

NUMIFORM 2019

The 13th International Conference
on Numerical Methods in Industrial Forming Processes

June 23-27, 2019 • Sheraton Portsmouth Harborside Hotel
Portsmouth, New Hampshire, USA

FINAL PROGRAM



www.tms.org/numiform2019

SCHEDULE OF EVENTS

Please note that all times are in Eastern Daylight Time (EDT) -0400 UTC.

Sunday, June 23	Time	Location
Registration	5:00 PM - 7:30 PM	Hotel Lobby
Welcome Reception	6:00 PM - 8:00 PM	F-Grand Ballroom
Monday, June 24		
Registration	7:00 AM - 6:00 PM	Hotel Lobby
Exhibitor Setup	7:00 AM - 10:00 AM	Ballroom & Conference Lobbys
Welcome & Introduction	8:00 AM - 8:30 AM	F-Grand Ballroom
Plenary 1 - Alan Needleman	8:30 AM - 9:20 AM	F-Grand Ballroom
Parallel Sessions	9:25 AM - 10:25 AM	See Technical Program
Exhibits Open	10:15 AM - 4:15 PM	Ballroom & Conference Lobbys
Break	10:25 AM - 10:45 AM	E-Harbor's Edge Room & Lobbys
Parallel Sessions	10:45 AM - 12:05 PM	See Technical Program
Lunch	12:10 PM - 1:30 PM	F-Grand Ballroom
Parallel Sessions	1:35 PM - 2:55 PM	See Technical Program
Plenary 2 - Ming Shi	3:00 PM - 3:50 PM	F-Grand Ballroom
Break	3:50 PM - 4:10 PM	E-Harbor's Edge Room & Lobbys
Parallel Sessions	4:10 PM - 5:50 PM	See Technical Program
Tuesday, June 25		
Registration	7:30 AM - 6:00 PM	Hotel Lobby
Plenary 3 - Marion Merklein	8:30 AM - 9:20 AM	F-Grand Ballroom
Parallel Sessions	9:25 AM - 10:25 AM	See Technical Program
Exhibits Open	10:15 AM - 4:15 PM	Ballroom & Conference Lobbys
Break	10:25 AM - 10:45 AM	E-Harbor's Edge Room & Lobbys
Parallel Sessions	10:45 AM - 12:05 PM	See Technical Program
Lunch	12:10 PM - 1:30 PM	F-Grand Ballroom
Parallel Sessions	1:35 PM - 2:55 PM	See Technical Program
Plenary 4 - Hyunok Kim	3:00 PM - 3:50 PM	F-Grand Ballroom
Break	3:50 PM - 4:10 PM	E-Harbor's Edge Room & Lobbys
Parallel Sessions	4:10 PM - 5:50 PM	See Technical Program
Wednesday, June 26		
Registration	7:30 AM - 5:30 PM	Hotel Lobby
Plenary 5 - Frederic Barlat	8:30 AM - 9:20 AM	F-Grand Ballroom
Parallel Sessions	9:25 AM - 10:25 AM	See Technical Program
Exhibits Open	10:15 AM - 4:15 PM	Ballroom & Conference Lobbys
Break	10:25 AM - 10:45 AM	E-Harbor's Edge Room & Lobbys
Parallel Sessions	10:45 AM - 12:05 PM	See Technical Program
Lunch	12:10 PM - 1:30 PM	F-Grand Ballroom
Parallel Sessions	1:35 PM - 2:55 PM	See Technical Program
Plenary 6 - Victor Oancea	3:00 PM - 3:50 PM	F-Grand Ballroom
Break	3:50 PM - 4:10 PM	E-Harbor's Edge Room & Lobbys
Parallel Sessions	4:10 PM - 5:50 PM	See Technical Program
Exhibits Breakdown	4:15 PM - 6:00 PM	Ballroom & Conference Lobbys
Conference Banquet	6:30 PM - 9:00 PM	Offsite
Thursday-Friday, June 27-28		
Technical and Social Tours	ALL DAY	Offsite

WELCOME TO NUMIFORM 2019

We are pleased to welcome you to the 13th iteration of the International Conference on Numerical Methods in Industrial Forming Processes (NUMIFORM 2019). Introduced in 1982, this meeting serves as a forum for the exchange of ideas that advance the state-of-the-art in numerical simulations of material forming processes. We hope you will take every opportunity during this week to immerse yourself in this unique, highly focused technical meeting where you have the chance to learn from and network with other experts in the field. The NUMIFORM 2019 technical program will include plenary and invited lectures, as well as oral and poster presentations encompassing a wide range of topic areas.

We look forward to an exciting conference and thank you for your participation in NUMIFORM 2019!

WARMEST REGARDS FROM THE ORGANIZING COMMITTEE

Lead Organizer:
Yannis Korkolis,
The Ohio State University (USA)

Co-Organizers:
Brad Kinsey,
University of New Hampshire
(USA)

Marko Knezevic,
University of New Hampshire
(USA)

Nikhil Padhye,
University of New Hampshire
(USA)

Steering Committee:
Frédéric Barlat,
Pohang University of Science
and Technology (Korea)

José Cesar de Sa,
University Porto (Portugal)

Lionel Fourment,
MINES ParisTech & CEMEF
(France)

Somnath Ghosh,
Johns Hopkins Univ. (USA)

Ken-Ichiro Mori,
Toyohashi University (Japan)

Khemais Saanouni,
University de Technologie de
Troyes (France)

Ton van den Boogaard,
University Twente (The
Netherlands)

Shi-Hong Zhang,
Institute of Metal Research,
Chinese Academy of Sciences
(China)

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REGISTRATION

Your registration badge ensures admission to each of these events:

- Sunday Welcome Reception
- Wednesday Conference Dinner*
- Morning and afternoon refreshment breaks during lecture intermissions
- Continental breakfast on Monday, Tuesday, Wednesday
- Daily lunches on Monday, Tuesday, Wednesday

**Please note that while one ticket for the conference dinner is included, registration was required for this event through the conference registration form. Check at the registration desk for more information.*

Registration for social and technical tours was available through the conference registration form. Check at the registration desk for more information.

REGISTRATION HOURS

The registration desk will be located at the Sheraton Portsmouth Harborside Hotel in the Hotel Lobby at the following times:

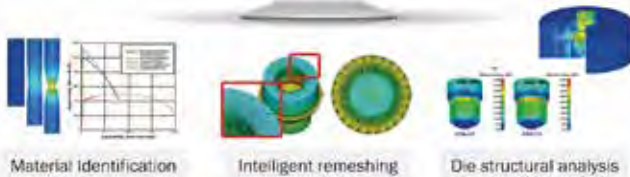
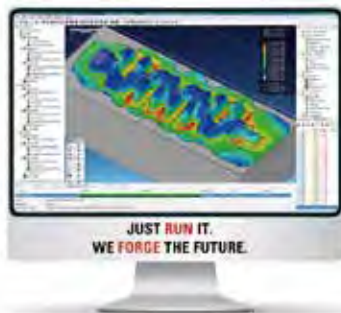
Sunday, June 23:
5:00 P.M. – 7:30 P.M.

Monday, June 24:
7:00 A.M. – 6:00 P.M.

Tuesday, June 25:
7:30 A.M. – 6:00 P.M.

Wednesday, June 26:
7:30 A.M. – 5:30 P.M.

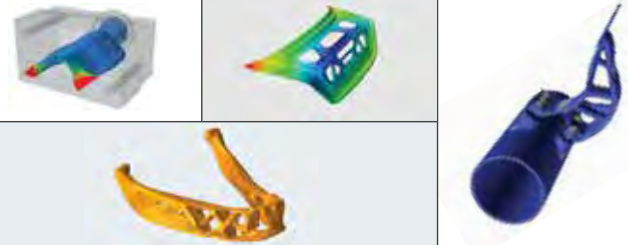
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CONFERENCE DETAILS

TECHNICAL SESSIONS

All oral and poster presentations will be held at in the Sheraton Portsmouth Harborside Hotel. The meeting rooms in the hotel will be the Gardner Room, the Lear Room, the Prescott Room, the Grand Ballroom, and the Amphitheater. See the Technical Program on pages 5-32 for room locations.

INTERNET ACCESS

Complimentary Wi-Fi internet access is available for attendees in the Sheraton meeting space and can be accessed using the following credentials:

Username: Sheraton conference

Password: Harborside2

PROCEEDINGS

Proceedings for NUMIFORM 2019 are being distributed on a USB memory stick (flash drive) at the registration desk. If you did not receive a copy or have questions, please visit the registration desk in the Sheraton Portsmouth Harborside Hotel Lobby.

EXHIBITION HOURS

The exhibition will be located in the Ballroom & Conference Lobbies.

Monday, June 24:
10:15 A.M. – 4:15 P.M.

Tuesday, June 25:
10:15 A.M. – 4:15 P.M.

Wednesday, June 26:
10:15 A.M. – 4:15 P.M.

NETWORKING & SOCIAL EVENTS

WELCOME RECEPTION

The Welcome Reception will be held on Sunday, June 23, from 6:00 P.M. to 8:00 P.M. in the Grand Ballroom of the Sheraton Portsmouth Harborside Hotel.

CONFERENCE BANQUET

The NUMIFORM 2019 dinner event will be held on Wednesday, June 26 from 6:30 P.M. to 9:00 P.M. at the Strawberry Banke Puddle Dock (14 Hancock St., Portsmouth, NH 03801). Please note that while one ticket for the dinner is included, registration was required for this event through the conference registration form. Onsite ticket sales are based on availability. Check with TMS staff at the registration desk, located in the Sheraton Hotel Lobby, for more information.

ABOUT THE VENUE

SHERATON PORTSMOUTH HARBORSIDE HOTEL

The Sheraton Portsmouth Harborside Hotel is located in the heart of Portsmouth's historic downtown district on the Piscataqua River. You are steps away from a variety of dining options, local breweries, and unique shopping experiences in Market Square. The hotel's location also provides easy access to museums, historic sites, picturesque beaches, outdoor recreation opportunities, and entertainment. Hotel amenities include a fitness center, complimentary high-speed internet access in public spaces and guest rooms, self and valet parking, and a full-service restaurant. For more information, visit www.marriott.com/sheraton/portsmouth.



PLENARY/KEYNOTE SPEAKERS

Plenary 1 - Alan Needleman,
Texas A&M University, USA
 Presentation Title: Toughness, Roughness and the Possibility of Microstructure Design for Improved Crack Growth Resistance

Monday, 8:30 AM - 9:20 AM

Plenary 2 - Ming Shi,
US Steel Corporation, USA
 Presentation Title: Third Generation Steels – Material Characterizations and Modeling for Accurate Numerical Simulations

Monday, 3:00 PM - 3:50 PM

Plenary 3 - Marion Merklein,
Institute of Manufacturing Technology, University of Erlangen-Nuremberg, Germany
 Presentation Title: Numerical Methods to Design Complex Process Chains in Sheet-bulk Metal Forming

Tuesday, 8:30 AM - 9:20 AM

Plenary 4 - Hyunok Kim,
EWI, USA
 Presentation Title: The Automotive Industry's Perspective on Advances and Challenges in Sheet Metal Forming

Tuesday, 3:00 PM - 3:50 PM

Plenary 5 - Frederic Barlat,
Pohang University of Science and Technology, South Korea
 Presentation Title: Continuum Description of Anisotropic Flow and Hardening Based on Lower Scale

Wednesday, 8:30 AM - 9:20 AM

Plenary 6 - Victor Oancea,
Dassault Systemes SIMULIA Corp, USA
 Presentation Title: Plasticity Models for Predictive Additive Manufacturing Process Simulations

Wednesday, 3:00 PM - 3:50 PM

All plenary talks will be held in room F - Grand Ballroom.

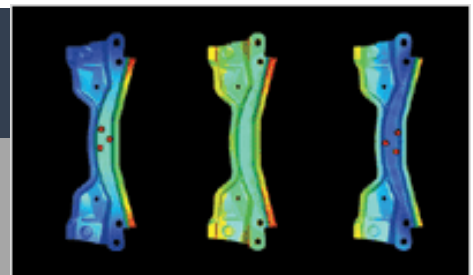
JSTAMP

Support tool design and process design for forming

Sheet metal forming Simulation

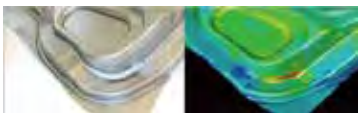
J SOL CORPORATION

J SOL supports industries with the simulation technology of state-of-the-art
cae.jsol.co.jp/en/jstamp/



CASE Studies

Functions



Prediction of **crack** on a dashboard upper panel

[Images courtesy of G-TECT CORORATION]



Precise **springback** prediction of hightensile materials by using the Y-U model



Prediction of **wrinkles** on a dashboard upper panel

[Images courtesy of G-TECT CORORATION]



Consideration of **temperature dependency** of the material and heat transfer to the tool

- Various Formability Evaluation
- High Accuracy Crack Analysis & Evaluation
- Convenient Geometry Evaluation
- Convenient Database Functions
- Quick Feedback Solutions
- High Accuracy Springback Analysis & Evaluation
- High Speedy Solutions
- Robust Process Management
- Convenient Meshing Functions
- HYSTAMP:Early Design Stage Solution

SPONSORS & EXHIBITORS

The NUMIFORM 2019 organizers would like to thank the following Sponsors and Exhibitors for their gracious support of the event:

SPONSORS



Altair is a leading provider of enterprise-class engineering software enabling innovation, reduced development times, and lower costs through the entire product lifecycle from concept design to in-service operation. Our simulation-driven approach to innovation is powered by our integrated suite of software which optimizes design performance across multiple disciplines encompassing structures, motion, fluids, thermal management, electromagnetics, system modeling and embedded systems, while also providing data analytics and true-to-life visualization and rendering. For more information visit altair.com.



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MFRC passionately contributes to the metal forming community by developing AFDEX, a metal forming simulation software. AFDEX can be the best fit for design and verification of your forging process with its outstanding analytical capabilities. With more than two decades of experience in metal forming simulation, we support our customers in various ways which include webinars, presentations and knowledge transfer from annual conferences on metal forming CAE technologies. The strong points of AFDEX are intelligent re-meshing technology, user friendliness and solution accuracy. We believe that this facilitates a wide application spectrum in metal forming ranging from structural analysis of dies, coupled analysis to other conventional and advanced manufacturing processes. Learn more online at <https://www.afdex.com/>.



