



# Visual-JW 2022

# & DEJI<sup>2</sup>MA-2

25-26 October 2022

Senri Life Science Center, Osaka, Japan

The 6th International Symposium  
on Visualization in Joining & Welding Science through  
Advanced Measurements and Simulation

&

The 2nd International Symposium  
on Design and Engineering by Joint Inverse  
Innovation for Materials Architecture (DEJI<sup>2</sup>MA-2)

in conjunction with

Symposium on the Research Activities of  
Joint Usage/Research Center on Joining and Welding

Organized by *Joining and Welding Research Institute, Osaka University*  
Co-organized by *Japan Welding Society*

# AGENDA

**25th October 2022**

Room A							
<b>Opening Ceremony</b>							
09:50-10:00	Greeting						
<b>Plenary Session</b>							
10:00-10:30	PL-01-L						
10:30-11:00	PL-02-L						
11:00-11:30	PL-03-L						
11:30-13:00	Lunch						
Room A		Room B		Room C			
<b>Joining Mechanics and Analyses 1</b>		<b>Welding Mechanism 1</b>		<b>Design &amp; Engineering by Joint Inverse Innovation for Materials Architecture (DEJI<sup>2</sup>MA)</b>			
13:00-13:20	JMA-01-L	13:00-13:20	WM-01-L	13:00-13:20	DEJI <sup>2</sup> MA-01-L		
13:20-13:35	JMA-02-O	13:20-13:35	WM-02-O	13:20-13:40	DEJI <sup>2</sup> MA-02-L		
13:35-13:50	JMA-03-O	13:35-13:50	WM-03-O	13:40-14:00	DEJI <sup>2</sup> MA-03-L		
13:50-14:05	JMA-04-O	13:50-14:05	WM-04-O	14:00-14:20	DEJI <sup>2</sup> MA-04-L		
14:05-14:20	JMA-05-O	14:05-14:20	WM-05-O	14:20-14:40	DEJI <sup>2</sup> MA-05-L		
14:20-14:35		14:20-14:35	WM-06-O	14:40-15:00	DEJI <sup>2</sup> MA-06-L		
14:30-14:50		14:35-14:50					
14:50-15:10	Coffee Break			15:00-15:20	Coffee Break		
<b>Joining Mechanics and Analyses 2</b>		<b>Welding Mechanism 2</b>		<b>Design &amp; Engineering by Joint Inverse Innovation for Materials Architecture (DEJI<sup>2</sup>MA)</b>			
15:10-15:25	JMA-06-O	15:10-15:25	WM-07-O	15:20-15:40	DEJI <sup>2</sup> MA-07-L		
15:25-15:40	JMA-07-O	15:25-15:40	WM-08-O	15:40-16:00	DEJI <sup>2</sup> MA-08-L		
15:40-15:55	JMA-08-O	15:40-15:55	WM-09-O	16:00-16:20	DEJI <sup>2</sup> MA-09-L		
15:55-16:10	JMA-09-O	15:55-16:10	WM-10-O	16:20-16:40	DEJI <sup>2</sup> MA-10-L		
16:10-16:25	JMA-10-O	16:10-16:25	WM-11-O	16:40-17:00	DEJI <sup>2</sup> MA-11-L		
16:25-16:40	JMA-11-O	16:25-16:40	WM-12-O	17:00-17:20	DEJI <sup>2</sup> MA-12-L		
16:40-16:55	JMA-12-O	16:40-16:55					
16:55-17:15	Coffee Break			17:20-17:30	Coffee Break		
<b>Micro Joining</b>		<b>Composite Material &amp; Joint Interface</b>		<b>Poster Session (DEJI<sup>2</sup>MA)</b>			
17:15-17:35	MJ-01-L	17:15-17:35	CJ-01-L	Room P 17:30-18:30 P-DEJI <sup>2</sup> MA-01-44			
17:35-17:50	MJ-02-O	17:35-17:50	CJ-02-O				
17:50-18:05	MJ-03-O	17:50-18:05	CJ-03-O				
18:05-18:20	MJ-04-O	18:05-18:20	CJ-04-O				
Break							
Banquet at Senri Hankyu Hotel 19:00-21:00							

**26th October 2022**

Room A		Room B		Room C	
Additive Manufacturing 1		Joining Metallurgical Evaluation		The Research Activities of Joint Usage / Research Center on Joining and Welding	
09:00-09:20	AM-01-L	09:00-09:20	JME-01-L	09:00-09:20	RAJU-01-L
09:20-09:35	AM-02-O	09:20-09:35	JME-02-O	09:20-09:40	RAJU-02-L
09:35-09:50	AM-03-O	09:35-09:50	JME-03-O	09:40-10:00	RAJU-03-L
09:50-10:05	AM-04-O	09:50-10:05	JME-04-O	10:00-10:20	RAJU-04-L
10:05-10:20	AM-05-O	10:05-10:20	JME-05-O		
10:20-10:40	Coffee Break				
10:40-10:55	AM-06-O	10:40-10:55	JME-06-O	10:40-11:00	RAJU-05-L
10:55-11:10	AM-07-O	10:55-11:10	JME-07-O	11:00-11:20	RAJU-06-L
11:10-11:25	AM-08-O	11:10-11:25	JME-08-O	11:20-11:40	RAJU-07-L
11:25-11:40	AM-09-O	11:25-11:40	JME-09-O	11:40-12:00	RAJU-08-L
12:00-13:00	Lunch				
<b>Poster Session (Visual-JW)</b>					
13:00-14:00	Room L P-01-LMP-01 - P-21-JME-01				
Additive Manufacturing 2		Laser Materials Processing		Energy Control of Processing	
Room A		Room B		Room C	
14:00-14:20	AM-11-L	14:00-14:20	LMP-01-L	14:05-14:20	ECP-01-O
14:20-14:35	AM-12-O	14:20-14:35	LMP-02-O	14:20-14:35	ECP-02-O
14:35-14:50	AM-13-O	14:35-14:50	LMP-03-O	14:35-14:50	ECP-03-O
14:50-15:05	AM-14-O	14:50-15:05	LMP-04-O	14:50-15:05	ECP-04-O
15:05-15:20	AM-15-O	15:05-15:20	LMP-05-O	15:05-15:20	ECP-05-O
15:20-15:35		15:20-15:35	LMP-06-O	15:20-15:35	ECP-06-O
15:35-15:50		15:35-15:50	LMP-07-O	15:35-15:50	

# CONTENS

## Plenary Session (Room A)

Chair: Manabu Tanaka (Osaka University, Japan)

<b>PL-01-L</b>	<b>Research on Novel Metal Materials by Laser Additive Manufacture .....</b>	<b>1</b>
	<u>Zhuguo Li</u> , Kai Feng, Zhihui Xiong, Yueqiao Feng, Xiaotong Pang	
	Shanghai Jiao Tong University, China	

Chair: Masahiro Tsukamoto (Osaka University, Japan)

<b>PL-02-L</b>	<b>Seeing is Believing - Some New Insight into Laser Beam Welding and Cutting Processes .....</b>	<b>2</b>
	Dirk Petring	
	Fraunhofer Institute for Laser Technology, Germany	

Chair: Yuichi Setsuhara (Osaka University, Japan)

<b>PL-03-L</b>	<b>How We Can Apply Computational Materials Science and Data Analyses to Developing New Semiconductor Materials.....</b>	<b>3</b>
	Toshio Kamiya	
	Tokyo Institute of Technology, Japan	

## Joining Mechanics and Analyses (Room A)

Chair: Yoshiki Mikami (Osaka University, Japan) / Peihao Geng (Osaka University, Japan)

<b>JMA-01-L</b>	<b>Novel Local Compression Methods for CTOD Testing of Welds that Ensure Unchanged Toughness Evaluation .....</b>	<b>4</b>
	<u>Tomoya Kawabata</u> <sup>1</sup> , Takumi Ozawa <sup>2</sup> , Yoshiki Mikami <sup>3</sup>	
	1. The University of Tokyo, Japan 2. National Maritime Research Institute, Japan 3. Osaka University, Japan	
<b>JMA-02-O</b>	<b>Particle-based Simulation of Slag Transfer Process During Metal Active Gas Welding.....</b>	<b>5</b>
	<u>Takamasa Fukazawa</u> <sup>1</sup> , Hisaya Komen <sup>1</sup> , Masaya Shigeta <sup>2</sup> , Manabu Tanaka <sup>1</sup> , Tetsuo Yamada <sup>3</sup> , Naoko Saito <sup>3</sup> , Mitsugi Fukahori <sup>3</sup>	
	1. Osaka University, Japan 2. Tohoku University, Japan 3. MAZDA Motor Corporation, Japan	
<b>JMA-03-O</b>	<b>Visualization and Estimation of Deformation for an Impeller Plate by Inverse Isogeometric Analysis and Fiber Optic Strain Sensing .....</b>	<b>6</b>
	<u>Thein Lin Aung</u> <sup>1</sup> , Ninshu Ma <sup>1</sup> , Kazushige Nakao <sup>1</sup> , Masanori Nakamachi <sup>2</sup> , Kinzo Kishida <sup>3</sup>	
	1. Osaka University, Japan 2. Fukui University of Technology, Japan 3. Neubrex Co. Ltd., Japan	
<b>JMA-04-O</b>	<b>Extended Contour Method Combining with XRD for Measuring 3D Internal Residual Stresses in Carburized Steel for Large Rolling Bearings.....</b>	<b>7</b>
	<u>Masako Tsutsumi</u> <sup>1,2</sup> , Daisuke Watanuki <sup>1</sup> , Yuji Miyamoto <sup>1</sup> , Shota Yamagami <sup>2</sup> , Kunio Narasaki <sup>2</sup> , Ninshu Ma <sup>2</sup>	
	1. NSK Ltd., Japan 2. Osaka University, Japan	
<b>JMA-05-O</b>	<b>Thermal and Mechanical Processes of Interface of Electroformed Nickel/ Zirconium Copper and Effect of Heat Input During Welding .....</b>	<b>8</b>
	<u>Yunjun Fei</u> , Aiping Wu	
	Tsinghua University, China	

