



GEC 2022

75th Annual Gaseous Electronics Conference



ICRP-11

11th International Conference on Reactive Plasmas

PROGRAM BOOK

Date : October 3 - 7, 2022

Sendai International Center Conference Building

Joint Conference in Sendai, Japan

Supported by
American Physical Society
Co-sponsored by
The Japan Society of Applied Physics



Photo courtesy of Miyagi Prefecture Tourism Promotion Division

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General Information

The 75th Annual Gaseous Electronics Conference (GEC-2022) will be held as an international joint conference with the 11th International Conference on Reactive Plasmas (ICRP-11).

GEC, a special meeting of the APS Division of Atomic, Molecular, and Optical Physics (DAMOP), promotes ideas on the physical and chemical processes and dynamics taking place in partially ionized, collisional plasma and between the atoms, molecules, charged particles, photons, waves, and fields. The GEC has a long leadership history of presenting fundamental and basic science contributions on plasma sources, diagnostics, simulation, plasma chemistry, basic phenomena, atomic and molecular processes. In recent years, GEC has also been a leading venue for reporting on emergent areas of plasma-biotechnology, plasma medicine, multiphase plasmas, environmental applications and atmospheric-pressure plasma systems.

ICRP has been taking place based on the initiative of the Division of Plasma Electronics, the Japan Society of Applied Physics since 1991. The subjects covered in ICRP are the entire field of reactive plasmas and their applications to material, environment, energy, space, bio and medical fields with emphasis on basic phenomena, technologies, and the underlying basic physics and chemistry.

The GEC-2022/ICRP-11 will continue its tradition of offering a truly outstanding venue for leading research in low temperature plasma science and collision physics.

Themes ranging from fundamental plasma research to advanced topics will be discussed at GEC-2022/ICRP-11.

Committee

GEC Executive Committee

Chair	Julian Schulze	(University of Bochum)	Germany
Chair elect	Shahid Rauf	(Applied Materials Inc.)	USA
Past secretary	Gabe Xu	(University of Alabama in Huntsville)	USA
Secretary	Toshiro Kaneko	(Tohoku University)	Japan
Secretary elect	Scott Baalrud	(University of Michigan)	USA
Treasurer	Aranka Derzsi	(Wigner Research Centre for Physics)	Hungary
	Kallol Bera	(Applied Materials Inc.)	USA
	Mark Koepke	(West Virginia University)	USA
	Mark Kushner	(University of Michigan)	USA
	Sandra Quintanilla	(University of North Texas)	USA
	Stephan Reuter	(Ecole Polytechnique de Montreal)	Canada
	Tetsuji Shimizu	(National Institute of Advanced Industrial Science and Technology)	Japan

ICRP International Organizing Committee

Chair	Fumiyoshi Tochikubo	(Tokyo Metropolitan University)	Japan
Vice-Chair	Wonho Choe	(KAIST)	Korea
Vice-Chair	Eugen Stamate	(Technical University of Denmark)	Denmark
	Natalia Babaeva	(Joint Institute for High Temperatures)	Russia
	Anne Bourdon	(École Polytechnique)	France
	Karol Hensel	(Comenius University)	Slovakia
	Mineo Hiramatsu	(Meijo University)	Japan
	Kenji Ishikawa	(Nagoya University)	Japan
	Toshiro Kaneko	(Tohoku University)	Japan
	Jason Kenney	(Applied Materials)	USA
	Akiko Kumada	(The University of Tokyo)	Japan
	Kazuaki Kurihara	(KIOXIA)	Japan
	Hae June Lee	(Pusan National University)	Korea
	Dingxin Liu	(Xi'an Jiaotong University)	China
	Izumi Murakami	(NIFS)	Japan
	Sander Nijdam	(Eindhoven University of Technology)	The Netherlands
	Deborah O'Connell	(Dublin City University)	Ireland
	Takayuki Ohta	(Meijo University)	Japan
	Osamu Sakai	(The University of Shiga Prefecture)	Japan
	Yasuhiko Sentoku	(Osaka University)	Japan
	Yuichi Setsuhara	(Osaka University)	Japan
	Meng-Jiy Wang	(National Taiwan University of Science and Technology)	Taiwan
	Takayuki Watanabe	(Kyushu University)	Japan
	Ron White	(James Cook University)	Australia
	Hitoki Yoneda	(The University of Electro-Communications)	Japan

GEC/ICRP Local Organizing Committee

Chair	Toshiro Kaneko	<i>(Tohoku University)</i>	Japan
	Akira Ando	<i>(Tohoku University)</i>	Japan
	Takehiko Sato	<i>(Tohoku University)</i>	Japan
	Naofumi Ohnishi	<i>(Tohoku University)</i>	Japan
	Masaya Shigeta	<i>(Tohoku University)</i>	Japan
	Toshiaki Kato	<i>(Tohoku University)</i>	Japan
	Kazunori Takahashi	<i>(Tohoku University)</i>	Japan
	Takeru Okada	<i>(Tohoku University)</i>	Japan
	Hidemasa Takana	<i>(Tohoku University)</i>	Japan
	Keisuke Takashima	<i>(Tohoku University)</i>	Japan
	Shota Sasaki	<i>(Tohoku University)</i>	Japan
	Makoto Sugimoto	<i>(Tohoku University)</i>	Japan
	Kenji Ishikawa	<i>(Nagoya University)</i>	Japan
	Hisaya Komen	<i>(Osaka University)</i>	Japan

Attendee Instructions

- Registration

The registration desk will be located in front of “Tachibana”, 2F, Sendai International Center. The registration desk will be open on Monday, October 3 from 9:00 AM, Tuesday through Friday, the registration will be open from 8:00 AM.

- Registration Fee

REGISTRATION TYPE	ON-SITE
Regular Attendee	\$ 550
Student	\$ 200
Retired / Unemployed	\$ 250
Monday Workshop Only	\$ 100

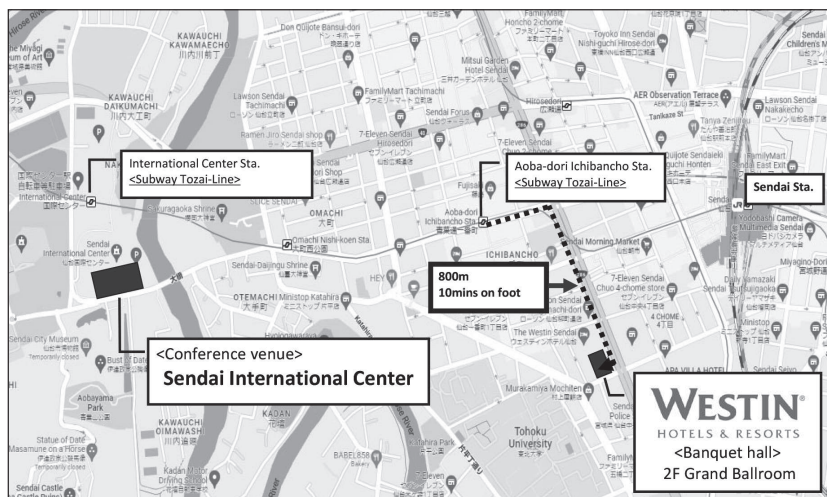
Information: All registrations are nonrefundable regardless of the reason for cancellation. Registration fees for attendees do include welcome reception fee, but do not include a banquet ticket, parking fees, or transportation costs.

- Welcome Reception and Banquet

Welcome Reception will be held from 6:00 PM to 8:00 PM on Monday, October 3, in “Sakura”, Sendai International Center. The cost of Welcome Reception is included in the attendee's registration fee.

On Thursday evening, October 6, the Banquet will be held from 7:00 PM to 9:00 PM in “Grand Ballroom”, 2F, Westin Hotel Sendai. It will take about 30 min. to the Westin Hotel Sendai from Sendai International Center by subway and on foot. Banquet is only available who had already registered and paid the Banquet fee. The GEC Awards for Best Student Oral and Poster Presentations will be presented during the Banquet.

- Access to the Banquet Venue



- Student Networking

Student Networking will be held from 12:15 PM to 1:15 PM on Thursday, October 6, in “Sakura 1”, Sendai International Center. Those who had applied to the student networking, please come to “Sakura 1” and pick up your lunch box and join the student networking discussion.

- Women in Science

Women in Science will be held from 6:30 PM to 8:00 PM on Tuesday, October 4, in “Tachibana”, Sendai International Center. Lectures by female researchers who are active on the cutting edge of science will be held. The scientists will talk not only about the research they are working on, but also about their own experiences, including their career paths. A free light meal will be served.

- Lunch and Drinks

Please check the lunch map in your congress bag. Coffees and teas will be available in “Sakura” during break time. Drinks and snacks will be also available to purchase at the “Service Counter”, 1F, Sendai International Center.
» [see Floor Plan](#)

Those who had applied and reserved lunch box from conference web site, please pay 1,000 yen and pick up your lunch box in from of “Hagi” during 11:30 AM to 1:30 PM. Please note you will be able to pay by Japanese YEN cash ONLY. For Wed., Oct. 5, please receive lunch box by 2:30 PM.

- During Your Stay in Japan

- In Japan, wearing masks is required for infection control. Please bring your own mask and wear the mask at all the times inside the venue. If you forget to bring your mask, you will receive one at the registration desk.
- GEC 2022/ICRP-11 requires antigen testing in the morning of a meal event (welcome reception, banquet, student networking) to prevent the spread of Covid-19. Since it is not possible to purchase large quantities of antigen test kits in Japan at this time, we ask that everyone bring their own antigen test kits. If you forget to bring your own antigen test kit, they will be available at the registration desk for a fee (2,000 JPY). However, only a limited number of tests will be available. In the morning of each meal event, you are requested to take the antigen test yourself in your hotel room and take a picture of the result with your phone. The results will be checked at the entrance of each meal event. Please make sure that the date of the photo is available when checking the photo.
- If your Covid-19 test is positive, please adhere to the following procedure:

- a. Stay in your hotel room.
- b. Call or send an e-mail to the GEC/ICRP Local Organizing Committee (LOC)
phone: +81-50-5534-1778
email : icrp-11@grp.tohoku.ac.jp
- c. LOC will take care of procedures such as registration of infected persons.
- d. LOC will bring food, etc. to your hotel room
- e. You should extend your hotel stay and reschedule your flight on your own. GEC/ICRP will not cover the cost of such changes.

