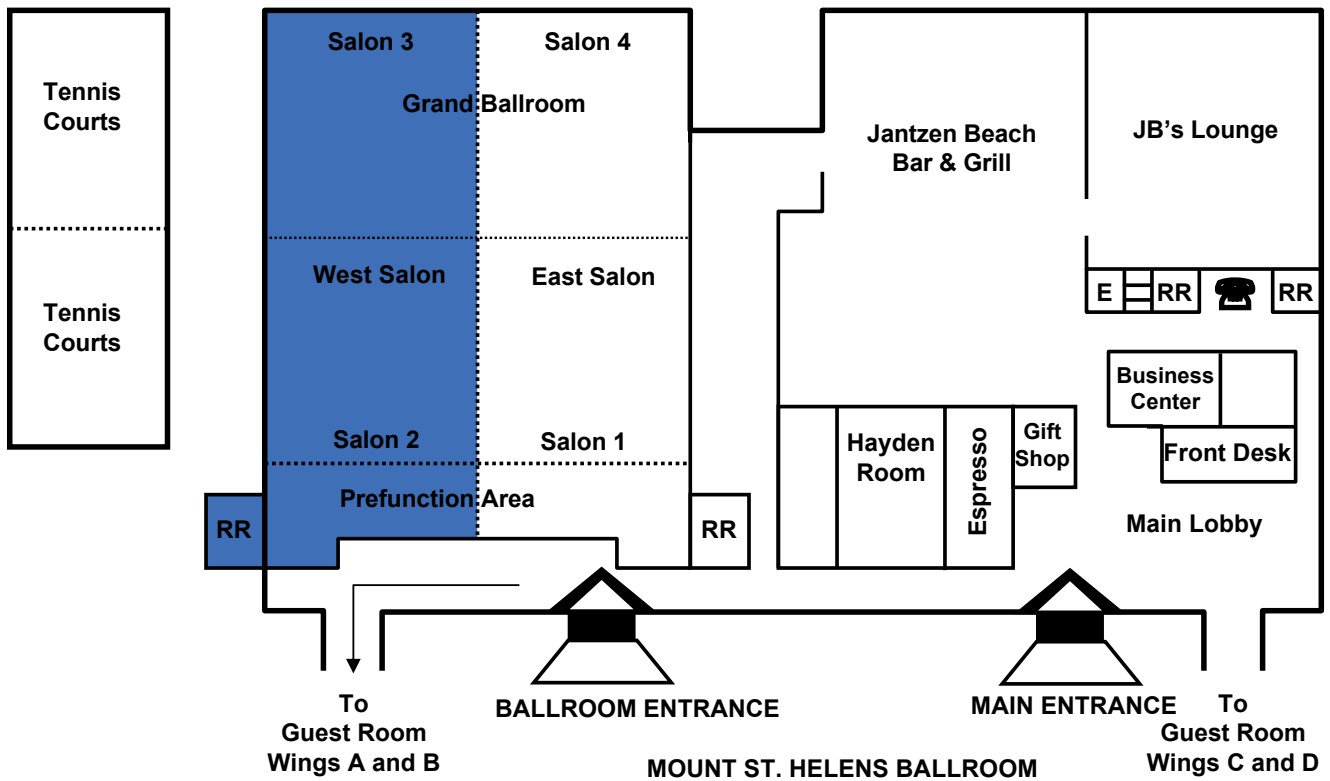
MONDAY JULY 15, 2019					
9:15am- 10:15am	10:30am- 11:20am	11:20am- 12:10pm	LUNCH	1:30pm- 3:10pm	3:30pm- 5:30pm
PLENERY SESSION 1	PLENERY SESSION 2	PLENERY SESSION 2		1-1 Guided Waves 1	1-1 Guided Waves 2
				2-1 NDE and NDT for Civil Engineering 1	2-1 NDE and NDT for Civil Engineering 2
				3-1 Machine Learning & Statistical Methods in NDE 1	3-1 Machine Learning & Statistical Methods in NDE 2
				4-1 New QNDE Technology & QNDE in Design 1	4-1 New QNDE Technology & QNDE in Design 2

TUESDAY JULY 16, 2019					
8:30am- 10:10am	10:30am- 12:10pm	LUNCH	1:00pm- 3:00pm	3:30pm- 5:10pm	
5-1 Structural Health Monitoring (SHM) 1	5-2 Structural Health Monitoring (SHM) 2		Annual Student Poster Session Professional Poster Session	10-1 NDE Modeling for Composites 1	
6-1 Fundamentals of all QNDE Methods I, 1	6-2 Fundamentals of all QNDE Methods I, 2				11-1 Digital Radiography and Computed Tomography 1
7-1 Thermography and Thermoacoustics 1	7-2 Thermography and Thermoacoustics 2				12-1 Microwave, Millimeter Wave, and the NDE 1
8-1 Resonant NDE and Ultrasonic Scattering 1	8-2 Resonant NDE and Ultrasonic Scattering 2				13-1 Model Assisted Probability of Detection 1

WEDNESDAY JULY 17, 2019						
8:30am- 10:10am	10:30am- 12:10pm	LUNCH	1:00pm- 3:00pm	3:30pm- 5:10pm		
14-1 Fundamentals of all QNDE methods, II, 1	14-2 Fundamentals of all QNDE methods, II, 2		18-1 Structural Health Monitoring (SHM) and Prognostics, II, 1	18-2 Structural Health Monitoring (SHM) and Prognostics, II, 2		
15-1 UT Phased Arrays, I, 1	15-2 UT Phased Arrays, I, 2				19-1 Nonlinear Ultrasonics 1	19-2 Nonlinear Ultrasonics 2
16-1 Sensors, Transducers and Probes, I, 1	16-2 Sensors, Transducers and Probes, I, 2				20-1 Characterization of Composites 1	20-2 Characterization of Composites 2
17-1 All Signal Processing Techniques, I, 1	17-2 All Signal Processing Techniques, I, 2				21-1 Materials and Microstructure Characterization, I, 1	21-2 Materials and Microstructure Characterization, I, 2

THURSDAY JULY 18, 2019						
8:30am- 10:10am	10:30am- 12:10pm	LUNCH	1:00pm- 3:00pm	3:30pm- 5:10pm		
22-1 UT Phased Arrays, II, 1	22-2 UT Phased Arrays, II, 2		27-1 Sensors, Transducers and Probes, II, 1	27-2 Sensors, Transducers and Probes, II, 2		
23-1 All Signal Processing Techniques, II and Digital Twin or Data Integration 1	23-2 All Signal Processing Techniques, II and Digital Twin or Data Integration 2				28-1 Materials and Microstructure Characterization, II and Metamaterials 1	28-2 Materials and Microstructure Characterization, II and Metamaterials 2
24-1 NDE-SHM Oil & Gas Industry, I, 1	24-2 NDE-SHM Oil & Gas Industry, I, 2				29-1 Additive Manufacturing and Other Advances 1	29-2 Additive Manufacturing and Other Advances 2
25-1 Nuclear Power NDE 1	26-1 Stress wave based NDE for Structures 1				30-1 NDE-SHM Oil & Gas Industry, II, 1	30-2 NDE-SHM Oil & Gas Industry, II, 2

At-A-Glance



KEY: Room Names	
	Clark
	Clackamas
	Multnomah
	Washington
	Grand Ballroom West



Monday, July 15, 2019

Grand Ballroom, Main Floor



Xiuming Wang

Institute of
Acoustics

Chinese Academy
of Sciences

“Borehole Acoustics and its Applications”

Biography: Prof. Xiuming Wang obtained his PhD in acoustics from University of the Chinese Academy of Sciences (UCAS) in 1995. He worked as assistant professor, associate professor, and full faculty professor in Northeast Petroleum University in China from 1991 to 1999. He worked as a visiting scholar and post-doc in Stanford University from 1998 to 1999. After that, he served for Commonwealth Scientific and Industrial Research Organization (CSIRO) of Australia as a scientist, senior scientist, and principal Scientist from 1999 to 2006. He has worked with the Institute of Acoustics in Chinese Academy of Sciences (IACAS) as a professor and laboratory director since 2006. Currently, he is a professor and director of the Research Center for Ultrasonics and Technologies in IACAS. He is the founder and director of Beijing Engineering Research Center for Deep Drilling Exploration. His scholar positions also include the standing committee member of the Acoustical Society of China (ASC), director of NDT Acoustics in ASC, Editor in Chief for the Journal of Applied Acoustics, and Deputy Editor in Chief for Chinese Journal of Acoustics. He was elected as the ICU standing committee member in 2017. He received the highest acoustics reward of Dah-You Maa from the Acoustical Society of China in 2012. His research interests are acoustic waves and waveguides in solids, ultrasonics and ultrasonic imaging, borehole acoustic logging, and petrophysics. He co-authored over 150 papers, and held tens of patents.

Abstract: Borehole acoustics is engaged in studies of acoustic waves and waveguides in a borehole. It is used in quantitative evaluations of the oil-well integrity and formation properties in the vicinity of a borehole. In this presentation, I will give a brief review on borehole acoustics and its applications.

The borehole acoustic fields contain the guided waves along the cylindrical wellbores and the reflection echoes from the formations. One can evaluate the mechanical properties of surrounding media by inversions from the received sonic logging signals. The necessary detections include porosity, permeability, geo-stresses, geological structures, and defects in cased wells. Those are crucial for the oil/gas productivity. To reveal the quantitative correlation between the field data and the downhole formations, wave propagation in various complex models were investigated over the years. Those academic issues of borehole acoustics focus on anisotropy media, saturated porous media, crack/cave scattering, eccentric tools, directional transducers, etc. The early developed downhole techniques were mostly based on wireline logging. In recent years, the acoustic logging while drilling became a frontier application. The collar waves propagating along the tools and the formation responses extracted from the strong noises are the critical research topics. The scientific research on above problems greatly promotes the development of downhole acoustic measurement techniques. I will introduce two applications, i.e., Imaging behind casing and far acoustic wave detection.

Good cement bond quality is essential for an oil well to prevent hydraulic communication between zones and to ensure layered exploitation. Conventional sonic logging techniques mainly record the amplitude of the casing arrivals, limited to the detection region immediately behind the casing. They can hardly be used to evaluate bonding quality between cement and formations. The ultrasonic technique based on the leaky Lamb waves is a potential solution for quantitative detection of the whole annulus. It is possible for integrated evaluation for both surfaces of the cement annulus by extracting attenuation properties of the Lamb waves.

The other novel application of downhole measurements demonstrated here is the far acoustic wave detection. Traditional sonic logs are only concerned with the near-borehole properties, with very limited detection depths no more than one meter, by extracting the direct waves propagating in wellbores. The far acoustic wave detection is a new technique to acquire images of the structures, with several tens of meters from the borehole, by the reflection wave migration. With improvements of acoustic sensor techniques, the means of the far acoustic wave detection with omnidirectional, cross-dipole, and phased array transducers have been investigated, respectively. The far distance detection tools with multi-component sensors are being developed, which have potentials to eliminate the azimuth ambiguity of reflection imaging.

Monday, July 15, 2019

Grand Ballroom, Main Floor

“Defect Characterisation using ultrasonic arrays – fundamental limitations and future possibilities”

Biography: In 1996, after obtaining B.Eng. and Ph.D. degrees from Imperial College, London, UK, he joined the Mechanical Engineering Department at the University of Bristol, UK, where he has remained. He was promoted to Professor of Ultrasonics in 2007 and now leads the Ultrasonics and NDT research group at Bristol. He has been involved in a diverse range of engineering topics including NDT&E, condition monitoring as well as ultrasonic levitation, tractor beams and haptics. He has worked on ultrasonic array imaging in 2000 and this is a common theme that now links together many of his research interests. Over the last 10 years he has been part of the UK Research Centre in NDE, where he has collaborated closely with industry to progress his research ideas into industrial reality. As a result, the ultrasonic imaging methods and algorithms he helped develop are now in widespread use by industry where they have improved the safety of aircraft, power stations and other complex engineering structures. His work has contributed to the detection of smaller defects than were previously possible and significantly improved defect sizing through the development of algorithms known as Full Matrix Capture (FMC) and the Total Focusing Method (TFM). This work has not only improved safety but has also opened up a new area of research and development. He has been involved in significant commercial impact, achieved through instrument sales, cost savings from reduced inspection time and reduced failure rate of components. For example, he commercialised an array-wheel device which dramatically reduced composite aircraft component inspection times. He actively engages with schools and the general public about engineering, acoustics and NDT through public talks and articles as well as developing hands-on exhibits.

Abstract: The use of ultrasonic arrays for imaging in NDT applications is now widespread. The last decade has seen significant research progress in parallel with industrial uptake. Arrays offer an intuitive view of the interior of a component from which geometric features and defects can be observed. Arrays also offer unprecedented information about the nature and extent of any defects. It is this ability of arrays to characterise and size defects that is the topic of this lecture.

When an ultrasonic array illuminates a defect the received signals depend on the defect reflectivity which is itself a function of both the incoming and scattered angles. In essence, the array illuminates the defects from a range of angles and thereby examines a small portion of the defect's scattering matrix. These scattered signals are useful as they encode information about the characteristics of the defect. The question then is, given some array reflectivity measurements can the defect be characterised and sized uniquely? The full answer to this question is still unclear, but fortunately, in most NDT applications, something definite is known about the possible types of defect. This knowledge unlocks the problem and leads to the general approach described here in which array scattering data is compared to simulations of scattering from possible defects. The closest match is then the characterisation result. Here we show that using this approach, coupled with additional information about the range of possible defects, accurate characterisation is possible even for defects that are fractions of a wavelength in size.

In any real ultrasonic array inspection some noise is always present and this sets a lower limit on what characterisation performance is possible. But also, as defects become smaller relative to the wavelength, their scattering behaviours become increasingly similar. When taken together, these two pieces of information lead to a fundamental limit on the characterisation performance that can be achieved with any linear imaging algorithm.

Recently it has been shown that the same ultrasonic array data that can be used for the above linear imaging and characterisation, also contains information about the nonlinearity of the defects. This future possibility represents a way to move beyond the fundamental limits imposed by linear scattering. The nonlinear information encodes new characterisation information such as crack tip closure which is crucial in structural integrity assessments. The exciting prospect is that this new information can be obtained from commercially available array equipment at little additional cost, a rare case of physics giving “something for nothing”.



Bruce Drinkwater

Professor Bruce Drinkwater

B.Eng., Ph.D.(Lond.)
A.C.G.I., D.I.C.
C.Eng., F.I.Mech.E.,
F.Inst.NDT, M.Inst.P.

Monday, July 15, 2019

Grand Ballroom, Main Floor



Ajit Mal

Distinguished
Professor and Vice
Chair

Director, Online
MS Programs in
Mechanical
Engineering

Mechanical and
Aerospace
Engineering
Department

University of
California,
Los Angeles, CA

ajit@ucla.edu

“Ultrasonic NDE of Composite Structures”

Biography: Professor Mal received his Ph.D. in Applied Mathematics/Mechanics from Calcutta University in 1964, did postdoctoral research at UCLA and UC Berkeley and joined the faculty at UCLA as an Assistant Professor of Engineering in 1967. He became a full professor in 1974 and is currently a Distinguished Professor, a special rank reserved for “scholars and teachers of the highest international distinction”. Professor Mal’s research interests are in the general area of Structural and Solid Mechanics. He has made major research contributions in nondestructive evaluation (NDE) of defects in metallic and composite structures. He has authored or coauthored a graduate textbook in Solid Mechanics, over 150 journal papers, 5 research monographs and made over 150 technical presentations at conferences, seminars and symposia. His honors and awards include a senior Fulbright Fellowship to Germany, election to the Fellow status of the American Academy of Mechanics (AAM), American Society of Mechanical Engineers (ASME) and the International Society of Optical Engineers (SPIE). He also received the Lifetime Achievement Award of SPIE and the Founder’s Award of the NDE Division of ASME

Abstract: Composite materials are being used increasingly in a variety of aircraft and aerospace structures due to their high strength to weight ratio. They are, however, susceptible to internal defects that can occur during manufacturing of the structural components or during service of the structure. Hidden defects, if undetected, may grow during service, become unstable and result in a catastrophic failure of the composite structure. Thus, composite structures require extensive periodic or continuous monitoring throughout the life of the structure to detect the initiation and growth of defects at an early stage of their occurrence. Ultrasonic methods offer a cost-effective method to achieve this goal. A good understanding of the highly complex characteristics of ultrasonic waves in composite structures is a prerequisite to developing a reliable nondestructive inspection technology for composite structures. This talk presents an overview of the work carried out by the speaker and his associates on the characteristics of ultrasonic waves that can propagate in plate-like composite structural components using a combination of analytical, numerical and experimental methods. No attempt is made here to provide a comprehensive review of the NDE of composite structures.

TRACK 1 GUIDED WAVES MONDAY, JULY 15, 2019

1-01 GUIDED WAVES 1

Lower Level, Clark

1:30pm - 3:10pm

Session Chair/Organizer: Michael J. S. Lowe

1:30pm - 1:50pm

QNDE2019:6730

An Ultrasonic Guided Wave Excitation Method at Constant Phase Velocity Using Ultrasonic Phased Array Probes

Author/Presenter: Geoffrey Veit

1:50pm - 2:10pm

QNDE2019:6734

Guided Wave Beam Steering for Imaging Applications Using Partial Circumferential Array in Pipes

Author/Presenter: Filip Szlaszynski

2:10pm - 2:30pm

QNDE2019:6786

Feature guided wave inspection of wedge-like components in aero engines

Author/Presenter: Joseph Corcoran

2:30pm - 2:50pm

QNDE2019:6939

Scattering of High frequency Guided Waves at Surface Defects in Monocrystalline Silicon Wafers

Author/Presenter: Paul Fromme

2:50pm - 3:10pm

QNDE2019:6715

Ultrasonic Waveguide based level measurement using fundamental guided wave mode L(0,1) T(0,1) and F(1,1) simultaneously

Author/Presenter: Nishanth R

1-02 GUIDED WAVES 2

Lower Level, Clark

3:30pm - 5:30pm

Session Chair/Organizer: Michael J. S. Lowe

3:30pm - 3:50pm

QNDE2019:7021

Design Of Ultrasonic Guided Waves Inspection Methods For Representative Aerospace Structures Using CIVA Simulations

Author/Presenter: Fatma Sellami

3:50pm - 4:10pm

QNDE2019:6945

SH1 Guided Wave Tomography

Author/Presenter: Andreas A.E. Zimmermann

4:10pm - 4:30pm

QNDE2019:6725

Crack growth monitoring using low frequency shear guided waves

Author/Presenter: Chien A. Chua

4:30pm - 4:50pm

QNDE2019:6872

Study On Quantitative Detection Of Lamination Defect In Thick-walled Metallic Pipe By Using Circumferential Guided Waves

Author/Presenter: Ziming Li

4:50pm - 5:10pm

QNDE2019:6744

Medium Range Remnant Thickness Gauging Using High Order Shear Horizontal Waves

Author/Presenter: Aurelien Thon

5:10pm - 5:30pm

QNDE2019:7043

A Modified Normal-Mode Expansion Method for Forced-Guided Waves in Plates ---- Sheared Horizontal Wave

Author/Presenter: Peng Zhang

Technical Sessions

TRACK 1 GUIDED WAVES MONDAY, JULY 15, 2019

1-01 GUIDED WAVES 1

Lower Level, Clark

1:30pm - 3:10pm

Session Chair/Organizer: Michael J. S. Lowe

1:30pm - 1:50pm

QNDE2019:6730

An Ultrasonic Guided Wave Excitation Method at Constant Phase Velocity Using Ultrasonic Phased Array Probes

Author/Presenter: Geoffrey Veit

1:50pm - 2:10pm

QNDE2019:6734

Guided Wave Beam Steering for Imaging Applications Using Partial Circumferential Array in Pipes

Author/Presenter: Filip Szlaskzynski

2:10pm - 2:30pm

QNDE2019:6786

Feature guided wave inspection of wedge-like components in aero engines

Author/Presenter: Joseph Corcoran

2:30pm - 2:50pm

QNDE2019:6939

Scattering of High frequency Guided Waves at Surface Defects in Monocrystalline Silicon Wafers

Author/Presenter: Paul Fromme

2:50pm - 3:10pm

QNDE2019:6715

Ultrasonic Waveguide based level measurement using fundamental guided wave mode L(0,1) T(0,1) and F(1,1) simultaneously

Author/Presenter: Nishanth R

1-02 GUIDED WAVES 2

Lower Level, Clark

3:30pm - 5:30pm

Session Chair/Organizer: Michael J. S. Lowe

3:30pm - 3:50pm

QNDE2019:7021

Design Of Ultrasonic Guided Waves Inspection Methods For Representative Aerospace Structures Using CIVA Simulations

Author/Presenter: Fatma Sellami

3:50pm - 4:10pm

QNDE2019:6945

SH1 Guided Wave Tomography

Author/Presenter: Andreas A.E. Zimmermann

4:10pm - 4:30pm

QNDE2019:6725

Crack growth monitoring using low frequency shear guided waves

Author/Presenter: Chien A. Chua

4:30pm - 4:50pm

QNDE2019:6872

Study On Quantitative Detection Of Lamination Defect In Thick-walled Metallic Pipe By Using Circumferential Guided Waves

Author/Presenter: Ziming Li

4:50pm - 5:10pm

QNDE2019:6744

Medium Range Remnant Thickness Gauging Using High Order Shear Horizontal Waves

Author/Presenter: Aurelien Thon

5:10pm - 5:30pm

QNDE2019:7043

A Modified Normal-Mode Expansion Method for Forced-Guided Waves in Plates ---- Sheared Horizontal Wave

Author/Presenter: Peng Zhang

TRACK 2 NDE AND NDT FOR CIVIL ENGINEERING MONDAY, JULY 15, 2019

2-01 NDE AND NDT FOR CIVIL ENGINEERING 1

Lower Level, Clackamas

1:30pm - 3:10pm

Session Chair/Organizer: Simon Laflamme

1:30pm - 1:50pm

QNDE2019:6751

Correlation Between Interfacial Transition Zone Characteristics And Ultrasonic Wave Velocity And Attenuation In Concrete

Author/Presenter: Manda Ramaniraka

1:50pm - 2:10pm

QNDE2019:6785

Nondestructive testing of concrete affected by swelling pathologies: from the laboratory to on site scale

Author/Presenter: Florian Ouvrier-Bufferet

2:10pm - 2:30pm

QNDE2019:6837

Nondestructive monitoring of mechanical stress in concrete for the survey of nuclear power plants