JSOL Corporation provides cutting edge CAE technology and technical consulting our own software products. We also offer expertise in modeling and its know-how as well as a software based on the expertise. We also develop simulation tools for press forming - JSTAMP for analyzing metal. Please come visit our exhibition booth for more details.



National Science Foundation

SPONSORS & EXHIBITORS



The University of New Hampshire inspires innovation and transforms lives in our state, nation and world. More than 16,000 students from all 50 states and 71 countries engage with an award-winning faculty in top-ranked programs in business, engineering, law, health and human services, liberal arts and the sciences across more than 200 programs of study. As one of the nation's highest-performing research universities, UNH partners with NASA, NOAA, NSF and NIH, and receives more than \$110 million in competitive external funding every year to further explore and define the frontiers of land, sea and space.



INTEGRATED SYSTEMS ENGINEERING

Manufacturing is recognized as one of the four strategic growth areas for The Ohio State University's College of Engineering. Manufacturing research has a long tradition at The Ohio State University, which also was the location of the 2004 NUMIFORM, and will be hosting the 2020 International Conference on the Technology of Plasticity (ICTP) next July. The College of Engineering graduate program is ranked first in Ohio and 16th among all public universities in U.S. News & World Report's 2019 Best Graduate Schools issue. The Department of Integrated Systems Engineering placed 13th overall in the industrial/manufacturing specialty, offering both an M.S. and Ph.D. in Industrial and Systems Engineering.



QForm software simulates the most complex metal forming problems and provides quick and easy solutions to difficult forming problems. QForm has been designed from the ground up to meet the requirements of the most demanding forge plants, academics and researchers from Universities. It is used around the world for the simulation of: all forging types of processes, extrusion, ring rolling, cold forming, heat treatment and microstructure evolution. It is the first metal forming simulation program based on a hybrid approach combining the advantages of Voronoi Cells and Finite-Element Method. This allows us to run simulations faster and obtain more accurate results than other purely FEM codes. New QForm builds on the famous ease-of-use of previous versions, but now allows for fast simulation of even the most complex problems. With advanced features like user-defined algorithms, impressive graphics and thermally/mechanically coupled simulations, QForm delivers easy and accurate simulations at a reasonable price.



U.S. Steel produces products that range from mild and bakehard steels (BH) for class A applications to high strength low alloy (HSLA) and dual phase (DP) steels for components requiring more strength. Our recent advances with XG3™ and Mart-Ten™ have expanded our capabilities to offer solutions to more complex vehicle crash events. XG3™, the leading grade in Generation 3 steels, solves the past dilemma of "more strength or more formability" by giving the design engineer both. 980 XG3™ steel offers almost twice the strength, with more formability than the typical 590 Dual Phase. For those applications requiring as much strength as possible, the Mart-Ten™ steels offer products from 900 MPa to 1700 MPa. Our material provides industry leading flatness allowing complex shapes to be roll formed, with dimensionally stable results. The 1500 MPa steel was the winner of the Altair Enlighten Award in 2018. U. S. Steel became the first steel company to ever win this prestigious award.

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We Manufacture Innovation

EWI empowers industry leaders to overcome complex manufacturing challenges and integrate new processes to bring products to market more quickly and efficiently. Since 1984, EWI's comprehensive engineering services have helped companies identify, develop, and implement the best options for their specific applications. Our customers include but are not limited to aerospace, automotive, consumer electronics, industrial products, defense, and heavy equipment. Backed by unmatched professional expertise, state-of-the-art lab facilities, and technology resources, we offer customized solutions that deliver game-changing results. EWI's associates – 160+ engineers, technicians, industry experts, and member advocates – can help you address your process and production issues and make your operation more competitive through technology innovation. Visit ewi.org, email <mailto:info@ewi.org>, or call 614.688.5000 to learn more.

TABLETOP EXHIBITOR



The New Hampshire Manufacturing Extension Partnership (NH MEP) is able to leverage a vast array of public and private resources and services that are available to every manufacturing enterprise in the state. The nationwide system of MEP centers is linked through the U.S. Department of Commerce - National Institute of Standards and Technology (NIST), with the common goal to strengthen the global competitiveness of U.S. manufacturers."

MEETING POLICIES

BADGES

All attendees must wear registration badges at all times during the congress to ensure admission to events included in the paid fee, such as technical sessions, exhibition, and receptions.

REFUNDS

The deadline for all refunds was April 30, 2019. No refunds will be issued at the conference. Fees and tickets are nonrefundable.

REGISTRATION

Registration is required for all presenting authors, attendees, accompanying persons, and sponsors/exhibitors.

PHOTO AND VIDEO RECORDING DEVICES

The NUMIFORM conference series reserves the right to all audio and video reproductions of presentations at NUMIFORM. By registering for this conference, all attendees acknowledge that



they may be photographed while at events, and that those photos may be used for promotional purposes, in and on NUMIFORM publications and websites, and on social media sites.

Any recording of sessions (audio, video, still photography, etc.) intended for personal use, distribution, publication, or copyright without the express written consent of the NUMIFORM organizing committee and the individual authors is strictly prohibited. Attendees violating this policy may be asked to leave the session.

MOBILE PHONES

In consideration of attendees and presenters, we kindly request that you minimize disturbances by setting all mobile phones and other devices on "silent" while in meeting rooms.



SOFTWARE FOR SIMULATION AND OPTIMIZATION OF METAL FORMING PROCESSES AND PROFILE EXTRUSION



LARGE RIGID-PLASTIC AND ELASTIC-PLASTIC DEFORMATION

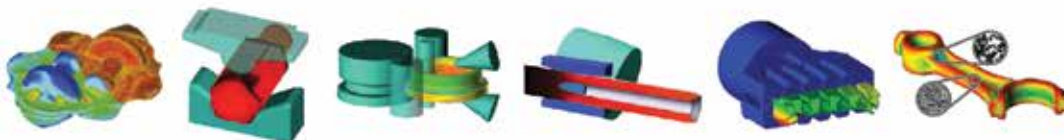
HEXAHEDRON AND TETRAHEDRON FINITE ELEMENTS

FULLY COUPLED SOLUTION FOR THERMO-MECHANICAL PROBLEM

SPRINGBACK AND RESIDUAL STRESSES

ASSEMBLED AND PRESTRESSED TOOLS

EASY PROGRAMMING OF USER'S DEFINED FUNCTIONS



EMERGENCY PROCEDURES

The chances of an emergency situation occurring at NUMIFORM 2019 are quite small. However, being prepared to react effectively in case of an incident is the most critical step in ensuring the health and safety of yourself and those around you. Please take a few moments to review the maps of the Sheraton Portsmouth Harborside Hotel printed in this program (on the back cover). When you enter the building, familiarize yourself with the exits and the stairs leading to those exits. When you arrive at your session or event location, look for the emergency exits that are in closest proximity to you.

In case of a fire, all attendees will be advised to leave the building through the nearest fire exit. The staff at the Sheraton Portsmouth Harborside are trained to get their guests out of the building and there is a fully automated fire warning system.

Please use the following local safety and security contact information if you or someone near you is experiencing an emergency.

Police Department: Dial 911 from a cell phone, or have hotel staff or bystanders dial 911. If safe to do so, notify hotel staff of the emergency and that you have called 911.

Fire Department: Dial 911 from a cell phone, or have hotel staff or bystanders dial 911. If safe to do so, notify hotel staff of the emergency and that you have called 911.

Nearest Hospital: Portsmouth Regional Hospital
333 Borthwick Ave, Portsmouth, New Hampshire,
03801
+1 (603) 436-5110

Alternate Hospital: York Hospital
1 Loving Kindness Way, York, Maine, 03909
+1 (207) 363-4321

USS

XG3

LIGHTWEIGHTING

Roof Header: 880 XG3 Steel
10% weight savings

Rear Rails: 880 XG3 Steel
20% weight savings

A Pillar (Outer/Inner): 880 XG3 Steel
Secondary mass savings

B Pillar (Outer/Inner): 880 XG3 Steel
20% weight savings

Longitudinal Members: 880 XG3 Steel
10% weight savings

Rear Pillars: 880 XG3 Steel
15% weight savings

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TOUR DETAILS

Please note pre-registration was required for all of the tours. There will be no on-site registration. Please see the registration desk in the Hotel Lobby with any questions.

TOUR A



If you registered for **Tour A - Maine Seacoast and Lobster Boat**, please note the following important information:

When: Thursday, June 27, 2019
 Where: Portsmouth, New Hampshire and Maine Seacoast
 Departure Time: Depart from Sheraton Portsmouth Harborside Hotel at 9:00 a.m.
 Return Time: Arrive at Sheraton Portsmouth Harborside Hotel at approximately 3:00 p.m.

Registration includes bus transportation to and from the Sheraton Portsmouth Harborside Hotel, local guide, and admission to the Finestkind cruise of the Maine Seacoast. Lunch on your own at Barnacle Billy's. *Fee does not include lunch.*

Schedule:

9:00 a.m.	Depart Sheraton Portsmouth, travel to Perkins Cover
10:00 a.m.	Embark on a cruise aboard the Finestkind Lobster boat at Perkins Cove. View the scenic Ogunquit coast and see how an authentic Maine Lobsterman hauls his traps to get lobsters.
11:00 a.m.	Explore the shops at Perkins Cove or take a walk on the Marginal Way.
12:00 p.m.	Lunch on your own at Barnacle Billy's
1:00 p.m.	Travel to York to see Nubble Light, perhaps the most beautiful and most painted and photographed lighthouse in America.
3:00 p.m.	Return to Sheraton Portsmouth

TOUR B



If you registered for **Tour B - University of New Hampshire Olson Center**, please note the following important information:

When: Thursday, June 27, 2019
 Where: Portsmouth, New Hampshire and University of New Hampshire
 Departure Time: Depart from Sheraton Portsmouth Harborside Hotel at 10:00 a.m.
 Return Time: Arrive at Sheraton Portsmouth Harborside Hotel at approximately 12:30 p.m.

Registration includes bus transportation to and from the Sheraton Portsmouth Harborside Hotel, and guided tour of the Olson Center facility. *Fee does not include lunch.*

Schedule:

10:00 a.m.	Depart Sheraton Portsmouth, travel to University of New Hampshire Olson Center
10:30 a.m.	Tour of the Olson Center
12:00 p.m.	Depart for return to Sheraton Portsmouth

Please note pre-registration was required for all of the tours. There will be no on-site registration. Please see the registration desk in the Hotel Lobby with any questions.

TOUR DETAILS

TOUR C



If you registered for **Tour C - University of NH Olson Center & Turbocam Facility**, please note the following important information:

When: Thursday, June 27, 2019
 Where: Portsmouth, New Hampshire and University of New Hampshire
 Departure Time: Depart from Sheraton Portsmouth Harborside Hotel at 10:00 a.m.
 Return Time: Arrive at Sheraton Portsmouth Harborside Hotel at approximately 4:30 p.m.

Registration includes bus transportation to and from the Sheraton Portsmouth Harborside Hotel, and guided tour of the Olson Center facility and Turbocam Facility. *Fee does not include lunch.*

Schedule:

10:00 a.m.	Depart Sheraton Portsmouth, travel to University of New Hampshire Olson Center
10:30 a.m.	Tour of the Olson Center
12:00 p.m.	Lunch at the Olson Center
1:00 p.m.	Travel to Turbocam by bus
1:30 p.m.	Tour Turbocam
3:30 p.m.	Depart for return to Sheraton Portsmouth (estimated arrival time: 4:30 p.m.)

TOUR D



If you registered for **Tour D - University of Michigan and Lightweight Innovations for Tomorrow**, please note the following important information:

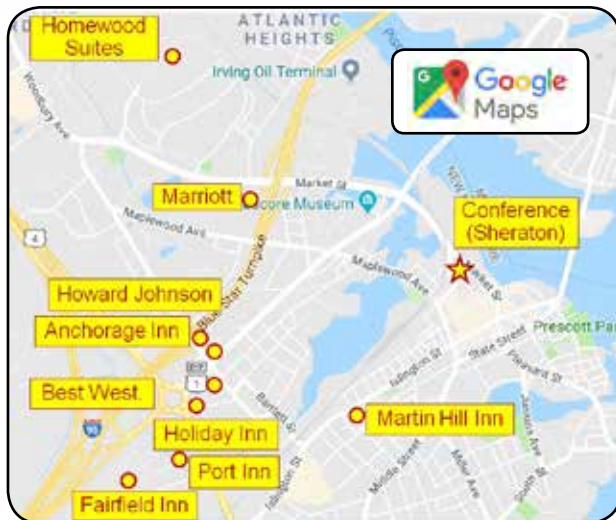
When: Thursday, June 27-28, 2019
 Where: Portsmouth, New Hampshire, University of Michigan in Ann Arbor Michigan, and the Lightweight Innovations for Tomorrow (LIFT) HQ in Detroit, Michigan

Schedule:

Day 1 – Thursday, June 27	
<ul style="list-style-type: none"> Travel* to Detroit, arriving at the Detroit airport in the afternoon. *Note: Participants are responsible for their own travel expenses between Portsmouth and Detroit airport, and accommodations. Travel via University of Michigan transportation to Ann Arbor, Michigan Tour LIFT-UM facility Dinner in Ann Arbor (on your own) 	
Day 2 – Friday, June 28:	
<ul style="list-style-type: none"> Tour of LIFT HQ in Detroit (included transport from Ann Arbor to Detroit). After the tour: <ul style="list-style-type: none"> Option 1 – Drive to Detroit airport for those who leave on June 28 Option 2 – Drive back to Ann Arbor for continuation of the LIFT-UM tour; Lunch in Ann Arbor; Short presentation about the LIFT projects Option 3 – Drive to Detroit airport on June 28 evening Option 4 – Drive to Detroit airport on June 29 	

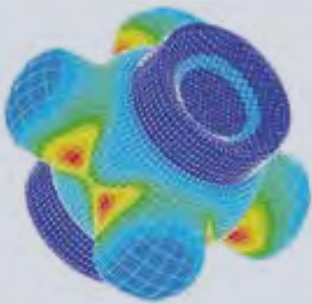
There is no charge for the tour. Participants are responsible for their own travel expenses and accommodations.