- GEC/ICRP2022 Mobile App

Lam Research is sponsoring the mobile conference app below



Download here 

ISO (Apple) Mobile App



Google Play (Android)



- Wi-Fi

Wi-Fi access is available at the venue, Sendai International Center.
The ID and PW will be posted on the sign boards near the registration desk.

Sponsors

Student Travel Support



National Science Foundation

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Lam Research

Session Sponsor



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Poster Session Sponsor



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Presenter Instructions

- Oral Presentations

Duration

Invited talk / 30 min total.

Regular talk / 15 min total.

Note

- ▶ Screen ratio is 16 : 9 (Widescreen) in all Session rooms.
- ▶ The projector has a VGA (analog RGB or D-sub) and HDMI connectors but not a mini DisplayPort.
- ▶ Use of equipped PC (OS: Windows10, Software: Microsoft PowerPoint 2019) is strongly recommended. Please upload your Microsoft PowerPoint file during the break time prior to the session. Note that your presentation time includes the presenter change time.
- ▶ If you use your own laptop computer, please check the connection between your PC and the projector during the break time.

- Poster Presentations

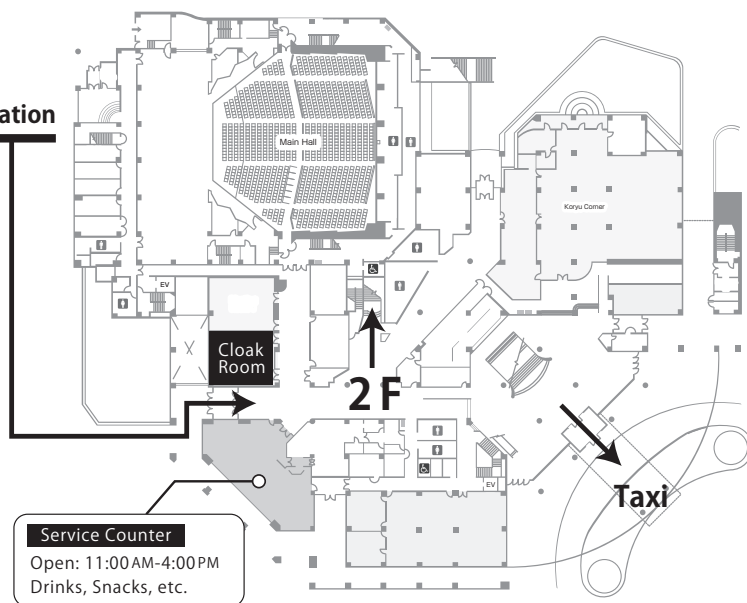
The size of the poster panel is 1200 mm (in width) x 1800 mm (in height).

Floor Plan

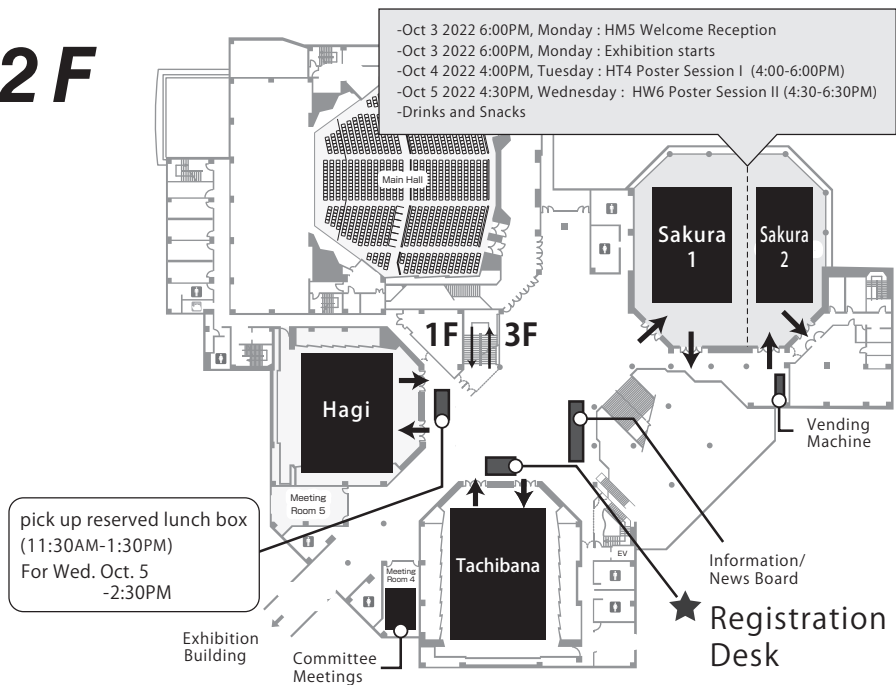
Sendai International Center

1 F

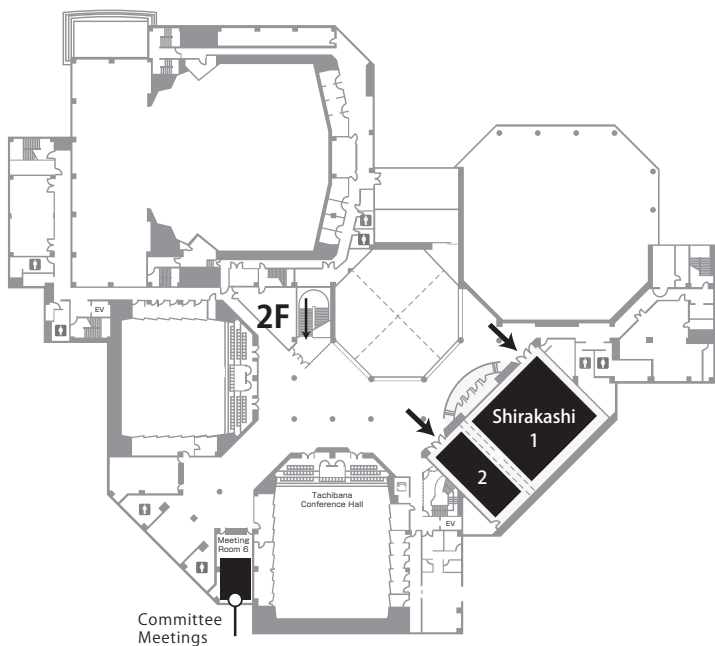
From
Subway Station



2F



3F



Program at a Glance

Day 1 Monday, October 3rd, 2022

Room	Tachibana	Hagi	
10:00 AM - 10:30 AM	DM1 Opening Ceremony • Toshiro Kaneko • Julian Schulze • Fumiyoshi Tochikubo		
10:30 AM - 12:00 PM	DM2 Workshop I Industrial Plasma Technologies [Jason Kenney / Hiroto Ohtake]	EM2 Workshop II Plasma Physics for Space Propulsion Technologies [Rei Kawashima / Amnon Fruchtman]	
12:00 PM - 1:30 PM	--- Lunch ---		
1:30 PM - 3:00 PM	DM2 Workshop I Industrial Plasma Technologies [Tsuyoshi Moriya / Jaeho Kim]	EM2 Workshop II Plasma Physics for Space Propulsion Technologies [Shinatora Cho / Justin Little]	
3:00 PM - 3:30 PM	--- Coffee Break ---		
3:30 PM - 5:45 PM	DM2 Workshop I Industrial Plasma Technologies [Tetsuya Tatsumi / Dae Hoon Lee]	EM2 Workshop II Plasma Physics for Space Propulsion Technologies [Mario Merino / Stephane Mazouffre / Roderick W Boswell]	
	- 5:00 PM		
6:00 PM - 8:00 PM			

【 】 *Invited Speaker*

	<i>Shirakashi 1</i>	<i>Shirakashi 2</i>	<i>Sakura</i>
	FM2 Workshop III Functional Surfaces in Plasma Elementary and Process-Applicable Reactions [Mitsunori Kurahashi / Hiroaki Nakamura]		
	FM2 Workshop III Functional Surfaces in Plasma Elementary and Process-Applicable Reactions [Kenzo Ibano / Tomohiro Nozaki]	GM2 Workshop IV Catalytic Effects in Plasma-Liquid Interaction [Renwu Zhou / Tomoyuki Murakami]	
	FM2 Workshop III Functional Surfaces in Plasma Elementary and Process-Applicable Reactions [June Young Kim / Eugen Stamaté] - 5:00 PM	GM2 Workshop IV Catalytic Effects in Plasma-Liquid Interaction [Naohiro Shimizu / Annemie Bogaerts] - 5:00 PM	Exhibition 6:00 PM - 8:00 PM
			HM5 Welcome Reception

Day 2 Tuesday, October 4th, 2022

Room	Tachibana	Hagi	
8:00 AM - 9:30 AM	DT1 Plasma Surface Interaction I [Sumit Agarwal]	ET1 Thermal and Arc Plasma I [Masaya Shigeta]	
9:30 AM - 10:00 AM	--- Coffee Break ---		
10:00 AM - 12:00 PM	DT2 Capacitively Coupled Plasmas I [Jing-Yu Sun]	ET2 Sheaths and Fireballs [Brett Scheiner]	
12:00 PM - 1:30 PM	--- Lunch ---		
1:30 PM - 3:30 PM	DT3 Plasmas and Nanotechnology II [Uros Cvelbar / Renato P Camata] - 3:00 PM	ET3 Laser Diagnostics I [Kunihiro Kamataki]	
3:30 PM - 4:00 PM	--- Coffee Break ---		
4:00 PM - 6:00 PM			
6:30 PM - 8:00 PM	DT5 Women in Science • Sunhee Lee • Aranka Derzsi • Douyan Wang • Airi Nakayama		

	<i>Shirakashi 1</i>	<i>Shirakashi 2</i>	<i>Sakura</i>
	FT1 Plasma Applications [James Colgan / Alexandre Likhanskii] - 9:15 AM	GT1 Electron and Photon Collisions - Excitation [Masamitsu Hoshino]	Exhibition
	FT2 Plasma Chemical Synthesis and Conversion [Lars Schücke]	GT2 Plasmas and Nanotechnology I [Ulf Helmersson] - 11:30 AM	Exhibition
	FT3 Modeling - High Pressure and Streamers [Atsushi Komuro]	GT3 Atmospheric Pressure Plasmas [Cheng Zhang]	Exhibition
			HT4 Poster Session I & Exhibition