Author/Presenter: Jean-François Chaix

2:30pm - 2:50pm

QNDE2019:6838

Defect propagation evaluation using active microwave thermography

Author/Presenter: Ali Mirala

2:50pm - 3:10pm

QNDE2019:7001

Pulsed Eddy Current Response to General Corrosion in Concrete Rebar

Author/Presenter: Ian C. Eddy

2-02 NDE AND NDT FOR CIVIL ENGINEERING 2

Lower Level, Clackamas

3:30pm - 5:10pm

Session Chair/Organizer: Simon Laflamme

3:30pm - 3:50pm

QNDE2019:6858

Lidar-based deformation measurement method of bridge structures using TLS

Author/Presenter: Gichun Cha

3:50pm - 4:10pm

QNDE2019:6879

Development of Electromagnetic Method to Evaluate the Corrosion of Steel Rebar

Author/Presenter: Dongfeng He

4:10pm - 4:30pm

QNDE2019:6951

Optimisation of gate time parameters for diffuse field nonlinear array imaging

Author/Presenter: Benjamin Robinson

4:30pm - 4:50pm

QNDE2019:6983

Detection of Ground Motion Induced Pipe Deformation using a Sensing Textile

Author/Presenter: Qixiang Tang

Technical Sessions

TRACK 3 MACHINE LEARNING & STATISTICAL METHODS IN NDE MONDAY, JULY 15, 2019

3-01 MACHINE LEARNING & STATISTICAL METHODS IN NDE 1

Lower Level, Multnomah

1:30pm - 3:10pm

Session Chair/Organizer: Joel B. Harley

Session Co-Chair/Organizer: Daniel M. Sparkman

1:30pm - 1:50pm

QNDE2019:6977

Characterization of Micrometeoroid and Orbital Debris (MMOD) Impacts on Space Structures Using Deep Learning Neural Networks Incorporating Experimental and Simulated Data

Author/Presenter: John Aldrin

1:50pm - 2:10pm

QNDE2019:6978

Deep Neural Network-based Guided Wave Damage Localization

Author/Presenter: Ishan D Khurjekar

2:10pm - 2:30pm

QNDE2019:7056

Convolutional neural network for automated diagnostic from guided wave imaging in a structural health monitoring context

Author/Presenter: Andrii Kulakovskiy

2:30pm - 2:50pm

QNDE2019:6708

Development in Automated Defect Detection for Fluorescent Penetrant Inspection using Machine Learning

Author/Presenter: Naomi Shipway

3-02 MACHINE LEARNING & STATISTICAL METHODS IN NDE 2

Lower Level, Multnomah

3:30pm - 5:30pm

Session Chair/Organizer: Joel B. Harley

Session Co-Chair/Organizer: Daniel M. Sparkman

3:30pm - 3:50pm

QNDE2019:6788

A Bayesian Level Set Method for Microtexture Region Characterization Using Eddy Current Data

Author/Presenter: Laura Homa

3:50pm - 4:10pm

QNDE2019:6764

Generalized Likelihood Ratio Tests For Defect Detection In SHM Of Pipes

Author/Presenter: Stefano Mariani

4:10pm - 4:30pm

QNDE2019:7064

Model-Assisted Reliability Analysis of Nondestructive Testing Systems Using Polynomial Chaos-Based Cokriging

Author/Presenter: Xiaosong Du

4:30pm - 4:50pm

QNDE2019:6789

Data Fusion Approach for Ultrasonic and X-ray Computed Tomography Data

Author/Presenter: Daniel M. Sparkman

TRACK 4 NEW QNDE TECHNOLOGY & QNDE IN DESIGN MONDAY, JULY 15, 2019

4-01 NEW QNDE TECHNOLOGY & QNDE IN DESIGN 1

Lower Level, Washington

1:30pm - 3:10pm

Session Chair/Organizer: Lucas Koester

1:30pm - 1:50pm

QNDE2019:6733

Development of a New, Wireless Acquisition System for EMATs
Compatible with the Robotics Operating System

Author/Presenter: Arnau Garriga-Casanovas

1:50pm - 2:10pm

QNDE2019:6712

Study on the Magnetic Nonlinear Mixing Frequency Technique and Its
Application in Mechanical Properties Assessment

Author/Presenter: Jingpin Jiao

2:10pm - 2:30pm

QNDE2019:6862

Nonlinear Imaging Of Closed Cracks By A Fundamental Wave Amplitude
Approach

Author/Presenter: Ewen Carcreff

2:30pm - 2:50pm

QNDE2019:6769

Evaluation of Surface Defects on Cast Parts Using Laser-Scanned Point
Cloud

Author/Presenter: Tatsuhiko Kawakami

4-02 NEW QNDE TECHNOLOGY & QNDE IN DESIGN 2

Lower Level, Washington

3:30pm - 5:30pm

Session Chair/Organizer: Lucas Koester

3:30pm - 3:50pm

QNDE2019:6903

In-Process Ultrasonic Inspection Of Thin Mild Steel Plate GMAW Butt
Welds Using Non-Contact Guided Waves

Author/Presenter: Momchil Vasilev

3:50pm - 4:10pm

QNDE2019:6867

Detection of disbonds in adhesively bonded aluminum plates using laser
ultrasound

Author/Presenter: Lukasz Ambrozinski

4:10pm - 4:30pm

QNDE2019:7020

Trends in industrial computed tomography

Author/Presenter: Dirk Steiner

4:30pm - 4:50pm

QNDE2019:6964

In-process inspection of multi-pass robotic welding

Author/Presenter: Yashar Javadi

4:50pm - 5:10pm

QNDE2019:6804

Laser induced phased arrays - towards online inspection of additive
manufacturing

Author/Presenter: Don Pieris

5:10pm - 5:30pm

QNDE2019:6716

Impact correlation with accelerometer in Home Appliance Industry

Author/Presenter: Somnath Chavan

Technical Sessions

TRACK 5 STRUCTURAL HEALTH MONITORING (SHM) TUESDAY, JULY 16, 2019

5-01 STRUCTURAL HEALTH MONITORING (SHM) 1

Lower Level, Clark

8:30am - 10:10am

Session Chair/Organizer: Simon Laflamme

Session Co-Chair/Organizer: Olivier Mesnil

8:30am - 8:50am

QNDE2019:7078

Toward field implementation of carbon nanotube-based composites for monitoring and repairing fatigue damaged steel structures

Author/Presenter: Shafique Ahmed

8:50am - 9:10am

QNDE2019:6955

Model-assisted validation of sensor networks

Author/Presenter: Jin Yan

9:10am - 9:30am

QNDE2019:6839

Sensing Skin for In-service Monitoring of Woven Composite Laminates Subjected to Impact Damage

Author/Presenter: Austin Downey

9:30am - 9:50am

QNDE2019:6836

UAS Based Nondestructive Testing Structural Monitoring Error Analysis

Author/Presenter: Shanyue Guan

9:50am - 10:10am

QNDE2019:7002

A Study on the Health Monitoring of Hot Rolling Mill (Poster Presentation)

Author/Presenter: Namho Shin

5-02 STRUCTURAL HEALTH MONITORING (SHM) 2

Lower Level, Clark

10:30am - 12:10pm

Session Chair/Organizer: Simon Laflamme

Session Co-Chair/Organizer: Olivier Mesnil

10:30am - 10:50am

QNDE2019:6999

In-flight detection of bearing faults in unmanned aerial vehicles

Author/Presenter: Portia Banerjee

10:50am - 11:10am

QNDE2019:6976

Dynamic Tracking Of Defects In Pipelines Via NDE Based Transfer Learning

Author/Presenter: Subrata Mukherjee

11:10am - 11:30am

QNDE2019:6797

A sensitive approach to determine the health status of I-beams by measuring its nonlinearity through the use of rayleigh waves

Author/Presenter: Peter W. Tse

11:30am - 11:50am

QNDE2019:6877

Analytical study on real-time detection of tendon failure in prestressed concrete beam

Author/Presenter: Keigo Suzuki

11:50am - 12:10pm

QNDE2019:7035

Linear And Nonlinear Ultrasonic Techniques For Investigations Of Cement Composites Of Different Ages

Author/Presenter: Umar Amjad

TRACK 6 FUNDAMENTALS OF ALL QNDE METHODS I TUESDAY, JULY 16, 2019

6-01 FUNDAMENTALS OF ALL QNDE METHODS I, 1

Lower Level, Clackamas

8:30am - 10:10am

Session Chair/Organizer: Pete Collins

Session Co-Chair/Organizer:

8:30am - 8:50am

QNDE2019:6891

The NDE of pultruded GRP composites using air-coupled ultrasound and EMAT-based Guided wave inspection

Author/Presenter: David A. Hutchins

8:50am - 9:10am

QNDE2019:6773

A Method for Accurate Measurement of Shear Wave Attenuation Coefficient Using A Contact Transducer

Author/Presenter: Guangdong Zhang

9:10am - 9:30am

QNDE2019:7019

Differential Imaging of microstructural evolution in composites of uncertain micro/macrostructure

Author/Presenter: Fatemeh Pourahmadian

9:30am - 9:50am

QNDE2019:6766

An Improved Damage Index for Non-destructive Testing Method on Honeycomb Sandwich Panel Using Guided Waves

Author/Presenter: Lifu Wang

9:50am - 10:10am

QNDE2019:6998

Toward Comprehensive Industrial CT Image Quality Assessment: I. Phantom Design

Author/Presenter: Xin Li

6-02 FUNDAMENTALS OF ALL QNDE METHODS I, 2

Lower Level, Clackamas

10:30am - 12:10pm

Session Chair/Organizer: Pete Collins

Session Co-Chair/Organizer:

10:30am - 10:50am

QNDE2019:6966

Corrosion inspection under repair by eddy current with external magnetic field

Author/Presenter: Vitor Silva

10:50am - 11:10am

QNDE2019:7052

Eddy Current Measurement of Layers Thicknesses Based on Reflection Coefficient's Spectrum Analysis

Author/Presenter: Weiyang Cheng

11:10am - 11:30am

QNDE2019:6952

Dual-Mode Galvanomagnetic Characterization of Shot-Peened IN18 Coupons

Author/Presenter: Dheeraj Velicheti

11:30am - 11:50am

QNDE2019:6706

Influence of grain morphology and size on ultrasonic attenuation in polycrystalline isotropic materials

Author/Presenter: Massoud Oudaa

11:50am - 12:10pm

QNDE2019:6707

Acoustoelastic characterization of Concrete Prisms Via Torsional Vibration Phenomena

Author/Presenter: Agustin Spalvier

Technical Sessions

TRACK 7 THERMOGRAPHY AND THERMOSONICS TUESDAY, JULY 16, 2019

7-01 THERMOGRAPHY AND THERMOSONICS 1

Lower Level, Multnomah

8:30am - 10:10am

Session Chair/Organizer: Stephen D Holland

Session Co-Chair/Organizer: Xiaoyan Han

8:30am - 8:50am

QNDE2019:6761

Quadrupole Simulations of Thermographic Responses of Impact Damage in Composites

Author/Presenter: William Winfree

8:50am - 9:10am

QNDE2019:7012

Application of Thermography Model-Based Inversion

Author/Presenter: Chevonne McInnis

9:10am - 9:30am

QNDE2019:7013

Modeling of the ultrasonic welder/specimen contact for vibrothermography

Author/Presenter: Stephen D. Holland

9:30am - 9:50am

QNDE2019:6728

The Application Of Line Scan Thermography Using Multiple Collaborative Robots

Author/Presenter: K. Elliott Cramer

9:50am - 10:10am

QNDE2019:6844

Finite element modeling of studying energy consumption of defects excited by single excitation ultrasonic pulse frequency in sonic infrared imaging

Author/Presenter: Qiuye Yu

7-02 THERMOGRAPHY AND THERMOSONICS 1

Lower Level, Multnomah

10:30am - 12:10pm

Session Chair/Organizer: Stephen D Holland

Session Co-Chair/Organizer: Xiaoyan Han

10:30am - 10:50am

QNDE2019:6874

Photothermal Super Resolution Image Reconstruction Using Structured 1D Laser Illumination

Author/Presenter: Samim Ahmadi

10:50am - 11:10am

QNDE2019:7008

The effect of defect size on the quantitative estimation of defect depth in composite structures using SIR NDE

Author/Presenter: Omar Obeidat

11:10am - 11:30am

QNDE2019:7030

In Situ Thermographic Process Monitoring During Automated Fiber Placement

Author/Presenter: Peter Juarez

11:30am - 11:50am

QNDE2019:6960

Evaluation of Thermography Inspection Procedures for Characterization of Water Degradation in Polymer 3D Printed FDM Parts

Author/Presenter: Paul Slayback

TRACK 8 RESONANT NDE AND ULTRASONIC SCATTERING TUESDAY, JULY 16, 2019

8-01 RESONANT NDE AND ULTRASONIC SCATTERING 1

Lower Level, Washington

8:30am - 10:10am

Session Chair/Organizer: Sunil Kishore Chakrapani

Session Co-chair/Organizer: Matthew Cherry

8:30am - 8:50am

QNDE2019:6881

Modeling of Ultrasonic Spectroscopy for Damage in Multilayer Structures

Author/Presenter: John Aldrin

8:50am - 9:10am

QNDE2019:6967

Characterizing Polymer O-Rings Nondestructively Using Resonant Ultrasound Spectroscopy

Author/Presenter: Richard Livings

9:10am - 9:30am

QNDE2019:7005

Evaluating fatigue damage in composites using nonlinear resonant spectroscopy

Author/Presenter: Sunil Kishore Chakrapani

9:30am - 9:50am

QNDE2019:7006

Influence of dislocations and residual stress on nonlinear resonance spectroscopy experiments

Author/Presenter: Guillermo E. Huanes-Alvan

9:50am - 10:10am

QNDE2019:7042

Effect of Stress on Impact-based Vibration in Steel Rails

Author/Presenter: Chi-Luen Huang

8-02 RESONANT NDE AND ULTRASONIC SCATTERING 2

Lower Level, Washington

10:30am - 12:10pm

Session Chair/Organizer: Sunil Kishore Chakrapani

Session Co-chair/Organizer: Matthew Cherry

10:30am - 10:50am

QNDE2019:7038

Validation of Model-Trained Process Compensated Resonance Testing Inspection for Creep Deformation - A Model-Assisted Probability of Detection Study

Author/Presenter: Eric Biedermann

10:50am - 11:10am

QNDE2019:6735

Ultrasonic Scattering Predictions for Textured Titanium Polycrystals

Author/Presenter: Nathaniel Matz

11:10am - 11:30am

QNDE2019:6739

Expected amplitudes of ultrasonic elastic waves scattered from rough defects

Author/Presenter: Stewart Haslinger

11:30am - 11:50am

QNDE2019:6986

Effects of manufacturing process on the microstructure of Ti6Al4V and their implications for grain sizing based on normal incidence diffuse ultrasonic backscatter

Author/Presenter: Luz D. Sotelo

11:50am - 12:10pm

QNDE2019:7031

Microstructure Characterization of Ti7Al: Ultrasonic Backscatter Measurements Analyzed using Synthetic Polycrystals

Author/Presenter: Musa Norouzi

Technical Sessions

TRACK 9 POSTER SESSION TUESDAY, JULY 16, 2019

9-01 ANNUAL STUDENT POSTER SESSION

Main Level, Grand Ballroom West

1:00pm - 3:00pm

Session Chair/Organizer: Paul Schafbuch

Session Co-Chair/Organizer:

QNDE2019-6718

Structural Health Monitoring Based on SH Wave Sparse Array and Phased Array System

Author/Presenter: Qiang Huan

QNDE2019-6746

Crack Corrosion Detection In Thin Tubes Using Torsional Guided Wave Mode T(0,1)

Author/Presenter: Aditya Chilukuri

QNDE2019-6747

Structural Health Monitoring of Reinforced Concrete Structures Using Guided Waves

Author/Presenter: Wilson Kairu

QNDE2019-6793

Multi-Point High Temperature Measurement Using Long Ultrasonic Ceramic Waveguides

Author/Presenter: Gokul Raja S. G.

QNDE2019-6814

Evaluation of Impact Testing Method and Ultrasonic Pulse Velocity Method for Estimating the Compressive Strength of Reinforced Concrete Structures

Authors/Presenters: Seonguk Hong/ Yongtaeg Lee

QNDE2019-6826

Design And Experiment Study Of Aluminum Alloy Pipe Detection Probe Based On ACFM

Author/Presenter: Jianming Zhao

QNDE2019-6854

Measurement of Acoustic Nonlinearity Parameter in Stainless Steel using Acoustoelastic Effect

Author/Presenter: Kyung-Young Jhang

QNDE2019-6855

Comparison of contact acoustic nonlinearities of longitudinal and shear waves

Author/Presenter: Kyung-Young Jhang

QNDE2019-6859

A Study On Thermoelastic Generation Of Narrowband Ultrasonic Lamb Waves Using A Pattern Source

Author/Presenter: Geo Davis

QNDE2019-6882

Photothermal Super Resolution Imaging: A Comparison Of Different Reconstruction Techniques

Author/Presenter: Samim Ahmadi

QNDE2019-6901

Channel Structured Metamaterials for Super Resolution Imaging

Author/Presenter: John Kiprotich Birir

QNDE2019-6905

Comparison of NDE Techniques for Damage Detection in Fibre-Reinforced Composites

Author/Presenter: Dana Shoukroun

QNDE2019-6942

Analytical Modeling of the Evolution of the Nonlinearity Parameter of Sensitized Stainless Steel

Author/Presenter: Brian Fuchs

QNDE2019-6943

Higher Harmonics Suppression using Nonlinear Waveguide Metamaterial Rod

Author/Presenter: Sandeep Kumar S. R.

QNDE2019-6946

Effect of conical profile on the transmission of elastic waves from cylindrical waveguide to bulk

Author/Presenter: Ahmed A. Zul Karnain

QNDE2019-6950

Quantitative Imaging Analysis of Moisture in Composites using a Clinical MRI System

Author/Presenter: Andreas A.E. Zimmermann

QNDE2019-6956

Directional and Nondirectional Galvanomagnetic Gauge Factor Measurements for Residual Stress Assessment in IN718

Author/Presenter: Nathanael Bodine

QNDE2019-6958

Using Nonlinear Ultrasound to Quantify the Material State of Pipeline Steel Specimens with Mechanical Defects

Author/Presenter: Denis Pfeifer

QNDE2019-6959

Numerical Study on the Excitation-Dependent Nonlinear Behavior of Distributed Microcracks

Author/Presenter: Marius M. Goletz

QNDE2019-6971

3D Reconstruction of Barely Visible Impact Damages Shape from Local Coherence Difference Between Laser Ultrasound Signals

Author/Presenter: Jakub Mrówka

QNDE2019-6994

Phononic Material as Ultrasonic Filters in Nondestructive Evaluation Measurements

Author/Presenter: Elizabeth J Smith

QNDE2019-7004

Investigation of nonlinear ultrasonic behavior of additive manufactured material with NRUS and SHG methods.

Author/Presenter: Daniel Niklas Fahse

QNDE2019-7016

A Laser and Video-based Displacement Transducer for the Monitoring of Bridge Deflections

Author/Presenter: Nicholas Brown

QNDE2019-7029

A Dual Modality Coplanar Electromagnetic Sensor for Non-Destructive Evaluation Application

Author/Presenter: Xiaokang Yin

QNDE2019-7034

Studying the Effect of Surface Treatments on Adhesion in Adhesively Bonded Plastic Plates Using Ultrasonic Testing

Author/Presenter: Karthik Gopalakrishnan

QNDE2019-7057

Array Based Guided Wave Multi-Mode Dispersion Correction

Author/Presenter: Ron Roberts

QNDE2019-7065

Meta-MAPOD: Open-Source Framework For Metamodel-Assisted Probability of Detection

Author/Presenter: Leifur Leifsson

QNDE2019-7080

Feasibility Study of Air-coupled Ultrasonic Vertical Reflection Method Using a Single Probe

Author/Presenter: Kento Suzuki

QNDE2019-7081

Active Thermographic Inspection Combined with Laser Cyclic Heating and Fourier Transform Processing

Author/Presenter: Yusuke Takenaka

QNDE2019-7094

Dynamic Characterization and 3-D Modeling of Wind Turbine Structures

Authors/Presenters: Chih-Hung Chiang/ Keng-Tsang Hsu

QNDE2019-7096

EVALUATION OF REPAIR QUALITY FOR CONCRETE STRUCTURE BY NONDESTRUCTIVE TECHNIQUE

Author/Presenter: Keng-Tsang Hsu

QNDE2019-7100

Diagnostic Imaging of Structural Concrete

Author/Presenter: Sina Mehdinia

PROFESSIONAL POSTER SESSION

TUESDAY, JULY 16, 2019

PROFESSIONAL POSTER SESSION

Main Level, Grand Ballroom West

1:00pm - 3:00pm

Session Chair/Organizer: Paul Schafbuch

Session Co-Chair/Organizer:

QNDE2019-6989

Baseline Estimation of Ultrasonic Response Of Metallic Structures Fabricated Via Laser Direct Energy Deposition (DED)

Author/Presenter: Guillermo E. Huanes-Alvan

QNDE2019-6992

MicroCT Analysis of Steel Fiber Orientation in Concrete Reinforcement

Author/Presenter: Davi Oliveira

QNDE2019-6975

X-Ray Microtomography System Applied in Characterization of Lightweight Concrete Structures

Authors/Presenters: Davi Oliveira/ Luan Bastos

QNDE2019-6833

MicroCT Analysis Tools for GRFP Laminated Joints Inspection

Authors/Presenters: Davi Oliveira/Cintia Ferreira

QNDE2019-6850

Shear Moduli Under Uniaxial Loading: Stress Dependence and Isotropy Condition Relating Shear Moduli to Young's Modulus and Poisson's Ratio

Author/Presenter: Kwang Kim

Technical Sessions

TRACK 10 MODELING FOR COMPOSITES TUESDAY, JULY 16, 2019

10-01 NDE MODELING FOR COMPOSITES 1

Lower Level, Clark

3:30pm - 5:50pm

Session Chair/Organizer: Michael J. S. Lowe

Session Co-Chair/Organizer:

3:30pm - 3:50pm

QNDE2019:6876

Phased Array Ultrasonic Approach for Characterization of Hidden Region of Impact Damage In Composites

Author/Presenter: John Aldrin

3:50pm - 4:10pm

QNDE2019:6902

Comparison of Simulated and Experimental Studies of the Composite Delamination Envelope Via Pitch-Catch Phased Array Ultrasound

Author/Presenter: John Wertz

4:10pm - 4:30pm

QNDE2019:7058

Modeling Ultrasound Propagation in Curved CFRP Composites

Author/Presenter: Ron Roberts

4:30pm - 4:50pm

QNDE2019:6866

Efficient Incorporation of Visco-Elastic Behaviors and Thin Intermediate Layers in Transient Finite Element Modeling of Laminate Structures

Author/Presenter: Alexandre Imperiale

4:50pm - 5:10pm

QNDE2019:6701

Electromagnetic Characterization of Advanced Composites by Voxel-Based Inverse Methods