Chair: Suo Li (Japan Atomic Energy Agency, Japan) / Hiroki Murakami (Osaka University, Japan)

<b>JMA-06-O</b>	Mechanical study of Trans-Varestraint Test by Using Numerical Analysis of Hot Cracking Based on Idealized Explicit FEM .....	9
	Shintaro Maeda, Wenda Wang, Masashi Habata, Kazuki Ikushima, Masakazu Shibahara Osaka Metropolitan University, Japan	
<b>JMA-07-O</b>	Application of Simple Numerical Simulation of Welding Distortion by Thermal Shrinkage Technique to Multi-layer Welded Joint .....	10
	Hiroki Murakami <sup>1</sup> , Hikaru Yamamoto <sup>2</sup> , Shigetaka Okano <sup>1</sup> , Masahito Mochizuki <sup>1</sup> 1. Osaka University, Japan 2. Hitachi Construction Machinery Co. Ltd., Japan	
<b>JMA-08-O</b>	Shell–solid Coupling Analysis of Mechanical Behavior in Complex Thin-plate Structure during Welding .....	11
	Zhihao Li <sup>1</sup> , Shintaro Maeda <sup>2</sup> , Kazuki Ikushima <sup>2</sup> , Masakazu Shibahara <sup>2</sup> 1. Osaka Prefecture University, Japan 2. Osaka Metropolitan University, Japan	
<b>JMA-09-O</b>	Effect of Annealing Models on the Welding-induced Residual Stress and Plastic Strain in Type 316 Stainless Steel Welded Joints .....	12
	Suo Li <sup>1</sup> , Yoshihito Yamaguchi <sup>1</sup> , Jinya Katsuyama <sup>1</sup> , Wei Sun <sup>2</sup> , Dean Deng <sup>3</sup> , Yinsheng Li <sup>1</sup> 1. Japan Atomic Energy Agency, Japan 2. University of Nottingham, UK 3. Chongqing University, China	
<b>JMA-10-O</b>	The Effect of Oscillating Capping TIG Welding on Residual Stresses of 2219-T8 Butt Joint.....	13
	Tianyi Zhao, Aiping Wu Tsinghua University, China	
<b>JMA-11-O</b>	Measurement and Simulation of Thermal-induced Residual Stresses within Friction Stir Lapped Al/Steel Plate.....	14
	Peihao Geng, Masashi Morimura, Ninshu Ma, Wenjia Huang, Weihao Li, Kunio Narasaki, Takuya Ogura, Yasuhiro Aoki, Hidetoshi Fujii Osaka University, Japan	
<b>JMA-12-O</b>	Creep Analysis of Large-scale Weld Pipe Structure in Thermal Power Plant .....	15
	Yuji Kitani <sup>1</sup> , Yuki Yamauchi <sup>2</sup> , Kazuki Ikushima <sup>2</sup> , Hidetaka Nishida <sup>3</sup> , Ninshu Ma <sup>1</sup> , Masakazu Shibahara <sup>2</sup> 1. Osaka University, Japan 2. Osaka Metropolitan University, Japan 3. The Chugoku Electric Power Company, Japan	

## Micro Joining (Room A)

Chair: Hiroshi Nishikawa (Osaka University, Japan) / Makoto Takahashi (Osaka University, Japan)

<b>MJ-01-L</b>	Photonic Sintering of Metallic/Nonmetallic Particles .....	16
	Jenn-Ming Song National Chung Hsing University, Taiwan	
<b>MJ-02-O</b>	Multilayer Anodic Bonding .....	18
	Makoto Takahashi Osaka University, Japan	
<b>MJ-03-O</b>	A Study on the Interfacial Properties of Sintered Joints with the Ratio of Bimodal Cu Paste .....	19
	Junghwan Bang <sup>1</sup> , Junhyuk Son <sup>1,2</sup> , Dong-Yurl Yu <sup>1,2</sup> , Yun-Chan Kim <sup>1</sup> , Shin-II Kim <sup>1,2</sup> 1. Korea Institute of Industrial Technology, Korea 2. Korea University, Korea	
<b>MJ-04-O</b>	Comparative Study of Sn-based Solder Wettability and Interfacial Reactions on Aluminum Substrate ....	20
	Jiahui Li, Hiroaki Tatsumi, Hiroshi Nishikawa Osaka University, Japan	

## **Welding Mechanism (Room B)**

Chair: Rishabh Shotri (Osaka University, Japan) / Seong Min Hong (Osaka University, Japan)

<b>WM-01-L</b>	Visualization of Surface Topography of Components Produced by Wire-Arc Additive Manufacturing ....21
	David Gordon, Yam Alcaraz, Natalia Chernovol, Tegoeh Tjahjowidodo, <u>Abhay Sharma</u>
	Katholieke Universiteit Leuven, Belgium
<b>WM-02-O</b>	Effect of the Direction of Additional Underneath Magnetic Field on the Weldability of Dissimilar Materials (GI Steel - Aluminum Alloy) Joints in AC Pulse GMAW .....23
	<u>Seong Min Hong</u> , Shinichi Tashiro, Manabu Tanaka, Kazuhiro Ito
	Osaka University, Japan
<b>WM-03-O</b>	Dominant Factors in Arc Efficiency of Arc Welding Measured with Liquid Nitrogen Calorimetry .....24
	<u>Shoji Fujiyama</u> , Yuki Asai, Hisaya Komen, Manabu Tanaka
	Osaka University, Japan
<b>WM-04-O</b>	Application of Deep Learning to Root Gap Identification in GMA Welding .....25
	<u>Taketo Masaki</u> , Rentaro Ito, Satoshi Yamane
	Saitama University, Japan
<b>WM-05-O</b>	Measurement of Electron Density Distribution During AC-GTA Welding in Like Mars Atmosphere by IR Method .....26
	<u>Kai Aoyama</u> <sup>1</sup> , Shinichiro Shobako <sup>2</sup> , Tomohiko Yamashita <sup>2</sup> , Noboru Terajima <sup>2</sup> , Hisaya Komen <sup>1</sup> ,
	Manabu Tanaka <sup>1</sup>
	1. Osaka University, Japan 2. National Institute of Technology, Kagawa College, Japan
<b>WM-06-O</b>	Pressure-Controlled Joule-Heat Forge Welding: Process Modeling .....27
	<u>Rishabh Shotri</u> , Yoshiaki Morisada, Hidetoshi Fujii
	Osaka University, Japan

Chair: Motomichi Yamamoto (Hiroshima University, Japan) / Hajime Yamamoto (Osaka University, Japan)

<b>WM-07-O</b>	A Study on the Influence of Welding Current on Metal Transfer Modes in "Pulsed Gas MAG" Welding ....28
	<u>Kohei Fujiwara</u> <sup>1</sup> , Tadahisa Tsuyama <sup>1</sup> , Masahiro Ohara <sup>2</sup> , Takashi Mizuguchi <sup>2</sup> , Naoki Mukai <sup>3</sup> ,
	Yoshihide Inoue <sup>3</sup>
	1. KAWADA Industries, Inc., Japan 2. Ehime University, Japan 3. Kobe Steel, Ltd., Japan
<b>WM-08-O</b>	Addition of Compressive Residual Stress and Retained Austenite in Steel Surface Layers by Friction Stir Processing with the WC Tool .....29
	<u>Hajime Yamamoto</u> , Yuji Yamamoto, Kazuhiro Ito, Yoshiki Mikami
	Osaka University, Japan
<b>WM-09-O</b>	Friction Stir Welding of Steel with Steel Tool by Efficient Tool Cooling Method.....30
	<u>Takuya Miura</u> , Yoshiaki Morisada, Kohsaku Ushioda, Hidetoshi Fujii
	Osaka University, Japan
<b>WM-10-O</b>	Large Process Tolerance of Single-pass Hot-wire MAG Welding .....31
	<u>Nattasak Suwannatee</u> , Kanon Nakamura, Jeong-Won Choi, Motomichi Yamamoto
	Hiroshima University, Japan
<b>WM-11-O</b>	Joint Properties Control During Narrow-gap Hot-wire Laser Welding .....32
	<u>Keita Marumoto</u> <sup>1</sup> , Yuta Sato <sup>1</sup> , Akira Fujinaga <sup>2</sup> , Takeshi Takahashi <sup>2</sup> , Hikaru Yamamoto <sup>2</sup> ,
	Jeong-Won Choi <sup>1</sup> , Motomichi Yamamoto <sup>1</sup>
	1. Hiroshima University, Japan 2. Hitachi Construction Machinery Ltd., Japan
<b>WM-12-O</b>	Development of Narrow Gap Welding Technology for Ultra-thick Cast Steel Using Hot-wire Laser Welding Method .....33
	<u>Yuta Sato</u> <sup>1</sup> , Keita Marumoto <sup>1</sup> , Akira Fujinaga <sup>2</sup> , Takeshi Takahashi <sup>2</sup> , Hikaru Yamamoto <sup>2</sup> ,
	Jeong-Won Choi <sup>1</sup> , Motomichi Yamamoto <sup>1</sup>
	1. Hiroshima University, Japan 2. Hitachi Construction Machinery Ltd., Japan

## **Joint Interface Structure and Formation Mechanism (Room B)**

Chair: Yutaka S. Sato (Tohoku University, Japan) / Yuyang Hou (Osaka University, Japan)