Day 3 *Wednesday, October 5th, 2022*

Room	Tachibana	Hagi	
8:00 AM - 9:30 AM	DW1 Green Plasma Science & Technology I [Keisuke Takashima / Muzammil Iqbal]	EW1 Aerospace Plasmas [Steven Barrett]	
9:30 AM - 10:00 AM	--- Coffee Break ---		
10:00 AM - 11:00 AM	DW2 Will Allis Prize Talk «Toshiaki Makabe»		
11:00 AM - 12:00 PM	DW3 Reactive Plasma Award Talk «Masaru Hori»		
12:00 PM - 1:00 PM	DW4 GEC Business Meeting [Julian Schulze]		
1:00 PM - 2:30 PM	--- Lunch ---		
2:30 PM - 4:00 PM	DW5 Green Plasma Science & Technology II [Igor V Adamovich / Juan P Trelles / Gottlieb Oehrlein]	EW5 Plasma Surface Interaction II [Jan Trieschmann]	
4:00 PM - 4:30 PM	--- Coffee Break ---		
4:30 PM - 6:30 PM			

	Shirakashi 1	Shirakashi 2	Sakura
	FW1 Modeling - Plasma Processing and Chemistry I	GW1 Electron and Photon Collisions - Ionization [Xueguang Ren / Yasuyuki Nagashima]	Exhibition
			Exhibition
			Exhibition
			Exhibition
	FW5 Atomic Layer Processes [Robert O'Connor / Kazunori Shinoda]	GW5 Heavy-Particle Collisions [Raul Oscar Barrachina / Alisher Kadyrov] - 3:45 PM	Exhibition
			HW6 Poster Session II & Exhibition

Day 4 *Thursday, October 6th, 2022*

Room	Tachibana	Hagi	
8:00 AM - 9:30 AM	DR1 Model Validation & Verification	ER1 Thermal and Arc Plasma II [Shinichi Namba]	
9:30 AM - 10:00 AM	--- Coffee Break ---		
10:00 AM - 12:00 PM	DR2 Plasma Surface Interaction III [Timo Gans]	ER2 Plasma Etching [Dmitry Levko]	
12:00 PM - 1:30 PM	--- Lunch ---		
1:30 PM - 3:30 PM	DR4 Plasma Propulsion II [Christine Charles]	ER4 Capacitively Coupled Plasmas II	
3:30 PM - 4:00 PM	--- Coffee Break ---		
4:00 PM - 6:00 PM	DR5 Optical Diagnostics [Hiroshi Akatsuka]	ER5 Jets and Gliding Arcs	
7:00 PM - 9:00 PM	Banquet (Westin Hotel Sendai)		

	<i>Shirakashi 1</i>	<i>Shirakashi 2</i>	<i>Sakura 1</i>	<i>Sakura 2</i>
	FR1 Magnetron Plasmas [Bocong Zheng]	GR1 Plasma Propulsion I	Exhibition	IR1 Plasma Liquid Interaction I
	FR2 Low Pressure Plasmas [Kentaro Hara]	GR2 Atomic and Molecular Physics [Christian Hill / Masanori Tachikawa / Christopher J Fontes]	Exhibition	IR2 Plasma Liquid Interaction II [Wonho Choe] - 11:45 AM
			HR3 Student Networking	--- Lunch ---
	FR4 Gas Phase Plasma Chemistry [Andrew R Gibson / Ali Mesbah] - 3:15 PM	GR4 Modeling - New Algorithms and Machine Learning	Exhibition	IR4 Plasma Liquid Interaction III [Paul Maguire]
	FR5 Modeling - Plasma Processing and Chemistry II [Amanda M Lietz]	GR5 Diamond Like Carbon Deposition	Exhibition	IR5 Plasma Liquid Interaction IV [Ahmad Hamdan / Haruka Suzuki / Tetsuya Haruyama]

Day 5 *Friday, October 7th, 2022*

Room	Tachibana	Hagi	
8:00 AM - 9:30 AM	DF1 Plasmas and Nanotechnology III [Wei-Hung Chiang] - 9:00 AM	EF1 Plasma Medical & Agricultural Application I [Dingxin Liu]	
9:30 AM - 10:00 AM	--- Coffee Break ---		
10:00 AM - 12:00 PM	DF2 Laser Diagnostics II [Holger Kersten]	EF2 Plasma Medical & Agricultural Application II [Kenji Ishikawa] - 11:45 AM	
12:00 PM - 1:30 PM	--- Lunch ---		
1:30 PM - 3:30 PM	DF3 Plasma Propulsion III [Andrei Smolyakov]	EF3 Plasma Medical & Agricultural Application III [Nevena Puac] - 3:15 PM	
3:30 PM - 4:00 PM	--- Coffee Break ---		
4:00 PM - 5:30 PM	DF4 Fundamental Processes - 5:15 PM	EF4 Plasma Medical & Agricultural Application IV [Mounir Laroussi]	
5:30 PM - 6:00 PM	DF5 Closing Ceremony - Toshiro Kaneko - Julian Schulze - Shahid Rauf		

	<i>Shirakashi 1</i>	<i>Shirakashi 2</i>	<i>Sakura 1</i>	<i>Sakura 2</i>
	FF1 Inductively Coupled Plasmas - 9:00 AM	GF1 Dissociative Electron Attachment and Distribution Functions [Sylvia Ptasinska] - 9:15 AM	Exhibition	IF1 Green Plasma Science and Technology III [Deanna A Lacoste] - 9:00 AM
	FF2 Green Plasma Science & Technology IV	GF2 Plasmas for Energy Applications [Shota Nunomura]	Exhibition	IF2 Discharge Physics
	FF3 Modeling - Thrusters and Wave-Plasma Interactions [Anne Bourdon]	GF3 Plasma Deposition [Matteo Gherardi / Giichiro Uchida]	Exhibition	IF3 Probe Diagnostics [Yegeon Lim] - 3:15 PM
	FF4 Basic Plasma Phenomena - 5:00 PM			IF4 Dielectric Barrier and Corona Discharges

PROGRAM

Monday, October 3rd, 2022

10:00AM - 10:30AM

Room: Tachibana

DM1 Opening Ceremony

Chair: Toshiro Kaneko (*Tohoku University*)

DM1.00001
10:00AM - 10:10AM

Welcome Remarks
Toshiro Kaneko

DM1.00002
10:10AM - 10:20AM

GEC Chair Welcome Remarks
Julian Schulze

DM1.00003
10:20AM - 10:30AM

ICRP Chair Welcome Remarks
Fumiyoshi Tochikubo

10:30AM - 5:00PM

Room: Tachibana

DM2 Workshop I: Industrial Plasma Technologies

Chair: Hajime Sakakita (*National Institute of Advanced Industrial Science and Technology*)
Taisei Motomura (*National Institute of Advanced Industrial Science and Technology*)

DM2.00001
10:30AM - 11:15AM

Modeling and Simulation of Plasmas for Etch Applications
Invited Speaker Jason Kenney

DM2.00002
11:15AM - 12:00PM

Thermal cyclic atomic-level etching in 3D ULSI device fabrication
Invited Speaker Hiroto Ohtake

DM2.00003
12:00PM - 1:30PM

Lunch

DM2.00004
1:30PM - 2:15PM

New challenges on semiconductor plasma manufacturing processes
Invited Speaker Tsuyoshi Moriya

DM2.00005
2:15PM - 3:00PM

Applications of plasma-enhanced deposition technologies in the semiconductor industry
Invited Speaker Jaeho Kim

DM2.00006
3:00PM - 3:30PM

Coffee Break

DM2.00007
3:30PM - 4:15PM

Quantitative Control of Plasma and Surface Reactions for Dielectric Film Etching

Invited Speaker [Tetsuya Tatsumi](#)

DM2.00008
4:15PM - 5:00PM

Plasma for a clean and carbon-neutral world

Invited Speaker [Dae Hoon Lee](#)

10:30AM - 5:45PM

Room: Hagi

EM2

Workshop II: Plasma Physics for Space Propulsion Technologies

Chair: Daisuke Kuwahara (*Chubu University*)

EM2.00001
10:30AM - 11:15AM

Anatomy of cross-field electron transport by steady and unsteady plasma structures in Hall thrusters

Invited Speaker [Rei Kawashima](#)

EM2.00002
11:15AM - 12:00PM

The effects of collisions and oscillating fields on the thrust in electric propulsion

Invited Speaker [Amnon Fruchtman](#)

EM2.00003
12:00PM - 1:30PM

Lunch

EM2.00004
1:30PM - 2:15PM

In-Space Electric Propulsion System Enabling JAXA Commercial Removal of Debris Demonstration (CRD2): Challenges and Relevant Physics

Invited Speaker [Shinatora Cho](#)

EM2.00005
2:15PM - 3:00PM

Magnetically Expanding Plasmas for Space Propulsion

Invited Speaker [Justin Little](#)

EM2.00006
3:00PM - 3:30PM

Coffee Break

EM2.00007
3:30PM - 4:15PM

Electrodeless plasma thrusters and magnetized plasma expansions for space propulsion

Invited Speaker [Mario Merino](#)

EM2.00008
4:15PM - 5:00PM

Electron thermodynamics and ion transport in the magnetic nozzle of electrodeless electric thrusters

Invited Speaker [Stephane Mazouffre](#)

EM2.00009
5:00PM - 5:45PM

The Blue Core Paradigm

Invited Speaker [Roderick W Boswell](#)

10:30AM - 5:00PM

Room: Shirakashi 1

FM2 Workshop III: Functional Surfaces in Plasma Elementary and Process-Applicable Reactions

Chair: Osamu Sakai (*The University of Shiga Prefecture*)

FM2.00001
10:30AM - 11:15AM

Application of hyperthermal spin- and alignment-controlled O₂ beam to surface reaction analysis

Invited Speaker [Mitsunori Kurahashi](#)