Author/Presenter: Harold Sabbagh

5:10pm - 5:30pm

QNDE2019:7104

Accelerated NDE Modelling of Composites using Cloud Based FEA

Author/Presenter: Jeff Dobson

5:30pm - 5:50pm

QNDE2019:6702

Electromagnetic Characterization of Advanced Composites by Voxel-Based Inverse Methods-II

Author/Presenter: Harold Sabbagh

TRACK 11 DIGITAL RADIOGRAPHY AND COMPUTED TOMOGRAPHY TUESDAY, JULY 16, 2019

11-01 DIGITAL RADIOGRAPHY AND COMPUTED TOMOGRAPHY 1

Lower Level, Clackamas

3:30pm - 5:10pm

Session Chair/Organizer: Zhan Zhang

Session Co-chair/Organizer:

3:30pm - 3:50pm

QNDE2019:6711

Realistic film noise simulation with space-varying statistics based on experimental data from a new optical film digitisation setup

Author/Presenter: Sebastian Eckel

3:50pm - 4:10pm

QNDE2019:7044

A Review of Reconstruction Methods for Limited Angle X-Ray Tomography in Nondestructive Evaluation Applications

Author/Presenter: Zhan Zhang

4:10pm - 4:30pm

QNDE2019:7071

Influence of Data Acquisition Algorithms on X-Ray Phase Contrast Imaging Computed Tomography

Author/Presenter: Collin Epstein

4:30pm - 4:50pm

QNDE2019:6937

Edge Illumination X-Ray Phase Contrast Imaging for imaging Defects in Composite Structures

Author/Presenter: Dana Shoukroun

4:50pm - 5:10pm

QNDE2019:7089

Reliability Studies of Application-Specific Integrated Circuits Operated at Cryogenic Temperature

Author/Presenter: Navaneeth Poonthottathil

5:10pm - 5:30pm

QNDE2019:7091

Quantitative Analysis of Porosity and Voids in Cast Fe-Mn-Al Steel Alloy Material Via X-Ray Computed Tomography

Author/Presenter: William H. Green

TRACK 12 MICROWAVE, MILLIMETER WAVE, AND THE NDE TUESDAY, JULY 16, 2019

12-01 MICROWAVE, MILLIMETER WAVE, AND THE NDE 1

Lower Level, Multnomah 3:30pm - 5:10pm

Session Chair/Organizer: Thomas (C-P) Chiou

Session Co-chair/Organizer:

3:30pm - 3:50pm

QNDE2019:7010

High Resolution Rapid Microwave NDE of Metal-Composite Joints Using Metallic Reflectors

Author/Presenter: Saptarshi Mukherjee

3:50pm - 4:10pm

QNDE2019:6957

Detection of Surface-Breaking Cracks in Metals Using a Radially-Polarized Microwave Probe

Author/Presenter: Matthew Dvorsky

4:10pm - 4:30pm

QNDE2019:6917

Handheld Microwave Imaging System for the Inspection of Non-Metallic Structures

Author/Presenter: Mohammad Tayeb Ghasr

4:30pm - 4:50pm

QNDE2019:6783

Conformal Coaxial Helical Antenna for Distributed Sensing Applications at Wellbores

Author/Presenter: Roman Shugayev

4:50pm - 5:10pm

QNDE2019:7092

Terahertz Defect Evaluation in Oxide/Oxide Ceramic Matrix Composites

Author/Presenter: Thomas (C-P) Chiou

TRACK 13 MODEL ASSISTED PROBABILITY OF DETECTION TUESDAY, JULY 16, 2019

13-01 MODEL ASSISTED PROBABILITY OF DETECTION 1

Lower Level, Washington 3:30pm - 5:30pm

Session Chair/Organizer: Leifur Leifsson

Session Co-chair/Organizer: Eric A. Lindgren

3:30pm - 3:50pm

QNDE2019:6806

Historical Overview of Model-Assisted Probability of Detection (MAPOD)

Author/Presenter: Eric A. Lindgren

3:50pm - 4:10pm

QNDE2019:6807

Probability of Detection Estimations for Dissimilar Metal Welds

Author/Presenter: Ryan Meyer

4:10pm - 4:30pm

QNDE2019:6892

Case Study of Model-Assisted Probability of Detection Evaluation for Manual Ultrasonic Inspection of Fastener Sites for Fatigue Cracks

Author/Presenter: John Aldrin

4:30pm - 4:50pm

QNDE2019:6932

Model assisted probability of detection applied to guided wave imaging for structural health monitoring

Author/Presenter: Olivier Mesnil

4:50pm - 5:10pm

QNDE2019:7063

Metamodel-Based Uncertainty Propagation for Model-Assisted Probability of Detection: An Overview of Recent Advances

Author/Presenter: Xiaosong Du

Technical Sessions

TRACK 14 FUNDAMENTALS OF ALL QNDE METHODS, II WEDNESDAY, JULY 17, 2019

14-01 NDE MODELING FOR COMPOSITES 1

Lower Level, Clark

8:30am - 10:10am

Session Chair/Organizer: Thomas (C-P) Chiou

Session Co-Chair/Organizer:

8:30am - 8:50am

QNDE2019:6765

Ultrasonic Elastic Waves in a Fiber-Metal Laminate Structures in Presence of Defects

Author/Presenter: Steffen Tai

8:50am - 9:10am

QNDE2019:6896

A 2D Hybrid Approach To Model a Complexed Shaped Defect in an Ultrasonic Inspection Situation

Author/Presenter: Maria Semenova

9:10am - 9:30am

QNDE2019:6768

Elastodynamic Green's Functions for Layered Structures

Author/Presenter: Leonardo Araque

9:30am - 9:50am

QNDE2019:6970

Analysis of Guided Wave Propagation in Multilayered Structures

Author/Presenter: Yevgeniya Lugovtsova

9:50am - 10:10am

QNDE2019:6774

Modeling Flaw Pulse-echo Signals in Cylindrical Components Using an Ultrasonic Line Focused Transducer

Author/Presenter: Weixin Wang

14-02 FUNDAMENTALS OF ALL QNDE METHODS, II, 2

Lower Level, Clark

10:30am - 12:10pm

Session Chair/Organizer: Thomas (C-P) Chiou

Session Co-chair/Organizer:

10:30am - 10:50am

QNDE2019:6831

Numerical Simulation of Ultrasonic Wave Interaction With A Closed Crack of Different Orientations Under Various Prestresses

Author/Presenter: Maodan Yuan

10:50am - 11:10am

QNDE2019:6893

A Novel Ellipse Localization Method in Composite Plate Using Lamb Wave

Author/Presenter: Haode Huo

11:10am - 11:30am

QNDE2019:6760

A Plausibility Argument For Angular Ultrasonic Scattering In Fiber-Reinforced Composites

Author/Presenter: Patrick H. Johnston

TRACK 15 UT PHASED ARRAYS, I WEDNESDAY, JULY 17, 2019

15-01 UT PHASED ARRAYS, I, 1

Lower Level, Clackamas

8:30am - 10:10am

Session Chair/Organizer: Paul Wilcox

Session Co-chair/Organizer: Robert Addison

8:30am - 8:50am

QNDE2019:6752

Ultrasound array probe: signal processing in case of structural noise

Author/Presenter: Nicolas Paul

8:50am - 9:10am

QNDE2019:6935

Ultrasonic Immersion Testing For Depth Sizing Of Crack-like Defects In Large Diameter Pipes

Author/Presenter: Rosen Rachev

9:10am - 9:30am

QNDE2019:6821

Enhanced Characterisation of Branched Surface Breaking Cracks Using Multi-Mode Reverse Time Migration (MMRTM) Method

Author/Presenter: Abhishek Saini

9:30am - 9:50am

QNDE2019:6865

Geometrical full waveform inversion of defects

Author/Presenter: Fan Shi

9:50am - 10:10am

QNDE2019:6965

Defect Characterization Using Multi-View TFM Imaging Algorithm

Author/Presenter: Nicolas Budyn

15-02 UT PHASED ARRAYS, I, 2

Lower Level, Clackamas

10:30am - 12:10pm

Session Chair/Organizer: Paul Wilcox

Session Co-chair/Organizer: Robert Addison

10:30am - 10:50am

QNDE2019:7018

Adaptive TFM Imaging in Anisotropic Steels Using Optimization Algorithms Coupled to a Surrogate Model

Author/Presenter: Corentin Menard

10:50am - 11:10am

QNDE2019:7033

Multi-mode Imaging In The Fourier Domain For Fast Reconstruction Of Crack-Like Defects

Author/Presenter: Lucas Merabet

11:10am - 11:30am

QNDE2019:7055

On the Use of the Geometric Median in Ultrasonic Array Imaging

Author/Presenter: Nicolas Budyn

11:30am - 11:50am

QNDE2019:7059

Data Reconstruction for Sparse Scans and Arrays

Author/Presenter: Thomas Heckel

11:50am - 12:10pm

QNDE2019:6864

Prediction of TFM mode for realistic defects imaging

Author/Presenter: Kombossé Sy

Technical Sessions

TRACK 16 SENSORS, TRANSDUCERS AND PROBES, I WEDNESDAY, JULY 17, 2019

16-01 SENSORS, TRANSDUCERS AND PROBES, I, 1

Lower Level, Multnomah

8:30am - 10:10am

Session Chair/Organizer: Bernhard Tittmann

Session Co-Chair/Organizer:

8:30am - 8:50am

QNDE2019:6934

Towards an Improved Piezoelectric Fiber Patch for SH0 Guided Wave Generation

Author/Presenter: Yongtak Kim

8:50am - 9:10am

QNDE2019:6818

Design and Calculation of the Shear Horizontal Waves Magnetostrictive Patch Transducer Based on Wiedemann Effect

Author/Presenter: Xinfeng Guo

9:10am - 9:30am

QNDE2019:6741

Excitation of Pure SH1 Mode and Evaluation of Its Sensitivity to Very Shallow Crack-Like Defects

Author/Presenter: Pouyan Khalili

9:30am - 9:50am

QNDE2019:6791

Evaluation of FeCo Magnetostrictive Sensors for SHM of Components Operating in Harsh Environmental Conditions

Author/Presenter: Sergey Vinogradov

9:50am - 10:10am

QNDE2019:6908

Dry-Coupled Automated Inspection For Wire + Arc Additive Manufacture

Author/Presenter: Charles Macleod

16-02 SENSORS, TRANSDUCERS AND PROBES, I, 2

Lower Level, Multnomah

10:30am - 12:10pm

Session Chair/Organizer: Thomas (C-P) Chiou

Session Co-chair/Organizer:

10:30am - 10:50am

QNDE2019:6875

A Model-Based Study of Transmit-Receive Longitudinal Arrays for Inspection of Subsurface Defects

Author/Presenter: Ehsan Mohseni

10:50am - 11:10am

QNDE2019:7095

Field Deployable Spray-on Transducers for Lamb Wave Generation in High-Temperature Conditions

Author/Presenter: Bernhard Tittmann

11:10am - 11:30am

QNDE2019:7047

A Survey of Ultrasonic Piezoelectrics for High Temperatures

Author/Presenter: Bernhard Tittmann

11:30am - 11:50am

QNDE2019:7054

Magnetic Flux Leakage Based On-line Measurement Technology For Surface And Subsurface Flaws Detection In Heavy Steel Plates

Author/Presenter: Juseung Lee

11:50am - 12:10pm

QNDE2019:6801

Discriminating the defects in the insulator layer and metal surface using multi-electrode capacitive sensor

Author/Presenter: Zhen Li

12:10pm - 12:30pm

QNDE2019:6790

Evaluation of FeCo Magnetostrictive Sensors for SHM of Components Operating in Harsh Environmental Conditions

Author/Presenter: Sergey Vinogradov

TRACK 17 ALL SIGNAL PROCESSING TECHNIQUES WEDNESDAY, JULY 17, 2019

17-01 ALL SIGNAL PROCESSING TECHNIQUES, I, 1

Lower Level, Washington

8:30am - 10:10am

Session Chair/Organizer: Stephen D Holland

Session Co-chair/Organizer:

8:30am - 8:50am

QNDE2019:6887

Ultrasonic Flaw Recognition By Multi-Angle Phased Array Data Integration

Author/Presenter: Xinyan Wang

8:50am - 9:10am

QNDE2019:6915

An Ultrasonic Frequency Domain Imaging Algorithm Using Virtual Sources

Author/Presenter: Ewan Hoyle

9:10am - 9:30am

QNDE2019:6993

A Toolbox For Ultrasound Signal Processing And Image Reconstruction

Author/Presenter: Thiago A. R. Passarin

9:30am - 9:50am

QNDE2019:6758

A super-resolution approach of the total focusing method for resolving close flaws

Author/Presenter: Nans Laroche

17-02 ALL SIGNAL PROCESSING TECHNIQUES, I, 2

Lower Level, Washington

10:30am - 12:10pm

Session Chair/Organizer: Stephen D Holland

Session Co-chair/Organizer:

10:30am - 10:50am

QNDE2019:6762

Detection of flaws in close proximity using convolutional neural networks

Author/Presenter: Arthur Chapon

10:50am - 11:10am

QNDE2019:6846

Image-Based Ultrasound Speed Estimation for NDT in Homogeneous Media

Author/Presenter: Hector Lise de Moura

11:10am - 11:30am

QNDE2019:7055

Research On Vibration Signal Noise Suppression Method Based On Smoothing Filtering

Author/Presenter: Ning Liu

11:30am - 11:50am

QNDE2019:7036

Damage Detection In Stiffened Composite Structures With Wave Field Imaging Method

Author/Presenter: Kaihong Zheng

11:50am - 12:10pm

QNDE2019:6714

Evaluation of the effect of motion on ultrasonic signals acquired using coded excitation

Author/Presenter: Frederic Cegla

Technical Sessions

TRACK 18 STRUCTURAL HEALTH MONITORING (SHM) AND PROGNOSTICS, II WEDNESDAY, JULY 17, 2019

18-01 STRUCTURAL HEALTH MONITORING (SHM) AND PROGNOSTICS, II, 1

Lower Level, Clark

1:30pm - 3:10pm

Session Chair/Organizer: Simon Laflamme
Session Co-Chair/Organizer: Olivier Mesnil

1:30pm - 1:50pm

QNDE2019:7083

Influence Of Frequency And Damage Index Estimation Method On The Probability Of Detection Of Fatigue Cracks By A Sparse Array Shm System

Author/Presenter: Lucas Dorneles

1:50pm - 2:10pm

QNDE2019:6719

Quantitative Evaluation of Hypervelocity Debris Cloud-Induced Pitting Damage Using Nonlinear Ultrasonic Waves

Author/Presenter: Wuxiong Cao

2:10pm - 2:30pm

QNDE2019:6753

A Structural Integrity Informed Approach to Evaluating the Probability of Detection Obtained with Permanently-Installed Sensors

Author/Presenter: Michael Siu Hey Leung

2:30pm - 2:50pm

QNDE2019:6769

Laser Generated Lamb Wave and Canny Edge Technique for Automatically Locating Defects Occurred in Plates

Author/Presenter: Peter W. Tse

2:50pm - 3:10pm

QNDE2019:6731

Structural Health Monitoring of Reinforced Concrete Structures Using Guided Waves

Author/Presenter: Wilson Kairu

18-02 STRUCTURAL HEALTH MONITORING (SHM) AND PROGNOSTICS, II, 2

Lower Level, Clark

3:30pm - 5:30pm

Session Chair/Organizer: Simon Laflamme
Session Co-Chair/Organizer: Olivier Mesnil

3:30pm - 3:50pm

QNDE2019:6756

A Case Study for Simulation Assisted Guided Wave Structural Health Monitoring Of Aerospace Structures

Author/Presenter: Elizabeth Gregory

3:50pm - 4:10pm

QNDE2019:6763

Location Specific Temperature Compensation of Guided Wave Signals

Author/Presenter: Stefano Mariani

4:10pm - 4:30pm

QNDE2019:6889

Passive Guided Wave Tomography for Pipe Inspection

Author/Presenter: Tom Druet

4:30pm - 4:50pm

QNDE2019:6925

Guided wave imaging of a composite plate using passive acquisitions by fiber Bragg gratings on optical fibers

Author/Presenter: Tom Druet

4:50pm - 5:10pm

QNDE2019:6947

A Study of Environmental Effects on Long Term Guided Wave Structural Health Monitoring in Outdoor Conditions

Author/Presenter: Sungwon Kim

TRACK 19 NONLINEAR ULTRASONICS WEDNESDAY, JULY 17, 2019

19-01 NONLINEAR ULTRASONICS 1

Lower Level, Clackamas

1:30pm - 3:10pm

Session Chair/Organizer: Kathryn Matlack

Session Co-chair/Organizer:

1:30pm - 1:50pm

QNDE2019:6997

An Experimental Method for Mapping Acoustic Nonlinearity from Accumulated Plastic Strain Field

Author/Presenter: Changgong Kim

1:50pm - 2:10pm

QNDE2019:7069

Modeling and Experiments of Reflection Based Nonlinear Ultrasonic Inspections of Adhesive Bonds

Author/Presenter: Do-Kyung Pyun

2:10pm - 2:30pm

QNDE2019:7003

Nonlinear Harmonic Imaging of Solids Using Nonlinear Immersion Ultrasonics

Author/Presenter: Guillermo E. Huanes-Alvan

2:30pm - 2:50pm

QNDE2019:6941

Nonlinear Ultrasonic Technique for the Quantification of Dislocation Density in Additive Materials

Author/Presenter: Aurelio Bellotti

2:50pm - 3:10pm

QNDE2019:6920

Investigation and Comparison of Classical and Nonclassical Nonlinearity in Metals

Author/Presenter: Katherine Levy

19-02 NONLINEAR ULTRASONICS 2

Lower Level, Washington

3:30pm - 5:30pm

Session Chair/Organizer: Kathryn Matlack

Session Co-chair/Organizer:

3:30pm - 3:50pm

QNDE2019:6909

Towards in-situ determination of Rayleigh Wave Acoustoelastic Constants for Surface Treated Materials Characterization

Author/Presenter: Sergey Gartsev

3:50pm - 4:10pm

QNDE2019:6885

On Simultaneous Generation of SH0 and S0 Harmonics by the Excitation of SH0 Nonlinear Ultrasonic Wave Mode on Aluminium Plates: A Case Study

Author/Presenter: Krishnadas V. K.

4:10pm - 4:30pm

QNDE2019:6930

Linear/nonlinearity Ultrasonic measurement system for evaluation of material elastic properties

Author/Presenter: Dong-Gi Song

4:30pm - 4:50pm

QNDE2019:6794

The Sizing of Fatigue Cracks Using Non-linear Shear Wave Mixing Method

Author/Presenter: Hongtao Lyu

4:50pm - 5:10pm

QNDE2019:6840

Evaluation of Acoustic Nonlinearity of Heat-Treated Specimens Using a Pulse-echo Method

Author/Presenter: Hyunjo Jeong

5:10pm - 5:30pm

QNDE2019:7074

An Experimental study of One-way Mixing of Guided Waves in Circular Cylinders

Author/Presenter: Maoxun Sun

Technical Sessions

TRACK 20 CHARACTERIZATION OF COMPOSITES WEDNESDAY, JULY 17, 2019

20-01 CHARACTERIZATION OF COMPOSITES 1

Lower Level, Multnomah

1:30pm - 3:10pm

Session Chair/Organizer: Yuris Dzenis

Session Co-Chair/Organizer:

1:30pm - 1:50pm

QNDE2019:6884

Azimuthally Scanned Angle-Beam Pulse Echo Ultrasound for Characterization of Impact Damage in Composites

Author/Presenter: John T. Welter

1:50pm - 2:10pm

QNDE2019:6899

Simultaneous Characterization of Orthotropic Elastic and Attenuation Properties in Unidirectional Polymer Matrix Composite Panels

Author/Presenter: Tyler Lesthaeghe

2:10pm - 2:30pm

QNDE2019:6913

Calculation of Ultrasonic Reflection Spectrums of Bonded Composite Plates with Thick Adhesive Layers

Author/Presenter: Cunfu He

2:30pm - 2:50pm

QNDE2019:6800

Improvements to Ultrasonic Inspection of Delamination within Wavy Composites

Author/Presenter: Zhen Zhang

2:50pm - 3:10pm

QNDE2019:6991

Nanofocus X-Ray Computed Tomography And Ultrasonic Inspection Of Barely Visible Impact Damage In Carbon Fiber Reinforced Polymers

Author/Presenter: Elliott Jost

20-02 CHARACTERIZATION OF COMPOSITES 2

Lower Level, Multnomah

3:30pm - 5:30pm

Session Chair/Organizer: Yuris Dzenis

Session Co-Chair/Organizer:

3:30pm - 3:50pm

QNDE2019:6856

Electromagnetic Pulse-Induced Acoustic Testing for Metal/Composite or Metal/Plastics Adhesive Joints and Its Data Processing

Author/Presenter: Toshiyuki Takagi

3:50pm - 4:10pm

QNDE2019:6948

Finite Frequency Sensitivity Kernels for Microwave NDE of Metal-Composite Joints

Author/Presenter: Saptarshi Mukherjee

4:10pm - 4:30pm

QNDE2019:6918

Non-contact laser-based damage detection in composite laminates using local wavenumber estimation

Author/Presenter: Jakub Spytek

4:30pm - 4:50pm

QNDE2019:7090

Elastic Constants Identification of Composite Wind Blade Using Measured Strains and Displacements

Author/Presenter: Tai Yan Kam

TRACK 21 MATERIALS AND MICROSTRUCTURE CHARACTERIZATION, I WEDNESDAY, JULY 17, 2019

21-01 MATERIALS AND MICROSTRUCTURE CHARACTERIZATION, I, 1 Lower Level, Washington 1:30pm - 3:10pm

Session Chair/Organizer: Ajit Mal

Session Co-chair/Organizer: Krishnan Balasubramaniam

1:30pm - 1:50pm

QNDE2019:6759

On the suitability of different wave description models for ultrasonic characterisation of an austenitic stainless steel weld

Author/Presenter: Michal K. Kalkowski

1:50pm - 2:10pm

QNDE2019:6742

Finite Element Modelling of Shear Wave Propagation in Crystalline Materials

Author/Presenter: Bo Lan

2:10pm - 2:30pm

QNDE2019:7023

Analysis of Critically Refracted Longitudinal Waves Based on Focused Transducer

Author/Presenter: Zenghua Liu

2:30pm - 2:50pm

QNDE2019:6779

Grain size measurements using ultrasonic backscattering: Accuracy and Precision

Author/Presenter: Paul Panetta

21-02 MATERIALS AND MICROSTRUCTURE CHARACTERIZATION, I, 2 Lower Level, Washington 3:30pm - 5:30pm

Session Chair/Organizer: Ajit Mal

Session Co-chair/Organizer: Krishnan Balasubramaniam

3:30pm - 3:50pm

QNDE2019:6772

Transverse-to-Transverse Diffuse Ultrasonic Double Scattering

Author/Presenter: Yuantian Huang

3:50pm - 4:10pm

QNDE2019:6732

Elastic Wave Propagation in Polycrystals under Conditions of Strong Scattering

Author/Presenter: Ming Huang.