PORTSMOUTH MAP



Map courtesy of Google Maps

Access the Portsmouth Google map from your device at:
www.tms.org/Numiform2019Location



NUMIFORM 2019

The 13th International Conference
on Numerical Methods in Industrial Forming Processes

TECHNICAL PROGRAM

*Lunch break for all sessions is 12:10 PM
in room F – Grand Ballroom*



NUMIFORM Plenary Session — Plenary I

Program Organizers: Yannis Korkolis, Ohio State University; Brad Kinsey, University of New Hampshire

Monday AM Room: F- Grand Ballroom
June 24, 2019 Location: Sheraton Portsmouth

Session Chair: Yannis Korkolis, Ohio State University

8:30 AM Plenary

Toughness, Roughness and the Possibility of Microstructure Design for Improved Crack Growth Resistance: *Alan Needleman*¹; ¹Texas A&M University

9:20 AM Break**S-01: Modeling of the Anisotropic Behavior in Plasticity — Session I**

Program Organizers: Frédéric Barlat, Pohang University of Science and Technology; Yanshan Lou, Xi'an Jiaotong University

Monday AM Room: A - Prescott
June 24, 2019 Location: Sheraton Portsmouth

Session Chairs: Toshihiko Kuwabara, Tokyo University Agriculture & Technology; Yanshan Lou, Xi'an Jiaotong University

9:25 AM

Rate-dependent Tension and Compression Hardening Behaviors of Ahss for Sheet Metal Forming Simulation: *Hoon Huh*¹; G. Joo²; J. Kwon³; ¹Korea Institute of Materials Science; ²Korea Advanced Institute of Science and Technology; ³Korea Institute of Material Science

9:45 AM

Comparison of Strain-path Indicators for Analysis of Processes in Sheet-bulk Metal Forming: *Florian Gutknecht*¹; Manfred Vogel²; Robert Schulte²; Marion Merklein²; Daniel Rosenbusch³; Sergej Koch³; Sven Hübner³; Bernd-Arno Behrens³; A. Erman Tekkaya¹; Till Clausmeyer¹; ¹TU Dortmund University; ²Friedrich-Alexander Universität Erlangen-Nürnberg; ³Leibniz Universität Hannover

10:05 AM

An Experimental Study on Yield Surface Evolution of a Trip-assisted Steel: Nan Guo¹; *Junying Min*¹; Yong Hou¹; Jianping Lin¹; John Carsley²; Thomas Stoughton²; A. Tekkaya³; Till Clausmeyer³; Heinrich Traphöner³; ¹Tongji University; ²General Motors Global Research and Development; ³Institute of Forming Technology and Lightweight Components

10:25 AM Break**S-04: Formability in Metal Forming Processes — Session I**

Program Organizers: Stefania Bruschi, University of Padua; Andrea Ghiotti, University of Padua

Monday AM Room: C - Gardner
June 24, 2019 Location: Sheraton Portsmouth

Session Chairs: Stefania Bruschi, University of Padua; Robert Schulte, Institute of Manufacturing Technology

9:25 AM

Experimental Study on Shear Characterization of 22MnB5 Steel under Different Quenching Conditions: *Botao Zhang*¹; Shuhui Li¹; Ji He¹; ¹Shanghai Jiao Tong University

10:05 AM

Modelling of 22MnB5 Hot Stamping Process Coupling Microstructural Evolution: Giulia Venturato¹; Enrico Simonetto¹; Andrea Ghiotti¹; *Stefania Bruschi*¹; ¹University of Padua

9:45 AM

Simulation of Phase Transformation and Material Plasticity for Press Hardening: *Melanie Tomasch*¹; Thomas Antretter¹; Werner Ecker²; ¹Montanuniversitaet Leoben; ²Material Center Leoben

10:25 AM Break**S-08: Incremental Forming — Effect of Material Properties in Incremental Forming**

Program Organizers: Anne Marie Habraken, University of Liege; Beatriz Silva, Instituto Superior Técnico; Ricardo Alves de Sousa, Universidade de Aveiro; Carpofo Vallellano, Universidad de Sevilla; Ghulam Hussain, GIK Institute of Engineering Sciences and Technology; M Luisa Garcia-Romeu, Universitat de Girona

Monday AM Room: B - Amphitheater
June 24, 2019 Location: Sheraton Portsmouth

Session Chairs: Beatriz Silva, Instituto Superior Técnico; Carpofo Vallellano, Universidad de Sevilla

9:25 AM

Effect of Hardening Law on Finite Element Simulation of Single Point Incremental Forming (SPIF) of 7075 Aluminum Alloy Sheet: *Rasoul Esmailpour*¹; H. Kim¹; T. Park¹; F. Pourboghra¹; A. Agha²; F. Abu-Farha³; ¹Ohio State University; ²Clemson Univeristy; ³Clemson University

9:45 AM

Effect of Plastic Anisotropy on Failure Prediction during Incremental Sheet Forming of AA6061 Alloy: *Abhishek Kumar*¹; Abhishek Singh¹; Amber Shrivastava¹; Sushil Mishra¹; K Narasimhan¹; ¹IIT Bombay

10:05 AM

Revisiting Micro-mechanical Damage Characterization for Single Point Incremental Forming Process: Parnika Shrivastava¹; *Puneet Tandon*¹; ¹PDPM IITDMJ

10:25 AM Break**S-12: Advances and Challenges in Welding/Joining Processes — Simulation of Microstructural Evolution**

Program Organizers: Saurabh Basu, Penn State University; Jingjing Li, Pennsylvania State University; Jian Chen, Oak Ridge National Laboratory; Wayne Cai, General Motors Global R&D Center

Monday AM Room: D - Lear
June 24, 2019 Location: Sheraton Portsmouth

Session Chairs: Mihaela Banu, University of Michigan; Junying Min, Tongji University

9:25 AM

Interfacial Microstructure Evolution and Mechanical Property of SA508-3/308L Joints Produced by Deformation Bonding: *Sheng Liu*¹; Mingyue Sun¹; Bin Xu¹; Jianyang Zhang¹; Dianzhong Li¹; ¹Institute of Metal Research, Chinese Academy of Sciences

9:45 AM

Simulation of Texture and Microstructure Evolution of the Seam Welding Zone in Extrusion Process: *Ding Tang*¹; Huamiao Wang¹; LeiLei Zhao¹; Dayong Li¹; Yinghong Peng¹; ¹Shanghai Jiao Tong University

10:05 AM

Numerical Modelling of Microstructure Evolution in Ti-6Al-4V Alloy during Friction Phase of Linear Friction Welding Process: *Samuel Bertrand*¹; Davood Shahriari¹; Mohammad Jahazi¹; Henri Champliand¹; ¹École de technologie supérieure

10:25 AM Break

S-02: Advanced Strategies for Inverse Identification of Constitutive Material Models — Strain Hardening Identification

Program Organizers: Sam Coppeters, KU Leuven; Antonio Andrade-Campos, Universidade de Aveiro

Monday AM Room: A - Prescott
June 24, 2019 Location: Sheraton Portsmouth

Session Chairs: Antonio Andrade-Campos, Universidade de Aveiro; Sam Coppeters, KU Leuven

10:45 AM

Effect of Strain Rate on Determining Post-necking Work Hardening of a Low-carbon Steel Sheet: *Tomoyuki Hakoyama*¹; Sam Coppeters²; Toshihiko Kuwabara³; ¹Gifu University; ²KU-Leuven; ³Tokyo University of Agriculture and Technology

11:05 AM

Large Strain Flow Curve Identification for Joining by Forming of Sheet Metal: *Sam Coppeters*¹; Mathias Jäckel²; Noa Miyake³; Toshihiko Kuwabara³; Dimitri Debruyne¹; Christian Kraus²; ¹KU Leuven; ²Fraunhofer; ³Tokyo University of Agriculture and Technology

11:45 AM Invited

Determination of Uniaxial Large-strain Workhardening for High-strength Steel Sheets with the Aid of DIC Technique: *Changwei Lian*¹; Jianping Lin²; ¹Baosteel; ²Tongji University

11:25 AM

Optimization of Parameters of Work Hardening Law in Tensile Fracture Simulation of Steel Sheet: *Ryunosuke Kakuta*¹; Susumu Takahashi¹; Daisuke Simizu¹; Masato Takamura²; Syunsuke Mihara²; ¹Nihon University; ²RIKEN

S-04: Formability in Metal Forming Processes — Session II

Program Organizers: Stefania Bruschi, University of Padua; Andrea Ghiotti, University of Padua

Monday AM Room: C - Gardner
June 24, 2019 Location: Sheraton Portsmouth

Session Chairs: Stefania Bruschi, University of Padua; Robert Schulte, Institute of Manufacturing Technology

10:45 AM

Investigation of Thermal FLD for AA7075 Aluminum Alloy based on GTN Damage Model under Hot Forming Process: *Liang Ying*¹; *Tianhan Gao*¹; Hai Rong¹; Ping Hu¹; ¹School of Automotive Engineering/Dalian University of Technology

11:05 AM

Enhancement of Forming Limits for Aluminum in Sheet-bulk Metal Forming by Local Laser Heat Treatment: *Robert Schulte*¹; Matthias Graser¹; Marion Merklein¹; ¹Institute of Manufacturing Technology

11:25 AM

High Strain Rate Formability of AA2B06-O Alloy during Impact Hydroforming: *Shihong Zhang*¹; Dayong Chen¹; Yong Xu¹; Atur Pokrovsky²; Doral Banabic³; ¹Institute of Metal Research, Chinese Academy of Sciences; ²Physical Technical Institute, National Academy of Sciences of Belarus; ³Technical University of Cluj-Napoca

S-08: Incremental Forming — Sensitivity of Incremental Forming to Process Conditions

Program Organizers: Anne Marie Habraken, University of Liege; Beatriz Silva, Instituto Superior Técnico; Ricardo Alves de Sousa, Universidade de Aveiro; Carpofofo Vallellano, Universidad de Sevilla; Ghulam Hussain, GIK Institute of Engineering Sciences and Technology; M Luisa Garcia-Romeu, Universitat de Girona

Monday AM Room: B - Amphitheater
June 24, 2019 Location: Sheraton Portsmouth

Session Chairs: Carpofofo Vallellano, Universidad de Sevilla; Anne Marie Habraken, University of Liege

10:45 AM

Bi-directional Contour Tool Path Scheme to Eliminate Twist during Incremental Sheet Forming: *Jaekwang Shin*¹; *Ankush Bansal*¹; Maya Nath; Alan Taub¹; Mihaela Banu¹; ¹University of Michigan

11:05 AM

FEM Simulation for the Single Point Incremental Forming of CFRP Prepreg: *Young Suk Kim*¹; JinJae Kim¹; VanCuong Do¹; SeungHan Yang¹; ¹Kyungpook National University

11:25 AM

Double-sided Incremental Forming of Periodic Structures with Free Edges: *Dohyun Leem*¹; Newell Moser¹; Kornel Ehmann¹; Jian Cao¹; ¹Northwestern University

11:45 AM

Numerical Analysis of the Complex Loading Path during Tube Flow Forming Processes: *Marie-Anne Vidal*¹; Pierre-Olivier Bouchard¹; François Frascati²; Jean-Pierre Mallet²; Katia Mocellin¹; ¹CEMEF Mines ParisTech; ²MBDA France

S-12: Advances and Challenges in Welding/Joining Processes — Solid State Joining

Program Organizers: Saurabh Basu, Penn State University; Jingjing Li, Pennsylvania State University; Jian Chen, Oak Ridge National Laboratory; Wayne Cai, General Motors Global R&D Center

Monday AM Room: D - Lear
June 24, 2019 Location: Sheraton Portsmouth

Session Chairs: Mihaela Banu, University of Michigan; Junying Min, Tongji University

10:45 AM

Interfacial Recrystallization and Element Diffusion during the Hot Compression-bonding of Ti-6321 to TC4: *Bijun Xie*¹; Mingyue Sun¹; Bin Xu¹; Dianzhong Li¹; ¹Institute of Metal Research, Chinese Academy of Sciences

11:05 AM

Modeling of the Ultrasonic Welding Process of Carbon Fiber Composite Materials: *Tae Lee*¹; Yang Li¹; Mihaela Banu¹; ¹University of Michigan

11:25 AM

Simulation of Friction Stir Welding Process and its Application to the Prediction of Mechanical Properties of Welded Specimen: *Dongjoon Myung*¹; Wooram Noh²; Jinyoung Yoon²; Ji-Hoon Kim³; Myoung-gyu Lee⁴; ¹Seoul national university; ²Korea Institute of Industrial Technology; ³Busan National University; ⁴Seoul National University

11:45 AM Break

Monday PM

S-01: Modeling of the Anisotropic Behavior in Plasticity — Session II

Program Organizers: Frédéric Barlat, Pohang University of Science and Technology; Yanshan Lou, Xi'an Jiaotong University

Monday PM
June 24, 2019
Room: A - Prescott
Location: Sheraton Portsmouth

Session Chairs: Frederic Barlat, Pohang Univ of Science and Technology; Jinjin Ha, The Ohio State University

1:35 PM

Modeling of the Differential Hardening of Pure Titanium Sheet and Application to Hole Expansion Forming Simulation: Chiharu Nagano¹; Toshihiko Kuwabara¹; Ryoji Kawamura²; Yuta Shimada²; ¹Tokyo University Agriculture & Technology; ²Honda Engineering

1:55 PM

Theory and Application Study of Springback Prediction Accuracy for QP Steel with Different Material Hardening Models: Chao Niu¹; Ping Chen¹; Jun Chen²; ¹Baosteel; ²Shanghai Jiaotong University

2:15 PM

Modeling of Sheet Metal Forming Based on Implicit Embedding of the Elasto-plastic Self-consistent Formulation in Finite Elements: Application to Cup Drawing of AA6022-T4: Timothy Barrett¹; Milovan Zecevic¹; Marko Knezevic¹; ¹University of New Hampshire

S-02: Advanced Strategies for Inverse Identification of Constitutive Material Models — Strain Hardening and Identification Strategies

Program Organizers: Sam Coppieters, KU Leuven; Antonio Andrade-Campos, Universidade de Aveiro

Monday PM
June 24, 2019
Room: C - Gardner
Location: Sheraton Portsmouth

Session Chairs: Sam Coppieters, KU Leuven; Steven Cooreman, ArcelorMittal Global R&D Gent

1:35 PM

Characterization of Plastic Behavior in a Wide Range of Strain for 6061-O Aluminum Sheet: Wen Zhang¹; Xincun Zhuang¹; Yu Zhang¹; Zhen Zhao¹; ¹Shanghai Jiao Tong University

1:55 PM

Quasi-static, Dynamic, and Thermal Non-contact Strain Measurements Utilizing VIC-3D Digital Image Correlation (DIC) Systems: Alistair Tofts¹; ¹Correlated Solutions, Inc.