FM2.00002
11:15AM - 12:00PM

Molecular Dynamics Simulations in Plasma-wave-material Interaction for Nuclear Fusion Study

Invited Speaker [Hiroaki Nakamura](#)

FM2.00003
12:00PM - 1:30PM

Lunch

FM2.00004
1:30PM - 2:15PM

Fibrous nanostructures formation using helium plasma and their applications as functional materials

Invited Speaker [Kenzo Ibano](#)

FM2.00005
2:15PM - 3:00PM

Dynamics of plasma and catalyst interfacial reactions: in situ IR spectroscopy of CO₂ hydrogenation

Invited Speaker [Tomohiro Nozaki](#)

FM2.00006
3:00PM - 3:30PM

Coffee Break

FM2.00007
3:30PM - 4:15PM

Kinetic Simulation of Narrow Gap Discharge

Invited Speaker [June Young Kim](#)

FM2.00008
4:15PM - 5:00PM

Advanced functional thin films for energy conversion and storage devices deposited by plasma-based processes

Invited Speaker [Eugen Stamate](#)

1:30PM - 5:00PM

Room: Shirakashi 2

GM2 Workshop IV: Catalytic Effects in Plasma-Liquid Interaction

Chair: Hiromasa Tanaka (*Nagoya University*)

GM2.00001
1:30PM - 2:15PM

Plasma Bubbles: A Route to Green Chemistry

Invited Speaker [Renwu Zhou](#)

GM2.00002
2:15PM - 3:00PM

Graph-based approach to catalytic effects in plasma-exposed liquids

Invited Speaker [Tomoyuki Murakami](#)

GM2.00003
3:00PM - 3:30PM

Coffee Break

GM2.00004
3:30PM - 4:15PM

Novel Hydrogen Generation Study Applying Rebound Tailing Pulse and Wet Electrode Methods

Invited Speaker [Naohiro Shimizu](#)

GM2.00005
4:15PM - 5:00PM

Modeling of plasma-liquid interactions

Invited Speaker [Annemie Bogaerts](#)

6:00PM - 8:00PM

Room: Sakura 1

HM5

Welcome Reception

* See the Attendee Instructions page

Tuesday, October 4th, 2022

8:00AM - 9:30AM

Room: Tachibana

DT1 Plasma Surface Interaction I

Chair: Jan Trieschmann (*Kiel University*)

- DT1.00001
8:00AM - 8:15AM
Photoemission induced plasma breakdown
Brian Z Bentz, Kevin Youngman, Asif Iqbal, Yang Zhou, Peng Zhang
- DT1.00002
8:15AM - 8:30AM
GEC Student Excellence Award Finalist Presentation - Dynamic surface surrogate model trained on atomistic data of AlN sputter depositions
Tobias Gergs, Thomas Mussenbrock, Jan Trieschmann
- DT1.00003
8:30AM - 9:00AM
Strategies to Enhance Etch Selectivity During Fluorocarbon Plasma-Assisted Atomic Layer Etching of Silicon-Based Dielectrics
Invited Speaker Sumit Agarwal
- DT1.00004
9:00AM - 9:15AM
Secondary electron emission due to atomic and molecular iodine ion bombardment
Lui Habi, Dmytro Rafalskyi, Trevor Lafleur
- DT1.00005
9:15AM - 9:30AM
Evidence of the dominant production mechanism of ammonia in a H₂/N₂ plasma
James Ellis, Daniel Köpp, Norbert Lang, Jean-Pierre H van Helden

8:00AM - 9:30AM

Room: Hagi

ET1 Thermal and Arc Plasma I

Chair: Shinichi Namba (*Hiroshima University*)

- ET1.00001
8:00AM - 8:15AM
Influence of charging in feedstock particles injected into modulated induction thermal plasma for nanoparticle synthesis with OML theory
Yasunori Tanaka, Ryudai Furukawa, Yurina Nagase, Yusuke Nakano, Tatsuo Ishijima, Shiori Sueyasu, Shu Watanabe, Keitaro Nakamura
- ET1.00002
8:15AM - 8:30AM
Arc Temperature Fluctuation near Electrode of Diode-Rectified Multiphase AC Arc
Manabu Tanaka, Junjie Chang, Yuki Takemoto, Takayuki Watanabe, Tsugio Matsuura, Tsuguo Ueda, Hideki Touzaki, Juan P Trelles, Masaya Shigeta
- ET1.00003
8:30AM - 9:00AM
Computational Studies of Thermal-Plasma-Induced Turbulence on Nanopowder Generation and Sustained Arc Discharge
Invited Speaker Masaya Shigeta
- ET1.00004
9:00AM - 9:15AM
Analysis of Amount of Metal Vapor Affected by Welding Speed in TIG Arc Welding
Yusuke Nemoto, Masahiro Takagi, Honoka Morishita, Yuki Suzuki, Zhenwei Ren, Gustilo C Reggie, Toru Iwao

ET1.00005
9:15AM - 9:30AM

Arc Temperature Measurement with High-Speed Camera Based on Continuum and Line Emissions in Argon-Nitrogen Free-Burning Arc
Yuki Takemoto, Manabu Tanaka, Takayuki Watanabe

8:00AM - 9:15AM

Room: Shirakashi 1

FT1 Plasma Applications

Chair: Kentaro Hara (*Stanford University*)

FT1.00001
8:00AM - 8:30AM

The role of atomic physics in collisional-radiative modeling of tin plasmas for lithography

Invited Speaker James Colgan

FT1.00002
8:30AM - 8:45AM

Profiling of High-Pressure DC Microdischarge for excimer emission.

Rumysa Manzoor

FT1.00003
8:45AM - 9:15AM

Bridging the gap between fluid and kinetic plasma simulations for industrial plasma sources

Invited Speaker Alexandre Likhanskii

8:00AM - 9:30AM

Room: Shirakashi 2

GT1 Electron and Photon Collisions - Excitation

Chair: Harindranath Ambalampitiya (*Quantemol Ltd*)

GT1.00001
8:00AM - 8:30AM

Quantitative measurements of electron collision cross sections and their database related to plasma modeling

Invited Speaker Masamitsu Hoshino

GT1.00002
8:30AM - 8:45AM

Calculation of electron scattering from tin atoms

Haadi Umer, Igor Bray, Dmitry V Fursa

GT1.00003
8:45AM - 9:00AM

Toward a frame-work for calculating comprehensive electron collision data sets for low-temperature plasma modeling: Vibrationally resolved cross sections of N_2 , N_2^+ and O_2

Mark C Zammit, James Colgan, Christopher J Fontes, Julie Jung, Amanda J Neukirch, Brett S Scheiner, Charles G Durfee, John W Rose, Matthew Webb, Eddy M Timmermans

GT1.00004
9:00AM - 9:15AM

Maximum angular momentum transfer in electron-atom collisions

Mariusz Piwiński, Lukasz Klosowski

GT1.00005
9:15AM - 9:30AM

Electron impact excitation cross sections of neutral molybdenum : cross sections of interest in plasma modeling

Indhu Suresh, Pnsnr R Srikar, Priti Priti, Rajesh Srivastava, Reetesh K Gangwar

DT2 Capacitively Coupled Plasmas IChair: Aranka Derzsi (*Wigner Research Centre, Hungary*)

- DT2.00001
10:00AM - 10:30AM
Resonant sheath heating in weakly magnetized capacitively coupled plasmas due to electron-cyclotron motion
Invited Speaker [Jing-Yu Sun](#)
- DT2.00002
10:30AM - 10:45AM
GEC Student Excellence Award Finalist Presentation - Uniformity control by customized electrode designs in capacitive RF plasmas
[Li Wang](#), Peter Hartmann, Zoltan Donko, Yuan-Hong Song, Julian Schulze
- DT2.00003
10:45AM - 11:00AM
Effect of the low-frequency voltage on nonlinear standing wave excitation in dual-frequency asymmetric capacitive discharges
[Fang-Jie Zhou](#), Jian-Kai Liu, Kai Zhao, You-Nian Wang
- DT2.00004
11:00AM - 11:15AM
Surface effects in a capacitive argon discharge in the intermediate pressure regime
[Jon T Gudmundsson](#), Janez Krek, De-Qi Wen, Emi Kawamura, Michael A Lieberman
- DT2.00005
11:15AM - 11:30AM
The effects of different boundary surface materials on electron power absorption dynamics in capacitive RF plasmas
[Florian Beckfeld](#), David A. Schulenberg, Ihor Korolov, Julian Schulze
- DT2.00006
11:30AM - 11:45AM
Kinetic behaviors of secondary electrons in magnetized capacitively coupled argon plasmas
[Hui Wen](#), Jing-Yu Sun, Quan-Zhi Zhang, You-Nian Wang
- DT2.00007
11:45AM - 12:00PM
GEC Student Excellence Award Finalist Presentation - Striations in dual-low-frequency (2/10 MHz) driven capacitively coupled CF₄ plasma
[Xiao-Kun Wang](#), Yong-Xin Liu, Julian Schulze, Zoltán Donk'o, You-Nian Wang

ET2 Sheaths and FireballsChair: Trevor Lafleur (*ThrustMe*)

- ET2.00001
10:00AM - 10:30AM
Electron Sheaths and Fireballs
Invited Speaker [Brett Scheiner](#)
- ET2.00002
10:30AM - 10:45AM
Direct measurement of ion and electron flux ratio at their respective sheath-edges and absence of the electron Bohm criterion effects
[Chenyao Jin](#), Chi-Shung Yip, Wei Zhang, Di Jiang, Guosheng Xu
- ET2.00003
10:45AM - 11:00AM
Sheath expansion around Langmuir Probes: is it only about the probe bias potential?
[Gregory Severn](#), Adrian Woodley, Peixuan Li, Oliver Schmitz
- ET2.00004
11:00AM - 11:15AM
How sheath properties change with gas pressure: modeling and simulation
[Lucas P Beving](#), Matthew M Hopkins, Scott D Baalrud

ET2.00005
11:15AM - 11:30AM

Plasma fireballs, their creation and behavior

Roman W Schrittwieser, Codrina Ionita, Reiner L Stenzel, Claudia T Konrad-Soare, Dan G Dimitriu, florin Enescu, Stefan A Irimiciuc

ET2.00006
11:30AM - 11:45AM

Development of a Discontinuous Galerkin fluid solver for argon plasma-sheath

Giuseppe Matteo Gangemi, Amaury Bilocq, Nayan Levaux, Koen Hillewaert, Thierry Magin, Alejandro Alvarez Laguna

ET2.00007
11:45AM - 12:00PM

A high density ($>10^{12}\text{cm}^{-3}$) multi-dipole confinement hot cathode discharge and its characteristics of plasma parameters formation

Chi-Shung Yip, Di Jiang, Chenyao Jin, Wei Zhang, Guosheng Xu

10:00AM - 12:00PM

Room: Shirakashi 1

FT2

Plasma Chemical Synthesis and Conversion

Chair: Masaharu Shiratani (*Kyushu University*)

FT2.00001
10:00AM - 10:15AM

Self-limiting trade-off between CO yield and CO₂ conversion energy efficiency in atmospheric pressure radio-frequency plasmas: picosecond laser spectroscopy

James Dedrick, Alex Foote, Andrew R Gibson, Kari Niemi, Steven Thomas, Jüri Raud, Joshua Boothroyd, Zaenab Abd-Allah, Jérôme Bredin, Michael North, Deborah O'Connell, Timo Gans

FT2.00002
10:15AM - 10:30AM

Thermocatalytic Plasma-Assisted Dry Reforming of Methane Over Heterogeneous Ni/Al₂O₃ Catalyst.