<b>CJ-01-L</b>	Synergistic Enhancement of Strength and Ductility in Hetero-deformation Induced Strengthening Titanium Composites via Powder Metallurgy .....	34
	<u>Shufeng Li</u> <sup>1</sup> , Lei Liu <sup>1</sup> , Deng Pan <sup>1</sup> , Abdollah Bahador <sup>2</sup> , Junko Umeda <sup>2</sup> , Katsuyoshi Kondoh <sup>2</sup> , Xin Zhang <sup>1</sup> , Bo Li <sup>1</sup>	
	1. Xi'an University of Technology, China 2. Osaka University, Japan	
<b>CJ-02-O</b>	Accelerating Effect of Oxides on TiN Formation to Promote δ-ferrite Nucleation in Ferritic Stainless Steel Weld Metals.....	37
	<u>Yuyang Hou</u> , Kota Kadoi	
	Osaka University, Japan	
<b>CJ-03-O</b>	Dissimilar Linear Friction Welding of AA5052 and AA6061 .....	38
	<u>Jeong-Won Choi</u> <sup>1</sup> , Jin-Ming Su <sup>1</sup> , Motomichi Yamamoto <sup>1</sup> , Yasuhiro Aoki <sup>2</sup> , Hidetoshi Fujii <sup>2</sup>	
	1. Hiroshima University, Japan 2. Osaka University, Japan	
<b>CJ-04-O</b>	Strength Improvement in Dissimilar Al/steel Weld by Simultaneous Addition of Si and Ni.....	39
	<u>Kyoaki T. Suzuki</u> <sup>1</sup> , Shun Omura <sup>1</sup> , Shun Tokita <sup>1</sup> , Yutaka S. Sato <sup>1</sup> , Yujiro Tatsumi <sup>2</sup>	
	1. Tohoku University, Japan 2. Nippon Steel Corporation, Japan	

## **Design & Engineering by Joint Inverse Innovation for Materials Architecture (DEJI<sup>2</sup>MA) (Room C)**

Chair: Yuichi Setsuhara (Osaka University, Japan)

<b>DEJI<sup>2</sup>MA-01-L</b>	Minimally Invasive Drug and Cell Delivery Systems Targeting the Posterior Segment of the Eye.....	40
	Hirokazu Kaji	
	Tokyo Medical and Dental University, Japan	
<b>DEJI<sup>2</sup>MA-02-L</b>	Antibacterial Design of Bioactive Nanomesh Ceramic Layers Using Chitosan Scaffold.....	41
	<u>Nobuhiro Matsushita</u> <sup>1</sup> , Junnosuke Nishimoto <sup>1</sup> , Yuta Kubota <sup>1</sup> , Michiyo Honda <sup>2</sup> , Takeshi Wada <sup>3</sup> , Hidemi Kato <sup>3</sup> , Takao Hanawa <sup>4</sup>	
	1. Tokyo Institute of Technology, Japan 2. Meiji University, Japan 3. Tohoku University, Japan	
	4. Tokyo Medical-Dental University, Japan	

Chair: Masakazu Kawashita (Tokyo Medical and Dental University, Japan)

<b>DEJI<sup>2</sup>MA-03-L</b>	Desktop Air Curtain System with Virus Inactivation Function.....	42
	<u>Kotaro Takamure</u> , Tomomi Uchiyama	
	Nagoya University, Japan	
<b>DEJI<sup>2</sup>MA-04-L</b>	Quantum Sensing using Nitrogen Vacancy Centers in Diamond for Analyses of Molecular Structures....	43
	Takashi Tanii	
	Waseda University, Japan	

Chair: Hidemi Kato (Tohoku University, Japan)

<b>DEJI<sup>2</sup>MA-05-L</b>	Post Weld Tungsten Alloying in a Topmost Steel Layer through Friction Stir Processing Using a WC Tool.....	44
	<u>Kazuhiro Ito</u> , Hajime Yamamoto, Yoshiki Mikami, Makoto Takahashi	
	Osaka University, Japan	
<b>DEJI<sup>2</sup>MA-06-L</b>	Strength and Electrical Conductivity of Cu-In Solid Solution Alloy Wires .....	45
	<u>Satoshi Semboshi</u> , Yasunori Abe, Naoya Masahashi	
	Tohoku University, Japan	

Chair: Hiroshi Kawarada (Waseda University, Japan)

<b>DEJI<sup>2</sup>MA-07-L</b>	Surface Functionalization of Honeycomb Scaffolds Consisting of Carbonate Apatite for Bone Regeneration and Infection Prevention .....	46
	<u>Masaya Shimabukuro</u> <sup>1</sup> , Koichiro Hayashi <sup>2</sup> , Taishi Yokoi <sup>1</sup> , Masakazu Kawashita <sup>1</sup> , Kunio Ishikawa <sup>2</sup>	
	1. Tokyo Medical and Dental University, Japan 2. Kyushu University, Japan	
<b>DEJI<sup>2</sup>MA-08-L</b>	Ceramic Stereolithography for Sustainable Societies .....	47
	<u>Fiona Spirrett</u> , Soshu Kiriha, Masaya Takahashi, Tatsuya Ito, Yasuhiro Uemura	
	Osaka University, Japan	

Chair: Minoru Osada (Nagoya University, Japan)

<b>DEJI<sup>2</sup>MA-09-L</b>	Ultrafine Porous Intermetallic Compounds by High-Temperature Liquid Metal Dealloying for Electrochemical Hydrogen Production .....	48
	<u>Ruirui Song</u> <sup>1</sup> , Juhui Han <sup>1,2</sup> , Masayuki Okugawa <sup>3,4</sup> , Rodion Belosludov <sup>1</sup> , Takeshi Wada <sup>1</sup> , Jing Jiang <sup>1</sup> , Daixiu Wei <sup>1</sup> , Akira Kudo <sup>1</sup> , Yuan Tian <sup>5</sup> , Mingwei Chen <sup>5</sup> , Hidemi Kato <sup>1</sup>	
	1. Tohoku University, Japan 2 Tianjin University of Technology, China 3 Osaka University, Japan	
	4 National Institute of Advanced Industrial Science and Technology, Japan 5 Johns Hopkins University, USA	
<b>DEJI<sup>2</sup>MA-10-L</b>	Alcohol Transformations through Borrowing Hydrogen Methodology over Supported Metal Catalysts with Assistance of MgO .....	50
	<u>Yusuke Kita</u> , Midori Kuwabara, Keigo Kamata, Michikazu Hara	
	Tokyo Institute of Technology, Japan	

Chair: Yutaka Majima (Tokyo Institute of Technology, Japan)

<b>DEJI<sup>2</sup>MA-11-L</b>	Oxidized-Si-Terminated (C–Si–O) Diamond MOSFETs with ALD-Al <sub>2</sub> O <sub>3</sub> Gate Insulator.....	51
	<u>Yu Fu</u> , Hiroshi Kawarada	
	Waseda University, Japan	
<b>DEJI<sup>2</sup>MA-12-L</b>	Band Engineering of Inorganic Nanosheets via Anion-substitution.....	52
	<u>Makoto Kobayashi</u> <sup>1</sup> , Eisuke Yamamoto <sup>1</sup> , Minoru Osada <sup>1,2</sup>	
	1. Nagoya University, Japan 2. National Institute for Materials Science, Japan	

### Poster Session (Room C)

#### Design & Engineering by Joint Inverse Innovation for Materials Architecture (DEJI<sup>2</sup>MA)

<b>P-DEJI<sup>2</sup>MA-01</b>	Cytocompatibility of Yttria-stabilized Zirconia Polycrystalline with L929 Cells - Basis of Evaluation of Soft Tissue Adhesion - .....	53
	<u>Michiko Nakaishi-Terada</u> <sup>1</sup> , Peng Chen <sup>1</sup> , Maki Ashida <sup>1</sup> , Takao Hanawa <sup>1,2</sup>	
	1. Tokyo Medical and Dental University, Japan 2. Kobe University, Japan	
<b>P-DEJI<sup>2</sup>MA-02</b>	Cellular Behaviors of Human Skeletal Muscle Satellite Cells on Tissue Specific Extracellular Matrix Coating and Hydrogels.....	54
	<u>Yoshihide Hashimoto</u> , Takuya Akizawa, Moeko Hagiwara, Mako Kobayashi, Tsuyoshi Kimura, Akio Kishida	
	Tokyo Medical and Dental University, Japan	
<b>P-DEJI<sup>2</sup>MA-03</b>	Synthesis of Fluorescent Nano-sized Octacalcium Phosphate with Incorporated Aromatic Dicarboxylate Ions.....	55
	<u>Taishi Yokoi</u> <sup>1</sup> , Tomoyo Goto <sup>2</sup> , Tohru Sekino <sup>2</sup> , Tomoka Hasegawa <sup>3</sup> , Masaya Shimabukuro <sup>1</sup> , Masakazu Kawashita <sup>1</sup>	
	1. Tokyo Medical and Dental University, Japan 2. Osaka University, Japan 3. Hokkaido University, Japan	
<b>P-DEJI<sup>2</sup>MA-04</b>	Visible-light-enhanced Antibacterial and Bioactive Titanium Surface Prepared by H <sub>2</sub> O <sub>2</sub> , Copper-Doping and Heat Treatment .....	56
	<u>Po-Cheng Sung</u> , Taishi Yokoi, Masaya Shimabukuro, Masakazu Kawashita	
	Tokyo Medical and Dental University, Japan	