2:15 PM

On the Numerical Efficiency of Inverse Identification Processes of Elastoplastic Constitutive Models using Advanced Parallel Optimization Strategies: Bernardete Coelho¹; Antonio Andrade-Campos¹; João Martins¹; Tiago Silva¹; Sandrine Thuillier²; ¹Universidade de Aveiro; ²University Bretagne

2:35 PM

On the Use of Direct Approximated Methods to Derive the Stress from the Strain in Plasticity: Attilio Lattanzi¹; Marco Rossi¹; ¹Università Politecnica delle Marche

2:55 PM Move to Plenary Session at F-Grand Ballroom

S-07: Computational Modelling of Scaled Processes and Experiments — Session I

Program Organizers: Keith Davey, The University of Manchester; Olga Bylya; Nick Biba, Micas Simulations Limited; Rooholamin Darvizeh, The University of Manchester

Monday PM
June 24, 2019
Room: D - Lear
Location: Sheraton Portsmouth

Session Chairs: Olga Bylya, The Advanced Forming Research Centre; Bhaskaran Krishnamurthy, Advanced Forming Research Centre

1:35 PM

Finite Similitude in Dynamic Powder Compaction: Keith Davey¹; Ali Golbaf²; Anees Al-Tamimi¹; Nasir Namazi²; Rooholamin Darvizeh¹; ¹The University of Manchester; ²University of Guilan

1:55 PM

Study on Micro-deformation and Hardening Behavior of DP Steel Based on CMSG Plasticity Model: Yongsheng Xu¹; Chuang Ren¹; Wenjiao Dan¹; Weigang Zhang¹; ¹Shanghai Jiaotong university

2:15 PM

Scaling of High Speed Chip Formation: Keith Davey¹; Hamed Sadeghi²; Anees Al-Tamimi¹; Ali Golbaf²; Rooholamin Darvizeh¹; ¹The University of Manchester; ²University of Guilan

2:35 PM

Exact and Inexact Multiple-scaled Models for Hot Forging: Part I Theory: Keith Davey¹; Olga Bylya²; Bhaskaran Krishnamurthy²; ¹University of Manchester; ²Advanced Forming Research Centre/University of Strathclyde

2:55 PM Move to Plenary Session at F-Grand Ballroom

S-08: Incremental Forming — Formability of Incremental Forming

Program Organizers: Anne Marie Habraken, University of Liege; Beatriz Silva, Instituto Superior Técnico; Ricardo Alves de Sousa, Universidade de Aveiro; Carpofoero Vallengano, Universidad de Sevilla; Ghulam Hussain, GIK Institute of Engineering Sciences and Technology; M Luisa Garcia-Romeu, Universitat de Girona

Monday PM
June 24, 2019
Room: B - Amphitheater
Location: Sheraton Portsmouth

Session Chairs: Anne Marie Habraken, University of Liege; Ghulam Hussain, GIK Institute of Engineering Sciences and Technology

1:35 PM

Analysis of Stress Triaxiality on the Formability of Hole-flanged Parts by SPIF: Andres J. Martinez-Donaire¹; Domingo Morales-Palma¹; Marcos Borrego¹; Jose A. López-Fernández¹; Gabriel Centeno¹; Carpofoero Vallengano¹; ¹Dpt. Mechanical and Manufacturing Engineering. University of Seville

1:55 PM

Effect of Feed Rate and Tool Material on the Formability of Single Point Incremental Forming of Copper: Kishore Jawale¹; André Cavaleiro²; J F Duarte²; Ana Reis²; M Beatriz Silva³; ¹University of Bath; ²INEGI, Campus da FEUP; ³IDMEC, Instituto Superior Técnico

2:15 PM

Numerical Study of Formability and Failure Prediction in Shrink and Stretch Flanging by SPIF: J.A. López-Fernández¹; Gabriel Centeno¹; M. Borrego¹; A.J. Martínez-Donaire¹; D. Morales-Palma¹; C. Vallengano¹; ¹University of Seville

2:35 PM

An Approach to Improve Thickness Distribution and Formability in Incremental Sheet Forming Process through Improved Blank Design: Satwik Priyadarshi¹; Swarit Singh¹; Pavan Kumar¹; Puneet Tandon¹; ¹PDPM IITDMJ

2:55 PM Move to Plenary Session at F-Grand Ballroom

NUMIFORM Plenary Session — Plenary II

Program Organizers: Yannis Korkolis, Ohio State University; Brad Kinsey, University of New Hampshire

Monday PM
June 24, 2019
Room: F- Grand Ballroom
Location: Sheraton Portsmouth

Session Chair: Nikhil Padhye, University of New Hampshire

3:00 PM Plenary

Third Generation Steels – Material Characterizations and Modeling for Accurate Numerical Simulations: Ming Shi¹; ¹United States Steel Corporation

3:50 PM Break

NUMIFORM 2019: General Session — Metal Forming

Program Organizers: Yannis Korkolis, Ohio State University; Brad Kinsey, University of New Hampshire; Nikhil Padhye, University of New Hampshire

Monday PM
June 24, 2019
Room: C - Gardner
Location: Sheraton Portsmouth

Session Chairs: Fuh-Kuo Chen, National Taiwan University; Chetan Nikhare, The Pennsylvania State University, The Behrend College

4:10 PM

A Numerical Study on Bending and Springback of Sheet metal with Material Discontinuity: Chetan Nikhare¹; ¹Pennsylvania State University

4:30 PM

Steady-state Formulation for Metal Forming Problems Involving Large Contact Evolution: Lionel Fourment¹; Shitij Arora¹; Pierre Montmitonnet¹; ¹MINES ParisTech, PSL Research University

4:50 PM

Numerical Investigation of Downhill Strategy in Chain-die Forming V-channel Product: Kang An¹; Zhen Qian¹; Chang Wang¹; Yong Sun¹; Paul Meehan¹; William Daniel¹; Shichao Ding¹; ¹The University of Queensland

5:10 PM

An Optimal Die Design for Punching Operations in the Hot Stamping Process: Shiang-Yang Lim; Ping-Kun Lee; Fuh-Kuo Chen¹; ¹National Taiwan University

5:30 PM

Modeling Temperature Effects on Friction in Cold Stamping Processes: Javad Hazrati¹; Chao Wang¹; Matthijn de Rooij¹; Mark Veldhuis²; Jan Filzek³; Emmanuel Georgiou⁴; Bernd Aha⁴; Dirk Drees⁴; Ton van den Boogaard¹; ¹University of Twente; ²Philips Consumer Lifestyle; ³Filzek Tribotech; ⁴Falex Tribology; ⁵Zeller+Gmelin GmbH & Co. KG

S-01: Modeling of the Anisotropic Behavior in Plasticity — Session III

Program Organizers: Frédéric Barlat, Pohang University of Science and Technology; Yanshan Lou, Xi'an Jiaotong University

Monday PM
June 24, 2019
Room: B - Amphitheater
Location: Sheraton Portsmouth

Session Chairs: Hoon Huh, KAIST; Florian Gutknecht, TU Dortmund

4:10 PM

An Anisotropic Yield Model Reduced From The Yld2004-18p Function For Metals With Gentle Anisotropy Under Triaxial Loading: Yanshan Lou¹; Saijun Zhang²; Jeong Whan Yoon³; Chong Zhang¹; Qi Zhang¹; ¹Xi'an Jiaotong University; ²South China University of Technology; ³KAIST

4:30 PM

A Comparative Study between Elasto-plastic Self-consistent Crystal Plasticity and Anisotropic Yield Function with Distortional Hardening Formulations for Sheet Metal Forming: Marko Knezevic¹; Zhangxi Feng¹; Seong-Yong Yoon²; Jaehyun Choi²; Milovan Zecevic¹; Frederic Barlat²; ¹University of New Hampshire; ²Pohang University of Science and Technology

4:50 PM

Material Modeling and Forming Limit Analysis of 6016-T4 Aluminum Alloy Sheet: Yu Ogasawara¹; Tomoyuki Hakoyama²; Hiroki Takeda³; Toshihiko Kuwabara¹; Frédéric Barlat⁴; ¹Tokyo University Agriculture & Technology; ²Gifu University; ³UACJ Corporation; ⁴Pohang University of Science and Technology

5:10 PM

Springback Prediction in Roll Forming using Nonlinear Kinematic and Homogeneous Anisotropic Hardening Models: Hyunsung Choi¹; Jeong Yoon²; Jongsup Lee³; Geunho Kim⁴; ¹Korea Advanced Institute of Science and Technology; ²Korea Advanced Institute of Science and Technology/Deakin University; ³Korea Institute of Industrial Technology; ⁴ASAN Co., Ltd.

5:30 PM

Determination of Strain Dependent Anisotropy in Layer Compression Tests and Resulting Influence on the Yield Locus Modelling: Matthias Lenzen¹; Marion Merklein¹; ¹Institute of Manufacturing Technology

S-03: Ductile Damage and Fracture: Experiments, Modeling and Numerical Prediction — Session I

Program Organizers: Yanshan Lou, Xi'an Jiaotong University; Pierre-Olivier Bouchard, CEMEF-Mines Paris Tech PSL; Jinjin Ha, The Ohio State University; Yannis Korkolis, University of New Hampshire; A. Tekkaya, Technical University Dortmund; Till Clausmeyer, TU Dortmund University; Carl LaBergere, Univ. Technologie Troyes, France; Houssem Badreddine, Univ Technologies Troyes

Monday PM
June 24, 2019
Room: A - Prescott
Location: Sheraton Portsmouth

Session Chairs: Khemais Saanouni, University of Technology of Troyes; Markus Koenemann, Steel Institute RWTH Aachen University

4:10 PM

A Multiscale Investigation on Ductile Fracture Behavior of 316LN Steel Influenced by Dynamic Recrystallization at Elevated Temperature: Zhenshan Cui¹; Xiaoqing Shang¹; Haiming Zhang¹; M.W. Fu²; ¹Shanghai Jiao Tong University; ²The Hong Kong Polytechnic University

4:30 PM

Fracture Prediction in Flat-bottom Hole Expansion Ratio Test using Various Phenomenological Models: Vivek Barnwal¹; Shin Yeong Lee¹; Seong-Yong Yoon¹; Frédéric Barlat¹; ¹GIFT, Pohang University of Science and Technology

4:50 PM

Ductile Fracture Modeling of Aluminum Tubes under Combined Internal Pressure and Axial Force: Madhav Baral¹; Yannis Korkolis¹; ¹University of New Hampshire

5:10 PM

Prediction of Void Evolution in Sheet Bending Based on Statistically Representative Microstructural Data for the Gurson-vergaard-needleman Model: Alexander Schowtjak¹; Carl Kusche²; rickmer meya¹; Sandra Korte-Kerzel³; Talal Al-Samman³; A. Erman Tekkaya¹; Till Clausmeyer¹; ¹Institute of Forming Technology and Lightweight Components; ²IMM; ³Institute of Physical Metallurgy and Metal Physics

5:30 PM

New Damage Model with Microcrack Closure Effect and its Application on Sheet Metal Forming: Pei Shan Wang¹; Houssem Badreddine¹; Carl Labergère¹; Khemais Saanouni¹; Jean-Louis Duval²; ¹University of Technology of Troyes; ²ESI Group

S-09: Intelligent Metal Forming Technologies — Session I

Program Organizer: Viorel Paunoiu, Dunarea de Jos University of Galati

Monday PM
June 24, 2019
Room: D - Lear
Location: Sheraton Portsmouth

Session Chairs: Hyunok Kim, EWI; Viorel Paunoiu, Dunarea de Jos University of Galati

4:10 PM

A Methodology to Measure the Variation of the Incoming Material Properties and Determine the Servo Forming Process Parameters: *Hyunok Kim*¹; Laura Zoller¹; Jiahui Gu¹; Tom Feister¹; ¹EWI Forming Center

4:30 PM

Numerical Simulation of Size Effect on the Deformation Behavior in the Flexible Variable Thickness Microrolling: *Hongmei Zhang*¹; ¹University Science and Technology Liaoning

4:50 PM

Localized Blank Holder Pressure Control in Cup Drawing through Tilting of the Ram: *Alexander Breunig*¹; Florian Hoppe¹; Peter Groche¹; ¹Technische Universität Darmstadt

5:10 PM

New Sheet Hydroforming Technologies for Small Batch Production: *Viorel Paunoiu*¹; Catalina Maier¹; Virgil Teodor¹; Nicusor Baroiu¹; Vasile Marinescu¹; ¹Dunarea de Jos University of Galati

5:30 PM

Influence of Laser Shock Peening Parameters on the Fatigue Life of 7075 Aluminum Alloy Specimens: *Xiuquan Cheng*¹; Junhao Zhang²; Sizhu Cheng¹; Qinxiang Xia²; ¹School of Aircraft Maintenance Engineering, Guangzhou Civil Aviation College; ²School of Mechanical and Automotive Engineering, South China University of Technology

Tuesday AM

NUMIFORM Plenary Session — Plenary III

Program Organizers: Yannis Korkolis, Ohio State University; Brad Kinsey, University of New Hampshire

Tuesday AM
June 25, 2019
Room: F- Grand Ballroom
Location: Sheraton Portsmouth

Session Chair: Brad Kinsey, University of New Hampshire

8:30 AM Plenary

Numerical Methods to Design Complex Process Chains in Sheet-bulk Metal Forming: *Marion Merklein*¹; ¹Institute of Manufacturing Technology, University of Erlangen-Nuremberg