4:10pm - 4:30pm

QNDE2019:6912

Effect of microstructure and residual stress on the magnetic barkhausen noise signal

Author/Presenter: Xiucheng Liu

4:30pm - 4:50pm

QNDE2019:6921

Characterization of Electromagnetic Properties by Simulations Using the Double-Ridged Cavity

Author/Presenter: Guorong Song

4:50pm - 5:10pm

QNDE2019:7032

Reconstruction of 3D Grain Size Distribution Based on 2D Statistics

Author/Presenter: Musa Norouziyan

Technical Sessions

TRACK 22 UT PHASED ARRAYS, II THURSDAY, JULY 18, 2019

22-01 UT PHASED ARRAYS, II, 1

Lower Level, Clark

8:30am - 10:10am

Session Chair/Organizer: Paul Wilcox

Session Co-Chair/Organizer: Robert Addison

8:30am - 8:50am

QNDE2019:6778

Reversible Ultrasonic Imaging for Fast Scattering Matrix Extraction

Author/Presenter: Eduardo Lopez Villaverde

8:50am - 9:10am

QNDE2019:6870

Improving Ultrasonic Imaging In Complex Components Through Topological Imaging With Cycle-Skipping Eliminated

Author/Presenter: Elliott Wise

9:10am - 9:30am

QNDE2019:6717

What Is the Link Between Phased Array Imaging and Tomography?

Author/Presenter: Peter Huthwaite

9:30am - 9:50am

QNDE2019:6871

Compression For Ultrasonic Phased Array Imaging: Compressive Sensing and Wavelet Thresholding

Author/Presenter: Richard Pyle

9:50am - 10:10am

QNDE2019:6949

Volumetric Imaging Of Defects Through A Non-Planar Surface

Author/Presenter: Jessica McKee

22-02 UT PHASED ARRAYS, II, 2

Lower Level, Clark

10:30am - 12:10pm

Session Chair/Organizer: Paul Wilcox

Session Co-Chair/Organizer: Robert Addison

10:30am - 10:50am

QNDE2019:6805

Experimental Validation of A Phased Array Model Applied In Ultrasonic Inspection of AM Parts

Author/Presenter: Xiangyu Lei

10:50am - 11:10am

QNDE2019:6914

CIVA Calibration for Linear Scanning Phased Array Ultrasonic Testing

Author/Presenter: Matthew J McInnes

11:10am - 11:30am

QNDE2019:6900

Ultrasonic-based determination of immersed phased array setup variables

Author/Presenter: Rhodri Bevan

11:30am - 11:50am

QNDE2019:6926

Improved Defect Detection for Ultrasonic NDE and Imaging Based on Angle of Arrival (AOA) Estimation in Dimension-Reduced Beam-Space

Author/Presenter: Minghui Li

11:50am - 12:10pm

QNDE2019:6817

3D Simulations of a Phased Array Based Ultrasonic Polar Scan System

Author/Presenter: Jannes Daemen

TRACK 23 ALL SIGNAL PROCESSING TECHNIQUES, II AND DIGITAL TWIN OR DATA INTEGRATION
THURSDAY, JULY 18, 2019

23-01 ALL SIGNAL PROCESSING TECHNIQUES, II AND DIGITAL TWIN OR DATA INTEGRATION 1

Lower Level, Clackamas 8:30am - 10:10am

Session Chair/Organizer: Stephen D. Holland
Session Co-chair/Organizer:

8:30am - 8:50am

QNDE2019:6883

A Novel Automatic Defect Detection Method For The Ultrasonic Inspection Of Aircraft Composite Parts

Author/Presenter: Loïc Séguin-Charbonneau

8:50am - 9:10am

QNDE2019:6767

Damage Identification Method Based on Vibration for Lattice Truss Core Sandwich Panels

Author/Presenter: Jie Zhou

9:10am - 9:30am

QNDE2019:6825

Effects Of Ferromagnetic Plate Thickness Of Feature Signal Using Pulsed Uniform Eddy Current

Author/Presenter: Jianming Zhao

9:30am - 9:50am

QNDE2019:6749

Intelligent recognition and classification of defects using ACFM technique

Author/Presenter: Xin'an Yuan

9:50am - 10:10am

QNDE2019:7053

Early Rotor Blade Fault Detection in Multi-Stage Rotor System Based on Wavelet Analysis

Author/Presenter: Ahmed Abdelrhman

23-02 ALL SIGNAL PROCESSING TECHNIQUES, II AND DIGITAL TWIN OR DATA INTEGRATION 2

Lower Level, Clackamas 10:30am - 12:10pm

Session Chair/Organizer: Stephen D. Holland
Session Co-chair/Organizer:

10:30am - 10:50am

QNDE2019:6940

De-La-Mo: A Framework for Structural Analysis of Layered Composites with Defects

Author/Presenter: Onur Bingol

10:50am - 11:10am

QNDE2019:6944

Introducing Adaptive Vision-Guided Robotic Non-Destructive Inspection

Author/Presenter: Aamir Khan

11:10am - 11:30am

QNDE2019:7000

3D Machine Vision Technology for Automatic Data Integration of Ultrasonic Data

Author/Presenter: Rafael Radkowski

11:30am - 11:50am

QNDE2019:7009

SpatialNDE2: A Library to Facilitate the Use of Geometry in NDE Modeling and Data Analysis

Author/Presenter: Stephen D. Holland

11:50am - 12:10pm

QNDE2019:6817

3D Simulations of a Phased Array Based Ultrasonic Polar Scan System

Author/Presenter: Jannes Daemen

Technical Sessions

TRACK 24 NDE-SHM OIL & GAS INDUSTRY, I THURSDAY, JULY 18, 2019

24-01 NDE-SHM OIL & GAS INDUSTRY, I, 1

Lower Level, Multnomah

8:30am - 10:10am

Session Chair/Organizer: Yang Liu

Session Co-Chair/Organizer:

8:30am - 9:10am

QNDE2019:6726

Advanced Borehole Reflection Imaging and Applications

Author/Presenter: Xiaoming Tang

9:10am - 9:30am

QNDE2019:6973

Non-Contact Magnetic Characterization of Steel Structures

Author/Presenter: Aroba Saleem

9:30am - 9:50am

QNDE2019:6842

An Efficient Multi Sensing System for SHM Of Oil and Gas Pipelines

Author/Presenter: Deepak Kumar

9:50am - 10:10am

QNDE2019:6827

Simulated Annealing Based Polarization Optimization for Dual Mach-Zehnder Interferometer Fiber Vibration Sensor

Author/Presenter: Jian Li

24-02 NDE-SHM OIL & GAS INDUSTRY, I, 2

Lower Level, Multnomah

10:30am - 12:10pm

Session Chair/Organizer: Yang Liu

Session Co-Chair/Organizer:

10:30am - 10:50am

QNDE2019:6819

Capacitive Imaging Technique for Challenging NDE Problems in Oil and Gas Industry

Author/Presenter: Xiaokang Yin

10:50am - 11:10am

QNDE2019:6963

Evaluation Of Fatigue Cracks In Welded Parts Of Clad Pipelines By Means Of Eddy Current Testing

Author/Presenter: Cesar Camerini

11:10am - 11:30am

QNDE2019:6835

Cracks Detection in Heat Exchanger Tubes by Eddy Current Testing Using Computational Simulation

Author/Presenter: Joao Marcos Rebello

11:30am - 11:50am

QNDE2019:6841

Steering and Focusing Acoustic Modal Energy in Cased-wellbores

Author/Presenter: Yang Liu

11:50am - 12:10pm

QNDE2019:7062

Information Content In Pulsed Eddy Current Measurements For Evaluation Of Four And More Metallic Barriers In Oil And Gas Wells

Author/Presenter: Saad Omar

TRACK 25 NUCLEAR POWER NDE THURSDAY, JULY 18, 2019

25-01 NUCLEAR POWER NDE 1

Lower Level, Washington

8:30am - 10:10am

Session Chair/Organizer: Bill Glass, III

Session Co-chair/Organizer:

8:30am - 8:50am

QNDE2019:6933

An EMAT-based Approach to Locating and Sizing Defects in Large Welded Steel Plate Structures

Author/Presenter: Bruce Maxfield

8:50am - 9:10am

QNDE2019:6996

Channel Gap Measurements in Nuclear Plate Fuel

Author/Presenter: James Smith

9:10am - 9:30am

QNDE2019:7007

Liquid Water Sensing in Dry Cask Storage Systems by Guided Waves

Author/Presenter: Ryan Meyer

9:30am - 9:50am

QNDE2019:6980

Simultaneous Extraction of Multiple Parameters from a Transmit-Receive Eddy Current Probe above a Layered Planar Conductive Structure

Author/Presenter: Mark S. Luloff

9:50am - 10:10am

QNDE2019:6787

Capacitance Measurements for Nondestructive Testing of Aged Nuclear Power Plant Cable

Author/Presenter: Bill Glass, III

TRACK 26 STRESS WAVE BASED NDE FOR STRUCTURES THURSDAY, JULY 18, 2019

26-01 STRESS WAVE BASED NDE FOR STRUCTURES 1

Lower Level, Washington

10:30am - 12:10am

Session Chair/Organizer: Thomas Schumacher

Session Co-chair/Organizer: John S. Popovics

10:30am - 10:50am

QNDE2019:7040

Detection of ASR Damage in Concrete Using Contactless Ultrasonic Scanning

Author/Presenter: John S. Popovics

10:50am - 11:10am

QNDE2019:6910

Ultrasonic Surface Wave in Concrete: Sensitivity Analysis of Phase Velocity Derivative

Author/Presenter: Ao Wang

11:10am - 11:30am

QNDE2019:7079

Capturing Minute Stress Changes and Residual Stresses in Structural Concrete Using the Ultrasonic Coda Wave Comparison Technique

Author/Presenter: Ali Hafiz

11:30am - 11:50am

QNDE2019:7017

A Review on Ultrasonic Monitoring of Concrete: Coda Wave Interferometry and Beyond

Author/Presenter: Ernst Niederleithinger

Technical Sessions

TRACK 27 SENSORS, TRANSDUCERS AND PROBES, II THURSDAY, JULY 18, 2019

27-01 SENSORS, TRANSDUCERS AND PROBES, II, 1

Lower Level, Clark

1:30pm - 3:10pm

Session Chair/Organizer: Thomas Krause

Session Co-Chair/Organizer:

1:30pm - 1:50pm

QNDE2019:6782

Frequency Optimisation for MFL Imaging Using QWHE Sensors

Author/Presenter: James Watson

1:50pm - 2:10pm

QNDE2019:7015

Ultrasonic Thickness Measurements Using Machine Learning

Author/Presenter: Caleb Garcia

2:10pm - 2:30pm

QNDE2019:7068

Fem Modeling and Sensitivity Study for Low Frequency Multilayer Donut Probe Inspections

Author/Presenter: Nicholas Van Zandt

2:30pm - 2:50pm

QNDE2019:6995

Eddy Current Array Inspection of Damaged CFRP Sandwich Panels

Author/Presenter: P. Ross Underhill

2:50pm - 3:10pm

QNDE2019:7011

Orientation Control of an Ultrasonic Soft Contact Probe Based on Neuro-Fuzzy Networks

Author/Presenter: Ludivina Facundo

TRACK 28 MATERIALS AND MICROSTRUCTURE CHARACTERIZATION, II AND METAMATERIALS THURSDAY, JULY 18, 2019

28-01 MATERIALS AND MICROSTRUCTURE CHARACTERIZATION, II AND METAMATERIALS 1

Lower Level, Clackamas

1:30pm - 3:10pm

Session Chair/Organizer: Ajit Mal

Session Co-Chair/Organizer: Krishnan Balasubramaniam

1:30pm - 1:50pm

QNDE2019:6906

TFM-Imaging of Side Drilled Holes Clusters: Study of Multiple Scattering Effects to Improve the Characterization of Fatigue Failure Criteria

Author/Presenter: Julien Vasseur

1:50pm - 2:10pm

QNDE2019:7050

Development of the Ultra High-Resolution Acoustic Microscopy System for Precision Diagnosis on Hidden Damage of Micro/Nano Structure

Author/Presenter: Ik Keun Park

2:10pm - 2:30pm

QNDE2019:7041

Laboratory Characterization of Carbon-exposed Sandstone

Author/Presenter: John S. Popovics

2:30pm - 2:50pm

QNDE2019:6953

Progress on Characterization of Complex Surface-Breaking and Sub-Surface Discontinuities Using Eddy Current Nondestructive Evaluation and Model-Based Inversion

Author/Presenter: Erin K. Oneida

TRACK 29 ADDITIVE MANUFACTURING AND OTHER ADVANCES THURSDAY, JULY 18, 2019

29-01 ADDITIVE MANUFACTURING AND OTHER ADVANCES 1

Lower Level, Multnomah

1:30pm - 3:10pm

Session Chair/Organizer: Lucas Koester

Session Co-chair/Organizer:

1:30pm - 1:50pm

QNDE2019:6984

Probability of Detection of X-Ray Computed Tomography of Additive Manufacturing Defects

Author/Presenter: Felix H. Kim

1:50pm - 2:10pm

QNDE2019:6860

Porosity Evaluation of Additive Manufactured Parts using Ultrasonic Nondestructive Testing

Author/Presenter: Seonghyun Park

2:10pm - 2:30pm

QNDE2019:6750

Improved Laser Ultrasonic Inspection for Additive Manufacturing by Incorporating Surface Profiling

Author/Presenter: Arno Volker

2:30pm - 2:50pm

QNDE2019:6777

Inspection of Additive Manufactured Samples with Computed Tomography

Author/Presenter: Rainer Stoessel

2:50pm - 3:10pm

QNDE2019:6979

Ultrasonic Nondestructive Characterization of Hybrid Additively Manufactured 420 Stainless Steel made with Directed Energy Deposition

Author/Presenter: Luz D. Sotelo

28-02 MATERIALS AND MICROSTRUCTURE CHARACTERIZATION, II AND METAMATERIALS 2

Lower Level, Clackamas

3:30pm - 5:30pm

Session Chair/Organizer: Ajit Mal

Session Co-chair/Organizer: Krishnan Balasubramaniam

3:30pm - 3:50pm

QNDE2019:6911

Towards a better understanding of GIUM microstructure characterisation by grain-scale finite element simulation

Author/Presenter: Michal K. Kalkowski

3:50pm - 4:10pm

QNDE2019:6832

Induction Infrared Thermography for Non-Destructive Evaluation of Alloy Sensitization

Author/Presenter: Matthew Roberts

4:10pm - 4:30pm

QNDE2019:6755

Basic Considerations in the Use of the 3MA System for the Assessment of Al-Si Coated Press Hardened Steels

Author/Presenter: Philip Meilland

4:30pm - 4:50pm

QNDE2019:6968

Model Based Study Of A Metamaterial Lens For NDE Of Composites

Author/Presenter: Srijan Datta

4:50pm - 5:10pm

QNDE2019:7061

Focusing of Elastic Waves in Bulk Media using Add-on Concentric Cylindrical Shells

Author/Presenter: Sai Aditya Raman Kuchibhatla

5:10pm - 5:30pm

QNDE2019:7067

Development of a Localized Resonance Measurement System Using Laser-Based Ultrasound Generation

Author/Presenter: Matthew Cherry

29-02 ADDITIVE MANUFACTURING AND OTHER ADVANCES 2

Lower Level, Multnomah

3:30pm - 5:30pm

Session Chair/Organizer: Lucas Koester

Session Co-chair/Organizer:

3:30pm - 3:50pm

QNDE2019:6985

In Situ Ultrasonic Characterization of Ti6Al4V parts made with Directed Energy Deposition Additive Manufacturing using Hybrid Capabilities

Author/Presenter: Luz D. Sotelo

3:50pm - 4:10pm

QNDE2019:6784

Performance Degradation Evaluation of Ferromagnetic Materials based on Magneto-acoustic Compounding Inspection Technique

Author/Presenter: Zenghua Liu

4:10pm - 4:30pm

QNDE2019:6849

Study of Second Higher -Harmonic Waves Generation Caused by Fatigue Cracks: The Measurement of Resonant Higher Harmonics and Natural Vibrations Caused by Cracks

Author/Presenter: Kosuke Kanda

4:30pm - 4:50pm

QNDE2019:6888

Exploring Parametric-Manifolds for Eddy-Current Defect Characterisation

Author/Presenter: Robert Hughes

4:50pm - 5:10pm

QNDE2019:7086

Simulation of an Instrumented Ultrasonic Test Run with a Rail Inspection Train

Author/Presenter: Thomas Heckel

TRACK 30 NDE-SHM OIL & GAS INDUSTRY, II

THURSDAY, JULY 18, 2019

30-01 NDE-SHM OIL & GAS INDUSTRY, II, 1

Lower Level, Washington

1:30pm - 3:10pm

Session Chair/Organizer: Yang Liu

Session Co-Chair/Organizer:

1:30pm - 2:10pm

QNDE2019:7093

On Adoption of Cloud Computing and Machine Learning for the Interpretation of Subsurface Measurements Data

Author/Presenter: Smaine Zeroug

2:10pm - 2:30pm

QNDE2019:6798

Research on Three-dimensional Information Acquisition of Changes in the Pipe Cross Section based on Circumferential Scanning and Phase Characteristics

Author/Presenter: Weixu Liu

2:30pm - 2:50pm

QNDE2019:6781

Semi-Analytical Finite Element Based Guided Wave Modelling and Applications in NDE, Seismology and Oil & Gas

Author/Presenter: Zheng Fan

2:50pm - 3:10pm

QNDE2019:6923

Investigation of the circumferential Guided Waves Propagation in Functionally Graded Hollow Cylinders by State Vector Formalism and Legendre Polynomial Hybrid Method

Author/Presenter: Jie Gao

30-02 NDE-SHM OIL & GAS INDUSTRY, II, 2

Lower Level, Multnomah

3:30pm - 5:30pm

Session Chair/Organizer: Yang Liu

Session Co-Chair/Organizer:

3:30pm - 3:50pm

QNDE2019:6721

Progress on the development of magnetostrictive patch transducers for ultrasonic guided waves inspection

Author/Presenter: Zenghua Liu

3:50pm - 4:10pm

QNDE2019:6710

Ultrasonic Nondestructive Testing and Insite Control of Welding Residual Stress of Pipeline by High-Energy Guided Wave

Author/Presenter: Chunguang Xu

4:10pm - 4:30pm

QNDE2019:6723

Modeling Casedhole Lamb-Wave Characteristics for an Oriented Transmitter and Receiver System

Author/Presenter: Xuelian Chen

4:50pm - 5:10pm

QNDE2019:6757

Pipeline Magnetic Shield Modeling for Deformation and Displacement Detection

Author/Presenter: Yu Zhang

Author Index

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Abdelrhman	Ahmed	23-1	QNDE2019-7053	Araque	Leonardo	14-1	QNDE2019-6768
Abraham	Odile	2-1	QNDE2019-6837	Araujo	Olga Maria		QNDE2019-6833
Abraham	Odile	26-1	QNDE2019-6910	Araujo	Olga Maria		QNDE2019-6975
Abraham	Odile	26-1	QNDE2019-7017	Araujo	Olga Maria		QNDE2019-6992
Adams	Daniel O.	18-2	QNDE2019-6947	Arretche	Ignacio	9-1	QNDE2019-6994
Adebisi	Rasheed	28-2	QNDE2019-7067	Artusi	Xavier	13-1	QNDE2019-6932
Ahmad	Iftikhar	23-1	QNDE2019-7053	Bachman III	William	8-1	QNDE2019-6967
Ahmadi	Samim	7-2	QNDE2019-6874	Balasubramaniam	Krishnan		QNDE2019-6715
Ahmadi	Samim	9-1	QNDE2019-6882	Balasubramaniam	Krishnan	9-1	QNDE2019-6859
Ahmed	Shafique	5-1	QNDE2019-7078	Balasubramaniam	Krishnan	9-1	QNDE2019-6943
Aldrin	John	3-1	QNDE2019-6977	Balasubramaniam	Krishnan	9-1	QNDE2019-6746
Aldrin	John	8-1	QNDE2019-6881	Balasubramaniam	Krishnan	9-1	QNDE2019-6793
Aldrin	John	8-2	QNDE2019-7038	Balasubramaniam	Krishnan	19-2	QNDE2019-6885
Aldrin	John	10-1	QNDE2019-6876	Baltazar	Arturo	27-1	QNDE2019-7015
Aldrin	John	10-1	QNDE2019-6902	Baltazar	Arturo	27-1	QNDE2019-7011
Aldrin	John	13-1	QNDE2019-6892	Banerjee	Portia	5-2	QNDE2019-6999
Aldrin	John	20-1	QNDE2019-6884	Banerjee	Sourav	5-1	QNDE2019-6839
Aldrin	John	27-1	QNDE2019-7068	Barden	Tim	3-1	QNDE2019-6708
Aldrin	John	28-1	QNDE2019-6953	Barnard	Daniel	8-1	QNDE2019-7005
Alnuaimi	Hamad N.	5-2	QNDE2019-7035	Barnard	Daniel	8-1	QNDE2019-7006
Amato	Silvio	6-1	QNDE2019-6891	Barnard	Daniel	11-1	QNDE2019-7089
Amaya	Kimihiko	5-2	QNDE2019-6877	Barnard	Daniel	19-1	QNDE2019-7069
Ambrozinski	Lukasz	4-1	QNDE2019-6862	Barnard	Daniel	19-1	QNDE2019-7003
Ambrozinski	Lukasz	4-2	QNDE2019-6867	Barrett	Ian	28-2	QNDE2019-7067
Ambrozinski	Lukasz	9-1	QNDE2019-6971	Barth	Martin	28-2	QNDE2019-6911
Amjad	Umar	5-2	QNDE2019-7035	Bastos	Luan		QNDE2019-6975
Ang	Yi Feng	20-1	QNDE2019-6800	Bastos	Luan		QNDE2019-6992
Angel Vicente Cabrera	Miguel	9-1	QNDE2019-7016	Belanger	Pierre		QNDE2019-6730
Araque	Leonardo	6-1	QNDE2019-6766	Belanger	Pierre	1-2	QNDE2019-6744