<b>P-DEJ<sup>2</sup>MA-05</b>	Electrochemical Surface Treatment to Improve Corrosion Resistance of Type 316L Austenitic Stainless Steel .....	57
	<u>Tomoyo Manaka</u> <sup>1</sup> , Yusuke Tsutsumi <sup>2</sup> , Peng Chen <sup>1</sup> , Takao Hanawa <sup>1</sup>	
	1. Tokyo Medical and Dental University, Japan 2. National Institute for Materials Science, Japan	
<b>P-DEJ<sup>2</sup>MA-06</b>	Promotion of Osteoconductivity of Titanium with Patterned Surface Groove Topographies using Femtosecond Laser Processing.....	58
	<u>Peng Chen</u> <sup>1</sup> , Keisuke Takenaka <sup>2</sup> , Yuji Sato <sup>2</sup> , Masahiro Tsukamoto <sup>2</sup> , Maki Ashida <sup>1</sup> , Takao Hanawa <sup>1,3</sup>	
	1. Tokyo Medical and Dental University, Japan 2. Osaka University, Japan 3. Kobe University, Japan	
<b>P-DEJ<sup>2</sup>MA-07</b>	Enhanced Dye Degradation of Dipole-regulated Titania Nanosheet.....	59
	<u>Kosuke Nozaki</u> <sup>1</sup> , Tomoyuki Mihara <sup>1</sup> , Yasuyuki Kowaka <sup>1</sup> , Kimihiro Yamashita <sup>1</sup> , Noriyuki Wakabayashi <sup>1</sup> , Takayuki Mokudai <sup>2</sup> , Satoshi Ohara <sup>3</sup>	
	1. Tokyo Medical and Dental University, Japan 2. Tohoku University, Japan 3. Osaka University, Japan	
<b>P-DEJ<sup>2</sup>MA-08</b>	Stereolithographic Additive Manufacturing of Metals and Ceramic Components with Geometrically Modulated Structures .....	60
	<u>Soshu Kirihara</u> , Fiona Spirrett	
	Osaka University, Japan	
<b>P-DEJ<sup>2</sup>MA-09</b>	Development of Air Curtain Device Blocking Aerosols in Exhaled Breath .....	61
	<u>Kotaro Takamure</u> <sup>1</sup> , Yasuaki Sakamoto <sup>1</sup> , Yasumasa Iwatani <sup>2</sup> , Hiroshi Amano <sup>1</sup> , Tetsuya Yagi <sup>3</sup> , Tomomi Uchiyama <sup>1</sup>	
	1. Nagoya University, Japan 2. Nagoya Medical Center, Japan 3. Nagoya University Hospital, Japan	
<b>P-DEJ<sup>2</sup>MA-10</b>	Preparation of Visible-light-responsive TiO <sub>2</sub> -xNx Photocatalyst Films Prepared by Chemical Treatment and Elevated Temperatures with Biocompatible and Antibacterial Properties .....	62
	<u>Li Chang</u> <sup>1</sup> , Hiroyasu Kanetaka <sup>1</sup> , Takayuki Mokudai <sup>1</sup> , Masakazu Kawashita <sup>2</sup> , Itaru Mizoguchi <sup>1</sup>	
	1. Tohoku University, Japan 2. Tokyo Medical and Dental University, Japan	
<b>P-DEJ<sup>2</sup>MA-11</b>	Evaluation of Core and Cushion Materials of Face Guards Made by Stereolithography Additive Manufacturing.....	63
	<u>Takahiro Wada</u> , Aya Takamura, Momoko Adachi, Ayumu Murata, Maho Shiozawa, Hiroshi Churei, Motohiro Uo	
	Tokyo Medical and Dental University, Japan	
<b>P-DEJ<sup>2</sup>MA-12</b>	Amorphous Mg-Ca Coatings for Hydrophilicity Protection of Dental Implant Surfaces.....	64
	<u>Masahiko Terauchi</u> <sup>1</sup> , Kengo Narita <sup>2</sup> , Shigeru Yamanaka <sup>2</sup> , Tetsuya Yoda <sup>1</sup> , Eriko Marukawa <sup>1</sup>	
	1. Tokyo Medical and Dental University, Japan 2. Maruemu Works Co. Ltd., Japan	
<b>P-DEJ<sup>2</sup>MA-13</b>	High-speed Formation of Pure Copper Layer by Multi-beam Laser Metal Deposition Method with Blue Diode Lasers .....	65
	<u>Y. Takazawa</u> <sup>1</sup> , R. Matsuda <sup>2</sup> , K. Takenaka <sup>1</sup> , Y. Sato <sup>1</sup> , M. Heya <sup>2</sup> , N. Matsushita <sup>3</sup> , P. Chen <sup>4</sup> , H. Hanawa <sup>4</sup> , M. Tsukamoto <sup>1</sup>	
	1. Osaka University, Japan 2. Osaka Sangyo University, Japan 3. Tokyo Institute of Technology, Japan	
	4. Tokyo Medical and Dental University, Japan	
<b>P-DEJ<sup>2</sup>MA-14</b>	High-Density NV Centers of Ultra High-Concentration Nitrogen-doped CVD Diamond Using Vacancies Created by Transmission Electron Microscope.....	66
	<u>Kyosuke Hayasaka</u> <sup>1</sup> , Mayu Ueda <sup>1</sup> , Kyotaro Kanehisa <sup>1</sup> , Takashi Tanii <sup>1</sup> , Shinobu Onoda <sup>2</sup> , Shinpei Enomoto <sup>1</sup> , Shozo Kono <sup>1</sup> , Hiroshi Kawarada <sup>1</sup>	
	1. Waseda University, Japan 2. National Institute of Quantum and Radiological Science and Technology, Japan	
<b>P-DEJ<sup>2</sup>MA-15</b>	Synthesis of Tailor-Made Ceramic Nanocrystals by Organic Ligand-Assisted Hydrothermal Method towards Solid Oxide Fuel Cell and Biomedical Applications .....	67
	<u>Satoshi Ohara</u> <sup>1</sup> , Minoru Osada <sup>2</sup> , Kosuke Nozaki <sup>3</sup>	
	1. Osaka University, Japan 2. Nagoya University, Japan 3. Tokyo Medical and Dental University, Japan	
<b>P-DEJ<sup>2</sup>MA-16</b>	Integration of Atmospheric-Pressure Low-Temperature Plasma Generation with Environmental Catalyst Technology for Virus Inactivation.....	68
	<u>Yuichi Setsuhara</u> <sup>1</sup> , Kosuke Takenaka <sup>1</sup> , Susumu Toko <sup>1</sup> , Masatomo Hattori <sup>2</sup> , Masakuni Ozawa <sup>2</sup>	
	1. Osaka University, Japan 2. Nagoya University, Japan	
<b>P-DEJ<sup>2</sup>MA-17</b>	Investigation of Na-ion Conduction in Pyrophosphate-based Cathode Materials .....	69
	<u>Tomoya Asayama</u> , Kazuki Nakanishi, George Hasegawa	
	Nagoya University, Japan	

<b>P-DEJI<sup>2</sup>MA-18</b>	Immiscible Fe/Mg Joining Using Liquid Metal Dealloying Reaction .....	70
	Kota Kurabayashi, Takeshi Wada, Hidemi Kato	
	Tohoku University, Japan	
<b>P-DEJI<sup>2</sup>MA-19</b>	Investigation of Electrochemical Process Using SiC Substrates for Electronic Packages.....	71
	Mikiko Saito <sup>1</sup> , Hiroshi Nishikawa <sup>2</sup>	
	1. Waseda University, Japan 2. Osaka University, Japan	
<b>P-DEJI<sup>2</sup>MA-20</b>	Elaboration of Micro-porous FeCrNi Powders by Liquid Metal Dealloying.....	72
	Louis Lesage <sup>1,2</sup> , Pierre-Antoine Geslin <sup>1</sup> , Nicolas Mary <sup>1</sup> , Eric Maire <sup>1</sup> , Takeshi Wada <sup>2</sup> , Hidemi Kato <sup>2</sup>	
	1. University of Lyon, France 2. Tohoku University, Japan	
<b>P-DEJI<sup>2</sup>MA-21</b>	Structural and Magnetic Properties of FeNi and FeCo Alloy Thin Films on Cu(001) Grown by Nitrogen Surfactant Epitaxy.....	73
	Toshio Miyamachi <sup>1</sup> , Hiroki Ono <sup>1</sup> , Yoshitaka Umeda <sup>1</sup> , Kaishu Kawaguchi <sup>2</sup> , Thomas Gozinski <sup>2,3</sup> , Takushi Iimori <sup>2</sup> , Kohei Yamamoto <sup>4</sup> , Masato Kotsugi <sup>5</sup> , Wulf Wulfherkel <sup>3</sup> , Toshihiko Yokoyama <sup>4</sup> , Fumio Komori <sup>2</sup> , Masaki Mizuguchi <sup>1</sup>	
	1. Nagoya University, Japan 2. The University of Tokyo, Japan 3. Karlsruhe Institute of Technology, Germany	
	4. Institute for Molecular Science, Japan 5. Tokyo University of Science, Japan	
<b>P-DEJI<sup>2</sup>MA-22</b>	Study on Corrosion Property of F82H/SUS316L Butt- Joint Produced by Friction Stir Welding .....	74
	Hisashi Serizawa <sup>1</sup> , Naofumi Nakazato <sup>2</sup> , Hirotatsu Kishimoto <sup>2</sup> , Hidetoshi Fujii <sup>1</sup> , Takashi Nozawa <sup>3</sup>	
	1. Osaka University, Japan 2. Muroran Institute of Technology, Japan	
	3. National Institute for Quantum Science and Technology, Japan	
<b>P-DEJI<sup>2</sup>MA-23</b>	Immiscible Mg-Ti Bonding with Liquid Metal Dealloying Technique .....	75
	Yusuke Ohashi, Kota Kurabayashi, Hidemi Kato	
	Tohoku University, Japan	
<b>P-DEJI<sup>2</sup>MA-24</b>	Synthesis of Perovskite Oxynitride Nanosheets “Ca <sub>2</sub> Nb <sub>3</sub> O <sub>10-x</sub> N <sub>x</sub> ” with Controlled Band Structures .....	76
	Makoto Kobayashi <sup>1</sup> , Hikaru Sugimoto <sup>1</sup> , Eisuke Yamamoto <sup>1</sup> , Minoru Osada <sup>1,2</sup>	
	1. Nagoya University, Japan 2. National Institute for Materials Science, Japan	
<b>P-DEJI<sup>2</sup>MA-25</b>	Synthesis of Binary Nitrides by Various Nitridization Processes .....	77
	Kota Hanzawa, Yu Toriumi, Tatsuya Sano, Hidenori Hiramatsu	
	Tokyo Institute of Technology, Japan	
<b>P-DEJI<sup>2</sup>MA-26</b>	Autonomous Materials Exploration System via High-Throughput Calculations and Machine Learning ....	78
	Akira Takahashi, Fumiyasu Oba	
	Tokyo Institute of Technology, Japan	
<b>P-DEJI<sup>2</sup>MA-27</b>	A Novel Approach for Evaluating the Dynamics of Quantum Coherence in Electron-Phonon Coupled Systems .....	79
	Itsuki Takagi <sup>1</sup> , Yuma Konno <sup>1</sup> , Yosuke Kayanuma <sup>1,2</sup> , Kazutaka G. Nakamura <sup>1</sup>	
	1. Tokyo Institute of Technology, Japan 2. Osaka Prefecture University, Japan	
<b>P-DEJI<sup>2</sup>MA-28</b>	Magnetization Reversal by Electric Field in Co-substituted BiFeO <sub>3</sub> under a Control of Domains by Trailing Fields .....	80
	Kei Shigematsu <sup>1,2</sup> , Takuma Itoh <sup>1</sup> , Masaki Azuma <sup>1,2</sup>	
	1. Tokyo Institute of Technology, Japan 2. Kanagawa Institute of Industrial Science and Technology, Japan	
<b>P-DEJI<sup>2</sup>MA-29</b>	Electrolyte Dependence on Solid Electrolyte Interface (SEI) Formation in BaTiO <sub>3</sub> Supported Lithium Ion Thin Film Batteries .....	81
	Shintaro Yasui <sup>1</sup> , Daigo Nanasawa <sup>1</sup> , Sou Yasuhara <sup>1</sup> , Takashi Teranishi <sup>2</sup> , Kanta Suzuki <sup>3</sup> , Ken-Ichi Kaminaga <sup>3</sup>	
	1. Tokyo Institute of Technology, Japan 2. Okayama University, Japan 3. Tohoku University, Japan	
<b>P-DEJI<sup>2</sup>MA-30</b>	Achievement of the First Normally-off operation in Vertical Diamond MOSFETs Using Oxidized Si Termination Diamond Channel.....	82
	Kosuke Ota, Yu Fu, Kento Narita, Chiyuki Wakabayashi, Atsushi Hiraiwa, Hiroshi Kawarada	
	Waseda University, Japan	
<b>P-DEJI<sup>2</sup>MA-31</b>	Seawater Wireless Communication in Pipe filled with Seawater Mediated by Ions in Electrolyte Solutions by utilizing Diamond Solution Gate FET.....	83
	Hirotaka Sato, Kota Masadome, Leona Nomoto, Yu Hao Chang, Hiroshi Kawarada	
	Waseda University, Japan	