9:20 AM Break

S-03: Ductile Damage and Fracture: Experiments, Modeling and Numerical Prediction — Session II

Program Organizers: Yanshan Lou, Xi'an Jiaotong University; Pierre-Olivier Bouchard, CEMEF-Mines Paris Tech PSL; Jinjin Ha, The Ohio State University; Yannis Korkolis, University of New Hampshire; A. Tekkaya, Technical University Dortmund; Till Clausmeyer, TU Dortmund University; Carl LaBergere, Univ. Technologie Troyes, France; Housseem Badreddine, Univ Technologies Troyes

Tuesday AM
June 25, 2019
Room: A - Prescott
Location: Sheraton Portsmouth

Session Chairs: Till Clausmeyer, TU Dortmund University; Vivek Barnwal, GIFT, Pohang University of Science and Technology

9:25 AM

Damage and Fracture Mechanisms in Metal Sheets under Non-proportional Loading Paths: *Michael Bruenig*¹; Steffen Gerke¹; Moritz Zistl¹; ¹Bundeswehr University Munich

9:45 AM

A Numerical Investigation of a Shear-Compression-Disk Specimen Over a Range of strain-rates: *Benjamin Mitchell*¹; Brad Kinsey¹; Yannis Korkolis¹; ¹University of New Hampshire

10:05 AM

Modeling of Plasticity and Ductile Fracture from Shear to Plane strain tension: *Yanshan Lou*¹; Saijun Zhang²; Jeong Whan Yoon³; ¹Xi'an Jiaotong University; ²South China University of Technology; ³KAIST

10:25 AM Break

S-04: Formability in Metal Forming Processes — Session III

Program Organizers: Stefania Bruschi, University of Padua; Andrea Ghiotti, University of Padua

Tuesday AM
June 25, 2019
Room: C - Gardner
Location: Sheraton Portsmouth

Session Chairs: Stefania Bruschi, University of Padua; Robert Schulte, Institute of Manufacturing Technology

9:25 AM

Global Formability Study on a 780-MPa Third Generation Advanced High Strength Steel: *Lu Huang*¹; Ming Shi¹; ¹United States Steel Corp.

9:45 AM

Crystal Plasticity Finite Element Modeling of Surface Ridging of Ferritic Stainless Steel during Deformation: *Chi Zhang*¹; ¹Dalian University of Technology

10:05 AM

Experimental Investigation of Dual-phase 1180 and 980 Steels using Continuous Bending under Tension: *Camille Poulin*¹; Marko Knezevic¹; ¹University of New Hampshire

10:25 AM Break

S-08: Incremental Forming — Variants of Incremental Forming Process

Program Organizers: Anne Marie Habraken, University of Liege; Beatriz Silva, Instituto Superior Técnico; Ricardo Alves de Sousa, Universidade de Aveiro; Carpofofo Vallengano, Universidad de Sevilla; Ghulam Hussain, GIK Institute of Engineering Sciences and Technology; M Luisa Garcia-Romeu, Universitat de Girona

Tuesday AM
June 25, 2019

Room: B - Amphitheater
Location: Sheraton Portsmouth

Session Chairs: Ricardo José Alves de Sousa, University of Aveiro; Beatriz Silva, Instituto Superior Técnico

9:25 AM

Improving the Accuracy of Finite Element Models in Double-Sided Incremental Forming by Quantifying the Effects of Mass Scaling on the Forming Mechanics: *Newell Moser*¹; Dohyun Leem¹; Shuheng Liao¹; Kornel Ehmann¹; Jian Cao¹; ¹Northwestern University

9:45 AM

Experimental and Finite Element Investigation of Wrinkling during Spinning of a Thin-walled Tube: *Biplov Roy*¹; Yannis Korkolis¹; Yoshio Arai¹; Wakao Araki¹; Takafumi IJIMA¹; Jin Kouyama¹; ¹Saitama University

10:05 AM

Finite Element Simulation Analysis of Thermolectric Coupling during Pure Titanium Electro-assisted Spinning: *Kai Jin*¹; Jianhua WANG¹; ¹Nanjing University of Aeronautics and Astronautics

10:25 AM Break

S-12: Advances and Challenges in Welding/Joining Processes — Mechanical Joining Method

Program Organizers: Saurabh Basu, Penn State University; Jingjing Li, Pennsylvania State University; Jian Chen, Oak Ridge National Laboratory; Wayne Cai, General Motors Global R&D Center

Tuesday AM
June 25, 2019

Room: D - Lear
Location: Sheraton Portsmouth

Session Chairs: Ding Tang, Shanghai Jiao Tong University; Haris Khan, Pennsylvania State University

9:25 AM

Numerical Analysis of Seam Welds during Porthole Die Extrusion Processes of Aluminium Hollow Profiles: *Michele Crosio*¹; David Hora²; Pavel Hora¹; ¹ETH Zurich; ²Inspire AG - IVP

9:45 AM

Numerical Simulation of the Frictional Penetration Process in Friction Stir Blind Riveting: *Junying Min*¹; Qingbao Yang¹; Kai Zhang¹; Shuang Wang¹; Jianping Lin¹; Shuhui Li²; ¹Tongji University; ²Shanghai Jiao Tong University

10:05 AM

Finite Element Analysis of Self-piercing Riveting of Aluminum Alloy and Advanced High Strength Steel Sheets: *Yong Chan Hur*¹; Sang Eon Park²; Daeyong Kim³; Kwang Seok Lee³; Min Gwan Bae²; Ji Hoon Kim¹; ¹Pusan National University; ²Sungwoo Hitech; ³Korea Institute of Materials Science

10:25 AM Break

S-02: Advanced Strategies for Inverse Identification of Constitutive Material Models — Anisotropy Identification

Program Organizers: Sam Coppieters, KU Leuven; Antonio Andrade-Campos, Universidade de Aveiro

Tuesday AM
June 25, 2019

Room: C - Gardner
Location: Sheraton Portsmouth

Session Chairs: Sam Coppieters, KU Leuven; Antonio Andrade-Campos, Universidade de Aveiro

10:45 AM

Inverse Calibration of Anisotropic Plasticity Models: A Numerical Study on the Coupling of a Biaxial Test and the Virtual Fields Method: *Joao Martins*¹; Sandrine Thuillier²; António Andrade-Campos³; ¹University of Aveiro and Université Bretagne-Sud; ²Université Bretagne-Sud; ³University of Aveiro

11:05 AM

Inverse Identification of Polynomial Anisotropic Material Parameters by Thickness Strain of Thin Sheet Metal: *Seung-Yong Yang*¹; Wei Tong²; ¹Korea University of Technology and Education; ²Souther Methodist University

11:25 AM

Identification of the Anisotropic Behavior of Sheet Metals using the Virtual Fields Method and Cruciform Specimens: *Marco Rossi*¹; Sam Coppieters²; Attilio Lattanzi¹; Federico Canonico¹; ¹Università Politecnica delle Marche; ²KU Leuven

11:45 AM

Identification of the Anisotropic Plastic Constitutive Parameters using the Virtual Fields Method for AZ31B Magnesium Alloy: *Jiawei Fu*¹; Wenwei Xie¹; Lehua Qi¹; ¹Northwestern Polytechnical University

S-03: Ductile Damage and Fracture: Experiments, Modeling and Numerical Prediction — Session III

Program Organizers: Yanshan Lou, Xi'an Jiaotong University; Pierre-Olivier Bouchard, CEMEF-Mines Paris Tech PSL; Jinjin Ha, The Ohio State University; Yannis Korkolis, University of New Hampshire; A. Tekkaya, Technical University Dortmund; Till Clausmeyer, TU Dortmund University; Carl LaBergere, Univ. Technologie Troyes, France; Houssein Badreddine, Univ Technologies Troyes

Tuesday AM
June 25, 2019

Room: A - Prescott
Location: Sheraton Portsmouth

Session Chairs: Michael Bruenig, Bundeswehr University Munich; Shihong Zhang, Institute of Metal Research Chinese Academy of Science

10:45 AM

Prediction of the Fracture Strains of Pre-strained Dual Phase Steel Sheets: *Shamik Basak*¹; Myoung-Gyu Lee¹; Sushanta Panda²; ¹Seoul National University; ²Indian Institute of Technology Kharagpur

11:05 AM

Loading and Generalized Corrosion Applied Over a Steel Overpack until Fracture: *Jérémy Serveaux*¹; Frédéric Bumbieler²; Carl Labergere³; Khemais Saanouni³; ¹Andra - R&D Division - 92290 Châtenay-Malabry - France and University of Technology of Troyes - ICD/LASMIS - 10300 Troyes - France; ²Andra - R&D Division - 92290 Châtenay-Malabry - France; ³University of Technology of Troyes - ICD/LASMIS - 10300 Troyes - France

11:25 AM

Ductile Fracture of Heat-Treated AA6111 Sheet under Proportional Loading: *Jinjin Ha*¹; Madhav Baral¹; Yannis P. Korkolis¹; ¹University of New Hampshire

11:45 AM

Scalebridging Approaches to Assess the Edge Crack Sensitivity of Multiphase Steels: *Sebastian Münstermann*¹; Junhe Lian²; Niloufar Habibi¹; Peerapon Wechsuanmanee¹; ¹RWTH Aachen University; ²Aalto University

S-05: Numerical Modeling of Thermomechanical Processes of Lightweight Metals — Modeling of Thermomechanical Behavior of Lightweight Metals I

Program Organizers: Mihaela Banu, University of Michigan; Alan Taub, University of Michigan

Tuesday AM
June 25, 2019

Room: B - Amphitheater
Location: Sheraton Portsmouth

Session Chairs: Alan Luo, Ohio State University; Challan Park, University of Michigan

10:45 AM

Constitutive Modeling of Nonlinear Elasticity and Stress Relaxation Behavior of Metals: *Jaebong Jung*¹; Soohwan Yun¹; Ji Hoon Kim¹; ¹Pusan National University

11:05 AM

Constitutive Modeling of Magnesium and Aluminum Alloys: Scott Sutton¹; Alan Luo¹; ¹Ohio State University

11:25 AM

A Pragmatic Approach to Simulate Plastic Instabilities: Application to the Portevin-Le Chatelier Effect in Al-Mg alloys: *Baptiste Reyne*¹; Nicolas Moës¹; Pierre-Yves Manach²; ¹Centrale Nantes; ²Univ. Bretagne Sud

11:45 AM

Numerical Modeling of Ti-6Al-4V Microstructure Evolution for Thermomechanical Process Control: *Sagar Bhatt*¹; Arun Baskaran¹; Daniel Lewis¹; Antoinette Maniatty¹; ¹Rensselaer Polytechnic Institute

S-11: Impulse Forming and Welding — Computational Models for Magnetic Pulse Welding and Forming

Program Organizers: Pierre L'Eplattenier, LSTC; Inaki Caldichoury, LSTC

Tuesday AM
June 25, 2019

Room: D - Lear
Location: Sheraton Portsmouth

Session Chairs: Pierre L'Eplattenier, LSTC; Inaki Caldichoury, LSTC

10:45 AM

A Computational Model for Magnetic Pulse Forming and Joining Processes – Application to a Test Case and Sensitivity to Process Parameters: *Francois Bay*¹; Jose Alves²; ¹Cemef - MinesParistech; ²Transvalor

11:05 AM

Magnetic Metal Forming Simulations Using LS-DYNA: *Inaki Caldichoury*¹; Pierre L'Eplattenier¹; ¹LSTC

11:25 AM

FEM-BEM Coupling for Non-Linear Electromagnetic Field Computations: *Lars Kielhorn*¹; Thomas Rüberg¹; Jürgen Zechner¹; ¹TAILSIT GMBH

Tuesday PM

S-01: Modeling of the Anisotropic Behavior in Plasticity — Session IV

Program Organizers: Frédéric Barlat, Pohang University of Science and Technology; Yanshan Lou, Xi'an Jiaotong University

Tuesday PM
June 25, 2019

Room: A - Prescott
Location: Sheraton Portsmouth

Session Chairs: Junying Min, Tongji University; Till Clausmeyer, TU Dortmund University

1:35 PM

Applications of a Stress Invariants-based Yield Criterion to DP980 & QP980 Steels: Qi Hu¹; Ji He¹; Chao Niu²; Xinpeng Chen²; Shuhui Li¹; *Jun Chen*¹; ¹Shanghai Jiao Tong University; ²Baoshan Iron and Steel Co., Ltd

1:55 PM

An Application of Homogeneous Anisotropic Hardening Model to Earing Predictions of Pre-strained Material: *Seong-Yong Yoon*¹; Min-Su Wi¹; Shin-Yeong Lee¹; Frédéric Barlat¹; ¹POSTECH-GIFT

2:15 PM

Plastic Anisotropy from Single Crystal to Multi-phase Steels: *Junhe Lian*¹; Wenqi Liu²; Sebastian Muenstermann²; ¹Aalto University; ²RWTH Aachen University

2:35 PM

Numerical Integration of Isotropic and Anisotropic Plasticity Models: *William Scherzinger*¹; Brian Lester¹; Jakob Ostien¹; ¹Sandia National Laboratories

2:55 PM Move to Plenary Session at F-Grand Ballroom

S-05: Numerical Modeling of Thermomechanical Processes of Lightweight Metals — Modeling of Thermomechanical Behavior of Lightweight Metals II

Program Organizers: Mihaela Banu, University of Michigan; Alan Taub, University of Michigan

Tuesday PM
June 25, 2019

Room: B - Amphitheater
Location: Sheraton Portsmouth

Session Chairs: Guillaume D'Amours, National Research Council Canada; Denis Pustovoitov, Nosov Magnitogorsk State Technical University

1:35 PM

Development of a Viscoplastic Material Model for Aluminium Hot Forming: *Guillaume D'Amours*¹; Alexandre Gariépy¹; Benoit Thériault¹; ¹National Research Council Canada

1:55 PM

Verification and Validation of a FEA Hot Rolling Model for Aluminium Alloys Considering Strip Profile: *Peter Simon*¹; Klaus Zeman²; Thomas Pumhoessel²; ¹AMAG rolling GmbH; ²Johannes Kepler University Linz