Tyler Wong, Daniel E Guerrero, Setrak Tanielyan, Jose L Lopez

FT2.00003
10:30AM - 11:00AM

The role of reactive oxygen and nitrogen species on the conversion of volatile organic compounds in a twin surface dielectric barrier discharge

Invited Speaker Lars Schücke

FT2.00004
11:00AM - 11:15AM

Nonthermal plasma assisted CO₂ hydrogenation over intermetallic Pd₂Ga/SiO₂

Daeyeong Kim, Shinya Furukawa, Tomohiro Nozaki

FT2.00005
11:15AM - 11:30AM

Reaction Mechanism for the Atmospheric Pressure Plasma Jet Treatment of Cysteine in Solution

Jordyn Polito, Sanjana J Kerketta, María J Herrera Quesada, katharina Stapelmann, Mark J Kushner

FT2.00006
11:30AM - 11:45AM

Plasma catalysis in fluidized-bed reactor for reverse water gas shift reaction

Xiaozhong Chen, Shinya Furukawa, Tomohiro Nozaki

FT2.00007
11:45AM - 12:00PM

Powderization behavior of uranium dioxide solid by non-equilibrium plasma oxidation

ZhuoRan Ma, Takaharu Tatsuno, Yoshiya Homma, Kenji Konashi, Tatsuya Suzuki

GT2 Plasmas and Nanotechnology I**Chair:** Uros Cvelbar (*Jozef Stefan Institute*)GT2.00001
10:00AM - 10:30AM**High-power pulsed gas-flow sputter synthesis of nanoparticles, core/shell nanoparticles, and extended chain-like complexes****Invited Speaker** Ulf HelmerssonGT2.00002
10:30AM - 10:45AM**Control of Schottky barrier height for efficient fabrication of graphene nanoribbon-based quantum dot devices**Tatsuki Kato, Toshiro Kaneko, Toshiaki KatoGT2.00003
10:45AM - 11:00AM**Understanding of monolayer WS₂ nucleation by in-situ monitoring CVD**Yuta Iwamoto, Toshiro Kaneko, Toshiaki KatoGT2.00004
11:00AM - 11:15AM**Coagulation and Condensation Rates in Si Nanoparticle Growth at Different Feeding Durations of Feedstock Using Tandem Modulated Induction Thermal Plasmas**Yurina Nagase, Yasunori Tanaka, Yusuke Nakano, Tatsuo Ishijima, Shiori Sueyasu, Shu Watanabe, Keitaro NakamuraGT2.00005
11:15AM - 11:30AM**Highly efficient exosome capture by carbon nanowalls template**Takumi Hashimoto, Hiroki Kondo, Hiromasa Tanaka, Kenji Ishikawa, Takayoshi Tsutsumi, Makoto Sekine, Takao Yasui, Yoshinobu Baba, Mineo Hiramatsu, Masaru Hori**DT3 Plasmas and Nanotechnology II****Chair:** Tsuyohito Ito (*The University of Tokyo*)DT3.00001
1:30PM - 2:00PM**Nanoplasmonic sensors designed by plasmas****Invited Speaker** Uros CvelbarDT3.00002
2:00PM - 2:15PM**Preparation of surfactant-free gold nano-particle dispersed aqueous solutions with solution plasma processing for surface-enhanced Raman scattering spectroscopy**Naoki MatsudaDT3.00003
2:15PM - 2:45PM**Plasma synthesis and processing of nanostructured quantum materials****Invited Speaker** Renato P CamataDT3.00004
2:45PM - 3:00PM**Size-control of Gold Nanoparticles Synthesized by Plasma in Contact with Liquids via Using Ligands**Phuoc V Thai

ET3 Laser Diagnostics IChair: Andrew Gibson (*Ruhr University Bochum, Germany*)ET3.00001
1:30PM - 1:45PM**Coherent Thomson scattering: a four-wave mixing approach to low temperature plasma diagnostics**Alexandros Gerakis, Mikhail N Shneider, Mikhail S MokrovET3.00002
1:45PM - 2:00PM**Spatially extended high-resolution Thomson scattering diagnostics with volume Bragg grating filters**Junhwi Bak, Jean Luis Suazo Betancourt, Anuj Rekhy, Amirhossein Abbasszadehrad, Richard B Miles, Christopher M Limbach, Mitchell L WalkerET3.00003
2:00PM - 2:15PM**GEC Student Excellence Award Finalist Presentation - Experimental and numerical investigation of low-pressure iodine plasmas**Benjamin Esteves, Cyril Drag, Alejandro Alvarez Laguna, Anne Bourdon, Pascal ChabertET3.00004
2:15PM - 2:45PM**Measurements of strength and fluctuation of 2D electric fields in plasmas using a fine particle trapped with laser tweezers****Invited Speaker** Kunihiro KamatakiET3.00005
2:45PM - 3:00PM**Vibrational excitation measurements by CARS in a nanosecond discharge**Jan Kuhfeld, Nikita D Lepikhin, Dirk Luggenhölscher, Uwe CzarnetzkiET3.00006
3:00PM - 3:15PM**GEC Student Excellence Award Finalist Presentation - Electric-field-vector-profile measurement in gases based on electric-field-induced second-harmonic generation**Shin Nakamura, Masataka Sogame, Masahiro Sato, Takashi Fujii, Akiko Kumada, Yuji OishiET3.00007
3:15PM - 3:30PM**High Spatial Resolution Measurement of Electric Field Vector in Positive Secondary Streamer Discharge under Atmospheric-Pressure Air**Yuki Inada, Tatsutoshi Shioda, Ryosuke Nakamura, Mitsuaki Maeyama, Akiko Kumada, Ryo Ono**FT3 Modeling - High Pressure and Streamers**Chair: Louis Reboul (*CMAP, Ecole Polytechnique*)FT3.00001
1:30PM - 1:45PM**Efficient preconditioning for the simulation of nanosecond discharge using Jacobian-Free Newton Krylov Methods**Alfredo J Duarte Gomez, Nicholas Deak, Fabrizio BisettiFT3.00002
1:45PM - 2:00PM**Electron dynamics and the mode-transition of a non-neutral discharge regime of the COST jet**Maximilian Klich, Sebastian Wilczek, Ralf Peter BrinkmannFT3.00003
2:00PM - 2:30PM**Modeling of chemical reaction processes induced by an atmospheric-pressure streamer discharge in air****Invited Speaker** Atsushi Komuro

- FT3.00004
2:30PM - 2:45PM
Design of a Microwave Plasma Enhanced Chemical Vapor Deposition System Using the Fluid Modeling based on the Finite Element Method
Kaviya Aranganadin, Yilang Jiang, Jing-Shyang Yen, Jwo-Shiun Sun, Hua-Yi Hsu, Ming-Chieh Lin
- FT3.00005
2:45PM - 3:00PM
Development of Three Dimensional Thermofluid Model for Ar-O₂ Loop Induction Thermal Plasmas with Reaction Rates for Dissociation of O₂ on the Substrate
Tomoya Fuwa, Hiroya Hara, Yasunori Tanaka, Yusuke Nakano, Tatsuo Ishijima, Tetsuya Yukimoto, Hiroshi Kawaura
- FT3.00006
3:00PM - 3:15PM
Massively parallel high-fidelity simulations of plasma-assisted ignition of hydrocarbon fuels using nanosecond pulsed discharges
Nicholas Deak, Alfredo J Duarte Gomez, Lucas Esclapez, Marcus Day, Fabrizio Bisetti
- FT3.00007
3:15PM - 3:30PM
Modelling and experimental studies of dielectric barrier discharges in dry and humidified air at sub-atmospheric pressure
Marjan Stankov, Sergey Gortschakow, Markus M Becker, Robert Bansemer, Klaus-Dieter Weltmann, Detlef Loffhagen

1:30PM - 3:30PM

Room: Shirakashi 2

GT3 Atmospheric Pressure Plasmas

Chair: Tatsuru Shirafuji (*Osaka Metropolitan University*)