<b>P-DEJI<sup>2</sup>MA-32</b>	Multi-finger 2DHG Diamond MOSFETs with Air-bridge Structure for Gate Width Expansion and Improved RF Characteristics.....	84
	<u>Fuga Asai</u> , Masakazu Arai, Akira Takahashi, Yukiko Suzuki, Atsushi Hiraiwa, Hiroshi Kawarada Waseda University, Japan	
<b>P-DEJI<sup>2</sup>MA-33</b>	Development Plasma Processing Technology for Low-temperature Formation of High Quality Functional Thin Films.....	85
	Yuichi Setsuhara <sup>1</sup> , <u>Kosuke Takenaka</u> <sup>1</sup> , Susumu Toko <sup>1</sup> , Keisuke Ide <sup>2</sup> , Toshio Kamiya <sup>2</sup> 1. Osaka University, Japan 2. Tokyo Institute of Technology, Japan	
<b>P-DEJI<sup>2</sup>MA-34</b>	Multi-Sensing Using Ion-Sensitive FETs by Common-Gate Method .....	86
	<u>Reona Nomoto</u> , Hirotaka Sato, Yu Hao Chang, Hiroshi Kawarada Waseda University, Japan	
<b>P-DEJI<sup>2</sup>MA-35</b>	Structure and Magnetic Properties of (Fe,Cr)S Compounds Fabricated by Powder Sintering .....	87
	<u>Rie Umetsu</u> <sup>1</sup> , Satoshi Semboshi <sup>1</sup> , Masato Miyakawa <sup>1</sup> , Noriharu Yodoshi <sup>2</sup> , Akira Masago <sup>3</sup> , Yosuke Kawahito <sup>3</sup> , Hisazumi Akai <sup>4</sup> 1. Tohoku University, Japan 2. Kyushu University, Japan 3. Japan Agency for Marine-Earth Science and Technology, Japan 4. Osaka University, Japan	
<b>P-DEJI<sup>2</sup>MA-36</b>	L <sub>1</sub> <sub>2</sub> -ordered CoPt <sub>3</sub> Nanowires Based Ferromagnetic Single-electron Transistor .....	88
	<u>Daigo Kobayashi</u> , Yutaka Majima Tokyo Institute of Technology, Japan	
<b>P-DEJI<sup>2</sup>MA-37</b>	Bottom-up Synthesis of 2D Layered High-entropy Transition Metal Hydroxides and their Properties ....	89
	<u>Fei Li</u> <sup>1</sup> , Takashi Naka <sup>2</sup> , Takeshi Hashishin <sup>3</sup> , Jun Maruyama <sup>4</sup> , Hiroya Abe <sup>1</sup> 1. Osaka University, Japan 2. National Institute for Materials Science, Japan 3. Kumamoto University, Japan 4. Osaka Research Institute of Industrial Science and Technology, Japan	
<b>P-DEJI<sup>2</sup>MA-38</b>	Green Synthesis of Silver Nanoparticles and Their Calorimetric Sensing .....	90
	<u>Masashi Uemura</u> , Yuina Yagi, Kanako Yoshida, Fei Li, Hiroya Abe Osaka University, Japan	
<b>P-DEJI<sup>2</sup>MA-39</b>	2D Thin Films Could Be One Drop Away .....	91
	Yue Shi <sup>1</sup> , Eisuke Yamamoto <sup>1</sup> , Makoto Kobayashi <sup>1</sup> , <u>Minoru Osada</u> <sup>1,2</sup> 1. Nagoya University, Japan 2. National Institute for Materials Science, Japan	
<b>P-DEJI<sup>2</sup>MA-40</b>	Effect of Several Heat Treatment Times on the Microstructure and Mechanical Behavior of Selective Laser Melted Co–Cr–Mo Alloys .....	92
	<u>Yuka Kajima</u> , Atsushi Takaichi, Takao Hanawa, Noriyuki Wakabayashi Tokyo Medical and Dental University, Japan	
<b>P-DEJI<sup>2</sup>MA-41</b>	Lithium-modified Titanium Biomaterials by Anodization with Enhanced Protein Adsorption and Early-stage Osteoblast Behavior.....	93
	<u>Wu Huaze</u> , Takeshi Ueno, Kosuke Nozaki, Xu Huichuan, Noriyuki Wakabayashi Tokyo Medical and Dental University, Japan	
<b>P-DEJI<sup>2</sup>MA-42</b>	Simulation Model of Resistance Heating and Thermal Cycles of Metallic Glass for Its Formability Improvement.....	94
	<u>Yurie Tai</u> <sup>1</sup> , Ninshu Ma <sup>1</sup> , Kunio Narazaki <sup>1</sup> , Rui Yamada <sup>2</sup> , Hidemi Kato <sup>2</sup> , Masanari Datekyu <sup>2</sup> 1. Osaka University, Japan 2. Tohoku University, Japan	
<b>P-DEJI<sup>2</sup>MA-43</b>	Theoretical Analysis of Similarity in Band Structure between Binary and Ternary Oxides .....	95
	<u>Takanori Ishii</u> , Akira Takahashi, Fumiyasu Oba Tokyo Institute of Technology, Japan	
<b>P-DEJI<sup>2</sup>MA-44</b>	Experimentally Mapping the Columnar-to-isotropic Transition in Laser Powder Bed Fusion Ti-10%Mo Alloys.....	96
	<u>Jack Peterson</u> , Shota Kariya, Junko Umeda, Katsuyoshi Kondoh Osaka University, Japan	
<b>P-DEJI<sup>2</sup>MA-45</b>	Glutathione Coating Immobilized by Chemical Grafting Enhances the Biocompatibility and Cell Behaviors on Titanium Surface .....	97
	<u>Xu Huichuan</u> , Takeshi Ueno, Kosuke Nozaki, Wu Huaze, Noriyuki Wakabayashi Tokyo Medical and Dental University, Japan	

## Additive Manufacturing (Room A)

Chair: Jens Günster (Federal Institute Of Materials Research And Testing: Bam, Germany) /  
Soshu Kiriha (Osaka University, Japan)