2:15 PM

Minimization of Vertical Bending and Residual Stresses during Asymmetric Cold Rolling of Thin Strips and Sheets: *Denis Pustovoitov*¹; Alexander Pesin¹; ¹Nosov Magnitogorsk State Technical University

2:35 PM

Study on Deformation Variation of Thick Plate during Gradient Temperature Shear Rolling: *Tao Zhang*¹; Lei Li¹; Huapu Sha¹; ¹Nanjing University of Aeronautics and Astronautics

2:55 PM Move to Plenary Session at F-Grand Ballroom

S-07: Computational Modelling of Scaled Processes and Experiments — Session II

Program Organizers: Keith Davey, The University of Manchester; Olga Bylya; Nick Biba, Micas Simulations Limited; Rooholamin Darvizeh, The University of Manchester

Tuesday PM Room: C - Gardner
June 25, 2019 Location: Sheraton Portsmouth

Session Chairs: Olga Bylya, The Advanced Forming Research Centre; Bhaskaran Krishnamurthy, Advanced Forming Research Centre

1:35 PM

Exact and Inexact Multiple-scaled Models for Hot Forging: Part II Experimental: *Olga Bylya*¹; Keith Davey²; Bhaskaran Krishnamurthy¹; ¹Advanced Forming Research Centre; ²University of Manchester

1:55 PM

Multi-scale Friction Modeling of Coated Steels for Sheet Metal Forming Applications: *Meghshyam Shisode*¹; Javad Hazrati¹; Tanmaya Mishra¹; Matthijn de Rooij¹; Ton van den Boogaard¹; ¹University of Twente

2:15 PM

Material Optimisation for Scaled Physical Modelling of Hot Forging Processes: *Bhaskaran Krishnamurthy*¹; Olga Bylya¹; Keith Davey²; ¹Advanced Forming Research Centre; ²The University of Manchester

2:35 PM

Anisotropic Scaling in Metal Forming: Keith Davey¹; *Rooholamin Darvizeh*¹; Ali Golbaf²; Hamed Sadeghi²; ¹The University of Manchester; ²University of Guilan

2:55 PM Move to Plenary Session at F-Grand Ballroom

S-11: Impulse Forming and Welding — Numerical Simulation of High Speed Welding

Program Organizers: Pierre L'Eplattenier, LSTC; Inaki Caldichoury, LSTC

Tuesday PM Room: D - Lear
June 25, 2019 Location: Sheraton Portsmouth

Session Chairs: Inaki Caldichoury, LSTC; Pierre L'Eplattenier, LSTC

1:35 PM

Numerical Investigations of Impact Welding by Eulerian and Smoothed Particle Hydrodynamics Methods: *Shunyi Zhang*¹; Brad Kinsey¹; ¹University of New Hampshire

1:55 PM

Advances in Numerical Simulation of High-Speed Impact Welding: *Ali Nassiri*¹; Tim Abke²; Glenn Daehn³; ¹Simulation Innovation and Modeling Center (SIMCenter), The Ohio State University; ²Honda R&D Americas, Inc.; ³The Ohio State University

2:15 PM

A Predictive and Reliable Eulerian Model to Compute the Interface Kinetics of Magnetic Pulse Welding: *Jishuai Li*¹; Rija Raelison²; Thaneshan Sapanathan³; Mohamed Rachik⁴; ¹University of Technology of Compiègne; ²Université de Bourgogne, France; ³UCLouvain, Louvain-la-Neuve, Belgium; ⁴Université de Technologie de Compiègne, France

2:35 PM

Effect of the Forming Behavior on the Impact Flash during Magnetic Pulse Welding of Tubes: *Joerg Bellmann*¹; Felix Ueberschaer¹; Joern Lueg-Althoff²; Sebastian Schulze³; Marlon Hahn²; Eckhard Beyer¹; A. Erman Tekkaya²; ¹TU Dresden; ²TU Dortmund; ³Fraunhofer IWS Dresden

2:55 PM Move to Plenary Session at F-Grand Ballroom

NUMIFORM Plenary Session — Plenary IV

Program Organizers: Yannis Korkolis, Ohio State University; Brad Kinsey, University of New Hampshire

Tuesday PM Room: F - Grand Ballroom
June 25, 2019 Location: Sheraton Portsmouth

Session Chair: Yannis Korkolis, Ohio State University

3:00 PM Plenary

The Automotive Industry's Perspective on Advances and Challenges in Sheet Metal Forming: *Hyunok Kim*¹; ¹EWI Forming Center

3:50 PM Break

S-01: Modeling of the Anisotropic Behavior in Plasticity — Session V

Program Organizers: Frédéric Barlat, Pohang University of Science and Technology; Yanshan Lou, Xi'an Jiaotong University

Tuesday PM Room: B - Amphitheater
June 25, 2019 Location: Sheraton Portsmouth

Session Chairs: Chen Jun, Northwest Institute Nonferrous Metal Research; Junhe Lian, Aalto University

4:10 PM

Prestraining Effect on Failure Behavior in Hole-Expansion Test of AA6022-T4 Sheet: *Jinjin Ha*¹; Moritz Dirian²; Christopher Dunn¹; Yannis P. Korkolis¹; ¹University of New Hampshire; ²Universität der Bundeswehr

4:30 PM

Accurate Modeling of Experimental Strain-hardening Characteristics for Series of High Strength Steel: Changwei Lian¹; Jianping Lin²; Weilong Hu¹; *Chao Niu*¹; ¹Baosteel; ²Tongji University

4:50 PM

Measurement of Unloading Behavior of AHSS and Its Effect on the Springback Prediction in FEM Simulation: *Nobuyasu Noma*¹; Taiki Maeda²; Toshihiko Kuwabara²; Tomoyuki Hakoyama³; ¹UNIPRES R&D CO., LTD.; ²Tokyo University of Agriculture and Technology; ³Gifu University

5:10 PM

Characterization of Anisotropic Yield Criteria Using an Indentation Based Technique for Steel Sheets: *Tanmaya Mishra*¹; Matthijn de Rooij¹; Meghshyam Shisode¹; Javad Hazrati¹; Dirk Schipper¹; ¹Univeristy of Twente

5:30 PM

Study on Hot Deformation Behavior and Microstructure of 5CrNiMoV Steel using Constitutive Modeling and Processing Map: *Wanhui Huang*¹; pan Zeng¹; Liping Lei¹; ¹Tsinghua university

S-03: Ductile Damage and Fracture: Experiments, Modeling and Numerical Prediction — Session IV

Program Organizers: Yanshan Lou, Xi'an Jiaotong University; Pierre-Olivier Bouchard, CEMEF-Mines Paris Tech PSL; Jinjin Ha, The Ohio State University; Yannis Korkolis, University of New Hampshire; A. Tekkaya, Technical University Dortmund; Till Clausmeyer, TU Dortmund University; Carl LaBergere, Univ. Technologie Troyes, France; Houssein Badreddine, Univ Technologies Troyes

Tuesday PM Room: A - Prescott
June 25, 2019 Location: Sheraton Portsmouth

Session Chairs: Jinjin Ha, The Ohio State University; Xincun Zhuang, Shanghai Jiao Tong University

4:10 PM

Calibration and Evaluation of Stress-based Ductile Failure Criteria: *Kelin Chen*¹; Stelios Kyriakides; ¹University of Texas at Austin

4:30 PM

A Modified Continuum Damage Model for Predicting Formability of AA7075 at Elevated Temperatures: *Hai Rong*¹; Liang Ying¹; Ping Hu¹; Wenbin Hou¹; Wenquan Liu²; ¹Dalian University of Technology; ²Civil Aviation University of China

4:50 PM

Comparative Analysis of different Ductile Damage Criteria in Cold and Hot Metal Forming: *Nikolay Biba*¹; Andrey Vlasov²; Sergey Stebunov³; Alexey Vlasov³; ¹MICAS Simulations Ltd; ²Bauman Moscow State Technical University; ³QuantorForm Ltd.

5:10 PM

Analysis of Competition between Onset of Dynamic Recrystallization and Damage Nucleation during Hot Forming: *Muhammad Inran*¹; Muhammad Junaid Afzal¹; Markus Bambach¹; ¹Brandenburg University of Technology Cottbus - Senftenberg

5:30 PM

Modeling of Void Closure Mechanisms in Multi-stages Hot Metal Forming Processes: A Multiscale Approach: *Pierre-Olivier Bouchard*¹; Abdelouahed Chbihi¹; Marc Bernacki¹; Daniel Pino Muñoz¹; ¹CEMEF

S-06: Simulation-driven Product Design and Process Optimization — Session I

Program Organizer: Subir Roy, Altair

Tuesday PM Room: C - Gardner
June 25, 2019 Location: Sheraton Portsmouth

Session Chairs: Mansoo Joun, Gyeongsang National University; Subir Roy, Altair

4:10 PM

Reduction Sequence Dependence of Relative Sliding and Power Consumptions in Hot Rolling: *Baohui Tian*¹; Siegfried Kleber¹; Silvia Schneller¹; Peter Markiewicz¹; ¹BOHLER Special Steel

4:30 PM

Effects of a Counter-punch System for Cold Full-forward Extrusion: *Alessandro Franceschi*¹; Holger Hoche¹; Matthias Kaffenberger¹; Matthias Oechsner¹; Peter Groche¹; ¹TU Darmstadt

4:50 PM

Practical Optimization in Metal Forming with Typical Applications: *Mansoo Joun*¹; Mincheol Kim¹; Sukhwan Chung²; ¹Gyeongsang National University; ²MFRC

5:10 PM

Numerical Investigation of the Influential Factors Regarding Forming Load in Chain-die Forming Process: *Zhen Qian*¹; Chang Wang¹; Yong Sun¹; Kang An¹; Paul Meehan¹; William Daniel¹; Shichao Ding¹; ¹University of Queensland

5:30 PM

Improving a Non-invasive Form Finding Approach to Forming Processes: *Caspari Michael*¹; Landkammer Philipp¹; Steinmann Paul¹; ¹Chair of Applied Mechanics

S-14: Composites Forming — Composites Forming

Program Organizers: James Sherwood, University of Massachusetts - Lowell; Igor Tsukrov, University of New Hampshire

Tuesday PM Room: D - Lear
June 25, 2019 Location: Sheraton Portsmouth

Session Chairs: Igor Tsukrov, University of New Hampshire; Borys Drach, New Mexico State University

4:10 PM

Study of the Flow-induced Orientation and Dispersion of Microcrystalline Cellulose Filled Polymer Composites: A Molecular Dynamics Simulation Approach: *Varun Venoor*¹; Jay Park¹; David Kazmer¹; Margaret Sobkowicz¹; Javier Vera-Sorroche¹; Jo Ann Ratto²; Robina Hogan³; Thomas Theyson⁴; ¹University of Massachusetts, Lowell; ²U.S. Army Natick Soldier Research Development and Engineering Center; ³Omni tech International/ Soy Bean Board; ⁴TensTech Inc

4:30 PM

Friction Characterization in Hybrid Thermoforming of Aluminum and GFRP: *Michael Grubenmann*¹; Ulrich Sachs²; Remko Akkerman³; Jörg Heingärtner¹; Pavel Hora⁴; ¹Inspire AG; ²ThermoPlastic Composites Research Center; ³University of Twente; ⁴ETH Zurich, Institute of Virtual Manufacturing

4:50 PM

Numerical Studies of the Composite Materials with Irregular Inclusions: *Romana Piar*¹; Pascal Happ¹; ¹University of Applied Sciences

5:10 PM

Numerical Evaluation of Reinforcement Morphology Contribution to Process-induced Residual Stresses in 3D Woven Composites: *Kostiantyn Vasylevskiy*¹; Hilary Buntrock¹; Todd Gross¹; Borys Drach²; Igor Tsukrov¹; ¹University of New Hampshire; ²New Mexico State University

5:30 PM

Effect of Matrix Viscoelasticity on Prediction of Residual Stresses in Orthogonal 3D Woven Composites: *Higor Galdino da Silva*¹; *Borys Drach*¹; *Kostiantyn Vasylevskiy*¹; *Igor Tsukrov*²; *Todd Gross*²; ¹New Mexico State University; ²University of New Hampshire

Wednesday AM

NUMIFORM Plenary Session — Plenary V

Program Organizers: Yannis Korkolis, Ohio State University; Brad Kinsey, University of New Hampshire

Wednesday AM Room: F- Grand Ballroom
June 26, 2019 Location: Sheraton Portsmouth

Session Chair: Jinjin Ha, The Ohio State University

8:30 AM Plenary

Continuum Description of Anisotropic Flow and Hardening Based on Lower Scale: *Frederic Bartat*¹; ¹Pohang University of Science and Technology

9:20 AM Break

NUMIFORM 2019: General Session — Material Modeling

Program Organizers: Yannis Korkolis, Ohio State University; Brad Kinsey, University of New Hampshire; Nikhil Padhye, University of New Hampshire

Wednesday AM
June 26, 2019

Room: A - Prescott
Location: Sheraton Portsmouth

Session Chairs: Maysam Gorji, MIT; Jun Hu, AK Steel

9:25 AM

Loading Path Dependent Shape Evolution of Yield Surfaces for Anisotropic Mg Alloy: Experiments and Constitutive Modeling: *Baodong Shi*¹; Yan Peng¹; Fusheng Pan²; ¹National Engineering Research Center for Equipment and Technology of Cold Strip Rolling, Yanshan University; ²National Engineering Research Center for Magnesium Alloys, Chongqing University

9:45 AM

A Basic Neural Network Model Describing the Plasticity of Sheet Metal: *Maysam Gorji*¹; Dirk Mohr²; ¹MIT; ²ETH

10:05 AM

Constitutive Hardening Model Development for Materials with Evolving Microstructural Phase Constituents: *Jun Hu*¹; Kavesary Raghavan¹; ¹AK Steel