- GT3.00001
1:30PM - 2:00PM
Ionization wave Propagation in Nanosecond Pulsed Discharge and its Application
Invited Speaker Cheng Zhang
- GT3.00002
2:00PM - 2:15PM
Strong Correlation Effects in Atmospheric Pressure Plasmas
Marco D Acciarri, Scott D Baalrud, Christopher H Moore
- GT3.00003
2:15PM - 2:30PM
The effect of humidity on streamer propagation in long air gaps
Andrey Starikovskiy, Eduard Bazelyan, Nikolay Aleksandrov
- GT3.00004
2:30PM - 2:45PM
Effects of humidity on the dynamics and electron recombination of a pin-to-pin discharge in He + H₂O at atmospheric pressure
Alexandra Brisset, Ben Harris, Aaron Dickenson, Kari Niemi, James Walsh, Erik Wagenaars
- GT3.00005
2:45PM - 3:00PM
Simulation of Nonthermal Plasma Discharges in Air and CO₂ in Sub-millimetre Needle-Plane Gaps Under Fast-Rising Voltages
Timothy Wong, Igor Timoshkin, Scott MacGregor, Mark Wilson, Martin Given
- GT3.00006
3:00PM - 3:15PM
Influence of water vapor and negative ions on self-organized luminous pattern formation in an atmospheric-pressure dc glow discharge
Toshiaki Miyazaki, Naoki Shirai, Koichi Sasaki
- GT3.00007
3:15PM - 3:30PM
Striations in Atmospheric Pressure AC Driven Helium Glow Discharge
Ayuob K Al wahaibi, Malik M Tahiyat, Sang Hee Won, Tanvir Farouk

HT4 Poster Session I

4:00PM - 6:00PM

- HT4.00001 **Convergent close-coupling calculations of electron scattering on HeH⁺**
Liam H Scarlett, [Mark C Zammit](#), Barry I Schneider, Igor Bary, Dmitry V Fursa
- HT4.00002 **The integral cross-section for electron-ion ionization collisions with an optical selection of the target's quantum state.**
[Lukasz Klosowski](#), Mariusz Piwinski
- HT4.00003 **Forming a pulsed beam of anions via electron dissociative attachment to diatomic molecules**
[Lukasz Klosowski](#), Mariusz Piwinski
- HT4.00004 **The Ps⁻ ion and e⁻-Ps Scattering**
[Sandra J Ward Quintanilla](#), William J Mitchell
- HT4.00005 **Quantum vortices in ionization processes by impact of positrons and ions.**
[Raul Oscar Barrachina](#), Tamara A Guarda, Francisco Navarrete
- HT4.00006 **Data-driven discovery of electron continuity equation and its application to measurement of electron transport coefficients in argon**
[Satoru Kawaguchi](#), Kazuhiro Takahashi, Kohki Satoh
- HT4.00007 **Scanning drift tube measurements and kinetic computations of electron swarm parameters in CO**
[Sasa Dujko](#), Danko Bošnjaković, Mate Vass, Peter Hartmann, Nuno R Pinhao, Detlef Loffhagen, Zoltan Donko
- HT4.00008 **Data-Homology(DH) Applied-Topology(AT) in/of Solutions of Wide-Class of Maze-Search/Sorting Analog-(Visible)-Computing Approach via/for Microfluidics-Chips via Glow-Discharges**
[E Carl-Ludwig Siegel](#), Herman Chernoff, Marvin Antonoff, Jerome Percus, George Yevick, Walter Munk, Mario Molina, Paul Butcher, Norman March, Frederic Young
- HT4.00009 **Development of a surface wave probe to examine intermediate pressure plasmas**
[Shadhin Hussain](#), Matthew Goeckner
- HT4.00010 **Characterization of low-pressure E×B plasmas generated by e-beam and non-thermal electrons in 0.1-10 torr air and nitrogen**
[Nirbhav S Chopra](#), Yevgeny Raitses
- HT4.00011 **Intermittent variation of electron temperature in converging field following a magnetic beach ECR plasma source**
[Atsushi Okamoto](#), Shunya Higuchi, Yuto Yamada, Koki Sato, Muneo Koike, Konan Yagasaki, Minami Sugimoto, Takaaki Fujita
- HT4.00012 **Fast electron heating due to the interplay of electron-and ion-acoustic waves in a current-driven turbulence**
Jian Chen, Alexander V Khrabrov, Igor D Kaganovich, [Andrew T Powis](#)
- HT4.00013 **Investigation of Single-particle Motion in the X-point of Two-wire Model**
[Bin Ahn](#), Yegeon Lim, Hoiyun Jeong, Yong Sung You, Jin Wook Kang, Young-chul Ghim

- HT4.00014 **Physical Regimes of Electrostatic Wave-Wave nonlinear interactions generated by an Electron Beam Propagation in Background Plasma**
Haomin Sun, Jian Chen, Igor D Kaganovich, Alexander Khrabrov, Dmytro Sydorenko, Andrew T Powis
- HT4.00015 **Coupled oscillations of the cathode temperature and the sheath in self-sustained arcs**
Michael D Campanell
- HT4.00016 **Simulations of stochastic heating induced by RF biased sheath in inductively coupled plasmas**
Jia-Wei Huang, Yu-Ru Zhang, You-Nian Wang
- HT4.00017 **Progress on development of optical tomography as a plasma diagnostic**
Brian Z Bentz, Kevin Youngman
- HT4.00018 **Optics-based measurements of temporal evolution of currents through a load of X-pinch system using Tb-doped optic fiber**
Seongmin Choi, H. J. Woo, Seunggi Ham, Jonghyeon Ryu, Kyoung-Jae Chung, Y. S. Hwang, Y.-c. Ghim
- HT4.00019 **Experimental verification of laser-induced fluorescence based on the velocity distribution of helium ash in multi-dipole device**
Di Jiang, Chi-Shung Yip, Wei Zhang, Chenyao Jin, Liang Wang, Guosheng Xu
- HT4.00020 **TALIF of atomic hydrogen in the divertor simulator NAGDIS-T**
Shin Kajita, Kota Hiraiwa, Hirohiko Tanaka, Ryosuke Nishio, Keigo Tojo, Ryo Yasuhara, Mitsutoshi Aramaki, Noriyasu Ohno
- HT4.00021 **Development and construction of a Laser-Induced Fluorescence (LIF) diagnostics system for a low temperature multidipole plasma device with X-point magnetic configuration, MAXIMUS**
Alvin A Sugianto, Yegeon Lim, Young-chul Ghim
- HT4.00022 **Position dependence diagnosis of electron temperature and density of inductively coupled argon plasma based on Abel inverted optical emission spectroscopic measurement and collisional-radiative model**
Yuya Yamashita, Kenta Doi, Tetsuji Kiyota, Akira Kobayashi, Sotaro Hosoya, Kazuma Yoneda, Atsushi Nezu, Hiroshi Akatsuka
- HT4.00023 **Development of a polarization-resolved spatial heterodyne spectrometer for high wavelength resolution and high throughput measurement of near-infrared atomic emission lines in magnetically confined toroidal plasmas**
Mengnan Xu, Taiichi Shikama, Minato Murakumo, Shinichiro Kado, Masahiro Hasuo
- HT4.00024 **Development of microwave plasma diagnostics for various plasma devices**
Daisuke Kuwahara, Tokihiko Tokuzawa, Naoji Yamamoto, Masayuki Yoshikawa, Junko Kohagura, Kazunobu Nagasaki, Shinsuke Ohshima, Yoshio Nagayama, Atsushi Mase
- HT4.00025 **A novel spectral element method for modelling streamer discharges and its comparison with the conventional finite-element method.**
Igor L Semenov, Aleksandar P. Jovanović, Markus M. Becker
- HT4.00026 **A novel Monte Carlo simulations code for electrons and ions including efficient variance reduction techniques**
Luca Vialetto, Elena Ancona, Paola Diomede, Savino Longo

- HT4.00027 **High Accuracy Interatomic Potential Model for Binary Collision Approximation and Its Application into Sputtering Yield Estimation**
Atsushi M Ito
- HT4.00028 **Electromagnetic Wave Analysis in Collisional Discontinuous Galerkin Particle-in-Cell Simulations**
Raymond Lau, Nicolas Lee, Sigrid Elschot
- HT4.00029 **Moments approach to compare a particle-in-cell simulation with a fluid model for RF capacitively coupled plasmas**
Hwan Ho Kim, Chang Ho Kim, Geonwoo Park, Hae June Lee
- HT4.00030 **Numerical Analysis of Fundamental Properties in Sub-atmospheric Pressure He/CH₄ Pulsed Plasmas for Hard Coating of Diamond-Like Carbon Thin Films**
Akinori Oda, Shun Sasaki, Ryo Fujita
- HT4.00031 **Influence of Electrode Structure on Ion Beam Extraction in Cold-cathode Ion Source**
Lee Minkeun, June Young Kim, M.A.I. Elgarhy, Kyung-Jae Chung*
- HT4.00032 **Importance of C₃H_y and C₃H_y⁺ in Modeling of Radio Frequency Methane Plasma**
Kei Ikeda, Tsukasa Kobayashi
- HT4.00033 **Complex network analysis of low-temperature plasma reaction systems**
Arisa Shinke, Tomoyuki Murakami
- HT4.00034 **Fokker-Planck-Boltzmann Model for Low-Pressure Plasmas**
Uwe Czarnetzki, Luis L Alves
- HT4.00035 **Simulations of Cathode Plasma Expansion in Vacuum**
Matthew M Hopkins, Christopher H Moore, Andreas Kyritsakis
- HT4.00036 **Features of DC gas breakdown between electrodes with variable gap**
Valeriy Lisovskiy, Stanislav Dudin, Dmytro Dudin, Ruslan Osmayev, Igor Lesnik, Vladimir Yegorenkov
- HT4.00037 **Generation of 2.45-GHz microwave plasma filament in sub-atmospheric pressure**
Zentarou Sasaki, Tsubasa Saito, Takaharu Kamada, Katsuyuki Takahashi, Koichi Takaki, Seiji Mukaigawa
- HT4.00038 **Analysis of a radiofrequency plasma reactor for etching**
Andrew S Fierro, Matthew M Hopkins, Thomas Hardin, Amanda M Lietz, Alex Belianinov, Brian Z Bentz
- HT4.00039 **Electron power absorption in capacitively coupled plasmas operated in gas mixtures containing oxygen**
Benedek Horvath, Aranka Derzsi, Peter Hartmann, Máté Vass, Julian Schulze, Ihor Korolov, Marton Gyulai, Zoltan Donko
- HT4.00040 **Numerical simulation of discharge mode in capacitively coupled plasma with beam injection**
Zhou Youyou, Wang Yu, Jiang Wei, Zhang Ya