<b>AM-01-L</b>	<b>Development of a Hybrid Multiscale Model of Wire–Arc Additive Manufacturing.....</b>	<b>99</b>
	<u>Anthony B. Murphy</u> , Dayalan Gunasegaram, Fiona F. Chen, Joshua Kim, David G. Thomas Commonwealth Scientific and Industrial Research Organisation, Australia	
<b>AM-02-O</b>	<b>Homogeneity of Microstructure and Mechanical Properties of Wire Arc Additive Manufactured Martensitic Stainless Steel by Control of Interpass Temperature.....</b>	<b>100</b>
	Zhiwei Lyu <sup>1</sup> , <u>Yutaka S. Sato</u> <sup>1</sup> , Shun Tokita <sup>1</sup> , Yue Zhao <sup>2</sup> , Jinlong Jia <sup>2</sup> , Aiping Wu <sup>2</sup> 1. Tohoku University, Japan 2. Tsinghua University, China	
<b>AM-03-O</b>	<b>Monitoring and Controlling of arc Welding Processes by Thermographic Image Processing with Deep Learning.....</b>	<b>101</b>
	Sven-Frithjof Goecke TH Brandenburg, Germany	
<b>AM-04-O</b>	<b>Correlation of Process, Design and Welding Residual Stresses in WAAM of High-strength Steel Components .....</b>	<b>102</b>
	<u>Dirk Schroepfer</u> <sup>1</sup> , Karsten Wandtke <sup>1</sup> , Arne Kromm <sup>1</sup> , Thomas Kannengiesser <sup>1</sup> , Ronny Scharf-Wildenheit <sup>2</sup> , Andre Haelsig <sup>2</sup> , Jonas Hensel <sup>2</sup> 1. Federal Institute of Materials Research And Testing (BAM), Germany 2. Technische Universität Chemnitz, Germany	
<b>AM-05-O</b>	<b>LPV Control of the Weld Pool in the WAAM Process under Consideration of the Interpass Temperature .....</b>	<b>104</b>
	<u>Maxim Scheck</u> , Erik Kunze, Stephan Beitler, Andreas Richter, Tobias Gehling, Kai Treutler, Volker Wesling, Christian Rembe, Christian Bohn Clausthal University of Technology, Germany	

Chair: Anthony B. Murphy (Commonwealth Scientific and Industrial Research Organization, Australia) /  
Johanna Sänger (Federal Institute of Materials Research and Testing: BAM, Germany)

<b>AM-06-O</b>	<b>Adaptive Evaluation of the Measurement of Geometric Variables in the WAAM Process for Closed-Loop Control .....</b>	<b>105</b>
	<u>Andreas Richter</u> , Maxim Scheck, Tobias Gehling, Kai Treutler, Volker Wesling, Christian Bohn, Christian Rembe Clausthal University of Technology, Germany	
<b>AM-07-O</b>	<b>Influence of Annealing on the Microstructure and Charpy Impact Toughness of Wire Arc Additive Manufactured Ti5111 Alloy.....</b>	<b>106</b>
	<u>Feipeng An</u> , Linjie Zhang Xi'an Jiaotong University, China	
<b>AM-08-O</b>	<b>Microstructural Evolution of Nanostructured WC-Co Cemented Carbide Granulated Powder Consolidated by Laser Cladding and Spark Plasma Sintering .....</b>	<b>107</b>
	<u>Kanawat Ratanapongpien</u> <sup>1,2</sup> , Motoko Yamada <sup>3</sup> , Hisashi Sato <sup>3</sup> , Yoshimi Watanabe <sup>3</sup> , Yorihiro Yamashita <sup>4</sup> , Takahiro Kunimine <sup>1</sup> 1. Kanazawa University, Japan 2. King Mongkut's University of Technology Thonburi, Thailand 3. Nagoya Institute of Technology, Japan 4. National Institute of Technology, Ishikawa College, Japan	
<b>AM-09-O</b>	<b>Influence of Tool Tilt Angle and Multipass on the Mechanical Properties and Microstructures of Manually Friction Stir Processed AA6061/SiCp Surface Composite.....</b>	<b>108</b>
	<u>Adinda Saraswati Rosadi</u> , Muhammad Anis, Winarto Universitas Indonesia, Indonesia	

Chair: Fiona Spirrett (Osaka University, Japan) / Hiroya Abe (Osaka University, Japan)

<b>AM-11-L</b>	<b>Challenges in the Technology Development for AM in Space .....</b>	109
	<u>J. Günster</u> <sup>1,2</sup> , Lena Meyer <sup>1</sup> , Janka Wilbig <sup>1</sup> , Andrea Zocca <sup>1</sup>	
	1. Federal Institute of Materials Research and Testing (BAM) Germany	
	2. Clausthal University of Technology, Germany	
<b>AM-12-O</b>	<b>Ceramic Meta Material via Two-Photon-Polymerization for Powder Processing .....</b>	110
	<u>J.C. Sänger</u> <sup>1</sup> , B.R. Pauw <sup>1</sup> , B. Riechers <sup>1</sup> , R. Maaß <sup>1,2</sup> , H. Sturm <sup>1,3</sup> , J. Günster <sup>1,4</sup>	
	1. Federal Institute of Materials Research and Testing (BAM), Germany 2. University of Illinois, USA	
	3. Technical University Berlin, Germany	
<b>AM-13-O</b>	<b>Microstructure Gradient Formation in Electron Beam Melting-Powder Bed Fusion of Ni-based Superalloy Haynes® 282® .....</b>	111
	<u>Sukhdeep Singh</u> <sup>1</sup> , Joel Andersson <sup>2</sup> , Kota Kadoi <sup>1</sup>	
	1. Osaka University, Japan 2. University West, Sweden	
<b>AM-14-O</b>	<b>Systematic Nanoparticles Sintering on Stereolithographic Additive Manufacturing for Fine Ceramic Microstructures .....</b>	112
	<u>Masaya Takahashi</u> , Fiona Spirrett, Soshu Kirihara	
	Osaka University, Japan	
<b>AM-15-O</b>	<b>Stereolithographic Additive Manufacturing of Glass/Ceramic Components as Sustainable Materials Engineering.....</b>	113
	<u>Ayaka Oi</u> , Fiona Spirrett, Soshu Kirihara	
	Osaka University, Japan	

### **Joining Metallurgical Evaluation (Room B)**

Chair: Kazufumi Nomura (Osaka University, Japan) / Tomoya Nagira (National Institute For Materials Science, Japan)

<b>JME-01-L</b>	<b>Study on Non-contact In-situ Measurement Method of Weld Joint Quality by Laser Ultrasonic Method .....</b>	114
	<u>Kazufumi Nomura</u> , Satoru Asai	
	Osaka University, Japan	
<b>JME-02-O</b>	<b>Hardness Prediction System for Multi-pass Weld Metal of Low-Alloy Steel Using Neural Network.....</b>	116
	<u>Lina Yu</u> , Kazutoshi Nishimoto, Kazuyoshi Saida	
	Osaka University, Japan	
<b>JME-03-O</b>	<b>Microstructure-based Modeling of the PMZ Mechanical Properties in 2219-T8 Aluminum Alloy TIG Welding Joint.....</b>	117
	<u>Zhandong Wan</u> , Aiping Wu, Yue Zhao	
	Tsinghua University, China	
<b>JME-04-O</b>	<b>In Situ Observation of Solidification Mode of Fe-Mn-Si Alloy During TIG Spot Welding Using Synchrotron X-ray .....</b>	118
	<u>Tomoya Nagira</u> <sup>1</sup> , Terumi Nakamura <sup>1</sup> , Takashi Kimura <sup>1</sup> , Fumiyoishi Yoshinaka <sup>1</sup> , Takahiro Sawaguchi <sup>1</sup> , Takayuki Yamashita <sup>2</sup> , Yasuhiro Aoki <sup>2</sup> , Hidetoshi Fujii <sup>2</sup>	
	1. National Institute for Materials Science, Japan 2. Osaka University, Japan	
<b>JME-05-O</b>	<b>Applicability of Metallurgical Model for Solidification Cracking Susceptibility.....</b>	119
	<u>Shotaro Yamashita</u> , Kazuyoshi Saida	
	Osaka University, Japan	

Chair: Shotaro Yamashita (Osaka University, Japan) / Lina Yu (Osaka University, Japan)

<b>JME-06-O</b>	<b>Influential Factor on Grain Boundary Liquation in HAZ of Alloy 625 .....</b>	120
	<u>Yudai Nakamori</u> <sup>1</sup> , Kota Kadoi <sup>1</sup> , Kana Jotoku <sup>2</sup> , Takahiro Osuki <sup>2</sup>	
	1. Osaka University, Japan 2. Nippon Steel Corporation, Japan	

<b>JME-07-O</b>	<b>Effect of Bead Shape on Solidification Cracking in Narrow-gap Joint of Ni-based Alloy During Hot-wire Laser Welding .....</b>	121
	<b>Kenshi Arima<sup>1</sup>, Jeong-Won Choi<sup>1</sup>, Koutarou Inose<sup>2</sup>, Kenji Shinozaki<sup>1</sup>, Motomichi Yamamoto<sup>1</sup></b>	
	1. Hiroshima University, Japan 2. IHI Corporation, Japan	
<b>JME-08-O</b>	<b>Numerical Analysis to Improve Solidification Cracking Susceptibility of Carbon Steel .....</b>	122
	<b>Naoki Sahara<sup>1</sup>, Shotaro Yamashita<sup>1</sup>, Kazuhiko Ono<sup>2</sup>, Weiming Lan<sup>2</sup>, Kazuyoshi Saida<sup>1</sup></b>	
	1. Osaka University, Japan 2. Komatsu Ltd., Japan	
<b>JME-09-O</b>	<b>Development of Variable Constraint and Relaxation Type Hot Cracking Test System.....</b>	123
	<b>Shaowei Yang, Kenshi Arima, Kenji Shinozaki, Jeong-Won Choi, Motomichi Yamamoto</b>	
	Hiroshima University, Japan	

### **Laser Materials Processing (Room B)**

Chair: Patcharapit Promoppatum (King Mongkut's University of Technology Thonburi, Thailand) /  
Yuji Sato (Osaka University, Japan)