10:25 AM Break

S-06: Simulation-driven Product Design and Process Optimization — Session II

Program Organizer: Subir Roy, Altair

Wednesday AM
June 26, 2019

Room: C - Gardner
Location: Sheraton Portsmouth

Session Chair: Subir Roy, Altair

9:25 AM

New Manufacturing Approach for Face Gearings by Means of Material Pre-distribution – Simulation and Experimental Results: *André Weiss*¹; Mathias Liewald¹; ¹Institute for Metal Forming Technology

9:45 AM

Experimental and Finite Element Analysis of Tube Hydroforming of an Airfoil Component: *Quan Tran*¹; Omid Majidi¹; Henri Champlaud¹; Priti Wanjara²; Javad Gholipour²; ¹Ecole de technologie supérieure; ²National Research Council

10:25 AM Break

S-10: Characterization, Modelling and Processing of HCP Metals — Session I

Program Organizers: Gianfranco Palumbo, Polytechnic University of Bari; Ali Arslan KAYA, University of Mugla

Wednesday AM
June 26, 2019

Room: B - Amphitheater
Location: Sheraton Portsmouth

Session Chairs: Gianfranco Palumbo, Polytechnic University of Bari; Gabriel Centeno, University of Seville

9:25 AM

Crystal Plasticity Finite-element Simulation of Deep Drawing of Commercially-pure Titanium Sheet: *Takayuki Hama*¹; Kaho Hirano¹; Ryo Matsuura¹; Yannis Korkolis²; Hirohiko Takuda¹; ¹Kyoto University; ²The Ohio State University

9:45 AM

Numerical/Experimental Investigation of the Mechanical Performance of Customized Titanium Cranial Prostheses: *Gianfranco Palumbo*¹; Antonio Piccininni¹; Giuseppina Ambrogio¹; Emanuele Sgambitterra¹; Giuseppe Serratore²; ¹Polytechnic University of Bari; ²Università della Calabria

10:05 AM

On the Assessment of Formability and Failure of Mg Sheets Formed by SPIF: Angela Cusanno¹; *Gabriel Centeno Bález*²; Maria Luisa Garcia-Romeu³; Isabel Bagudanch³; Gianfranco Palumbo¹; ¹Polytechnic University of Bari; ²Universidad de Sevilla; ³Universitat de Girona

10:25 AM Break

S-13: Numerical Methods for Polymer Processing and Forming — Session I

Program Organizers: Nikhil Padhye, University of New Hampshire; Marat Andreev, Massachusetts Institute of Technology

Wednesday AM
June 26, 2019

Room: D - Lear
Location: Sheraton Portsmouth

Session Chair: To Be Announced

9:25 AM

Numerical Simulation of the Thermoforming Process and Anamorphosis Method: *Jordan Biglione*¹; Yves Béreaux²; Jean-Yves Charneau³; Hayet Lakhdar⁴; Pierre Dumont¹; Florian Martoia¹; Sambor Chhay⁴; ¹LaMCoS UMR 5259; ²GEPEA CNRS 6144; ³IMP UMR 5223; ⁴Site de Plasturgie de l'INSA Lyon à Oyonnax

9:45 AM

On Mechanics of Thin-Structures: Finite Stretching and Bending Applications: *Nikhil Padhye*¹; ¹University of New Hampshire

10:25 AM Break

S-03: Ductile Damage and Fracture: Experiments, Modeling and Numerical Prediction — Session V

Program Organizers: Yanshan Lou, Xi'an Jiaotong University; Pierre-Olivier Bouchard, CEMEF-Mines Paris Tech PSL; Jinjin Ha, The Ohio State University; Yannis Korkolis, University of New Hampshire; A. Tekkaya, Technical University Dortmund; Till Clausmeyer, TU Dortmund University; Carl LaBergere, Univ. Technologie Troyes, France; Houssein Badreddine, Univ Technologies Troyes

Wednesday AM
June 26, 2019

Room: A - Prescott
Location: Sheraton Portsmouth

Session Chairs: A. Tekkaya, Technical University Dortmund; Yanshan Lou, Xi'an Jiaotong University

10:45 AM

Fracture Initiation and Propagation Properties of 6000 Series Aluminum Sheet: *Andrey Ilimich*¹; Stephen Luckey; ¹Ford Motor Company

11:05 AM

Mixed-Mode Deformation and Failure of Magnesium Sheets: *Dirk Steglich*¹; ¹HZG

11:25 AM

Continuum Damage Mechanics Based Anisotropic Damage Modeling: Titanium Materials: Heng Yang¹; Heng Li¹; Hang Huang¹; *Zhao Zhang*¹; ¹Northwestern Polytechnical University

11:45 AM

Impact Toughness and Fracture Mechanisms of AHSS under Impact Loading using a New Testing Concept: *Markus Koennemann*¹; Sebastian Muenstermann¹; Manuel Henrich¹; ¹Steel Institute RWTH Aachen University

S-05: Numerical Modeling of Thermomechanical Processes of Lightweight Metals — Modeling of Thermomechanical Processes of Lightweight Metals I

Program Organizers: Mihaela Banu, University of Michigan; Alan Taub, University of Michigan

Wednesday AM
June 26, 2019

Room: B - Amphitheater
Location: Sheraton Portsmouth

Session Chairs: Chen Zhang, Beihang University; Omid Majidi, École de technologie supérieure (ÉTS)

10:45 AM

Finite Element Analysis of the Plane Strain Deformation of a Superplastic Forming of an Al-Mg Alloy: *Omid Majidi*¹; Mohammad Jahazi¹; Nicolas Bombardier²; ¹École de Technologie Supérieure (ÉTS); ²Verbom Inc.

11:05 AM

Numerical Simulation and Experimental Verification for Hot Stretch Bnding of Titanium Alloy Extrusion: *Chen Zhang*¹; Dongsheng Li¹; Xiaoqiang Li¹; Guiqiang Guo¹; ¹School of Mechanical Engineering and Automation, Beihang University

11:25 AM

Physical and Numerical Simulation of Hot Deformation of ZE20 Mg Alloy Implementing an Advanced Constitutive Flow Stress Model: *John Plumeri*¹; Wojciech Misiolek¹; ¹Lehigh University

11:45 AM

Multi-field Simulation of the Autoclave Age Forming Process of 2524 AL Alloy Component: *Yongqian Xu*¹; Lihua Zhan¹; ¹Central South University

S-06: Simulation-driven Product Design and Process Optimization — Session III

Program Organizer: Subir Roy, Altair

Wednesday AM
June 26, 2019

Room: C - Gardner
Location: Sheraton Portsmouth

Session Chairs: Subir Roy, Altair; Renganathan Sekar, MFRC

10:45 AM

Optimal Design of Clinching Process for Maximizing Joint Strength within Limited Formability of Sheet Metal: *Seokmoo Hong*¹; Renganathan Sekar²; ¹Kongju National University; ²MFRC

11:05 AM

Numerical Investigation on a New Process of Combined Counter-trimming with Regard to Improvement of the Residual Formability of Burr-free Shear-cut Edges: *Sergei Senn*¹; ¹IFU

11:25 AM

Utilizing Topography and Topology Optimization with Manufacturability Considerations for Light-weighting of Stamped Parts and Associated Tooling: *Subir Roy*¹; Hariharasudhan Palaniswamy¹; Prashant Hiremath¹; ¹Altair

S-11: Impulse Forming and Welding — Analytical and Numerical Models for High Speed Forming

Program Organizers: Pierre L'Eplattenier, LSTC; Inaki Caldichoury, LSTC

Wednesday AM
June 26, 2019

Room: D - Lear
Location: Sheraton Portsmouth

Session Chairs: Pierre L'Eplattenier, LSTC; Inaki Caldichoury, LSTC

10:45 AM

Numerical Modeling of Energy Deposition for Vaporizing Foil Actuator Forming: *Marlon Hahn*¹; Siddhant Goyal¹; Soeren Gies¹; A. Erman Tekkaya¹; ¹TU Dortmund Univ., Institute of Forming Technology a. Lightweight Components

11:05 AM

A Predictive Model to Estimate the Energy Requirements for Electromagnetic (EM) Springback Calibration of DP600 and TRIP700 profiles: *Eduarne Iriondo*¹; José Luis Alcaraz¹; Unai Alonso¹; Franck Giroit¹; ¹University of the Basque Country

11:25 AM

A Semi-analytical Method for Magnetic Pressure Calculation in Electromagnetic Sheet Forming: *Zhipeng Lai*¹; Quanliang Cao¹; Meng Chen¹; Ning Liu¹; Xiaoxiang Li¹; Yujie Huang¹; Changxing Li¹; Xiaotao Han¹; Liang Li¹; ¹Huazhong University of Science & Technology

Wednesday PM

NUMIFORM 2019: General Session — Additive Manufacturing and Joining

Program Organizers: Yannis Korkolis, Ohio State University; Brad Kinsey, University of New Hampshire; Nikhil Padhye, University of New Hampshire

Wednesday PM
June 26, 2019

Room: D - Lear
Location: Sheraton Portsmouth

Session Chairs: Jaebong Yang, Scientific Forming Technologies Corporation; Alexander Chugreev, IFUM, Leibniz Universitaet Hannover

1:35 PM

Influence of the Mask on the Deposition Profile of the Cold Spraying Process for Additive Manufacturing: *Weijun Zhu*¹; Xiaoyu Zhang¹; Sheng Huang¹; Dichen Li¹; ¹Xi'an Jiaotong University

1:55 PM

Residual Stress and Distortion Analysis for Additive Manufacturing Process with 3D Finite Element Method: *Jaebong Yang*¹; Hari Polisetty¹; Weiqi Luo¹; Jinyong Oh¹; Ravi Shankar¹; Wei Tsu Wu¹; ¹Scientific Forming Technologies Corporation

2:15 PM

Modeling Single-side Inflating of Flow Channels in Roll-bonded Aluminum Panels: *Josef Domitner*¹; Peter Auer¹; Regina Eckhard¹; Janko Fercec²; Christof Sommitsch¹; ¹Graz University of Technology; ²TALUM Tovarna aluminija d.d. Kidricevo

2:35 PM

FE-simulation of Rotary Friction Welding Process Considering Thermo-mechanical-metallurgical Coupling: Bernd-Arno Behrens¹; *Alexander Chugreev*¹; Christoph Kock¹; Kai Brunotte¹; Tim Matthias¹; Hendrik Wester¹; ¹IFUM, Leibniz Universitaet Hannover

2:55 PM Move to Plenary Session at F-Grand Ballroom

NUMIFORM 2019: General Session — Bulk Forming

Program Organizers: Yannis Korkolis, Ohio State University; Brad Kinsey, University of New Hampshire; Nikhil Padhye, University of New Hampshire

Wednesday PM Room: C - Gardner
June 26, 2019 Location: Sheraton Portsmouth

Session Chairs: Mathias Liewald, IFU Uni Stuttgart; Tang Delin, Central South University

1:35 PM

Numerical Investigation of a Cold Forging Process for Manufacturing Hollow Shafts with Variable Wall Thickness: *Alexander Weiss*¹; Mathias Liewald¹; ¹Institute for Metal Forming Technology

1:55 PM

Numerical Calculation and Experimental Study on Cross Shear Ratio during Asymmetrical Rolling: Tang Delin¹; Yu Hailiang¹; Wang Zhaofei²; Zhang Bei³; ¹Central South University; ²Yantai Wanlong Vacuum Metallurgy Co., Ltd.; ³Yantai Valliant Pharmaceutical Co., Ltd.

2:15 PM

Study on the Thermo-elastic-plastic Deformation Behavior of Double-layer Combined Die in Forging: *Chengliang Hu*¹; Zibo Li¹; Zhen Zhao¹; ¹Shanghai Jiao Tong University

2:35 PM

Numerical Investigation on Strip Shape of High-strength Steel considering Roll Effect During Rolling Process: Lianjie Li¹; Haibo Xie¹; Xu Liu²; Tianwu Liu²; Enrui Wang²; *Zhengyi Jiang*¹; ¹University of Wollongong; ²Iron & Steel Research Institute, Hesteel Group

2:55 PM Move to Plenary Session at F-Grand Ballroom

S-03: Ductile Damage and Fracture: Experiments, Modeling and Numerical Prediction — Session VI

Program Organizers: Yanshan Lou, Xi'an Jiaotong University; Pierre-Olivier Bouchard, CEMEF-Mines Paris Tech PSL; Jinjin Ha, The Ohio State University; Yannis Korkolis, University of New Hampshire; A. Tekkaya, Technical University Dortmund; Till Clausmeyer, TU Dortmund University; Carl LaBergere, Univ. Technologie Troyes, France; Housseem Badreddine, Univ Technologies Troyes

Wednesday PM Room: A - Prescott
June 26, 2019 Location: Sheraton Portsmouth

Session Chairs: Elisabeth Massoni, CEMEF MINES ParisTech; Dirk Stiglich, HZG

1:35 PM

Numerical Prediction of Ductile Damage in Hot Sheet Metal Forming for Mg Alloy AZ31B: Kai Zhang¹; Housseem Badreddine; Khemais Saanouni¹; *Carl Labergere*¹; ¹University of Technology of Troyes

1:55 PM

Influence of Process Conditions and Pore Morphology on the Closure Rate of Pores in Hot Rolling of Steel: Conrad Liebsch¹; Xinyang Li¹; *Johannes Lohmar*¹; Gerhard Hirt¹; ¹Institute of Metal Forming

2:15 PM

Phase Field Approach for Ductile Failure using the Rousselier Model: *Erfan Azinpour*¹; Jose De Sa¹; ¹University of Porto

2:35 PM

Multiscale Methodology to Predict Failure of DP Steel Sheet during Forming: *Harisankar K R*¹; Arshdeep Singh¹; Srimannarayana P¹; Danish Khan¹; Pramod Zagade¹; ¹Tata Consultancy Services Limited

2:55 PM Move to Plenary Session at F-Grand Ballroom

S-05: Numerical Modeling of Thermomechanical Processes of Lightweight Metals — Modeling of Thermomechanical Processes of Lightweight Metals II

Program Organizers: Mihaela Banu, University of Michigan; Alan Taub, University of Michigan

Wednesday PM Room: B - Amphitheater
June 26, 2019 Location: Sheraton Portsmouth

Session Chairs: Anne Marie Habraken, University of Liege; Tracy Berman, University of Michigan

1:35 PM

Numerical Simulation of Creep Forming Processes of Large-scale and Friction Stir Welded AlMgSc Sheets for Aeronautical Applications: *Frieder Zimmermann*¹; Alexander Brosius²; Jens Standfuß¹; Axel Jahn¹; ¹Fraunhofer Institute for Material and Beam Technology IWS Dresden; ²TU Dresden, Institute of Manufacturing Science and Engineering

1:55 PM

Numerical Analysis of Thermal Stress in Laser Cladding Technology of M4 High Speed Steel: Ruben Jardin¹; Jérôme Tchuindjang¹; Laurent Duchêne¹; Raoul Carrus²; Anne Mertens¹; *Anne Marie Habraken*¹; Son Tran¹; ¹University of Liege; ²Research Center Sirris

2:15 PM

Prediction of Texture Evolution of Al-Li Forged Alloy with DEFORM: *Challan Park*¹; Tracy Berman¹; Veera Sundararaghavan¹; John Allison¹; ¹Univ of Michigan

2:35 PM

Numerical Simulation of the Stamping Process of a AA5754 Railway Vehicle Component using a Locally Annealed Blank: *Antonio Piccininni*¹; Gianfranco Palumbo¹; Andrea Lo Franco²; ¹Politecnico di Bari; ²O.Me.R. s.p.a.