- HT4.00041 **Experimental and numerical investigation of the plasma characteristics and mode transition in dual-frequency capacitively coupled argon plasmas: effects of low-frequency source and gas pressure**
Yang Zhou, Kai Zhao, Fang-Fang Ma, Yong-Xin Liu, You-Nian Wang
- HT4.00042 **On plasma parameters with changing chamber size**
Ju-Ho Kim, Chinwook Chung
- HT4.00043 **Investigations of the INductively Coupled Array (INCA) discharge**
Christian Lütke Stetzkamp, Tsanko V Tsankov, Dirk Luggenhölscher, Uwe Czarnetzki
- HT4.00044 **Spectroscopic measurement of a compact helium ECR discharge produced in a simple cusp field**
Taiichi Shikama, Takumi Komiyama, Mikiya Oki, Masahiro Hasuo
- HT4.00045 **Investigating the influence of ion mass on plasma characteristics in low temperature E×B plasmas using 2D-3V PIC-MCC simulations**
Bhaskar Chaudhury, Durgesh Mishra, Teja V Reddy, Miral Shah, Mainak Bandyopadhyay
- HT4.00046 **Comparison of space and time-resolved electric fields from experiment and simulation in packed bed dielectric barrier discharges**
Zaka-ul-Islam Mujahid, Constantin Neuroth, Zdeněk Navrátil, Ihor Korolov, Tomas Hoder, Thomas Mussenbrock, Julian Schulze
- HT4.00047 **Observation of the stripe and filamentary self-organized structure of atmospheric pressure nitrogen microgap dielectric barrier discharge**
Ryota Akaishi, Ryoya Karino, Katuyuki Takahashi, Koichi Takaiki, Seiji Mukaigawa
- HT4.00048 **Production of large-volume atmospheric-pressure dielectric barrier discharge using high-rate helium flow**
Yuta Soga, Naoki Shirai, Koichi Sasaki
- HT4.00049 **Application of Sliding Discharge with Tri-Electrode Dielectric Barrier Discharge for Formation of Planar Atmospheric Pressure Plasma**
Hiroshi Akamatsu
- HT4.00050 **DC glow discharge - Fluidized bed reactor for CO₂ recycling**
Carolina A Garcia Soto, Olivier Guaitella, Edmond Baratte, Paloma Thevenet, Dihya Sadi
- HT4.00051 **Upscaling of a Surface Dielectric Barrier Discharge for Air Purification**
Alexander Böddecker, Arisa Bodnar, Lars Schücke, Jonas Giesekus, Katja Wenselau, Anna Lena Schöne, Jana Schoene, Felix Fuchs, Ryan Thomas Nguyen-Smith, Maximilian Passmann, Andrew R. Gibson, Peter Awakowicz
- HT4.00052 **Analysis of Electron Temperature and Heavy Particle Temperature at Vacuum Arc Cathode Spot as a Function of Ambient Pressure**
Hiroto Suzuki, Masahiro Takagi, Yusuke Nemoto, Honoka Morishita, Yuki Suzuki, Zhenwei Ren, Gustilo C Reggie, Toru Iwao
- HT4.00053 **Contribution to Bead Width Using Welding Torch Feedback Control with Real-time AI Discrimination**
Susumu Ichinose, Yuki Kusakari, Honoka Morishita, Masahiro Takagi, Yuki Suzuki, Zhenwei Ren, Yusuke Nemoto, Gustilo C Reggie, Toru Iwao
- HT4.00054 **Research on current filament mechanism of nonlinear semi-insulation GaAs photoconductive semiconductor switches**
Cheng Ma, Wei Shi, Lei Hou, Hong Liu, Yue Wang, Liqiang Tian, Lei Yang, Meilin Wu, Hui Liu, Zhiyuan Chen

- HT4.00055 **Development of an alternative differential pumping system by virtual vacuum interface plasma window**
Shinichi Namba, Kosuke Okuda, Ohshi Yanagi, Junya Kono, Ayumu Saito, Daisuke Mori, Makoto Takagi, Noriyasu Ohno, Naoki Tamura, Yuki Hayashi, Yukinori Hamaji, Suguru Masuzaki, Hiroki Okuno, Kotaro Yamasaki
- HT4.00056 **Spectrum Intensity and Temperature of Cu I and Cu II Measurement of Vacuum Arc Cathode Spot as a Function of External Transverse Magnetic Field**
Nozomi Ishihara, Hiroto Suzuki, Kenshin Saigo, Masahiro Takagi, Honoka Morishita, Yuki Suzuki, Yusuke Nemoto, Zhenwei Ren, Gustilo C Reggie, Toru Iwao
- HT4.00057 **Measurement of Temperature at Anode Spot Affected by External Magnetic Field Just Before Re-strike in Magnetic Driven Arc**
Kenshin Saigo, Hiroto Suzuki, Susumu Ichinose, Yuki Kusakari, Yusuke Nemoto, Zhenwei Ren, Gustilo C Reggie, Toru Iwao
- HT4.00058 **Fluid Density Dependence of Electrical Discharges Generated Using Carbon Nanotube as Electrode in Liquid, Supercritical, and Gaseous Nitrogen**
Hitoshi Muneoka, Tomoki Kuroda, Tsuyohito Ito, Kazuo Terashima
- HT4.00059 **The effect of electrolyte concentration on the microdischarge behaviour during plasma electrolytic oxidation (PEO) on aluminium and titanium**
Jan-Luca Gembus, Vera Bracht, Peter Awakowicz, Andrew R. Gibson
- HT4.00060 **Supercontinuum spectroscopy for studying the production of solvated electrons**
Adam D Light
- HT4.00061 **Characteristics of DC discharges with a liquid cathode and a metal anode**
Bhagirath Ghimire, Gabe Xu, Vladimir I Kolobov
- HT4.00062 **Production of reactive oxygen species in an atmospheric-pressure pulsed He+H₂O plasma: Effect of pulse repetition frequency**
 Ben Harris, Erik Wagenaars
- HT4.00063 **Plasma-chemical kinetics in a parallel plate capillary plasma jet operated in He/H₂O/O₂ mixtures**
Anna Lena Schoene, Steffen Schüttler, Emanuel Jeß, Judith Golda, Andrew R. Gibson
- HT4.00064 **Fundamental processes in CO₂-CH₄ plasmas: a comparison of experimental and numerical results**
Edmond Baratte, Olivier Guaitella, Vasco Guerra, Tiago Silva, Dihya Sadi
- HT4.00065 **Princeton Collaborative Low Temperature Plasma Research Facility (PCRf)**
Yevgeny Raitses, Igor D Kaganovich, Mikhail N Shneider, Sophia Gershman, Shurik Yatomi, Arthur Dogariu
- HT4.00066 **Measurement of Bead Width Using Feedback Control During Welding Speed Change in TIG Welding**
Yuki Kusakari, Susumu Ichinose, Kenshin Saigo, Hiroto Suzuki, Yusuke Nemoto, Zhenwei Ren, Gustilo C Reggie, Toru Iwao
- HT4.00067 **Feasibility study for monitoring of tendency of particle generation in plasma etching by load impedance measurement**
Yuji Kasashima, Tatsuo Tabaru

- HT4.00068 **Measurement of thickness of silicon carbide using multi-frequency analysis in the inductively coupled plasma**
Beom-Jun Seo, Se-Hun Ahn, Chin-Wook Chung
- HT4.00069 **A study on the effect of ultra-low electron temperature on the etching of MoS₂ layer**
Junyoung Park, Jiwon Jung, Min-Seok Kim, Chin-Wook Chung
- HT4.00070 **Time-dependent Measurement of Ion Composition in Pulse-operated Ar/C₄F₈/O₂ Dual-frequency Capacitively-Coupled Plasma**
Yuto Seki, Haruhito Kato, Shuichi Kuboi, Haruka Suzuki, Hirotaka Toyoda
- HT4.00071 **Synthesis of diamond-like carbon thin film via multi pulse high-power impulse magnetron sputtering**
Takashi Kimura
- HT4.00072 **Plasma discharge characteristics for balanced magnetron sputtering cathode**
Taisei Motomura, Tatsuo Tabaru
- HT4.00073 **Phase-Resolved Analysis of an Inductively Coupled Plasma with a Dual-Frequency Bias Using a Two-Dimensional Particle-in-Cell Simulation**
Heesung Park, HaeJune Lee
- HT4.00074 **Elemental gradient functional thin film production for hydrogen entry prevention using powder target**
Hiroharu Kawasaki
- HT4.00075 **Characteristics of DLC films deposited by pseudo-spark discharge PE-CVD with different substrate bias voltages**
Takaharu Kamada, Masayuki Watanabe, Yoshitaka Nakamura, Seiji Mukaigawa
- HT4.00076 **TiN Film Formation by Linear and Novel Winding Filtered-Arc Deposition**
Yoshinori Saiki, Jumpei Kito, Yuki Hashimoto, Takahiro Bando, Toru Harigai, Hirofumi Takikawa, Hiroki Gima, Hiroaki Sugita
- HT4.00077 **Deposition of nitrogen doped amorphous carbon film using high power impulse magnetron sputtering**
Ryo Usui, Takayuki Ohta
- HT4.00078 **Investigation of Material Properties of Fluorocarbon Films Deposited by Plasma-Enhanced Chemical Vapor Deposition**
Toru Takeya, Takeru Okada
- HT4.00079 **Thin plasma-polymerised layers on PET-substrates under the influence of NaOH solution**
Jana Schöne, Marcel Rudolph, Jonathan Jenderny, Peter Awakowicz
- HT4.00080 **Design and Preliminary Performance Assessment of a Porous Dielectric Barrier Discharge Reactor for Ammonia Synthesis**
Visal Veng, Ephraim M Simasiku, Fanglin Che, HsiWu Wong, Maria Carreon, Juan P Trelles
- HT4.00081 **Effect of discharge parameters on the shock wave pretreatment of wood flour for enzymatic saccharification**
Wataru Ueda, Fumiyoshi Tochikubo, Yusuke Nakagawa

