Aug. 6 (Mon) Kitakyushu International Conference Center

9:20 — 9:30 Opening Address Prof. Akira Kawasaki (President, Functionally Graded Materials Forum, Japa 9:30 — 9:40 Congratulatory Address Dr. Yuji Oie (President, Kyushu Institute of Technology) Guest of Honor Plenary Lecture Chair: Prof. Akira Kawasa 9:50 — 10:40 PL-1 "Lessons learned with FGM development" Prof. Michael Gasik Aalto University Foundation, Finland Break Room A 11:00 — 11:20 O-1 Dynamic behavior of a functionally graded coating subjected to moving contact with a semi-circular punch Mehmet N. Balol and Serkan Dag ² 1 Hacetsepe University, Turkey 2 Middle East Technical University, Turkey 2 Middle East Technical University, Turkey 11:20 — 11:40 O-2 (Invited) Dynamic Address Prof. Akira Kawasaki (President, Functionally Graded Beams Asmita Rokaya and Jenopho Kim University of Connecticut, USA 11:40 — 12:00 O-3 Thermal Buckling of Functionally Graded Annular Micro-Plates with a Variable Length Scale Paramet Iman Eshraghi and Serkan Dag ² 1 University of Tehran, Iran 2 Middle East Technical University, Turkey Thermal fracture of functionally graded materials: a semi-analytical model in application to thermal barrier coatings Vera Petroval 2 and Siegfried Schmauder 1 1 1 MWF, University of Stuttgart, Germany 2 Voronezh State University, Russia Exhibition & Lunch					
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1 Shanghai University of Engineering Science, P. R. China	14:30 — 14:50	O-8		-	
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 $11:00-11:30 \quad \text{O-9} \quad \textit{(Keynote)} \ \textbf{Control of Crystallographic Orientation Fabricated by Additive Manufacturing of Beta-type Ti Alloys}$