2:55 PM Move to Plenary Session at F-Grand Ballroom

NUMIFORM Plenary Session — Plenary VI

Program Organizers: Yannis Korkolis, Ohio State University; Brad Kinsey, University of New Hampshire

Wednesday PM Room: F- Grand Ballroom
June 26, 2019 Location: Sheraton Portsmouth

Session Chair: Marko Knezevic, University of New Hampshire

3:00 PM Plenary

Plasticity Models for Predictive Additive Manufacturing Process Simulations: *Victor Oancea*¹; Tyler London; Madie Alen; Qi Zhang; Yangzhan Yang; Jing Bi; ¹Dassault Systems SIMULIA Corporation

3:50 PM Break

NUMIFORM 2019: General Session — Incremental and Sheet Forming

Program Organizers: Yannis Korkolis, Ohio State University; Brad Kinsey, University of New Hampshire; Nikhil Padhye, University of New Hampshire

Wednesday PM Room: D - Lear
June 26, 2019 Location: Sheraton Portsmouth

Session Chairs: Evripides Loukaides, University of Bath; Ali Davar, University of New Hampshire

4:10 PM

An Equivalent Sub-model of B-pillar Assembly Representing the Side Crashworthiness of a Vehicle: *Yongji Li*¹; Junying Min¹; Ye Lin¹; Jianping Lin¹; Hongzhou Lu²; ¹Tongji University; ²Citic Metal Co., Ltd.

4:30 PM

The Effect of an Edge Roller in Mandrel-free Spinning: Kishore Jawale¹; Eviropides G. Loukaides¹; ¹University of Bath, United Kingdom

4:50 PM

Study on Processing Map of 23-8N Heat Resistant Steel: Hongchao Ji¹; Zhongman Cai¹; ¹North China University of Science and Technology

5:10 PM

Experimental Analysis of Rotational Tooling During Tube Flaring: Elizabeth Mamros¹; Chetan Nikhare¹; ¹Penn State Behrend

NUMIFORM 2019: General Session — Microstructural Approaches and Forming

Program Organizers: Yannis Korkolis, Ohio State University; Brad Kinsey, University of New Hampshire; Nikhil Padhye, University of New Hampshire

Wednesday PM
June 26, 2019

Room: C - Gardner
Location: Sheraton Portsmouth

Session Chairs: Michael Liebrecht, MathConsult GmbH; Jan Kusiak, AGH University of Science and Technology

4:10 PM

Efficient Numerical Model Predicting Coils Cooling Time for the System Managing Logistics of Cranes in a Stockyard of Hot Coils: Lukas Rauch¹; Krzysztof Bzowski¹; Andriy Milenin¹; Ivan Milenin¹; Jan Kusiak¹; ¹Akademia Gorniczo-Hutnicza

4:30 PM

Finite Element Modeling and Texture Evolution in Cold Drawing of Seamless Steel Tubes: Peter Bella¹; ¹ZP VVC s.r.o.

4:50 PM

The Microstructure Evolution of Cr4Mo4V Steel Deformed at the Semi-solid State during Solidification: Weifeng Liu¹; Mingyue Sun²; ¹Institute of Metal Research, Chinese Academy of Sciences; ²Institute of Metal Research, Chinese Academy of Sciences

5:10 PM

Process Model for the Industrial Plate Leveling Operation with Special Emphasis on Online Control: Michael Liebrecht¹; Ann-Kristin Baum²; Roman Wahl³; Michael Aichinger³; Erik Parteder⁴; ¹MathConsult GmbH; ²Johann Radon Institute (RICAM); ³uni software plus GmbH; ⁴voestalpine Grobblech GmbH

5:30 PM

Crystal Plasticity Analysis of Surface Roughening of an Al-Mg Oligocrystal: Paul Knysh¹; Kanta Sasaki²; Tsuyoshi Furushima³; Marko Knezevic¹; Yannis Korkolis¹; ¹University of New Hampshire; ²Tokyo Metropolitan University; ³University of Tokyo

S-03: Ductile Damage and Fracture: Experiments, Modeling and Numerical Prediction — Session VII

Program Organizers: Yanshan Lou, Xi'an Jiaotong University; Pierre-Olivier Bouchard, CEMEF-Mines Paris Tech PSL; Jinjin Ha, The Ohio State University; Yannis Korkolis, University of New Hampshire; A. Tekkaya, Technical University Dortmund; Till Clausmeyer, TU Dortmund University; Carl LaBergere, Univ. Technologie Troyes, France; Houssem Badreddine, Univ Technologies Troyes

Wednesday PM
June 26, 2019

Room: A - Prescott
Location: Sheraton Portsmouth

Session Chairs: Zhenshan Cui, Shanghai Jiao Tong University; Andrey Ilinich, Ford Motor Co.

4:10 PM

Anisotropic Ductile Damage and Fracture Properties of High Strength Pipeline Steels: Fuhui Shen¹; Junhe Lian¹; Sebastian Münstermann¹; ¹RWTH Aachen University, Steel Institute (IEHK)

4:30 PM

Prediction of Damage Accumulation in the Multi-stage Rolling of DP600 Steel Sheets: Iman Sari Sarraf¹; Daniel Green¹; ¹University of Windsor

4:50 PM

Damage and Failure Model Characterization and Validation for a High Strength AA6xxx Automotive Aluminum Alloy: Sebastijan Jurendic¹; David Anderson²; ¹Novelis Deutschland GmbH; ²Novelis, Inc

5:10 PM

A Comparative Study on Damage Models of Central Cracks in Cross Wedge Rolling: Xianyan Zhou¹; Jun Jiang¹; Jianguo Lin¹; ¹Imperial College London

5:30 PM

Fracture Behavior of Welded T-joints of Aluminum Alloy EN AW-6063: Zahra Silvayeh¹; Josef Domitner¹; Florian Grünbart¹; Bruno Götzinger²; Christof Sommitsch¹; ¹Graz University of Technology; ²Magna Steyr Fahrzeugtechnik AG & Co KG

S-10: Characterization, Modelling and Processing of HCP Metals — Session II

Program Organizers: Gianfranco Palumbo, Polytechnic University of Bari; Ali Arslan KAYA, University of Mugla

Wednesday PM
June 26, 2019

Room: B - Amphitheater
Location: Sheraton Portsmouth

Session Chairs: Gabriel Centeno, University of Seville; Gianfranco Palumbo, Polytechnic University of Bari

4:10 PM

Development of Novel Drawing Process for Fabrication of Biodegradable ZM21 Magnesium Alloy Tubes: Tsuyoshi Furushima¹; Peifua Du¹; Shusaku Furusawa¹; ¹University of Tokyo

4:30 PM

Numerical/Experimental Investigation of Microstructure Evolution of a Laser Heat-treated Magnesium Alloy az31 Sheet: Donato Sorgente¹; Gianfranco Palumbo²; Pasquale Guglielmi²; Alessandro Fortunato³; Alessandro Ascari³; Ali Arslan Kaya⁴; ¹Università degli Studi della Basilicata; ²Polytechnic University of Bari; ³University of Bologna; ⁴University of Mugla

4:50 PM

A Thermo-mechanical VPSC-DRX Model and its Application to Magnesium Alloy: Dayong Li¹; Zihan Li¹; Yinghong Peng¹; Peidong Wu²; ¹Shanghai Jiao Tong University; ²McMaster University

5:10 PM

Investigation on the Method and Equipment for Strengthening and Texture Modification of Lightweight Alloy Sheet: Ming Cheng¹; Shuai-feng Chen¹; Ce Zheng¹; Shi-hong Zhang¹; ¹Institute of Metal Research, Chinese Academy of Sciences

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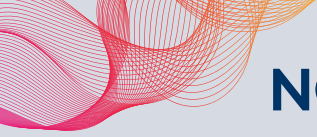
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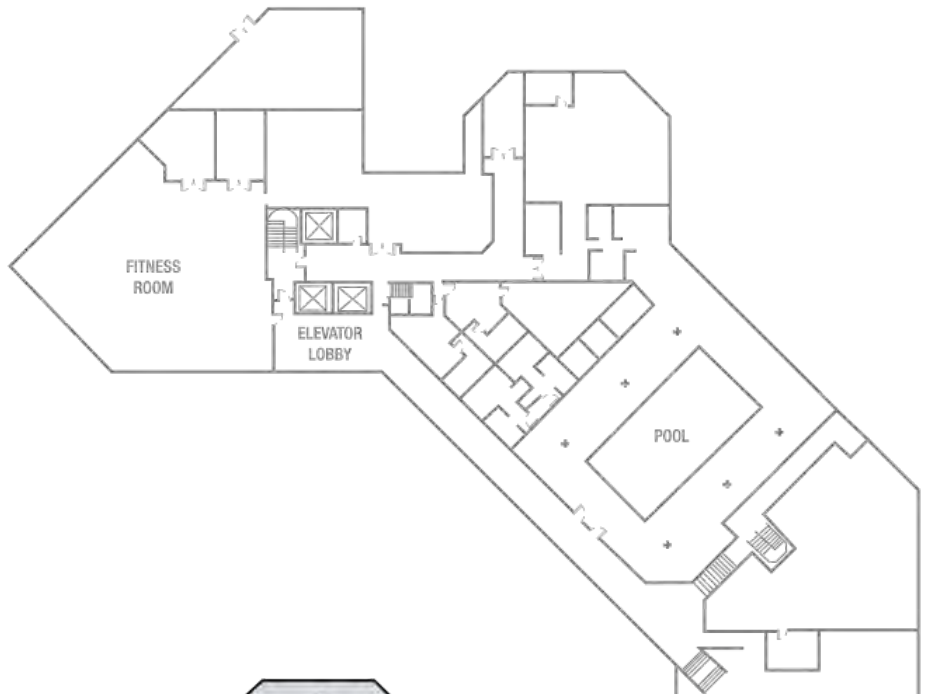
NOTES

TECHNICAL PROGRAM OVERVIEW

Monday, June 24		Tuesday, June 25				Wednesday, June 26			
8:00-8:30	Opening ceremony in F - Grand Ballroom								
8:30-9:20	Plenary 1 in F - Grand Ballroom								
5min	Move to parallel sessions								
	A Prescott	B Amphitheater	C Gardner	D Lear	A Prescott	B Amphitheater	C Gardner	D Lear	
9:25-9:45	S-01: Modeling of the Anisotropic Behavior in Plasticity	S-08: Incremental Forming	S-04: Formability in Metal Forming Processes	S-12: Advances and Challenges in Welding/Joining Processes	S-03: Ductile Damage and Fracture: Modeling and Numerical Prediction	S-08: Incremental Forming	S-04: Formability in Metal Forming Processes	S-12: Advances and Challenges in Welding/Joining Processes	S-13: Numerical Methods for Polymer Processing and Forming
9:45-10:05									
10:05-10:25									
10:25-10:45	Coffee Break								
10:45-11:05	S-02: Advanced Strategies for Inverse Identification of Constitutive Mat'l Models	S-08: Incremental Forming	S-04: Formability in Metal Forming Processes	S-12: Advances and Challenges in Welding/Joining Processes	S-03: Ductile Damage and Fracture: Modeling and Numerical Prediction	S-05: Numerical Modeling of Thermomechanical Processes of Lightweight Metals	S-02: Advanced Strategies for Inverse Identification of Constitutive Mat'l Models	S-11: Impulse Forming and Welding	S-11: Impulse Forming and Welding
11:05-11:25									
11:25-11:45									
11:45-12:05									
12:10-1:30	Lunch								
Time	A Prescott	B Amphitheater	C Gardner	D Lear	A Prescott	B Amphitheater	C Gardner	D Lear	
1:35-1:55	S-01: Modeling of the Anisotropic Behavior in Plasticity	S-08: Incremental Forming	S-02: Advanced Strategies for Inverse Identification of Constitutive Material Models	S-07: Computational Modelling of Scaled Processes and Experiments	S-01: Modeling of the Anisotropic Behavior in Plasticity	S-05: Numerical Modeling of Thermomechanical Processes of Lightweight Metals	S-07: Computational Modelling of Scaled Processes and Experiments	S-11: Impulse Forming and Welding	General Session
1:55-2:15									
2:15-2:35									
2:35-2:55									
5min	Move to plenary in F - Grand Ballroom								
3:00-3:50	Plenary 2								
3:50-4:10	Coffee Break								
4:10-30	S-03: Ductile Damage and Fracture: Modeling and Numerical Prediction	S-01: Modeling of the Anisotropic Behavior in Plasticity		S-09: Intelligent Metal Forming Technologies	S-03: Ductile Damage and Fracture: Modeling and Numerical Prediction	S-01: Modeling of the Anisotropic Behavior in Plasticity	S-06: Simulation-driven Product Design and Process Optimization	S-14: Composites Forming	General Session
4:30-4:50									
4:50-5:10									
5:10-5:30									
5:30-5:50									

VENUE FLOORPLANS

LOWER LEVEL



LOBBY LEVEL