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Bélanger	Pierre	17-2	QNDE2019-6762	Budyn	Nicolas	15-2	QNDE2019-7055
Bellotti	Aurelio	19-1	QNDE2019-6941	Budyn	Nicolas	22-2	QNDE2019-6900
Bevan	Rhodri	15-1	QNDE2019-6965	Bueno	Clifford	6-1	QNDE2019-6998
Bevan	Rhodri	22-1	QNDE2019-6871	Bulling	Jannis	14-1	QNDE2019-6970
Bevan	Rhodri	22-1	QNDE2019-6949	Burgholzer	Peter	7-2	QNDE2019-6874
Bevan	Rhodri	22-2	QNDE2019-6900	Burgholzer	Peter	9-1	QNDE2019-6882
Biedermann	Eric	8-1	QNDE2019-6967	C T	Manjunath	28-2	QNDE2019-7061
Biedermann	Eric	8-2	QNDE2019-7038	Caire	Giuseppe	7-2	QNDE2019-6874
Bingol	Onur	23-2	QNDE2019-6940	Caire	Giuseppe	9-1	QNDE2019-6882
Birir	John Kiprotich	9-1	QNDE2019-6901	Calmon	Pierre	13-1	QNDE2019-6932
Bischof	Daniel	2-1	QNDE2019-6838	Calmon	Pierre	15-2	QNDE2019-7018
Bishop	Joseph E.	19-1	QNDE2019-6941	Camerini	Cesar	6-2	QNDE2019-6966
Blandford	Benjamin	20-1	QNDE2019-6991	Camerini	Cesar	24-2	QNDE2019-6963
Bobbs	Brad	29-1	QNDE2019-6750	Campos	Lucas	6-2	QNDE2019-6966
Bodine	Nathanael	9-1	QNDE2019-6956	Campos	Lucas	24-2	QNDE2019-6963
Boehm	Rainer	15-2	QNDE2019-7059	Candido	Filipe B. G.	17-1	QNDE2019-6993
Boller	Christian	14-1	QNDE2019-6970	Cao	Wuxiong	18-1	QNDE2019-6719
Bond	Leonard	11-1	QNDE2019-7044	Carcreff	Ewen	4-1	QNDE2019-6863
Bond	Leonard	11-1	QNDE2019-7089	Carcreff	Ewen	17-1	QNDE2019-6758
Bond	Leonard	19-1	QNDE2019-7069	Cartier	François	15-2	QNDE2019-7033
Bose	Sandip	24-2	QNDE2019-6841	Cawley	Peter	1-2	QNDE2019-6725
Bourguignon	Sébastien	17-1	QNDE2019-6758	Cawley	Peter	3-2	QNDE2019-6764
Boutaleb	Nabil	3-1	QNDE2019-6977	Cawley	Peter	18-1	QNDE2019-6753
Bowler	Nicola	25-1	QNDE2019-6787	Cawley	Peter	18-2	QNDE2019-6763
Braconnier	Dominique	4-1	QNDE2019-6863	Cegla	Frederic	4-1	QNDE2019-6733
Braconnier	Dominique	17-1	QNDE2019-6758	Cegla	Frederic	16-1	QNDE2019-6741
Brault	Michelle	6-1	QNDE2019-6998	Cegla	Frederic	7-2	QNDE2019-6714
Brown	Nicholas	9-1	QNDE2019-7016	Cetrangolo	Gonzalo	6-2	QNDE2019-6707
Budyn	Nicolas	15-1	QNDE2019-6965	Cha	Gichun	2-2	QNDE2019-6858

Author Index

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Chaix	Jean-François	2-1	QNDE2019-6837	Cherry	Matthew	28-1	QNDE2019-6953
Chaki	Salim	28-1	QNDE2019-6906	Cherry	Matthew	28-2	QNDE2019-7067
Chakrapani	Sunil Kishore	8-1	QNDE2019-7005	Chiang	Chih-Hung	9-1	QNDE2019-7094
Chakrapani	Sunil Kishore	8-1	QNDE2019-7006	Chilukuri	Aditya	9-1	QNDE2019-6746
Chakrapani	Sunil Kishore	9-1	QNDE2019-7034	Chiou	Thomas (C-P)	12-1	QNDE2019-7092
Chakrapani	Sunil Kishore	9-1	QNDE2019-6989	Cho	Sungjong	19-2	QNDE2019-6840
Chakrapani	Sunil Kishore	19-1	QNDE2019-7003	Choi	Se-ho	16-2	QNDE2019-7054
Chambers	Janelle K.	8-1	QNDE2019-6881	Choi	Sunggho	9-1	QNDE2019-6854
Chang	Yu	4-1	QNDE2019-6712	Choi	Sunggho	9-1	QNDE2019-6855
Chapon	Arthur	17-2	QNDE2019-6762	Choi	Sunggho	19-2	QNDE2019-6930
Chapuis	Bastien	3-1	QNDE2019-7056	Choi	Sunggho	29-1	QNDE2019-6860
Chapuis	Bastien	13-1	QNDE2019-6932	Chua	Chien A.	1-2	QNDE2019-6725
Chapuis	Bastien	18-2	QNDE2019-6889	Clarke	Thomas	18-1	QNDE2019-7083
Chapuis	Bastien	18-2	QNDE2019-6925	Cobb	Adam	16-1	QNDE2019-6791
Charlton	Peter	17-1	QNDE2019-6915	Contant	Stephane	25-1	QNDE2019-6980
Chavan	Somnath	4-2	QNDE2019-6716	Corcoran	Joseph		QNDE2019-6786
Chen	An	5-1	QNDE2019-6955	Corcoran	Joseph	18-1	QNDE2019-6753
Chen	Guoming	9-1	QNDE2019-7029	Correas	Monica	24-2	QNDE2019-6835
Chen	Guoming	9-1	QNDE2019-6826	Cottle	David	25-1	QNDE2019-6996
Chen	Guoming	16-2	QNDE2019-6801	Coutinho	Leandro	18-1	QNDE2019-7083
Chen	Guoming	23-1	QNDE2019-6825	Cramer	K. Elliott	7-1	QNDE2019-6728
Chen	Guoming	24-2	QNDE2019-6819	Craster	Richard	8-2	QNDE2019-6739
Chen	Jianlin	17-2	QNDE2019-7036	Croxford	Anthony J.	2-2	QNDE2019-6951
Chen	Xuelian	30-2	QNDE2019-6723	Croxford	Anthony J.	15-1	QNDE2019-6965
Chen	Zhengyu	29-2	QNDE2019-6784	Croxford	Anthony J.	19-2	QNDE2019-6794
Cheng	Fang	20-1	QNDE2019-6800	Croxford	Anthony J.	22-1	QNDE2019-6778
Cheng	Weiyang	6-2	QNDE2019-7052	Croxford	Anthony J.	22-2	QNDE2019-6900
Cherry	Matthew	3-2	QNDE2019-6788	Daemen	Jannes	22-2	QNDE2019-6817
Cherry	Matthew	27-1	QNDE2019-7068	Dagel	Amber L.	11-1	QNDE2019-7071

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
d'Almeida	Ana Lucia	6-2	QNDE2019-6966	Doshi	Sagar	5-1	QNDE2019-7078
d'Almeida	Oscar	3-1	QNDE2019-7056	Dotta	Fernando	18-1	QNDE2019-7083
d'Almeida	Oscar	13-1	QNDE2019-6932	Downey	Austin	5-1	QNDE2019-6955
d'Almeida	Oscar	18-2	QNDE2019-6925	Downey	Austin	5-1	QNDE2019-6839
D'Angelo	Ralph	24-2	QNDE2019-6841	Downs	Andrew	9-1	QNDE2019-7057
Datta	Srijan	12-1	QNDE2019-7010	Drillet	Pascal	28-2	QNDE2019-6755
Datta	Srijan	28-2	QNDE2019-6968	Drinkwater	Bruce	2-2	QNDE2019-6951
Davis	Geo	9-1	QNDE2019-6859	Drinkwater	Bruce	29-2	QNDE2019-6888
De Man	Bruno	6-1	QNDE2019-6998	Druet	Tom	18-2	QNDE2019-6889
de Moura	Hector L.	17-1	QNDE2019-6993	Druet	Tom	18-2	QNDE2019-6925
de Moura	Hector Lise	17-2	QNDE2019-6846	Du	Hualong	21-1	QNDE2019-6779
de Souza	Andreia R.	17-1	QNDE2019-6993	Du	Xiaosong	3-2	QNDE2019-7064
Delrue	Steven	22-2	QNDE2019-6817	Du	Xiaosong	9-1	QNDE2019-7065
Demaldent	Edouard	10-1	QNDE2019-6866	Du	Xiaosong	13-1	QNDE2019-7063
Deng	Yiming	5-2	QNDE2019-6976	Duclos	Aroune	17-1	QNDE2019-6758
Deng	Yiming	9-1	QNDE2019-7034	Dupont	Benoît	28-1	QNDE2019-6906
Deng	Yiming	12-1	QNDE2019-7010	Durville	Benoît	2-1	QNDE2019-6785
Deng	Yiming	24-1	QNDE2019-6842	Dvorsky	Matthew	12-1	QNDE2019-6957
Deng	Yiming	28-2	QNDE2019-6968	Dziedziech	Kajetan	20-2	QNDE2019-6918
Dentinger	Aaron	6-1	QNDE2019-6998	Eckel	Sebastian	11-1	QNDE2019-6711
Devkota	Jagannath	12-1	QNDE2019-6783	Eddy	Ian C.	2-1	QNDE2019-7001
Ding	Jialou	16-1	QNDE2019-6908	Eisch	Jonathan	11-1	QNDE2019-7089
Dixon	Steven	6-1	QNDE2019-6891	Epstein	Collin	11-1	QNDE2019-7071
Dobie	Gordon	23-2	QNDE2019-6944	Facundo	Ludivina	27-1	QNDE2019-7015
Dobson	Jeff	10-1	QNDE2019-7104	Facundo	Ludivina	27-1	QNDE2019-7011
Domenech	Leandro	6-2	QNDE2019-6707	Fahse	Daniel Niklas	9-1	QNDE2019-7004
Donmez	Alkan	29-1	QNDE2019-6984	Fan	Junwei	30-2	QNDE2019-6721
Donnell	Kristen M.	2-1	QNDE2019-6838	Fan	Zheng	15-1	QNDE2019-6821
Dorneles	Lucas	18-1	QNDE2019-7083	Fan	Zheng	30-1	QNDE2019-6987

Author Index

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Fan	Zheng	30-1	QNDE2019-6781	Gao	Fei	6-1	QNDE2019-6766
Fang	Jinwei	15-1	QNDE2019-6821	Gao	Jie	30-1	QNDE2019-6923
Feng	Hao	24-1	QNDE2019-6827	Gao	Yuan	12-1	QNDE2019-6917
Feng	Hao	30-2	QNDE2019-6757	Garcia	Caleb	27-1	QNDE2019-7015
Ferre	Antoine	15-1	QNDE2019-6752	Garnier	Vincent	2-1	QNDE2019-6751
Ferreira	Cintia		QNDE2019-6833	Garnier	Vincent	2-1	QNDE2019-6785
Fifield	Leonard S.	25-1	QNDE2019-6787	Garnier	Vincent	2-1	QNDE2019-6837
Fisher	Jay	16-1	QNDE2019-6791	Garrett	Tim	23-2	QNDE2019-7000
Fitzgerald	Paul F	6-1	QNDE2019-6998	Garriga-Casanovas	Arnau	4-1	QNDE2019-6733
Forsyth	David	13-1	QNDE2019-6892	Gartsev	Sergey	19-2	QNDE2019-6909
Foster	Euan	4-2	QNDE2019-6964	Gatari	Michael J.	9-1	QNDE2019-6901
Fox	Jason	29-1	QNDE2019-6984	Gatari	Michael J.	9-1	QNDE2019-6747
Freed	Shaun	7-2	QNDE2019-6960	Gatari	Michael J.	18-1	QNDE2019-6731
Frishman	Anatoli	7-1	QNDE2019-7013	Georgantopoulou	Christina	23-1	QNDE2019-7053
Fromme	Paul		QNDE2019-6939	Ghasr	Mohammad Tayeb	2-1	QNDE2019-6838
Fromme	Paul	9-1	QNDE2019-6905	Ghasr	Mohammad Tayeb	12-1	QNDE2019-6917
Fromme	Paul	11-1	QNDE2019-6937	Glass, III	Bill	25-1	QNDE2019-7007
Fu	Jiaming	9-1	QNDE2019-7029	Glass, III	Bill	25-1	QNDE2019-6787
Fu	Lin	6-1	QNDE2019-6998	Glover	Alison	22-2	QNDE2019-6914
Fuchs	Brian	9-1	QNDE2019-6942	Goletz	Marius M.	9-1	QNDE2019-6959
Fukuda	Masato	5-2	QNDE2019-6877	Good	Morris	25-1	QNDE2019-7007
Gachagan	Anthony	4-2	QNDE2019-6903	Goodner	Ryan N.	11-1	QNDE2019-7071
Gachagan	Anthony	4-2	QNDE2019-6964	Gopalakrishnan	Karthik	9-1	QNDE2019-7034
Gachagan	Anthony	16-1	QNDE2019-6908	Green	William H.	11-1	QNDE2019-7091
Gachagan	Anthony	16-2	QNDE2019-6875	Gregory	ELizabeth	7-2	QNDE2019-7030
Gachagan	Anthony	22-2	QNDE2019-6914	Gregory	ELizabeth	18-2	QNDE2019-6756
Gagliani	Roberto	25-1	QNDE2019-6787	Grigorieva	Raisa	28-2	QNDE2019-6755
Galbraith	Walter	4-2	QNDE2019-6903	Gu	Yue	16-2	QNDE2019-6801
Gandhi	Harsh	2-2	QNDE2019-6983	Guan	Shanyue	5-1	QNDE2019-6836

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Guan	Xuefei	17-1	QNDE2019-6887	He	Cunfu	21-2	QNDE2019-6912
Guarneri	Giovanni A.	17-1	QNDE2019-6993	He	Cunfu	21-2	QNDE2019-6921
Guarneri	Giovanni A.	17-2	QNDE2019-6846	He	Cunfu	29-2	QNDE2019-6784
Guerreiro	Marco T. L.	17-1	QNDE2019-6993	He	Cunfu	30-1	QNDE2019-6923
Guo	Xinfeng	16-1	QNDE2019-6818	He	Cunfu	30-2	QNDE2019-6721
Guo	Xu	2-2	QNDE2019-6983	He	Dongfeng	2-2	QNDE2019-6879
Gurrala	Praveen	9-1	QNDE2019-7065	He	Jingjing	14-2	QNDE2019-6893
Gurrala	Praveen	13-1	QNDE2019-7063	Heckel	Thomas	15-2	QNDE2019-7059
Guy	Philippe	6-2	QNDE2019-6706	Heckel	Thomas	29-2	QNDE2019-7086
Guzas	Emily L	28-2	QNDE2019-6832	Heffernan	Julieanne	8-2	QNDE2019-7038
Gyuk	Geza	3-1	QNDE2019-6977	Hénault	Jean-Marie	2-1	QNDE2019-6837
Hadidi	Haitham	29-1	QNDE2019-6979	Hirsch	Philipp	7-2	QNDE2019-6874
Hafiz	Ali	26-1	QNDE2019-7079	Hirsch	Philipp	9-1	QNDE2019-6882
Hamaoka	Koji	5-2	QNDE2019-6877	Hoang	Huu Tinh	18-2	QNDE2019-6889
Hameed	M. Saqib	17-2	QNDE2019-7036	Holland	Stephen D	7-1	QNDE2019-7012
Han	Xiaoyan	7-1	QNDE2019-6844	Holland	Stephen D	7-1	QNDE2019-7013
Han	Xiaoyan	7-2	QNDE2019-7008	Holland	Stephen D	23-2	QNDE2019-6940
Harley	Joel B.	3-1	QNDE2019-6978	Holland	Stephen D	23-2	QNDE2019-7000
Harley	Joel B.	18-2	QNDE2019-6947	Holland	Stephen D	23-2	QNDE2019-7009
Hashizume	Hidetoshi	6-2	QNDE2019-7052	Holmes	Aimee	13-1	QNDE2019-6807
Haslinger	Stewart	8-2	QNDE2019-6739	Homa	Laura	3-2	QNDE2019-6788
Hassan	Waled	6-2	QNDE2019-6952	Honarvar	Mike	29-1	QNDE2019-6750
Hassan	Waled	8-2	QNDE2019-6735	Hong	Jungyeon	19-2	QNDE2019-6930
Hassan	Waled	21-1	QNDE2019-6779	Hong	Seonguk	9-1	QNDE2019-6814
Hauptert	Sylvain	4-1	QNDE2019-6863	Hornung	Mirko	1-2	QNDE2019-7021
He	Cunfu	1-2	QNDE2019-6872	Horpin	Margaux	18-2	QNDE2019-6925
He	Cunfu	4-1	QNDE2019-6712	Howell	Patricia	7-1	QNDE2019-6761
He	Cunfu	20-1	QNDE2019-6913	Hoyle	Ewan	17-1	QNDE2019-6915
He	Cunfu	21-1	QNDE2019-7023	Hsu	Keng-Tsang	9-1	QNDE2019-7094

Author Index

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Hsu	Keng-Tsang	9-1	QNDE2019-7096	Huthwaite	Peter	22-1	QNDE2019-6717
Hu	Ping	6-1	QNDE2019-6773	Hutson	Alisha L.	28-1	QNDE2019-6953
Hu	Yanan	30-2	QNDE2019-6721	Idier	Jérôme	17-1	QNDE2019-6758
Huan	Qiang	9-1	QNDE2019-6718	Imperiale	Alexandre	10-1	QNDE2019-6866
Huanes-Alvan	Guillermo E.	8-1	QNDE2019-7006	Ishikawa	Masashi	9-1	QNDE2019-7080
Huanes-Alvan	Guillermo E.	9-1	QNDE2019-6989	Ishikawa	Masashi	9-1	QNDE2019-7081
Huanes-Alvan	Guillermo E.	19-1	QNDE2019-7003	Islam	Showmic	8-2	QNDE2019-6735
Huang	Chi-Luen	8-1	QNDE2019-7042	Islam	Showmic	8-2	QNDE2019-7031
Huang	Ming	21-1	QNDE2019-6742	Jack	David	20-1	QNDE2019-6991
Huang	Ming	21-2	QNDE2019-6732	Jacobs	Laurence	9-1	QNDE2019-6958
Huang	Pin-Han	9-1	QNDE2019-7094	Jacobs	Laurence	9-1	QNDE2019-6959
Huang	Xinjing	30-2	QNDE2019-6757	Jacobs	Laurence	9-1	QNDE2019-6942
Huang	XuHui	5-2	QNDE2019-6976	Jacobs	Laurence	9-1	QNDE2019-7004
Huang	Yuantian	21-2	QNDE2019-6772	Jacobs	Laurence	19-1	QNDE2019-6941
Hughes	Robert	29-2	QNDE2019-6888	Jacobs	Laurence	19-1	QNDE2019-6920
Huo	Haode	14-2	QNDE2019-6893	Jamoussi	Anouar	25-1	QNDE2019-6933
Huo	Zhilin	29-2	QNDE2019-6784	Jared	Bradley H.	19-1	QNDE2019-6941
Hurst	David	3-1	QNDE2019-6977	Jasi?nien?	Elena	6-1	QNDE2019-6891
Huser	Ben	7-1	QNDE2019-7012	Jauriqui	Leanne	8-2	QNDE2019-7038
Hutchins	David A.	6-1	QNDE2019-6891	Javadi	Yashar	4-2	QNDE2019-6964
Hutchinson	Christopher	25-1	QNDE2019-7007	Javadi	Yashar	16-1	QNDE2019-6908
Huthwaite	Peter		QNDE2019-6734	Javadi	Yashar	16-2	QNDE2019-6875
Huthwaite	Peter	1-2	QNDE2019-6945	Jeketo	Alejandro		QNDE2019-6786
Huthwaite	Peter	3-1	QNDE2019-6708	Jeong	Hyunjo	19-2	QNDE2019-6840
Huthwaite	Peter	8-2	QNDE2019-6739	Jesse	Casey	25-1	QNDE2019-6996
Huthwaite	Peter	11-1	QNDE2019-6711	Jhang	Kyung-Young	9-1	QNDE2019-6854
Huthwaite	Peter	15-1	QNDE2019-6865	Jhang	Kyung-Young	9-1	QNDE2019-6855
Huthwaite	Peter	21-1	QNDE2019-6742	Jhang	Kyung-Young	19-2	QNDE2019-6930
Huthwaite	Peter	22-1	QNDE2019-6870	Jhang	Kyung-Young	29-1	QNDE2019-6860

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Jiao	Jingpin	4-1	QNDE2019-6712	Khalili	Pouyan	16-1	QNDE2019-6741
Jiao	Jingpin	19-2	QNDE2019-6794	Khan	Aamir	23-2	QNDE2019-6944
John	Abin	9-1	QNDE2019-6793	Khurjekar	Ishan D	3-1	QNDE2019-6978
Johnson	Kyle	19-1	QNDE2019-6941	Kiefel	Denis	29-1	QNDE2019-6777
Johnston	Patrick H.	14-2	QNDE2019-6760	Kim	Changgong	19-1	QNDE2019-6997
Jost	Elliott	20-1	QNDE2019-6991	Kim	Felix H.	29-1	QNDE2019-6984
Juarez	Peter	7-2	QNDE2019-7030	Kim	Jin-Yeon	9-1	QNDE2019-6942
Jung	Peter	7-2	QNDE2019-6874	Kim	Jin-Yeon	9-1	QNDE2019-6959
Jung	Peter	9-1	QNDE2019-6882	Kim	Jin-Yeon	9-1	QNDE2019-7004
Ka?ys	Rymantas Jonas	6-1	QNDE2019-6891	Kim	Jin-Yeon	9-1	QNDE2019-6958
Kairu	Wilson	9-1	QNDE2019-6747	Kim	Jin-Yeon	19-1	QNDE2019-6941
Kairu	Wilson	18-1	QNDE2019-6731	Kim	Jin-Yeon	19-1	QNDE2019-6920
Kalkowski	Michal K.	21-1	QNDE2019-6759	Kim	Kwang	9-1	QNDE2019-6850
Kalkowski	Michal K.	28-2	QNDE2019-6911	Kim	Seunghun	9-1	QNDE2019-6814
Kam	Tai Yan	20-2	QNDE2019-7090	Kim	Sungwon	18-2	QNDE2019-6947
Kanda	Kosuke	29-2	QNDE2019-6849	Kim	Yongtak	16-1	QNDE2019-6934
Kaneko	Hirota	5-2	QNDE2019-6877	Klein	Marvin	29-1	QNDE2019-6750
Kang	Dongchan	28-1	QNDE2019-7050	Koester	Lucas	11-1	QNDE2019-7089
Kanger	Cody	29-2	QNDE2019-6985	Koester	Lucas	19-1	QNDE2019-7069
Karagianni	Christina	7-2	QNDE2019-6874	Köhler	Bernd	16-1	QNDE2019-6934
Karagianni	Christina	9-1	QNDE2019-6882	Köhler	Bernd	19-2	QNDE2019-6909
Karunakaran	Rakeshku- mar	29-2	QNDE2019-6985	Köhler	Bernd	28-2	QNDE2019-6911
Kassis	Paul	15-1	QNDE2019-6752	Konishi	Takaaki	4-1	QNDE2019-6769
Katoh	Takeo	9-1	QNDE2019-7081	Kramb	Victoria A.	10-1	QNDE2019-6876
Kawada	Naoki	5-2	QNDE2019-6877	Kramb	Victoria A.	10-1	QNDE2019-6902
Kawakami	Tatsuhiko	4-1	QNDE2019-6769	Kramb	Victoria A.	20-1	QNDE2019-6884
Keller	Kristin	28-1	QNDE2019-6953	Krause	Thomas	2-1	QNDE2019-7001
Kersemans	Mathias	22-2	QNDE2019-6817	Krause	Thomas	24-1	QNDE2019-6973
Khalili	Pouyan	4-1	QNDE2019-6733	Krause	Thomas	25-1	QNDE2019-6980