<b>LMP-01-L</b>	<b>Electronically Conductive 3D Printed Acetylene Black/Natural Rubber Composite for Flexible Sensor Applications .....</b>	124
	<b>Sasitorn Srisawadi, Siwaporn Srimongkol, Kittaporn Utra, Natsaporn Butsri, Panithi Wiroonpochit</b>	
	National Metal and Materials Technology Center, Thailand	
<b>LMP-02-O</b>	<b>Defect Prediction in Laser-powder Bed Fusion Utilizing Spatter Image Processing .....</b>	125
	<b>Krisda Tapracharoen</b>	
	National Metal and Materials Technology Center, Thailand	
<b>LMP-03-O</b>	<b>Defects Controlling Mechanical Properties of Additively Manufactured Ti-6Al-4V .....</b>	126
	<b>Patcharapit Promoppatum</b>	
	King Mongkut's University of Technology Thonburi, Thailand	
<b>LMP-04-O</b>	<b>Numerical and Experimental Investigation of Single Track Formation Under Varied Layer Thickness of Additively Manufactured Inconel 718 .....</b>	127
	<b>Boonyakorn Tummak, Patcharapit Promoppatum</b>	
	King Mongkut's University of Technology Thonburi, Thailand	
<b>LMP-05-O</b>	<b>Characterization of TiN Reinforced Metal Matrix Composite Stainless Steel Fabricated by Laser Powder Bed Fusion .....</b>	128
	<b>Bralee Chayasombat<sup>1</sup>, Dhritti Tanprayoon<sup>1</sup>, Sasitorn Srisawadi<sup>1</sup>, Piyaporn Sukchot<sup>1</sup>, Yuji Sato<sup>2</sup>, Tetsuo Suga<sup>2</sup>, Masahiro Tsukamoto<sup>2</sup></b>	
	1. National Metal and Materials Technology Center, Thailand 2. Osaka University, Japan	
<b>LMP-06-O</b>	<b>Assessment of the Universality of Duplex Stainless Steel Powder in Laser Additive Repairing Based on Schaeffler Diagram.....</b>	129
	<b>Jie Ning, Jia-Hao Wen, Lin-Jie Zhang, Suck-Joo Na</b>	
	Xi'an Jiaotong University, China	
<b>LMP-07-O</b>	<b>Fiber Laser Spot Welding of Molybdenum Alloy in a Hyperbaric Environment .....</b>	130
	<b>Jian Long, Lin-Jie Zhang, Suck-Joo Na</b>	
	Xi'an Jiaotong University, China	

### **The Research Activities of Joint Usage / Research Center on Joining and Welding (Room C)**

Chair: Kota Kadoi (Osaka University, Japan)

<b>RAJU-01-L</b>	<b>Growth of Ga<sub>2</sub>O<sub>3</sub> Films on Si and GaN Substrates by Atomic Layer Deposition and Post-deposition Annealing.....</b>	131
	<b>Toshihide Nabatame<sup>1</sup>, Tomomi Sawada<sup>1</sup>, Makoto Takahashi<sup>2</sup>, Kazuhiro Ito<sup>2</sup>, Takashi Onaya<sup>1</sup>, Yoshihiro Irokawa<sup>1</sup>, Yasuo Koide<sup>1</sup>, Kazuhito Tsukagoshi<sup>1</sup></b>	
	1. National Institute for Materials Science, Japan 2. Osaka University, Japan	

<b>RAJU-02-L</b>	Hydrogen Absorption Properties of Magnesium Alloys Processed by Various Severe Plastic Deformation Methods.....	132
	Yoshihisa Kimoto <sup>1</sup> , Yoshiaki Morisada <sup>2</sup> , Hidetoshi Fujii <sup>2</sup> , Norbert Enzinger <sup>3</sup> , Christof Sommitsch <sup>3</sup> , Peter Cengeri <sup>4</sup> , Gerhard Krexner <sup>4</sup> , Michael Zehetbauer <sup>4</sup> , Erhard Schafler <sup>4</sup>	
	1. Osaka Research Institute of Industrial Science and Technology, Japan 2. Osaka University, Japan	
	3. Graz University of Technology, Austria 4. University of Vienna, Austria	
<b>RAJU-03-L</b>	Nanoscale Electrochemical Imaging on Metal Alloy.....	133
	Akichika Kumatani <sup>1,2,3</sup>	
	1. Tohoku University, Japan 2. National Institute for Materials Science, Japan 3. University College London, UK	
<b>RAJU-04-L</b>	Microstructural Features of Additively Manufactured Metallic Materials by Multi-Beam Laser Directed Energy Deposition .....	134
	Takahiro Kunimine <sup>1</sup> , Yorihiro Yamashita <sup>2</sup> , Yuji Sato <sup>3</sup> , Masahiro Tsukamoto <sup>3</sup>	
	1. Kanazawa University, Japan 2. National Institute of Technology, Ishikawa College, Japan	
	3. Osaka University, Japan	
Chair: Takayuki Yamashita (Osaka University, Japan)		
<b>RAJU-05-L</b>	Measurement of Local Mechanical Properties of Spot Welded High Strength Steel Plates and Rupture Prediction by CAE .....	135
	Masaki Omiya <sup>1</sup> , Zhenduo Yao <sup>1</sup> , Ninshu Ma <sup>2</sup>	
	1. Keio University, Japan 2. Osaka University, Japan	
<b>RAJU-06-L</b>	Review and Proposal of a Requirement on Test Temperature Control Time in Fracture Toughness Test .....	137
	Takumi Ozawa <sup>1</sup> , Tomoya Kawabata <sup>2</sup> , Yoshiki Mikami <sup>3</sup>	
	1. National Maritime Research Institute, Japan 2. The University of Tokyo, Japan 3. Osaka University, Japan	
<b>RAJU-07-L</b>	Evaluation of Fatigue Strength for Butt Laser Welds Based on Dissipated Energy .....	138
	Yuki Ogawa <sup>1</sup> , Takumi Yamamoto <sup>1</sup> , Taiju Horita <sup>1</sup> , Kota Kadoi <sup>2</sup> , Daiki Shiozawa <sup>1</sup> , Takahide Sakagami <sup>1</sup>	
	1. Kobe University, Japan 2. Osaka University, Japan	
<b>RAJU-08-L</b>	Dynamic and Quantitative Measurement of Hydrogen Release during Fracture of Metallic Materials ....	139
	Keitaro Horikawa, Yoshiki Mikami	
	Osaka University, Japan	

## Energy Control of Processing (Room C)

Chair: Yosuke Ogino (Osaka University, Japan) / Hisaya Komen (Osaka University, Japan)

<b>ECP-01-O</b>	Development of Weld Quality Monitoring Technique by Using a Visual Sensor and Numerical Simulation .....	142
	Yosuke Ogino, Seiya Nitta, Satoru Asai, Tomokazu Sano	
	Osaka University, China	
<b>ECP-02-O</b>	Application of Machine Learning to Keyhole Detection in Plasma Welding .....	143
	Jidong Lu, Siqi Wang, Satoshi Yamane	
	Saitama University, Japan	
<b>ECP-03-O</b>	Sensing and Control of Melting State at Groove Root in Pulsed MAG Welding Using Deep Learning ....	144
	Chuanzhi Wang, Gewei Zhang, Satoshi Yamane	
	Saitama University, Japan	
<b>ECP-04-O</b>	Influence of CO <sub>2</sub> Content in Shielding Gas on Droplet Transfer Behavior in Metal-cored Arc Welding ....	145
	Ngoc Quang Trinh <sup>1,2</sup> , Shinichi Tashiro <sup>1</sup> , Tetsuo Suga <sup>1</sup> , Tomonori Kakizaki <sup>3</sup> , Kei Yamazaki <sup>3</sup> , Hanh Van Bui <sup>2</sup> , Manabu Tanaka <sup>1</sup>	
	1. Osaka University, Japan 2. Hanoi University of Science and Technology, Vietnam 3. Kobe Steel Ltd., Japan	
<b>ECP-05-O</b>	Identification of Dominant Factor for Droplet Ejection from Electrode During AC TIG Welding by Visualization of Electrode Phenomena.....	146
	Kenta Iida <sup>1</sup> , Hisaya Komen <sup>1</sup> , Masaya Shigeta <sup>2</sup> , Manabu Tanaka <sup>1</sup>	
	1. Osaka University, Japan 2. Tohoku University, Japan	