Chairs: Prof. Naoyuki Nomura and Prof. Soshu Kirihara

Room B

Multi-dimensional printing I

Takayoshi Nakano, Koji Hagihara and Takuya Ishimoto Osaka University, Japan

11:30 — 11:50	O-10		Effects of heterogeneous nucleus TiC particles on relative density and microstructure of selective laser melted Ti-6Al-4V
			Tadachika Chiba ¹ , Masafumi Sato ¹ , Hisashi Sato ¹ , Yoshimi Watanabe ¹ , Naoko Sato ² and Shizuka Nakano ² 1 Nagoya Institute of Technology (NIT), Japan 2 National Institute of Advanced Industrial Science and Technology (AIST), Japan
11:50 — 12:10	O-11	(Invited)	5D printer for FGM
			Fujio Tsumori Kyushu University, Japan
12:10 — 13:30			Exhibition & Lunch
		Thin F	ilms and Coatings Chairs: Prof. Chang-Chun Ge and Prof. Takashi Goto
13:30 — 13:50	O-12		Preparation of Graded-Tungsten Coating by "Cold Spray + Chemical Vapor Deposition" Process for Nuclear Fusion Facilities Chang Chun Col. Vice No Rep. 1 Alia Vice 1 and Beng Hugan 12
			Chang-Chun Ge ¹ , Xiao-Na Ren ¹ , Min XiaA ¹ and Peng Huang ^{1,2} 1 University of Science and Technology Beijing, P. R. China 2 Southwest Jiaotong University, P. R. China
13:50 — 14:10	O-13		A Normal Crack in a Functionally Graded Thermal Barrier Coating Bonded to a Homogeneous Elastic Substrate under Transient Thermal Loading Yuya Nakano and Sei Ueda
			Osaka Institute of Technology, Japan
14:10 — 14:30	O-14		Deposition of functionally graded wear-resistant coatings by a combination of pulsed arc evaporation and electro spark deposition
			Kuptsov K.A., Sheveyko A.N. and Shtansky D.V. National University of Science and Technology "MISIS", Russia
14:30 — 14:50	O-15		Oxidation Resistant Coatings of NbSi ₂ /Nb FGMs Layer for TiAl Intermetallic Compounds by Electron Beam Irradiation
44.50 45.40	0.46		Katsuhiro Takagi ¹ , Toshimitsu Tetsui ² , Daisuke Yonekura ¹ and Kazuhiro Hasezaki ¹ 1 Tokushima University, Japan 2 National Institute for Materials Science (NIMS), Japan Fabrication and Microstructure of Electrodeposited Cu-based Alloy Films Having High Composition
14:50 — 15:10	0-10		Gradient Hiroyuki Hagiwara, Yoshihisa Kaneko and Makoto Uchida Osaka City University, Japan
Room C		<u>Spark</u>	Plasma Sintering for Industrialization I Chairs: Prof. Hiroshi Izui and Dr. Masao Tokita
Room C 11:00 - 11:20	O-17		Plasma Sintering for Industrialization I Chairs: Prof. Hiroshi Izui and Dr. Masao Tokita Development of ZrO ₂ /Ti alloy FGMs Horn tip tool for Ultra-sonic Homogenizer by Spark Plasma Sintering (SPS) Method
	O-17		Development of ZrO ₂ /Ti alloy FGMs Horn tip tool for Ultra-sonic Homogenizer by Spark Plasma Sintering (SPS) Method Masao Tokita ¹ , Yasuhiro Mitsui ² and Hiroyuki Yoshida ³
	O-17		Development of ZrO ₂ /Ti alloy FGMs Horn tip tool for Ultra-sonic Homogenizer by Spark Plasma Sintering (SPS) Method
			Development of ZrO ₂ /Ti alloy FGMs Horn tip tool for Ultra-sonic Homogenizer by Spark Plasma Sintering (SPS) Method Masao Tokita ¹ , Yasuhiro Mitsui ² and Hiroyuki Yoshida ³ 1 NJS Co.,Ltd., Japan; 2 Mitsui Electric Co.,Ltd., Japan 3 Chiba Industrial Technology Research Institute, Japan Development of lightning receptor for wind turbine blade by copper-graphite FGMs
11:00 — 11:20			Development of ZrO ₂ /Ti alloy FGMs Horn tip tool for Ultra-sonic Homogenizer by Spark Plasma Sintering (SPS) Method Masao Tokita ¹ , Yasuhiro Mitsui ² and Hiroyuki Yoshida ³ 1 NJS Co.,Ltd., Japan; 2 Mitsui Electric Co.,Ltd., Japan 3 Chiba Industrial Technology Research Institute, Japan
11:00 — 11:20	O-18		Development of ZrO ₂ /Ti alloy FGMs Horn tip tool for Ultra-sonic Homogenizer by Spark Plasma Sintering (SPS) Method Masao Tokita¹, Yasuhiro Mitsui² and Hiroyuki Yoshida³ 1 NJS Co.,Ltd., Japan; 2 Mitsui Electric Co.,Ltd., Japan 3 Chiba Industrial Technology Research Institute, Japan Development of lightning receptor for wind turbine blade by copper-graphite FGMs Toshiyuki Ueno¹, Takashi Yoshioka¹, Shuichi Asahina¹, Daisuke Nakasa², Yoshihiro Moriya² and Atsushi Minoda³, 1 Simane institute for industrial technology, Japan; 2 Moriya cutlery laboratory, Ltd, Japan 3 National institute of technology, Matsue college, Japan An Application of Weldable FGMs Cemented Carbide to Extruder Screw