Author Index

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Krause	Thomas	27-1	QNDE2019-6995	Lesselier	Dominique	15-2	QNDE2019-7018
Krennrich	Frank	11-1	QNDE2019-7089	Lesthaeghe	Tyler	10-1	QNDE2019-6902
Krishnamurthy	Adarsh	23-2	QNDE2019-6940	Lesthaeghe	Tyler	20-1	QNDE2019-6884
Krishnamurthy	Adarsh	23-2	QNDE2019-7009	Lesthaeghe	Tyler	20-1	QNDE2019-6899
Kuchibhatla	Sai Aditya Raman	28-2	QNDE2019-7061	Lesthaeghe	Tyler	28-2	QNDE2019-7067
Kulakovskiy	Andrii	3-1	QNDE2019-7056	Leung	Michael Siu Hey	18-1	QNDE2019-6753
Kumar	Deepak	24-1	QNDE2019-6842	Levy	Katherine	9-1	QNDE2019-7004
Kundu	Tribikram	5-2	QNDE2019-7035	Levy	Katherine	19-1	QNDE2019-6920
Kurihara	Yuki	5-2	QNDE2019-6877	Leymarie	Nicolas	10-1	QNDE2019-6866
laffont	guillaume	18-2	QNDE2019-6925	Leymarie	Nicolas	28-1	QNDE2019-6906
Laflamme	Simon	5-1	QNDE2019-6955	Lhuillier	Pierre-Emile	6-2	QNDE2019-6706
Lan	Bo	21-1	QNDE2019-6742	Lhuillier	Pierre-Emile	15-1	QNDE2019-6752
Laroche	Nans	17-1	QNDE2019-6758	Li	Dezhi	30-2	QNDE2019-6710
Larose	Eric	26-1	QNDE2019-7017	Li	Faxin	9-1	QNDE2019-6718
Le Feuvre	Mathieu	26-1	QNDE2019-6910	Li	Jian	24-1	QNDE2019-6827
Leckey	Cara	18-2	QNDE2019-6756	Li	Jian	30-2	QNDE2019-6757
Leclere	Quentin	6-2	QNDE2019-6706	Li	Minghui	22-2	QNDE2019-6926
Lee	Juseung	16-2	QNDE2019-7054	Li	Wei	9-1	QNDE2019-6826
Lee	Seunghoon	9-1	QNDE2019-6855	Li	Wei	9-1	QNDE2019-7029
Lee	Seungmi	28-1	QNDE2019-7050	Li	Wei	16-2	QNDE2019-6801
Lee	Yongtaeg	9-1	QNDE2019-6814	Li	Wei	23-1	QNDE2019-6825
Lee	YoungC-hang	9-1	QNDE2019-6855	Li	Wei	23-1	QNDE2019-6749
Lei	Xiangyu	22-2	QNDE2019-6805	Li	Wei	24-2	QNDE2019-6819
Leifsson	Leifur	3-2	QNDE2019-7064	Li	Xin	6-1	QNDE2019-6998
Leifsson	Leifur	9-1	QNDE2019-7065	Li	Xiongbing	6-1	QNDE2019-6773
Leifsson	Leifur	13-1	QNDE2019-7063	Li	Xiongbing	14-1	QNDE2019-6774
Leinov	Eli		QNDE2019-6786	Li	Xiongbing	19-2	QNDE2019-6840
Leong	M Salman	23-1	QNDE2019-7053	Li	Xiongbing	21-2	QNDE2019-6772
Leparoux	Donatienne	26-1	QNDE2019-6910	Li	Yongkun	20-1	QNDE2019-6913

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Li	Zhen	16-2	QNDE2019-6801	Lopez Villaverde	Eduardo	22-1	QNDE2019-6778
Li	Zheng	17-2	QNDE2019-7036	Loukas	Charalampos	4-2	QNDE2019-6964
Li	Zheng	23-1	QNDE2019-6767	Lowe	Michael J. S.		QNDE2019-6734
Li	Zhixiang	30-2	QNDE2019-6710	Lowe	Michael J. S.		QNDE2019-6786
Li	Ziming	1-2	QNDE2019-6872	Lowe	Michael J. S.	3-1	QNDE2019-6708
Liang	Chen W	27-1	QNDE2019-6782	Lowe	Michael J. S.	8-2	QNDE2019-6739
Lin	Bruce	13-1	QNDE2019-6807	Lowe	Michael J. S.	21-1	QNDE2019-6759
Lin	Min	30-1	QNDE2019-6987	Lowe	Michael J. S.	21-1	QNDE2019-6742
Lin	Shan	29-2	QNDE2019-6849	Lowe	Michael J. S.	21-2	QNDE2019-6732
Lin	Yung-Chiang	9-1	QNDE2019-7094	Lowe	Michael J. S.	28-2	QNDE2019-6911
Lindgren	Eric A.	10-1	QNDE2019-6876	Lu	Yuren	30-2	QNDE2019-6710
Lindgren	Eric A.	13-1	QNDE2019-6806	Lugovtsova	Yevgeniya	14-1	QNDE2019-6970
Lindgren	Eric A.	13-1	QNDE2019-6892	Luloff	Mark S.	25-1	QNDE2019-6980
Lines	David	4-2	QNDE2019-6964	Luzi	Francesco	25-1	QNDE2019-7007
Lines	David	16-1	QNDE2019-6908	Lv	Fuzai	30-1	QNDE2019-6798
Lines	David	16-2	QNDE2019-6875	Lyu	Hongtao	19-2	QNDE2019-6794
Liu	Ning	17-2	QNDE2019-7014	Lyu	Yan	20-1	QNDE2019-6913
Liu	Weixu	30-1	QNDE2019-6798	Lyu	Yan	21-2	QNDE2019-6921
Liu	Xiucheng	21-2	QNDE2019-6912	Lyu	Yan	30-1	QNDE2019-6923
Liu	Yang	24-2	QNDE2019-6841	Machado	Alessandra		QNDE2019-6975
Liu	Yang	30-1	QNDE2019-6987	Machado	Alessandra S.		QNDE2019-6992
Liu	Zenghua	1-2	QNDE2019-6872	Macleod	Charles	4-2	QNDE2019-6903
Liu	Zenghua	21-1	QNDE2019-7023	Macleod	Charles	4-2	QNDE2019-6964
Liu	Zenghua	29-2	QNDE2019-6784	Macleod	Charles	16-1	QNDE2019-6908
Liu	Zenghua	30-2	QNDE2019-6721	Macleod	Charles	16-2	QNDE2019-6875
Livings	Richard	8-1	QNDE2019-6967	Macleod	Charles	23-2	QNDE2019-6944
Lopes	Ricardo T.		QNDE2019-6833	Mal	Ajit	6-1	QNDE2019-6766
Lopes	Ricardo T.		QNDE2019-6975	Mal	Ajit	14-1	QNDE2019-6765
Lopes	Ricardo T.		QNDE2019-6992	Mal	Ajit	14-1	QNDE2019-6768

Author Index

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Malcolm	Andrew	20-1	QNDE2019-6800	Mehdinia	Sina	9-1	QNDE2019-7100
Malkin	Robert	22-1	QNDE2019-6949	Meiland	Philip	28-2	QNDE2019-6755
Mariani	Stefano	3-2	QNDE2019-6764	Menard	Corentin	15-2	QNDE2019-7018
Mariani	Stefano	18-2	QNDE2019-6763	Merabet	Lucas	15-2	QNDE2019-7033
Marquié	Christophe	2-1	QNDE2019-6785	Mesnil	Olivier	3-1	QNDE2019-7056
Marshall	Margaret	25-1	QNDE2019-6996	Mesnil	Olivier	13-1	QNDE2019-6932
Martens	Arvid	22-2	QNDE2019-6817	Mesnil	Olivier	18-2	QNDE2019-6925
Martina	Filomino	16-1	QNDE2019-6908	Meyer	Ryan	13-1	QNDE2019-6807
Martins	Fabiana		QNDE2019-6833	Meyer	Ryan	25-1	QNDE2019-7007
Masserey	Bernard		QNDE2019-6939	Mineo	Carmelo	23-2	QNDE2019-6944
Masson	Benoît	23-1	QNDE2019-6883	Miorelli	Roberto	3-1	QNDE2019-7056
Masurkar	Faez	5-2	QNDE2019-6797	Miorelli	Roberto	13-1	QNDE2019-6932
Matlack	Kathryn	9-1	QNDE2019-6994	Mir	Fariha	5-1	QNDE2019-6839
Matlack	Kathryn	19-1	QNDE2019-6997	Mirala	Ali	2-1	QNDE2019-6838
Matsue	Hirofumi	4-1	QNDE2019-6769	Missous	Mohamed	27-1	QNDE2019-6782
Matz	Nathaniel	8-2	QNDE2019-6735	Mohseni	Ehsan	4-2	QNDE2019-6964
Matz	Nathaniel	21-2	QNDE2019-7032	Mohseni	Ehsan	16-1	QNDE2019-6908
Maxfield	Bruce	25-1	QNDE2019-6933	Mohseni	Ehsan	16-2	QNDE2019-6875
Mayes	Alexander	8-2	QNDE2019-7038	Moldenhauer	Henry	7-1	QNDE2019-7013
Mayr	Günther	7-2	QNDE2019-6874	Mook	Gerhard	29-2	QNDE2019-7086
Mayr	Günther	9-1	QNDE2019-6882	Moore	David G	20-1	QNDE2019-6991
Mazdiyasni	Siamack	8-2	QNDE2019-7038	Morelli	Jordan	2-1	QNDE2019-7001
Mazdiyasni	Siamack	28-1	QNDE2019-6953	Morelli	Jordan	25-1	QNDE2019-6980
McConnell	Jennifer R	5-1	QNDE2019-7078	Morency	Christina	20-2	QNDE2019-6948
McInnes	Matthew J	22-2	QNDE2019-6914	Moulin	Emmanuel	18-2	QNDE2019-6889
McInnis	Chevonne	7-1	QNDE2019-7012	Mrowka	Jakub	4-1	QNDE2019-6862
McKee	Jessica	22-1	QNDE2019-6949	Mrówka	Jakub	9-1	QNDE2019-6971
Meeker	William	9-1	QNDE2019-7065	Mrówka	Jakub	20-2	QNDE2019-6918
Meeker	William	13-1	QNDE2019-7063	Muia	Lavi	9-1	QNDE2019-6747

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Muia	Lavi	18-1	QNDE2019-6731	Ohara	Yoshikazu	4-1	QNDE2019-6863
Mukherjee	Saptarshi	12-1	QNDE2019-7010	Ohodnicki	Paul	12-1	QNDE2019-6783
Mukherjee	Saptarshi	20-2	QNDE2019-6948	O'Leary	Richard	22-2	QNDE2019-6914
Mukherjee	Saptarshi	28-2	QNDE2019-6968	Oliveira	Davi		QNDE2019-6833
Mukherjee	Subrata	5-2	QNDE2019-6976	Oliveira	Davi		QNDE2019-6975
Mumenya	Siphila	9-1	QNDE2019-6747	Oliveira	Davi		QNDE2019-6992
Mumenya	Siphila	18-1	QNDE2019-6731	Oliveira	Henrique	18-1	QNDE2019-7083
Murphy	R. Kim	10-1	QNDE2019-6701	Olivo	Sandro	9-1	QNDE2019-6905
Murphy	R. Kim	10-1	QNDE2019-6702	Olivo	Sandro	11-1	QNDE2019-6937
Murphy	R. Kim	28-1	QNDE2019-6953	Omar	Saad	24-2	QNDE2019-7062
Nagarajah	Romesh	9-1	QNDE2019-6859	Omeragic	Dzevat	24-2	QNDE2019-7062
Nagawkar	Jethro	3-2	QNDE2019-7064	Oneida	Erin K.	28-1	QNDE2019-6953
Nagawkar	Jethro	9-1	QNDE2019-7065	O'Neil	Aaron	9-1	QNDE2019-6989
Nagawkar	Jethro	13-1	QNDE2019-7063	Osterlitz	Mark	6-1	QNDE2019-6998
Nagy	Peter	6-2	QNDE2019-6952	Otsuki	Tetsuya	9-1	QNDE2019-7081
Nagy	Peter	9-1	QNDE2019-6956	Oudaa	Massoud	6-2	QNDE2019-6706
Najat	Saam	23-1	QNDE2019-7053	Ouvrier-Buffer	Florian	2-1	QNDE2019-6785
Nehr	Simon	18-2	QNDE2019-6925	Palanisamy	Suresh	9-1	QNDE2019-6859
Niederleithinger	Ernst	26-1	QNDE2019-7017	Panetta	Paul	21-1	QNDE2019-6779
Nishino	Hideo	9-1	QNDE2019-7080	Park	Ik Keun	28-1	QNDE2019-7050
Nishino	Hideo	9-1	QNDE2019-7081	Park	Seonghyun	29-1	QNDE2019-6860
Norouzian	Musa	8-2	QNDE2019-6735	Park	Seunghee	2-2	QNDE2019-6858
Norouzian	Musa	8-2	QNDE2019-7031	PARK	TAESUNG	28-1	QNDE2019-7050
Norouzian	Musa	21-2	QNDE2019-7032	Patel	Bhav	6-1	QNDE2019-6766
Obaton	Anne-Francoise	29-1	QNDE2019-6984	Paul	Nicolas	11-1	QNDE2019-6711
Obeidat	Omar	7-1	QNDE2019-6844	Paul	Nicolas	15-1	QNDE2019-6752
Obeidat	Omar	7-2	QNDE2019-7008	Pavlakovic	Brian	1-2	QNDE2019-6945
O'Donnell	Matthew	4-1	QNDE2019-6862	Payan	Cédric	2-1	QNDE2019-6751
O'Donnell	Matthew	4-2	QNDE2019-6867	Payan	Cédric	2-1	QNDE2019-6785

Author Index

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Pei	Ning	21-1	QNDE2019-7023	Popovics	John S.	28-1	QNDE2019-7041
Pei	Ning	29-2	QNDE2019-6784	Pourahmadian	Fatemeh	6-1	QNDE2019-7019
Pelivanov	Ivan	4-1	QNDE2019-6862	Prada	Claire	15-2	QNDE2019-7033
Pelivanov	Ivan	4-2	QNDE2019-6867	Prager	Jens	14-1	QNDE2019-6970
Pereira	Gabriela	6-2	QNDE2019-6966	Pratt	Cody	8-2	QNDE2019-6986
Pereira	Gabriela		QNDE2019-6833	Price	J. Scott	6-1	QNDE2019-6998
Pereira	Gabriela	24-2	QNDE2019-6963	Pyle	Richard	22-1	QNDE2019-6871
Pereira	Gabriela	24-2	QNDE2019-6835	Pyun	Do-Kyung	19-1	QNDE2019-7069
Persson	Gert	14-1	QNDE2019-6896	Pyzik	Patrycja	4-2	QNDE2019-6867
Pfeifer	Denis	9-1	QNDE2019-6958	Qiu	Zhen	4-2	QNDE2019-6964
Pieczonka	Lukasz	20-2	QNDE2019-6918	Qiu	Zhen	16-1	QNDE2019-6908
Pierce	S. Gareth	23-2	QNDE2019-6944	Qiu	Zhen	16-2	QNDE2019-6875
Pierce	Stephen Gareth	4-2	QNDE2019-6903	Qu	Jianmin	1-2	QNDE2019-7043
Pierce	Stephen Gareth	4-2	QNDE2019-6964	Qu	Jianmin	9-1	QNDE2019-6942
Pierce	Stephen Gareth	16-1	QNDE2019-6908	Qu	Jianmin	19-2	QNDE2019-7074
Pierce	Stephen Gareth	16-2	QNDE2019-6875	R	Nishanth		QNDE2019-6715
Pieris	Don	4-2	QNDE2019-6804	R	Nishanth	9-1	QNDE2019-6793
Pilchak	Adam L.	8-2	QNDE2019-7031	R. Passarin	Thiago A.	17-1	QNDE2019-6993
Pilchak	Adam L.	21-2	QNDE2019-7032	R. Passarin	Thiago A.	17-2	QNDE2019-6846
Pintar	Adam L.	29-1	QNDE2019-6984	Rachev	Rosen	15-1	QNDE2019-6935
Pipa	Daniel R.	17-1	QNDE2019-6993	Radkowski	Rafael	23-2	QNDE2019-7000
Pipa	Daniel Rodrigues	17-2	QNDE2019-6846	Raja	Nishanth	9-1	QNDE2019-6746
Pires	Gustavo P.	17-1	QNDE2019-6993	Rajagopal	Prabhu	9-1	QNDE2019-6747
Pires	Gustavo P.	17-2	QNDE2019-6846	Rajagopal	Prabhu	9-1	QNDE2019-6946
Piwakowski	Bogdan	2-1	QNDE2019-6837	Rajagopal	Prabhu	9-1	QNDE2019-6901
Poonthottathil	Navaneeth	11-1	QNDE2019-7089	Rajagopal	Prabhu	9-1	QNDE2019-6943
Popovics	John S.	6-2	QNDE2019-6707	Rajagopal	Prabhu	9-1	QNDE2019-6859
Popovics	John S.	8-1	QNDE2019-7042	Rajagopal	Prabhu	18-1	QNDE2019-6731
Popovics	John S.	26-1	QNDE2019-7040	Rajagopal	Prabhu	28-2	QNDE2019-7061

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Rakotonarivo	Sandrine	2-1	QNDE2019-6751	Ryu	Juyoung	19-2	QNDE2019-6930
Ramaniraka	Manda	2-1	QNDE2019-6751	S G	GOKUL RAJA	9-1	QNDE2019-6793
Ramsdell	David	24-2	QNDE2019-6841	S R	SANDEEP KUMAR	9-1	QNDE2019-6943
Ranaivomanana	Narintsoa	2-1	QNDE2019-6785	Sabbagh	Elias H.	10-1	QNDE2019-6701
Rao	Jing	30-1	QNDE2019-6987	Sabbagh	Elias H.	10-1	QNDE2019-6702
Rao	Prahalada	8-2	QNDE2019-6986	Sabbagh	Elias H.	28-1	QNDE2019-6953
REBELLO	JOAO MARCOS	24-2	QNDE2019-6963	Sabbagh	Harold	10-1	QNDE2019-6701
REBELLO	JOAO MARCOS	24-2	QNDE2019-6835	Sabbagh	Harold	10-1	QNDE2019-6702
recoquillay	arnaud	18-2	QNDE2019-6925	Sabbagh	Harold	28-1	QNDE2019-6953
Reddy	Keerthana	8-2	QNDE2019-6986	Sadaoka	Noriyuki	4-1	QNDE2019-6769
Rees	Stephen John	17-1	QNDE2019-6915	Sahasrabudhe	Himanshu	9-1	QNDE2019-6989
Rellinger	Tanner	27-1	QNDE2019-6995	Saini	Abhishek	15-1	QNDE2019-6821
Renaud	Guillaume	4-1	QNDE2019-6863	Saldana	Christo- pher	20-1	QNDE2019-6991
Rjelka	Marek	19-2	QNDE2019-6909	Saleem	Aroba	24-1	QNDE2019-6973
Rjelka	Marek	28-2	QNDE2019-6911	Santos	Rafael	24-2	QNDE2019-6963
Robert	Sebastien	15-2	QNDE2019-7018	Santos	Thais Maria		QNDE2019-6833
Robert	Sebastien	15-2	QNDE2019-7033	Sasaki	Eiichi	5-2	QNDE2019-6877
Roberts	Matthew	28-2	QNDE2019-6832	Sasmal	Saptarshi	5-2	QNDE2019-7035
Roberts	Ron	9-1	QNDE2019-7057	Sato	Karoline A.	17-1	QNDE2019-6993
Roberts	Ron	9-1	QNDE2019-7065	Schehl	Norman D.	10-1	QNDE2019-6876
Roberts	Ron	10-1	QNDE2019-7058	Schick	Fritz	9-1	QNDE2019-6950
Roberts	Ron	13-1	QNDE2019-7063	Schneck III	William	18-2	QNDE2019-6756
Robinson	Benjamin	2-2	QNDE2019-6951	Schumacher	Thomas	5-1	QNDE2019-7078
Rokhlin	Stanislav I.	21-2	QNDE2019-6732	Schumacher	Thomas	9-1	QNDE2019-7100
Rosell	Anders	22-2	QNDE2019-6805	Schumacher	Thomas	9-1	QNDE2019-7016
Ross	William R	6-1	QNDE2019-6998	Schumacher	Thomas	26-1	QNDE2019-7079
Roy	Olivier	15-2	QNDE2019-6864	Schumm	Andreas	11-1	QNDE2019-6711
Rulli	Ricardo	18-1	QNDE2019-7083	Schumm	Andreas	15-1	QNDE2019-6752
Ryu	Juyoung	9-1	QNDE2019-6854	Scott	Clark	25-1	QNDE2019-6996