<b>ECP-06-O</b>	Investigation for Oxygen Absorption Mechanism During Gas Tungsten Arc Welding with Carbon Dioxide Gas .....	147
	<u>Yuki Asai</u> <sup>1</sup> , Hisaya Komen <sup>1</sup> , Manabu Tanaka <sup>1</sup> , Masashi Nomoto <sup>2</sup> , Kotaro Watanabe <sup>2</sup> , Takahiro Kamo <sup>2</sup>	
	1. Osaka University, Japan 2. Nippon Steel Corporation, Japan	
<b>Poster Session (Room L)</b>		
<b>Laser Materials Processing</b>		
<b>P-01-LMP-01</b>	Nano-ablation of Titanium Surface by Two-color Double Pulse Femtosecond Laser Beam .....	148
	<u>Keisuke Takenaka</u> <sup>1</sup> , Masaki Hashida <sup>2</sup> , Hitoshi Sakagami <sup>3</sup> , Satoru Iwamori <sup>2</sup> , Yuji Sato <sup>1</sup> , Masahiro Tsukamoto <sup>1</sup>	
	1. Osaka University, Japan 2. Tokai University, Japan 3. National Institute for Fusion Science, Japan	
<b>P-02-LMP-02</b>	Polarization Direction Dependence of Laser-induced Periodic Surface Structures on Ti Plate with Dual-wavelength Femtosecond Double Pulse .....	149
	<u>Kosei Yamamoto</u> <sup>1</sup> , Keisuke Takenaka <sup>1</sup> , Masaki Hashida <sup>2</sup> , Hitoshi Sakagami <sup>3</sup> , Satoru Iwamori <sup>2</sup> , Yuji Sato <sup>1</sup> , Masahiro Tsukamoto <sup>1</sup>	
	1. Osaka University, Japan 2. Tokai University, Japan 3. National Institute for Fusion Science, Japan	
<b>P-03-LMP-03</b>	Improvement of Fatigue Strength of HT780 Butt-Welded Joints with Portable Laser Peening Device ....	150
	<u>Tomoharu Kato</u> <sup>1</sup> , Yoshihiro Sakino <sup>1</sup> , Yuji Sano <sup>2</sup> , Yoshio Mizuta <sup>3</sup> , Satoshi Tamaki <sup>4</sup> , Tomonao Hosokai <sup>3</sup>	
	1. Kindai University, Japan 2. Institute for Molecular Science, Japan 3. Osaka University, Japan 4. LACubed Co., Ltd., Japan	
<b>P-04-LMP-04</b>	Observation of Welding Behavior for Elucidation of Spatter Reduction Effect in Vacuum Laser Welding Using a 16 kW Disk Laser .....	151
	<u>Yoshiaki Kurita</u> <sup>1</sup> , Tomoki Arita <sup>2</sup> , Masami Mizutani <sup>1</sup> , Yuji Sato <sup>1</sup> , Hitoshi Nakano <sup>2</sup> , Masahiro Tsukamoto <sup>1</sup>	
	1. Osaka University, Japan 2. Kindai University, Japan	
<b>P-05-LMP-05</b>	Welding of Pure Copper Using Single-Mode Fiber Laser with Preheating by Blue Diode Laser .....	152
	<u>Shunpei Fujio</u> , Mao Sudo, Keisuke Takenaka, Yuji Sato, Rika Ito, Masahiro Tsukamoto	
	Osaka University, Japan	
<b>P-06-LMP-06</b>	In Situ Observation of Longitudinal Section of Molten Pool Behavior by Two-color Thermometer in Laser Welding .....	153
	<u>Tomoki Arita</u> <sup>1</sup> , Yoshiaki Kurita <sup>2</sup> , Masami Mizutani <sup>2</sup> , Yuji Sato <sup>2</sup> , Hitoshi Nakano <sup>1</sup> , Masahiro Tsukamoto <sup>2</sup>	
	1. Kindai University, Japan 2. Osaka University, Japan	
<b>P-07-LMP-07</b>	Development of LMD System with Blue Diode Lasers for Pure Copper Rod.....	154
	<u>Ritsuko Higashino</u> <sup>1</sup> , Yuji Sato <sup>1</sup> , Keisuke Takenaka <sup>1</sup> , Yoshinori Funada <sup>2</sup> , Yorihiro Yamashita <sup>3</sup> , Nobuyuki Abe <sup>1</sup> , Masahiro Tsukamoto <sup>1</sup>	
	1. Osaka University, Japan 2. Industrial Research Institute of Ishikawa, Japan 3. National Institute of Technology, Ishikawa College, Japan	
<b>Additive Manufacturing</b>		
<b>P-08-AM-01</b>	Effects of Laser Irradiation Conditions on the Number of Cracks Generated in WC-Co Cemented Carbide Cladded by Multi-Beam Laser Metal Deposition .....	155
	<u>Yorihiro Yamashita</u> <sup>1</sup> , Mirai Sakai <sup>1</sup> , Takahiro Kunimine <sup>2</sup> , Yuji Sato <sup>3</sup> , Yoshinori Funada <sup>4</sup> , Masahiro Tsukamoto <sup>3</sup>	
	1. National Institute of Technology, Ishikawa College, Japan 2. Kanazawa University, Japan 3. Osaka University, Japan 4. Industrial Research Institute of Ishikawa, Japan	
<b>P-09-AM-02</b>	Effect of Modulated Pulsed Laser on Material Microstructure in Spatter-Less Selective Laser Melting ...	156
	<u>Yuta Mizuguchi</u> <sup>1</sup> , Yuji Sato <sup>1</sup> , Norio Yoshida <sup>1</sup> , Sasitorn Srisawadi <sup>2</sup> , Dhritti Tanprayoon <sup>2</sup> , Masahiro Tsukamoto <sup>1</sup>	
	1. Osaka University, Japan 2. National Metal and Materials Technology Center, Thailand	
<b>P-10-AM-03</b>	Effects of Heat Treatments on Compressive Deformation Behavior of AlSi10Mg Origami-Architected Materials Fabricated by Additive Manufacturing.....	157
	<u>Takeshi Inamura</u> <sup>1</sup> , Hiromi Yasuda <sup>2</sup> , Takahiro Kunimine <sup>1</sup>	
	1. Kanazawa University, Japan 2. Japan Aerospace Exploration Agency, Japan	
<b>P-11-AM-04</b>	Suppression of Spatter by Profile Control for High Quality Fabrication of SS316L in Vacuum SLM....	158
	<u>Masahiro Ihama</u> , Yuta Mizuguchi, Norio Yoshida, Yuji Sato, Masahiro Tsukamoto	
	Osaka University, Japan	

## **Energy Control of Processing**

<b>P-12-EC-01</b>	2D Temperature Measurement of Molten Area in Electroslag Welding .....	159
	Sota Nakajima <sup>1</sup> , Yosuke Ogino <sup>1</sup> , Tomokazu Sano <sup>1</sup> , Tadahisa Tsuyama <sup>2</sup> , Kohei Fujiwara <sup>2</sup> , Kazuhro Kojima <sup>3</sup> , Daisuke Ohmura <sup>3</sup> , Hiroyuki Ohnishi <sup>3</sup>	
	1. Osaka University, Japan 2. Kawada Industries Inc., Japan 3. Nippon Steel Welding & Engineering Co. Ltd., Japan	

## **Joining Mechanics and Analyses**

<b>P-13-JMA-01</b>	Systematic Investigation of Weld Distortion and Weld Residual Stress under External Restraint .....	160
	Hiroki Murakami, Shigetaka Okano, Masahito Mochizuki	
	Osaka University, Japan	
<b>P-14-JMA-02</b>	Study on Application of Efficient FE Modeling Technique in Analysis of Welding Mechanics .....	161
	Zhihao Li <sup>1</sup> , Shintaro Maeda <sup>2</sup> , Kazuki Ikushima <sup>2</sup> , Masakazu Shibahara <sup>2</sup>	
	1. Osaka Prefecture University, Japan 2. Osaka Metropolitan University, Japan	
<b>P-15-JMA-03</b>	Effect of Load Changing on Creep-Fatigue Life of Pipe Joints .....	162
	Yuji Kitani <sup>1</sup> , Kazuki Ikushima <sup>2</sup> , Masayuki Arai <sup>3</sup> , Hidetaka Nishida <sup>4</sup> , Ninshu Ma <sup>1</sup> , Masakazu Shibahara <sup>2</sup>	
	1. Osaka University, Japan 2. Osaka Metropolitan University, Japan 3. Tokyo University of Science, Japan	
	4. The Chugoku Electric Power Company, Japan	
<b>P-16-JMA-04</b>	Numerical Simulation of Hydrogen Diffusion and Accumulation Behavior in Duplex Stainless Steel Weld Metal Using Three-Dimensional Microstructural Model .....	163
	Kanta Uemura, Yoshiki Mikami, Kazuhiro Ito	
	Osaka University, Japan	

## **Welding Mechanism**

<b>P-17-WM-01</b>	Influence of Welding Wire Materials on Driving Force Balance in Metal Transfer Phenomenon .....	164
	Yuriko Sato, Yosuke Ogino, Tomokazu Sano	
	Osaka University, Japan	
<b>P-18-WM-02</b>	Discussion of Dominant Factor of Metal Transfer by a Simplified Numerical Simulation Model .....	165
	Hayato Ohgushi, Yosuke Ogino, Tomokazu Sano	
	Osaka University, Japan	
<b>P-19-WM-03</b>	Strengthening of Al/Cu Dissimilar Joint due to Complicated Interface Produced by Pulsed TIG Welding with a Constricted Nozzle .....	166
	Yusuke Yanagi <sup>1</sup> , Hajime Yamamoto <sup>1</sup> , Kazuhiro Ito <sup>1</sup> , Hisaya Komen <sup>1</sup> , Manabu Tanaka <sup>1</sup> , Akihisa Murata <sup>2</sup>	
	1. Osaka University, Japan 2. Murata Welding Laboratories Co. Ltd., Japan	
<b>P-20-WM-04</b>	Study on Detecting Method of Internal Defects by Laser Ultrasonics in Lap Joint Welding of Galvanized Steel Sheet and Finite Element Analysis of its Detectability .....	167
	Norimitsu Okuyama <sup>1</sup> , Taketo Matsuida <sup>1</sup> , Kazufumi Nomura <sup>1</sup> , Tomokazu Sano <sup>1</sup> , Keiji Kadota <sup>2</sup> , Seiya Nitta <sup>2</sup> , Tetsuo Era <sup>2</sup> , Satoru Asai <sup>2</sup>	
	1. Osaka University, Japan 2. Daihen Welding and Joining Research Alliance Laboratories, JWRI, Japan	

## **Joining Metallurgical Evaluation**

<b>P-21-JME-01</b>	Effect of Deformation-induced Martensitic Transformation on Low-temperature Toughness in Delta Ferrite-containing Austenitic Stainless Steel Weld metals .....	168
	Reika Oda <sup>1</sup> , Hajime Yamamoto <sup>1</sup> , Kazuhiro Ito <sup>1</sup> , Hirofumi Maniwa <sup>2</sup> , Yoshihiko Kitagawa <sup>2</sup> , Hirohisa Watanabe <sup>2</sup>	
	1. Osaka University, Japan 2. Kobe Steel Ltd., Japan	

## **Senri Life Science Center**

<b>ACCESS</b> .....	169
<b>FLOOR MAP</b> .....	170