11:00 — 11:20 11:20 — 11:40	O-18		Development of ZrO ₂ /Ti alloy FGMs Horn tip tool for Ultra-sonic Homogenizer by Spark Plasma Sintering (SPS) Method Masao Tokita ¹ , Yasuhiro Mitsui ² and Hiroyuki Yoshida ³ 1 NJS Co.,Ltd., Japan; 2 Mitsui Electric Co.,Ltd., Japan 3 Chiba Industrial Technology Research Institute, Japan Development of lightning receptor for wind turbine blade by copper-graphite FGMs Toshiyuki Ueno ¹ , Takashi Yoshioka ¹ , Shuichi Asahina ¹ , Daisuke Nakasa ² , Yoshihiro Moriya ² and Atsushi Minoda ³ , 1 Simane institute for industrial technology, Japan; 2 Moriya cutlery laboratory, Ltd, Japan 3 National institute of technology, Matsue college, Japan
11:00 — 11:20 11:20 — 11:40	O-18		Development of ZrO ₂ /Ti alloy FGMs Horn tip tool for Ultra-sonic Homogenizer by Spark Plasma Sintering (SPS) Method Masao Tokita¹, Yasuhiro Mitsui² and Hiroyuki Yoshida³ 1 NJS Co.,Ltd., Japan; 2 Mitsui Electric Co.,Ltd., Japan 3 Chiba Industrial Technology Research Institute, Japan Development of lightning receptor for wind turbine blade by copper-graphite FGMs Toshiyuki Ueno¹, Takashi Yoshioka¹, Shuichi Asahina¹, Daisuke Nakasa², Yoshihiro Moriya² and Atsushi Minoda³, 1 Simane institute for industrial technology, Japan; 2 Moriya cutlery laboratory, Ltd, Japan 3 National institute of technology, Matsue college, Japan An Application of Weldable FGMs Cemented Carbide to Extruder Screw Y. Nakajima¹, Y. Miyakoshi¹, H. Takahashi¹, M. Tokita², H. Ando², K. Shimamura³ and K. Satoh³ 1 Hokkaido Research Institute, Japan; 2 NJS Co., Ltd., Japan
11:00 — 11:20 11:20 — 11:40 11:40 — 12:00	O-18	(Invited)	Development of ZrO ₂ /Ti alloy FGMs Horn tip tool for Ultra-sonic Homogenizer by Spark Plasma Sintering (SPS) Method Masao Tokita¹, Yasuhiro Mitsui² and Hiroyuki Yoshida³ ¹ NJS Co.,Ltd., Japan; ² Mitsui Electric Co.,Ltd., Japan ³ Chiba Industrial Technology Research Institute, Japan Development of lightning receptor for wind turbine blade by copper-graphite FGMs Toshiyuki Ueno¹, Takashi Yoshioka¹, Shuichi Asahina¹, Daisuke Nakasa², Yoshihiro Moriya² and Atsushi Minoda³, ¹ Simane institute for industrial technology, Japan; ² Moriya cutlery laboratory, Ltd, Japan ³ National institute of technology, Matsue college, Japan An Application of Weldable FGMs Cemented Carbide to Extruder Screw Y. Nakajima¹, Y. Miyakoshi¹, H. Takahashi¹, M. Tokita², H. Ando², K. Shimamura³ and K. Satoh³ ¹ Hokkaido Research Institute, Japan; ² NJS Co., Ltd., Japan ³ Sapporo Kensaku Kogyo Co., Ltd., Japan
11:00 — 11:20 11:20 — 11:40 11:40 — 12:00	O-18 O-19	(Invited)	Development of ZrO ₂ /Ti alloy FGMs Horn tip tool for Ultra-sonic Homogenizer by Spark Plasma Sintering (SPS) Method Masao Tokita¹, Yasuhiro Mitsui² and Hiroyuki Yoshida³ ¹ NJS Co.,Ltd., Japan; ² Mitsui Electric Co.,Ltd., Japan ³ Chiba Industrial Technology Research Institute, Japan Development of lightning receptor for wind turbine blade by copper-graphite FGMs Toshiyuki Ueno¹, Takashi Yoshioka¹, Shuichi Asahina¹, Daisuke Nakasa², Yoshihiro Moriya² and Atsushi Minoda³, ¹ Simane institute for industrial technology, Japan; ² Moriya cutlery laboratory, Ltd, Japan ³ National institute of technology, Matsue college, Japan An Application of Weldable FGMs Cemented Carbide to Extruder Screw Y. Nakajima¹, Y. Miyakoshi¹, H. Takahashi¹, M. Tokita², H. Ando², K. Shimamura³ and K. Satoh³ ¹ Hokkaido Research Institute, Japan; ² NJS Co., Ltd., Japan ³ Sapporo Kensaku Kogyo Co., Ltd., Japan Exhibition & Lunch Plasma Sintering for Industrialization II Chairs: Prof. Tatsuya Misawa and Dr. Masao Tokita
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Tatsuya Misawa¹, Takumi Sakamaki², Yuji Kawakami¹ and Masakazu Kawahara³ 1 Saga University, Japan; 2 National Institute of Technology, Kurume Collage, Japan 3 Kawahara SPS Technical Office, Japan

14:20 - 14:40 O-22

Fabrication of FGMs Devices using Spark Plasma Sintering Technique

Khaled Jabri¹, Tomohiro Sato¹ and Masao Tokita² 1 SINTER LAND INC., Ltd., Japan 2 NJS Co., Ltd., Japan

Poster Room

Poster session

15:10 — 17:00

P-1 ~ P-43

17:00 - **Banquet**