Author Index

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Sealy	Michael P.	29-1	QNDE2019-6979	Smith	Casey	30-1	QNDE2019-6987
Sealy	Michael P.	29-2	QNDE2019-6985	Smith	Elizabeth J	9-1	QNDE2019-6994
Séguin-Charbonneau	Loïc	23-1	QNDE2019-6883	Smith	James	25-1	QNDE2019-6996
Sellami	Fatma	1-2	QNDE2019-7021	Sneed	Lesley	2-1	QNDE2019-6838
Semenova	Maria	14-1	QNDE2019-6896	Sockalingam	Subramani	5-1	QNDE2019-6839
Sexton	James	27-1	QNDE2019-6782	Song	Dong-Gi	9-1	QNDE2019-6854
Sha	Gaofeng	21-2	QNDE2019-6732	Song	Dong-Gi	19-2	QNDE2019-6930
Sha	Zhou	24-1	QNDE2019-6827	Song	Guorong	20-1	QNDE2019-6913
Shang	Wangli	21-2	QNDE2019-6912	Song	Guorong	21-2	QNDE2019-6921
Shell	Eric B.	28-1	QNDE2019-6953	Song	Guorong	30-1	QNDE2019-6923
Shepard	Steven	7-2	QNDE2019-6960	Song	Homin	26-1	QNDE2019-7040
Shi	Fan	8-2	QNDE2019-6739	Song	Jiming	9-1	QNDE2019-7065
Shi	Fan	15-1	QNDE2019-6865	Song	Jiming	13-1	QNDE2019-7063
Shi	Fan	22-1	QNDE2019-6870	Song	Xubo	9-1	QNDE2019-7100
Shi	Xiaodong	12-1	QNDE2019-7010	Song	yongfeng	21-2	QNDE2019-6772
Shi	Xiaodong	28-2	QNDE2019-6968	Sotelo	Luz D.	8-2	QNDE2019-6986
Shin	Hyojeong	19-2	QNDE2019-6840	Sotelo	Luz D.	29-1	QNDE2019-6979
Shin	Namho	5-1	QNDE2019-7002	Sotelo	Luz D.	29-2	QNDE2019-6985
Shipway	Naomi	3-1	QNDE2019-6708	Spalvier	Agustin	6-2	QNDE2019-6707
Shoukroun	Dana	9-1	QNDE2019-6905	Sparkman	Daniel M.	3-2	QNDE2019-6788
Shoukroun	Dana	11-1	QNDE2019-6937	Sparkman	Daniel M.	3-2	QNDE2019-6789
Shugayev	Roman	12-1	QNDE2019-6783	Sparkman	Daniel M.	20-1	QNDE2019-6884
Silva	Vitor	6-2	QNDE2019-6966	Spytek	Jakub	9-1	QNDE2019-6971
Silva	Vitor	24-2	QNDE2019-6963	Spytek	Jakub	20-2	QNDE2019-6918
Silva	Vitor O.	17-1	QNDE2019-6993	Steiner	Dirk	4-2	QNDE2019-7020
Silva	Vitor O.	17-2	QNDE2019-6846	Stoessel	Rainer	29-1	QNDE2019-6777
Sinha	Vikas	28-1	QNDE2019-6953	Su	Zhongqing	18-1	QNDE2019-6719
Slayback	Paul	7-2	QNDE2019-6960	Sun	Maoxun	19-2	QNDE2019-7074
Smiderle	Joaquim	24-2	QNDE2019-6835	Susan	Donald	19-1	QNDE2019-6941

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Sutcliffe	Mark	17-1	QNDE2019-6915	Treesatayapun	Chidentree	27-1	QNDE2019-7011
Suter	Jonathan	25-1	QNDE2019-7007	TSE	Peter W.	5-2	QNDE2019-6797
Suyama	Natsuki	5-2	QNDE2019-6877	TSE	Peter W.	18-1	QNDE2019-6796
Suzuki	Keigo	5-2	QNDE2019-6877	Turner	Joseph A.	8-2	QNDE2019-6735
Suzuki	Kento	9-1	QNDE2019-7080	Turner	Joseph A.	8-2	QNDE2019-6986
Swindell	Paul	18-2	QNDE2019-6756	Turner	Joseph A.	8-2	QNDE2019-7031
Sy	Kombossé	15-2	QNDE2019-6864	Turner	Joseph A.	21-2	QNDE2019-6772
Szlaszynski	Filip		QNDE2019-6734	Turner	Joseph A.	21-2	QNDE2019-7032
Tai	Steffen	6-1	QNDE2019-6766	Turner	Joseph A.	29-1	QNDE2019-6979
Tai	Steffen	14-1	QNDE2019-6765	Turner	Joseph A.	29-2	QNDE2019-6985
Takagi	Toshiyuki	20-2	QNDE2019-6856	Tuttipongsawat	Porjan	5-2	QNDE2019-6877
Takahashi	Toshiichi	4-1	QNDE2019-6769	Uchic	Michael D.	3-2	QNDE2019-6789
Takenaka	Yusuke	9-1	QNDE2019-7081	Uchic	Michael D.	8-2	QNDE2019-7031
Tamba	Andre	18-1	QNDE2019-7083	Uchic	Michael D.	20-1	QNDE2019-6884
Tang	Qixiang	2-2	QNDE2019-6983	Uchic	Michael D.	21-2	QNDE2019-7032
Tang	Xiaoming	24-1	QNDE2019-6726	Udpa	Lalita	5-2	QNDE2019-6976
Tang	Xiaoming	30-2	QNDE2019-6723	Udpa	Lalita	12-1	QNDE2019-7010
Tang	Zhifeng	30-1	QNDE2019-6798	Udpa	Lalita	28-2	QNDE2019-6968
Tao	Aihua	30-2	QNDE2019-6723	Udpa	Satish	12-1	QNDE2019-7010
Tarr	Jared	29-1	QNDE2019-6984	Underhill	P. Ross	2-1	QNDE2019-7001
Taylor	Jared	7-1	QNDE2019-7013	Underhill	P. Ross	24-1	QNDE2019-6973
Taylor	Jared	23-2	QNDE2019-6940	Underhill	P. Ross	27-1	QNDE2019-6995
Thiel	Erik	7-2	QNDE2019-6874	V K	Krishnadas	9-1	QNDE2019-6943
Thiel	Erik	9-1	QNDE2019-6882	V K	Krishnadas	19-2	QNDE2019-6885
Thompson	Kyle R.	11-1	QNDE2019-7071	Vakili Rad	Cyrus	5-1	QNDE2019-6839
THON	Aurelien	1-2	QNDE2019-6744	Van Den Abeele	Koen	22-2	QNDE2019-6817
Thostenson	Erik T	5-1	QNDE2019-7078	Van Paepegem	Wim	22-2	QNDE2019-6817
Tittmann	Bernhard	16-2	QNDE2019-7095	Van Zandt	Nicholas	27-1	QNDE2019-7068
Tittmann	Bernhard	16-2	QNDE2019-7047	VanZant	Lia	2-1	QNDE2019-6838

Author Index

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Vasilev	Momchil	4-2	QNDE2019-6903	Wang	Xiaoyu	16-1	QNDE2019-6818
Vasilev	Momchil	4-2	QNDE2019-6964	Wang	Xingwei	2-2	QNDE2019-6983
Vasilev	Momchil	16-1	QNDE2019-6908	Wang	Xinyan	17-1	QNDE2019-6887
Vasilev	Momchil	16-2	QNDE2019-6875	Wang	Zhiyong	25-1	QNDE2019-6933
VASSEUR	Julien	28-1	QNDE2019-6906	Wathavana Vithanage	Randika Kosala	4-2	QNDE2019-6964
Veit	Geoffrey		QNDE2019-6730	Wathavana Vithanage	Randika Kosala	16-1	QNDE2019-6908
Velicheti	Dheeraj	6-2	QNDE2019-6952	Wathavana Vithanage	Randika Kosala	16-2	QNDE2019-6875
Velichko	Alexander	15-1	QNDE2019-6935	Watson	James	27-1	QNDE2019-6782
Velichko	Alexander	22-1	QNDE2019-6778	Weinstein	Amanda	11-1	QNDE2019-7089
Verboven	Erik	22-2	QNDE2019-6817	Weiss	Michael	3-1	QNDE2019-6977
Verdier	Jerôme	2-1	QNDE2019-6837	Welter	John T.	3-2	QNDE2019-6789
Vereen	Alexander	5-1	QNDE2019-6839	Welter	John T.	10-1	QNDE2019-6876
Vinayaka	Sanjana	2-2	QNDE2019-6983	Welter	John T.	10-1	QNDE2019-6902
Vinogradov	Sergey	16-1	QNDE2019-6791	Welter	John T.	20-1	QNDE2019-6884
Vinogradov	Sergey	16-2	QNDE2019-6790	Welter	John T.	20-1	QNDE2019-6899
Volker	Arno	15-2	QNDE2019-7059	Wertz	John	10-1	QNDE2019-6876
Volker	Arno	29-1	QNDE2019-6750	Wertz	John	10-1	QNDE2019-6902
Vyas	Jaishree	6-1	QNDE2019-6891	Wertz	John	20-1	QNDE2019-6899
Wack	Yannick	29-2	QNDE2019-7086	Wicks	Jacob	8-2	QNDE2019-6986
Walter	Julien	23-1	QNDE2019-6883	Wiedmann	Max	29-1	QNDE2019-6750
Wan	Eric	9-1	QNDE2019-7100	Wiesmayer	Michael	1-2	QNDE2019-7021
Wang	Ao	26-1	QNDE2019-6910	Wilcox	Paul	15-1	QNDE2019-6935
Wang	G. C.	18-1	QNDE2019-6796	Wilcox	Paul	15-1	QNDE2019-6965
Wang	Jianing	2-2	QNDE2019-6983	Wilcox	Paul	22-1	QNDE2019-6871
Wang	Kai	18-1	QNDE2019-6719	Wilcox	Paul	22-1	QNDE2019-6949
Wang	Kevin G	28-2	QNDE2019-6832	Wilcox	Paul	22-2	QNDE2019-6900
Wang	Lifu	6-1	QNDE2019-6766	Williams	Stewart	16-1	QNDE2019-6908
Wang	Lifu	14-1	QNDE2019-6768	Wincheski	Russell A.	10-1	QNDE2019-6701
Wang	Weixin	14-1	QNDE2019-6774	Wincheski	Russell A.	10-1	QNDE2019-6702

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER	LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Winfree	William	7-1	QNDE2019-6761	Yuan	Xin'an	23-1	QNDE2019-6749
Wirdelius	Håkan	14-1	QNDE2019-6896	Zainey	David A.	10-1	QNDE2019-6876
Wirdelius	Håkan	22-2	QNDE2019-6805	Zainey	David A.	20-1	QNDE2019-6884
Wise	Elliott	22-1	QNDE2019-6870	Zalameda	Joseph	7-1	QNDE2019-6761
Wowk	Diane	27-1	QNDE2019-6995	Zeroug	Smaine	24-2	QNDE2019-6841
Wu	Bin	1-2	QNDE2019-6872	Zeroug	Smaine	30-2	QNDE2019-7093
Wu	Bin	4-1	QNDE2019-6712	Zhang	Binpeng	21-2	QNDE2019-6921
Wu	Bin	21-1	QNDE2019-7023	zhang	guang-dong	6-1	QNDE2019-6773
Wu	Bin	21-2	QNDE2019-6921	Zhang	Jie	19-2	QNDE2019-6794
Wu	Bin	29-2	QNDE2019-6784	Zhang	Peng	1-2	QNDE2019-7043
Wu	Bin	30-1	QNDE2019-6923	Zhang	Shuzeng	6-1	QNDE2019-6773
Wu	Bin	30-2	QNDE2019-6721	Zhang	Shuzeng	14-1	QNDE2019-6774
Wu	Mingye	6-1	QNDE2019-6998	Zhang	Shuzeng	19-2	QNDE2019-6840
Xiang	Yanxun	16-1	QNDE2019-6818	Zhang	Wei	17-1	QNDE2019-6887
Xu	chun-guang	30-2	QNDE2019-6710	Zhang	Yichi	6-1	QNDE2019-6766
YAN	JIN	5-1	QNDE2019-6955	Zhang	Yongchen	30-2	QNDE2019-6721
Yin	Peng	30-2	QNDE2019-6710	Zhang	Yu	24-1	QNDE2019-6827
Yin	Xiaokang	9-1	QNDE2019-7029	Zhang	Yu	30-2	QNDE2019-6757
Yin	Xiaokang	9-1	QNDE2019-6826	Zhang	Zhan	11-1	QNDE2019-7044
Yin	Xiaokang	16-2	QNDE2019-6801	Zhang	Zhan	11-1	QNDE2019-7089
Yin	Xiaokang	23-1	QNDE2019-6825	Zhang	Zhen	20-1	QNDE2019-6800
Yin	Xiaokang	23-1	QNDE2019-6749	Zhao	Bin	21-1	QNDE2019-7023
Yin	Xiaokang	24-2	QNDE2019-6819	Zhao	Jianming	9-1	QNDE2019-6826
YU	QIUYE	7-1	QNDE2019-6844	Zhao	Jianming	23-1	QNDE2019-6825
Yu	Qiuye	7-2	QNDE2019-7008	Zhao	Jianming	23-1	QNDE2019-6749
Yu	Tzuyang	2-2	QNDE2019-6983	Zhao	Xin	21-1	QNDE2019-7023
Yuan	Maodan	14-2	QNDE2019-6831	Zhao	Xin	29-2	QNDE2019-6784
Yuan	Xin'an	9-1	QNDE2019-6826	Zheng	Kaihong	17-2	QNDE2019-7036
Yuan	Xin'an	23-1	QNDE2019-6825	Zhou	Jie	17-2	QNDE2019-7036

Author Index

LAST NAME	FIRST NAME	SESSION	PAPER NUMBER
Zhou	Jie	23-1	QNDE2019-6767
Zhou	Jingcheng	2-2	QNDE2019-6983
Zhu	Wujun	16-1	QNDE2019-6818
Zhu	Xuan	8-1	QNDE2019-7042
Zhu	Yuan	24-2	QNDE2019-6819
Zhu	Zhen	5-1	QNDE2019-6836
Ziaja-Sujdak	Aleksandra	4-2	QNDE2019-6867
Ziegler	Mathias	7-2	QNDE2019-6874
Ziegler	Mathias	9-1	QNDE2019-6882
Zimmermann	Rastislav	4-2	QNDE2019-6964
Zimmermann	Rastislav	16-1	QNDE2019-6908
Zimmermann	Rastislav	16-2	QNDE2019-6875
Zimmermann	Andreas A.E.	1-2	QNDE2019-6945
Zimmermann	Andreas A.E.	9-1	QNDE2019-6950
Zou	Xingxing	2-1	QNDE2019-6838
Zoughi	Reza	12-1	QNDE2019-6957
Zoughi	Reza	12-1	QNDE2019-6917
Zscherpel	Uwe	11-1	QNDE2019-6711
Zul Karnain	Ahmed A.	9-1	QNDE2019-6946
Zuo	Peng	30-1	QNDE2019-6781

2019 CONFERENCE CHAIRS

Conference Chairs	Lester Schmerr <i>QNDE Programs</i>
	Shiv Joshi <i>ASME NDP Division</i>
ASME – NDPD Division	Ajit Mal
Secretary	Paul Schafbuch <i>WFNDEC</i>
Co-editor — 2018 Conference Proceedings	Steve Holland Simon Laflamme
Co-Organizer — Short-course	Leifur Leifsson Greg Selby

2020 CONFERENCE CHAIRS

Conference Chairs	Peter Collins <i>ISU CNDE</i>
	Kevin Smith <i>Pratt and Whitney</i>

2018-2019 ASME OFFICERS

President	Said Jahanmir
Past President	Charla C. Wise
President-Nominee/Elect	Richard Laudenat
Executive Director	Thomas Costabile

Track/Session Chair Organizers

TRACK NO.	TRACK NAME	FIRST NAME	LAST NAME	COMPANY	TRACK CHAIRS/ORGANIZERS
1	GUIDED WAVES	Michael J. S.	Lowe	Imperial College London	Session Organizer
2	NDE AND NDT FOR CIVIL ENGINEERING	Simon	Laflamme	Iowa State University	Session Organizer
3	MACHINE LEARNING & STATISTICAL METHODS IN NDE	Joel B.	Harley	University of Florida	Session Organizer
3	MACHINE LEARNING & STATISTICAL METHODS IN NDE	Daniel M.	Sparkman	Air Force Research Laboratory	Session Co-Organizer
4	NEW QNDE TECHNOLOGY & QNDE IN DESIGN	Lucas	Koester	Iowa State University - CNDE	Session Organizer
5	STRUCTURAL HEALTH MONITORING (SHM)	Simon	Laflamme	Iowa State University	Session Organizer
5	STRUCTURAL HEALTH MONITORING (SHM)	Olivier	Mesnil	CEA	Session Co-Organizer
6	FUNDAMENTALS OF ALL QNDE METHODS, I	Pete	Collins	Iowa State University	Session Organizer
7	THERMOGRAPHY AND THERMOSONICS	Stephen D	Holland	Iowa State University	Session Organizer
8	RESONANT NDE AND ULTRASONIC SCATTERING	Sunil Kishore	Chakrapani	Michigan State University	Session Organizer
8	RESONANT NDE AND ULTRASONIC SCATTERING	Matthew	Cherry	Air Force Research Laboratory	Session Co-Organizer
9	POSTER SESSION	Paul	Schafbuch	Iowa State University	Session Organizer
9	POSTER SESSION	Paul	Schafbuch	Iowa State University	Session Organizer
10	NDE MODELING FOR COMPOSITES	Michael J. S.	Lowe	Imperial College London	Session Organizer
11	DIGITAL RADIOGRAPHY AND COMPUTED TOMOGRAPHY	Zhan	Zhang	Iowa State University	Session Organizer
12	MICROWAVE, MILLIMETER WAVE, & THE NDE	Thomas (C-P)	Chiou	Iowa State University	Session Organizer
13	MODEL ASSISTED PROBABILITY OF DETECTION	Leifur	Leifsson	Iowa State University	Session Organizer
13	MODEL ASSISTED PROBABILITY OF DETECTION	Eric A.	Lindgren	US Air Force Research Laboratory	Session Co-Organizer
14	FUNDAMENTALS OF ALL QNDE METHODS, II	Thomas (C-P)	Chiou	Iowa State University	Session Organizer
15	UT PHASED ARRAYS, I	Paul	Wilcox	University of Bristol	Session Organizer
16	SENSORS, TRANSDUCERS AND PROBES, I	Bernhard	Tittmann	Penn State University	Session Organizer
17	ALL SIGNAL PROCESSING TECHNIQUES, I	Stephen D.	Holland	Iowa State University	Session Organizer
18	STRUCTURAL HEALTH MONITORING (SHM) AND PROGNOSTICS, II	Simon	Laflamme	Iowa State University	Session Organizer
18	STRUCTURAL HEALTH MONITORING (SHM) AND PROGNOSTICS, II	Olivier	Mesnil	CEA	Session Co-Organizer

TRACK NO.	TRACK NAME	FIRST NAME	LAST NAME	COMPANY	TRACK CHAIRS/ORGANIZERS
19	NONLINEAR ULTRASONICS	Kathryn	Matlack	University of Illinois at Urbana-Champaign	Session Organizer
20	CHARACTERIZATION OF COMPOSITES	Yuris	Dzenis	University Of Nebraska	Session Organizer
21	MATERIALS AND MICROSTRUCTURE CHARACTERIZATION, I	Ajit	Mal	University Of California	Session Organizer
21	MATERIALS AND MICROSTRUCTURE CHARACTERIZATION, I	Krishnan	Balasubramaniam	Indian Institute of Technology Madras	Session Co-Organizer
22	UT PHASED ARRAYS II	Paul	Wilcox	University of Bristol	Session Organizer
23	ALL SIGNAL PROCESSING TECHNIQUES, II AND DIGITAL TWIN OR DATA INTEGRATION	Stephen D.	Holland	Iowa State University	Session Organizer
24	NDE-SHM OIL & GAS INDUSTRY, I	Yang	Liu	University of Wyoming	Session Organizer
25	NUCLEAR POWER NDE	Bill	Glass, III	PNNL	Session Organizer
26	STRESS WAVE BASED NDE FOR STRUCTURES	Thomas	Schumacher	Portland State University	Session Organizer
26	STRESS WAVE BASED NDE FOR STRUCTURES	John S.	Popovics	University of Illinois at Urbana-Champaign	Session Co-Organizer
27	SENSORS, TRANSDUCERS AND PROBES, II	Thomas	Krause	Royal Military College of Canada	Session Organizer
28	MATERIALS AND MICROSTRUCTURE CHARACTERIZATION, II AND METAMATERIALS	Ajit	Mal	University Of California	Session Organizer
28	MATERIALS AND MICROSTRUCTURE CHARACTERIZATION, II AND METAMATERIALS	Krishnan	Balasubramaniam	Indian Institute of Technology Madras	Session Co-Organizer
29	ADDITIVE MANUFACTURING AND OTHER ADVANCES	Lucas	Koester	Iowa State University - CNDE	Session Organizer
30	NDE-SHM OIL & GAS INDUSTRY, II	Yang	Liu	University of Wyoming	Session Organizer
31	KEYNOTE SESSIONS	Professor Bruce Drinkwater B.Eng., Ph.D.(Lond.) A.C.G.I., D.I.C. C.Eng., F.I.Mech.E., F.Inst. NDT, M.Inst.P.			
31	KEYNOTE SESSIONS	Ajit Mal Distinguished Professor and Vice Chair Director, Online MS Programs in Mechanical Engineering Mechanical and Aerospace Engineering Department University of California, Los Angeles, CA 90095-1597 ajit@g.ucla.edu			
31	KEYNOTE SESSIONS	Xiuming Wang Institute of Acoustics Chinese Academy of Sciences Title: Borehole Acoustics and its Applications			



Products

Fiber-optic Sagnac interferometers for US signal detection



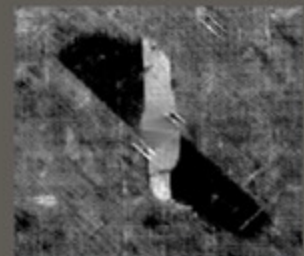
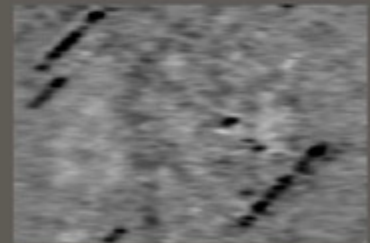
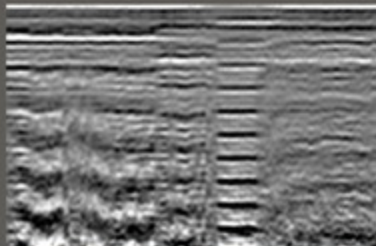
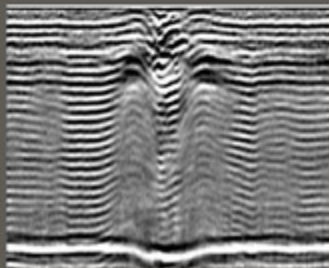
- All components are **fiber-optic**
- **Sensitivity** approaching **thermal noise** limit for untreated surfaces
- Powered by a **tiny SLD source**
- **Variable bandwidth**: from 100 kHz to GHz
- **NO reference arm** – extremely stable to environmental noise
- **NO stabilization** is required
- Speckle insensitive
- Reduced sensitivity to surface roughness
- Very compact footprint (by request)

Custom built laser-ultrasound systems

- Integration of a pulsed laser and the Sagnac interferometer into a laser-ultrasound system operated on a linear translator or robotic platform

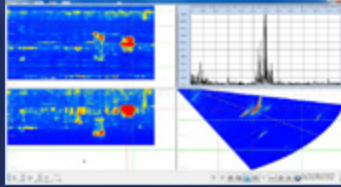
Applications

- Non-contact laser-ultrasound NDT & ME
- Metrology
- Transducer characterization
- Biomedical microscopy & imaging

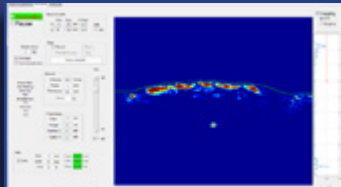


LuxSonics Inc. 808 East Shelby Street, Seattle, WA 98102, USA
Email: ivan.pelivanov@gmail.com
Phone: +1(206) 504-6609

Experts in
Phased Array
Ultrasound



Prelude Software:
• PAUT Acquisition and Analysis



ARIA Software:
• Advanced FMC/TFM
• Adaptive FMC/TFM

www.tpac-ndt.com
info@tpac-ndt.com

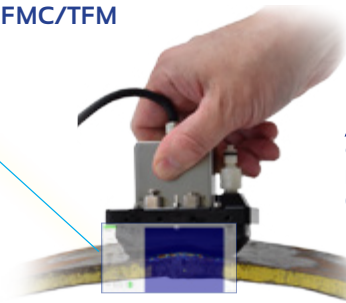
Field Ready Real-Time Adaptive TFM

NEW!

Designed For IP68



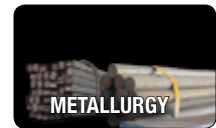
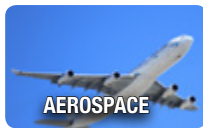
Explorer 64/128
Phased Array Including FMC/TFM
Option:
• Advanced FMC/TFM
• Adaptive FMC/TFM



Adaptive TFM
Scan from top of the weld!
Real-Time Geometry
Correction



Instrumentation • Software • Solutions • Facilitation • Customization



HIGH PERFORMANCE **PHASED ARRAY** ULTRASONICS



OEM-MC 32 ch

OEM
Brand custom solutions with an open platform



NEW!

OEM-PA Mini 64/128
Option FMC

COMPACT
Integrate our small lightweight instruments almost anywhere



NEW!

OEM-PA2 128

ADVANCED
Ultra fast data speeds of **3 GB/s**
Up to **8192 Channels!**

Cutting Edge Technology, Including;
Full Matrix Capture (FMC) & Total Focusing Method (TFM)

www.aos-ndt.com • contact@aos-ndt.com



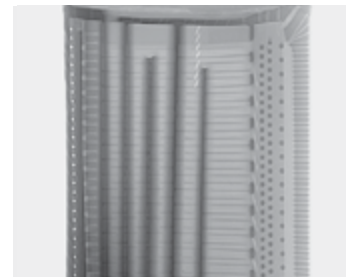
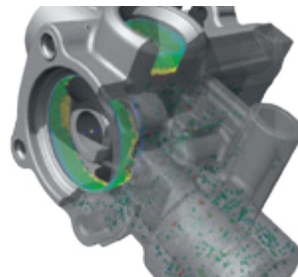
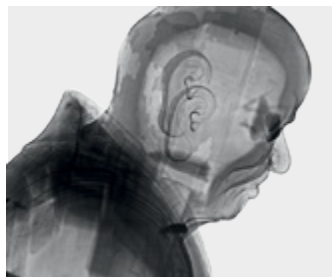
YXLON

X-ray and Computed Tomography

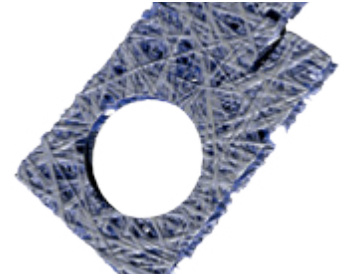
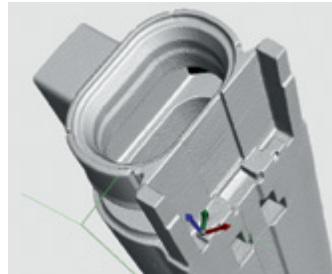
Need Industrial 2D and CT X-ray Imaging? Think YXLON



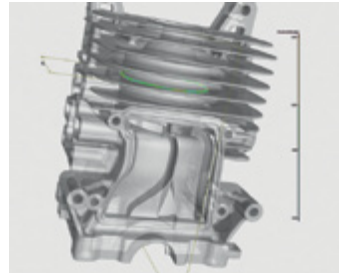
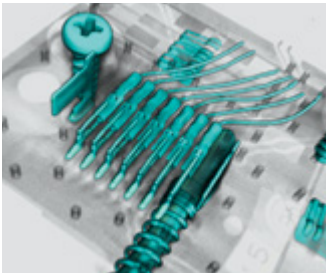
MU2000



FF35 CT



FF85 CT



Industrial X-ray and Computed Tomography Inspection Systems:

- Non-destructive inspection
- Defect and porosity identification
- Internal inspection and validation
- Reverse engineering and dimensional metrology
- Actual/Nominal comparison
- Geometric dimensioning and tolerancing

Contact YXLON's Dirk Steiner for consultation and system quote at 1-770-289-7708 or Dirk.Steiner@yxlon.com.

YXLON Sales & Service, Hudson, Ohio 1-234-284-7849
Comet Group Lab ONE, San Jose, California 1-408-325-8770



THE ULTIMATE ULTRASOUND PAUT/TFM IMAGING MACHINE

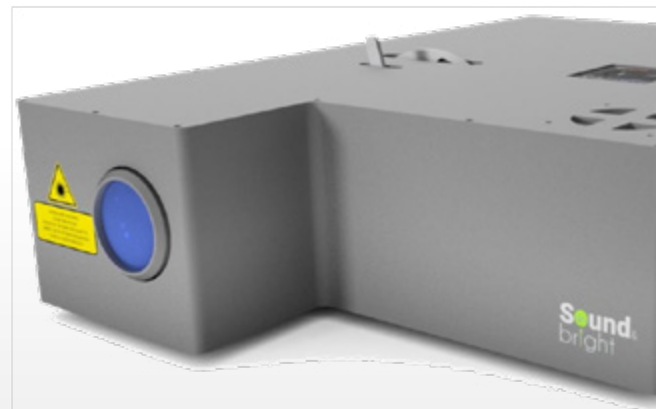
www.m2m-ndt.com/panther

M2M PANTHER



Unparalleled Sensitivity. All Surface Types.

The Future is **bright**

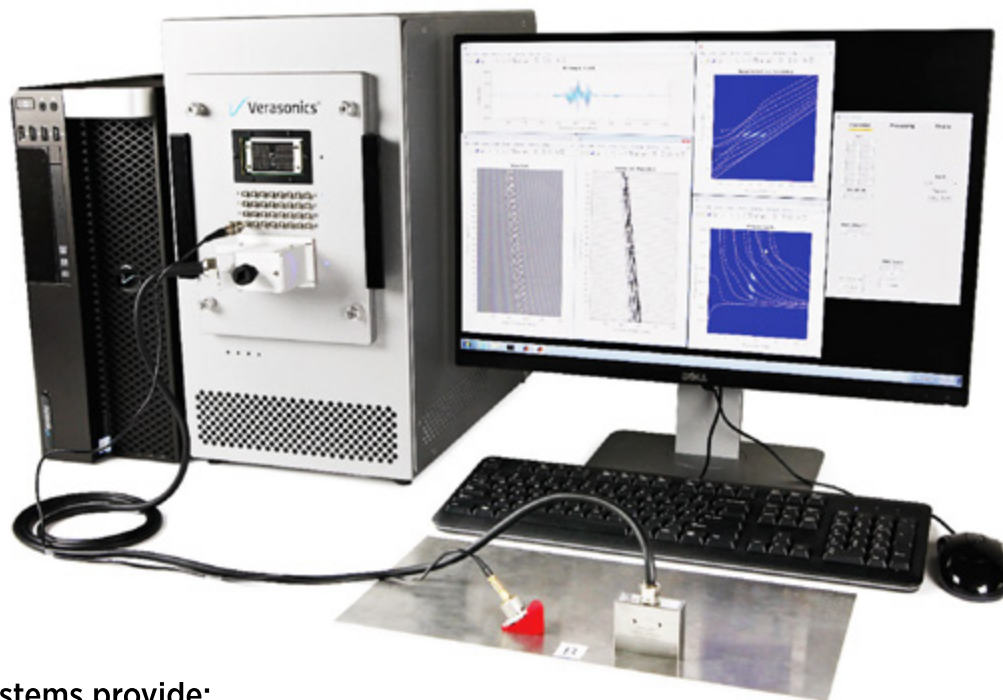


LASER ULTRASONICS FOR NON-DESTRUCTIVE TESTING
www.soundnbright.com

Sound &
bright



Unique Functionality Provides Significant Advantages for Research in Non-Destructive Evaluation



Vantage systems provide:

- Advanced phased array technology with 32, 64, 128 or 256 channels
- Open architecture for unparalleled flexibility and real-time access to raw RF data
- Programmable transmit sequences and focal laws
- Arbitrary waveform capability on each channel
- Frequency ranges from 50 kHz to 50 MHz
- 6.6 GB/s data transfer rate
- Compatibility with the University of Bristol's BRAIN software
- TFM and FMC, plus guided wave, ultrafast imaging and tomography capabilities
- Support for many transducers with a suite of Universal Transducer Adapters
- MATLAB user interface with easy integration of real-time custom processing



To learn more, visit us at:
www.verasonics.com

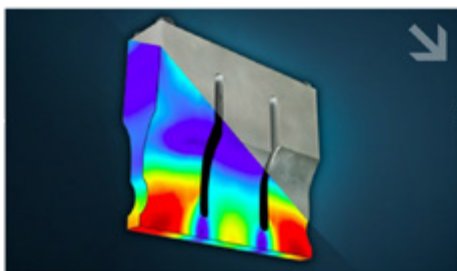
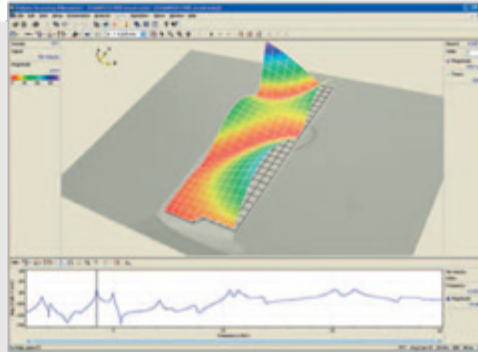
Email:
Info@verasonics.com



Polytec Scanning Vibrometers:

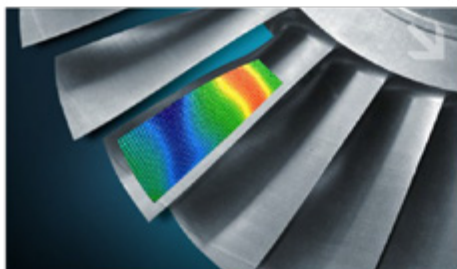
Benefits for Aerospace Testing

- = Dramatically increases test throughput while lowering measurement costs
- = Simplifies frequency response measurements and wave propagation analyses
- = Efficient large-scale vibration data acquisition and management
- = Variable stand-off distances from short to up to 50 m for measuring typical surfaces of large objects
- = High spatial and frequency resolution (0.001 Hz) e.g. for modal analysis on turbine blades
- = Test data can be measured directly at FE nodes
- = Fatigue testing at very high vibration levels up to 20 m/s
- = Measurement of rigid body modes (including in-plane motions)
- = Smooth transfer of measured data to modal analysis software and processing of multiple references for MIMO measurements
- = Partial measurements on large structures can be grouped together (stitched) to form a global data set of 3-D geometry and 3-D vibration data



Ultrasonics and NDT

Renowned manufacturers of ultrasonic equipment for industrial applications rely on Polytec's scanning vibrometers for their research, development and production testing. Measure and visualize vibration characteristics of actuators and sensors with laser vibrometry – the precise and reliable tool for FE validation, optimization and troubleshooting. Research NDE by studying wave propagation interactions with defects in metals and composites.



Stress & Strain

Scanning 3D vibrometry provides a fast and precise validation of stress and strain calculations. It angles the laser to measurement locations imported directly from the FE mesh and avoids the expense, uncertainties and added mass associated with conventional methods such as strain gages. High spatial resolution locates stress and strain maxima with high precision, leading to improved component design.

Polytec GmbH (Germany)
 Polytec-Platz 1-7
 76337 Waldbronn
 Tel. +49 7243 604-0
 Fax +49 7243 69944
 info@polytec.de

Polytec France S.A.S.
 Technosud II
 Bâtiment A
 99, Rue Pierre Semard
 92320 Châtillon
 Tel. +33 1 496569-00
 info@polytec.fr

Polytec Ltd. (Great Britain)
 Lambda House
 Batford Mill
 Harpenden, Herts AL5 5BZ
 Tel. +44 1582 711670
 info@polytec-ltd.co.uk

Polytec Japan
 Arena Tower, 13th floor,
 3-1-9, Shinyokohama,
 Kohoku-ku, Yokohama-shi
 Kanagawa 222-0033
 Tel.+8145478-6980
 info@polytec.co.jp

Polytec, Inc. (USA)
 North American
 Headquarters 16400 Bake
 Parkway
 Suite 150 & 200
 Irvine, CA 92618
 Tel. +1 949 943-3033
 Fax +1 949 679-0463
 info@polytec.com

Polytec, Inc.
 Central Office
 1046 Baker Road
 Dexter, MI 48130
 Tel. +1 734 253-9428
 Fax +1 734 424-9304

Polytec, Inc.
 East Coast Office
 1 Cabot Rd, Suite 102
 Hudson, MA 01749
 Tel. +1 508 417-1040
 Fax +1 508 544-1225



NdtXducer is an independent, privately owned company dedicated to provide advanced product.

We design and manufacture state-of-the-art ultrasonic transducers and accessories for academic research and industrial NDT applications.

Our ultrasonic transducers cover the frequency range from 50kHz and up to 200MHz.

We develop custom ultrasonic transducers for scientific, semiconductor, material analysis and medical applications.

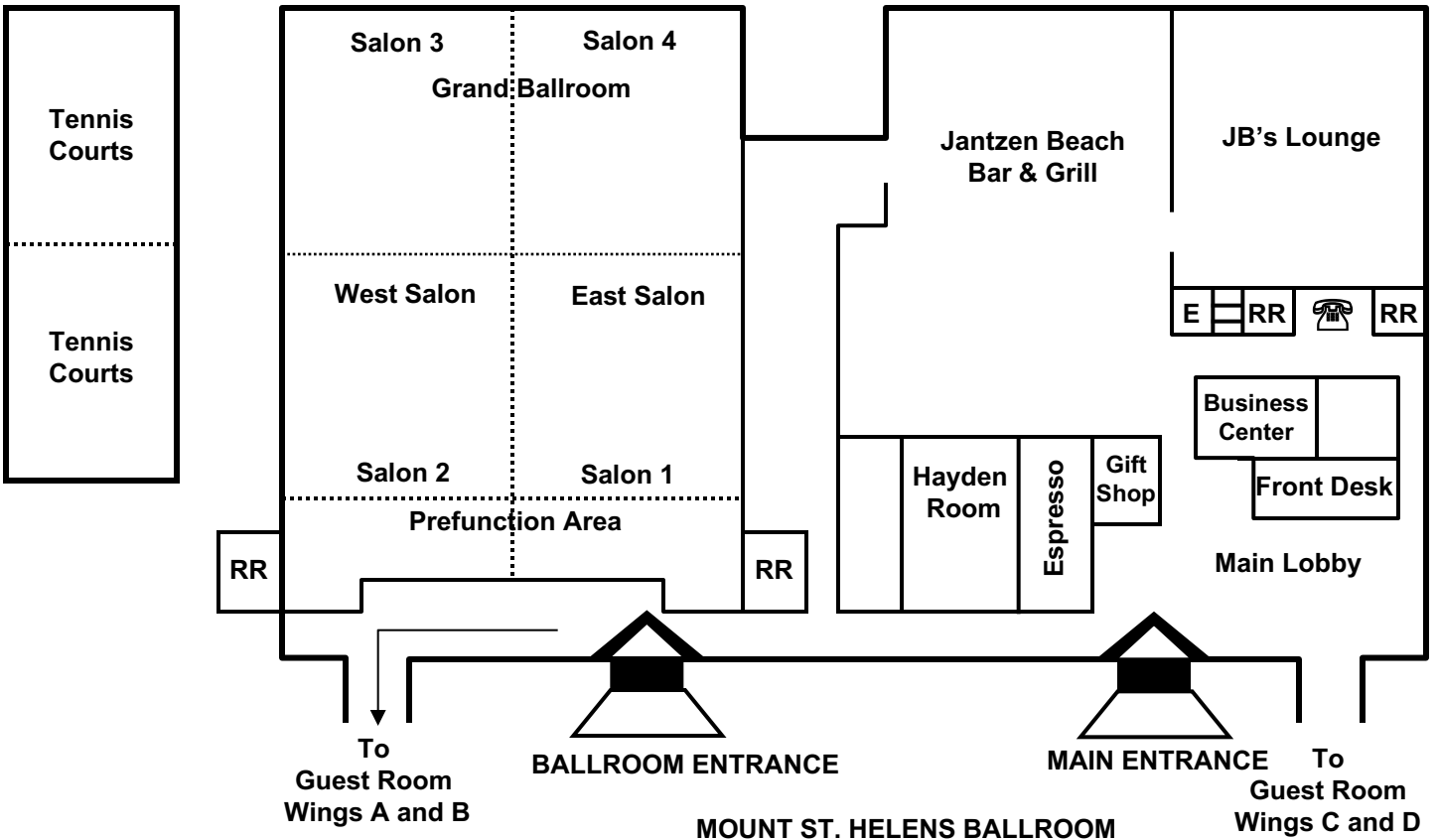
Striving to answer many demanding manufacturing and engineering challenges.

Hotel Floor Plan



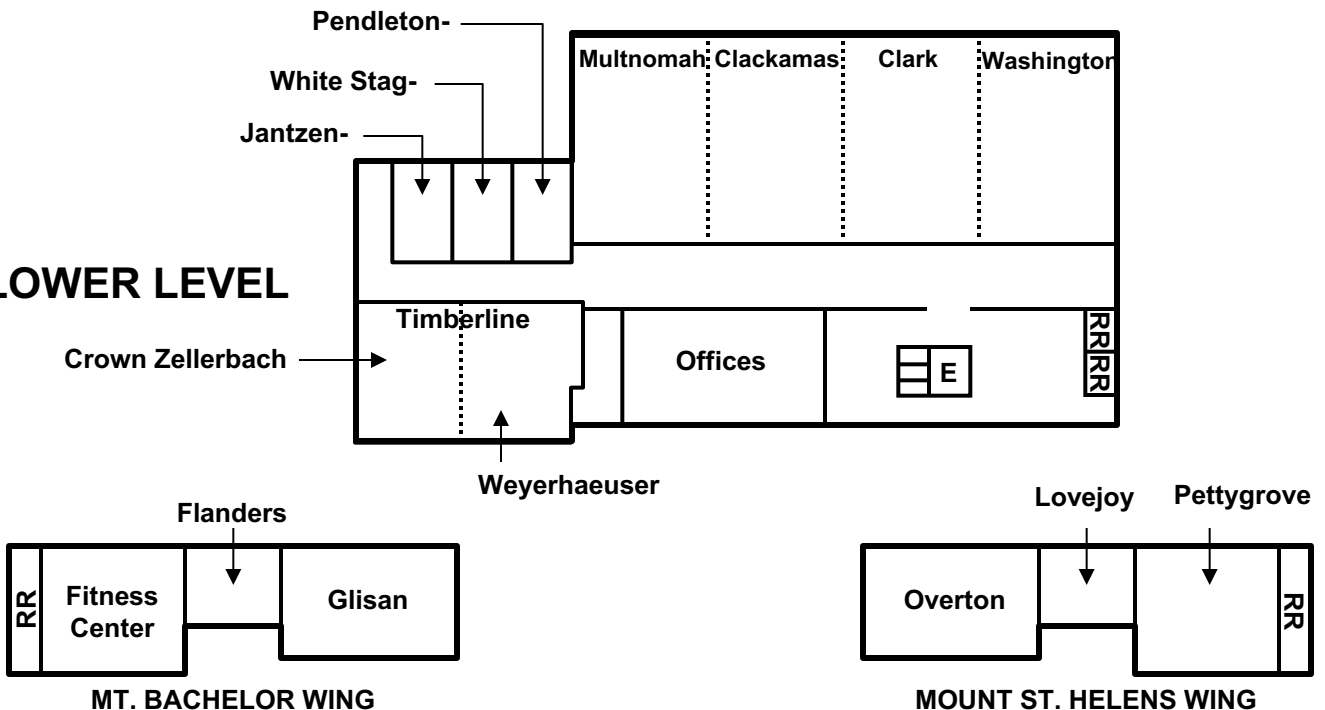
RED LION HOTEL ON THE RIVER JANTZEN BEACH – PORTLAND

MAIN LEVEL



MOUNT ST. HELENS BALLROOM

LOWER LEVEL



MT. BACHELOR WING

MOUNT ST. HELENS WING

**CONFERENCE EVALUATION FORM
46TH ANNUAL REVIEW OF PROGRESS IN QNDE
RED LION HOTEL ON THE RIVER, PORTLAND, OR
JULY 13 – 18, 2019**

We value your opinions. Your input will be used in planning future QNDE conferences.

PLEASE RATE THE FOLLOWING AND SHARE ANY CONCERNS YOU HAVE

	Excellent	Satisfactory	Not Satisfactory	Specific Concern
Pre-conference communication and pre-registration procedures				
Conference communication and organization at meeting site				
Meeting Facilities: Plenary, Technical/Poster Sessions				
Audio-Visual				
Welcome Event: Sunday				
Evening Reception: Tuesday				
Banquet: Tuesday				
Absence of 5K event				
Conference breakfasts: Monday – Thursday				
Conference lunches: Monday- Thursday				
Conference break items: Monday – Thursday				

PLEASE RANK 2019 AND PAST QNDE CONFERENCE SITES; 3 EXCELLENT, 2 SATISFACTORY, 1 UNSATISFACTORY.

	Appeal of Meeting Site	Quality of Meeting Facilities	Costs	Comments
'19 Red Lion Hotel, Portland, OR				
'18 Davis Center, University of Vermont, Burlington, VT				
'17 Utah Valley Convention Center,				
'16 Georgia Tech Hotel, Atlanta, GA				
'15 Hyatt Hotel, Minneapolis, MN				

PLEASE RECOMMEND FUTURE QNDE CONFERENCE SITES AND / OR SHARE ADDITIONAL COMMENTS:

Thank you for your participation. Please turn this form into the conference onsite office (Jantzen Room) or it may [emailed](mailto:micelik@asme.org) to Kim Miceli, micelik@asme.org



2019 QNDE

46th Annual Review of Progress in
Quantitative Nondestructive Evaluation

See you in 2020!

event.asme.org/QNDE