- HT4.00082 **Increased energy efficiency by optimization of the separation processes in waste incineration plants by means of Gemini**
Daniel Szeremley
- HT4.00083 **Decomposition of high-density toluene in water-vapor-mixed Nitrogen/Air using dielectric barrier discharge**
Mao Xu, Yohei Fukuyama, Zhizhi Liu, Akitoshi Okino
- HT4.00084 **Development of an experimental system for cell viability assays of yeasts using gas-temperature controllable plasma jets**
Shinji Yoshimura, Yoko Otsubo, Akira Yamashita, Katsuki Johzuka, Takayoshi Tsutsumi, Kenji Ishikawa, Masaru Hori
- HT4.00085 **New Plasma Device for Selective Generation of Dinitrogen Pentoxide from Air and Its Applications**
Toshiro Kaneko, Shota Sasaki, Keisuke Takashima
- HT4.00086 **Antitumor effects on mouse colorectal Colon-26 tumors in mice induced by normal tissue treatment using streamer discharge**
Reima Jinno, Kengo Wada, Atsushi Komuro, Hideyuki Yanai, Ryo Ono
- HT4.00087 **Comprehensive analysis of gene expression in PAL-treated glioblastoma cells**
Hiromasa Tanaka, Masaaki Mizuno, Ayako Tanaka, Yuki Shibata, Kenji Ishikawa, Hiroki Kondo, Hiroshi Hashizume, Camelia Miron, Yasumasa Okazaki, Shinya Toyokuni, Kae Nakamura, Hiroaki Kajiyama, Fumitaka Kikkawa, Masaru Hori
- HT4.00088 **Enhancement of cytokine production and differentiation from sensitized EL4 T-cell by using atmospheric plasma irradiation**
Nobuya Hayashi, Haruka Uematsu, Reona Aijima, Yoshio Yamashita
- HT4.00089 **Role of short-lived nitrogen species generated at low-pressure RF plasma on the germination and seedling growth**
Kazunori Koga, Pankaj Attri, Takamasa Okumura, Teruki Anan, Takumi Nakao, Kunihiro Kamataki, Naoto Yamashita, Naho Itagaki, Masaharu Shiratani
- HT4.00090 **The effect of plasma-activated water in enhancing seeds germination, plant growth, and its use as a nitrogen source for algae growth**
Vikas Rathore, Budhi S Tiwari, Sudhir Nema
- HT4.00091 **Dependence of depth in liquid and gas-flow-rate ratio irradiated with nitric-oxide radicals on proliferation of fibroblast cells**
Yasumasa Mori, Naoyuki Iwata, Tomiyasu Murata, Masaru Hori, Masafumi Ito
- HT4.00092 **Application of heavy ion plasma to understand treatment mechanism of heavy ion cancer therapy**
Kengo Moribayashi
- HT4.00093 **Effect of alcohol addition on radical production**
Hiroto Matsuura, Nguyen T Tran, Min Hu, Takumi Nakano
- HT4.00094 **Changes in the permeation characteristics of ROS through biological membranes by discharge plasma-Induced electric field**
Yuta Iwata, Ippei Yagi, Kosuke Tachibana, Akinori Oda, Takehiko Sato, Satoshi Uchida
- HT4.00095 **Improvement of gene transfer efficiency for establishing cells with higher safety for gene therapy by using surface discharge**
Kenjiro Ohnishi, Susumu Satoh, Satomi Ihara, Masafumi Jinno

- HT4.00096 **Mechanism of macromolecule introduction into plant cells by plasma treatment.**
Yuki Hamada, Ryosuke Ueshima, Yoshihisa Ikeda, Yugo Kido, Hidetaka Kaya, Masafumi Jinno
- HT4.00097 **Effect of non-equilibrium atmospheric pressure plasma (APP) on adipocyte browning via modulations of TRPV1 and TRPA1 channels**
Weijian Chen, Nyasha M Ruvarashe, Sara Fujii, Yuki Shirakawa, Shota Sasaki, Toshiro Kaneko, Makoto Kanzaki
- HT4.00098 **Effect of plasma-generated gaseous nitrogen on plant growth**
Taro Yamanashi, Shoki Takeshi, Shota Sasaki, Keisuke Takashima, Toshiro Kaneko, Yasuhiro Ishimaru, Nobuyuki Uozumi
- HT4.00099 **Analysis of Intracellular Nucleic Acid Damage Induced by Cold Atmospheric Pressure Plasma Irradiation**
Khulan Bidbayasakh, Sumire Arai, Atsushi Fukuda, Kazunori Takashima, Hirofumi Kurita
- HT4.00100 **Introduce gene into many cells by creepage discharge method**
Yuta Kuroki, Susumu Satoh, Yoshihisa Ikeda, Hideki Motomura, Yugo Kido, Masafumi Jinno
- HT4.00101 **Density profile control of a magnetically expanding plasma and its impact on a plasma thruster**
Soya Sumikawa, Kazunori Takahashi
- HT4.00102 **Forced van der Pol oscillator modeling of Hall-thruster's externally modulated breathing mode**
Mark E Koepke
- HT4.00103 **Size controlled synthesis of gold nanoparticle/carbon nanotube composites by atmospheric-pressure microplasma**
Hiroyuki Yoshiki, Kenji Otosaka
- HT4.00104 **Growth of metal-organic frameworks in solution influenced by laser-induced plasma at the early stage**
Shota Chiba, Moriyuki Kanno, Hitoshi Muneoka, Tsuyohito Ito, Kazuo Terashima
- HT4.00105 **A 2D Particle-In-Cell model of an Electron Cyclotron Resonance plasma for the purpose of lifetime tests**
Efe Kemaneci, Denis Eremin, Andrei Yakunin, Ruben Snijdwind, Mark van de Kerkhof, Ralf Peter Brinkmann
- HT4.00106 **Treatment of Polyethylene Terephthalate using low-temperature atmospheric pressure helium plasma jet for improvement of adhesion**
Tetsuji Shimizu, Junya Nonaka, Yuhei Ishihara, Hajime Sakakita
- HT4.00107 **Effect of Biasing Voltage on Fiber-Form Nanostructured Tungsten Formation by Collisional Helium Arc Plasma Irradiation**
Mitsuo Tajima, Yusuke Kikuchi, Tatsuya Aota, Shiro Maenaka, Kazunori Fujita, Shuichi Takamura
- HT4.00108 **Dependence of ground-state NH radical fluorescence in atmospheric-pressure pulsed-arc plasma jet on operating gas composition**
Noritake Yagawa, Ryuta Ichiki, Kosuke Tachibana, Takashi Furuki, Seiji Kanazawa

- HT4.00109 **Low-temperature nitrocarburizing by pulsed-DC discharge of N_2 - H_2 - C_2H_2 for surface engineering of austenitic stainless steel**
Jeet V Sah, Alphonsa Joseph, Ghanshyam Jhala, Subroto Mukherjee
- HT4.00110 **Initial growth of graphene on copper foil in non-equilibrium atmospheric pressure remote plasma CVD**
Akihiro Kajino, Yusuke Sakai, Keigo Takeda, Mineo Hiramatsu
- HT4.00111 **Fabrication of Amorphous Carbon Nitride Films with High $[N]/([N]+[C])$ Ratios Using the Plasma Chemical Vapor Deposition of the Gas Mixture of C_2H_2 with N_2 : The Possibility to obtain the $[N]/([N]+[C])$ Ratio of >0.5**
Haruhiko Ito, Yuga Satoh, Tsuneo Suzuki, Hidetoshi Saitoh
- HT4.00112 **Machine learning-based prediction of process conditions in atmospheric-pressure microwave plasma reactor from plasma images**
Cheolwoo Bong, Moon Soo Bak, Byeong Soo Kim, Dong Ju Kim
- HT4.00113 **Hot carrier dynamics in LSPR tuneable plasmonic TiN at the interface of p and n type semiconductors**
Santanu Podder, Arup R Pal
- HT4.00114 **Separating Critical Materials using an Electromagnetic Centrifuge**
Drue Hood-McFadden, Thomas C Underwood

6:30PM - 8:00PM

Room: Tachibana

DT5

Women in Science**Chair:** Noriko Hosaka (*Tohoku University / National Institute of Technology, Sendai College, Japan*)DT5.00001
6:30PM - 8:00PM**Women in Science**

Co-sponsorship: Tohoku University Center for Gender Equality Promotion (TUMUG), Japan

Sunhee LeeAranka DerzsiDouyan WangAiri Nakayama

Wednesday, October 5th, 2022

8:00AM - 9:30AM

Room: Tachibana

DW1 Green Plasma Science & Technology I

Chair: Gerard von Rooij (*Maastricht University*)

- DW1.00001
8:00AM - 8:30AM
Nitrogen vibrational excitation in a non-self-sustained discharge plasma toward efficient nitrogen fixation processes
Invited Speaker [Keisuke Takashima](#)
- DW1.00002
8:30AM - 8:45AM
Selective Energy Input into Vibrational Energy of Nitrogen Molecule in Non-Self-Sustaining DC Discharge Plasma Source
[Yuki Kunishima](#), Keisuke Takashima, Toshiro Kaneko
- DW1.00003
8:45AM - 9:00AM
The energy cost of N₂ dissociation in a microwave discharge: combining modeling and experiments
[Margherita Altin](#), Pedro Viegas, Luca Vialeto, Alex W van de Steeg, Savino Longo, Gerard J Van Rooij, Paola Diomede
- DW1.00004
9:00AM - 9:30AM
Plasma assisted green ammonia production from water and nitrogen at atmospheric pressure
Invited Speaker [Muzammil Iqbal](#)

8:00AM - 9:30AM

Room: Hagi

EW1 Aerospace Plasmas

Chair: Mark Koepke (*West Virginia University*)

- EW1.00001
8:00AM - 8:15AM
Regime Transitions of a Pulsed Nanosecond Discharge Driven by Dynamic Flame Instabilities
[Colin A Pavan](#), Santosh Shanbhogue, Drew Weibel, Ahmed F Ghoniem, Felipe G del Campo, Carmen Guerra-Garcia
- EW1.00002
8:15AM - 8:30AM
Global and PIC Modeling of Air - Breathing Plasma Engines
Salman Sarwar, Igor D Kaganovich, Alexander V Khrabrov, Dmytro Sydorenko, [Willca Villafana](#)
- EW1.00003
8:30AM - 9:00AM
Electroaerodynamic aircraft propulsion
Invited Speaker [Steven Barrett](#)
- EW1.00004
9:00AM - 9:15AM
Development of Fully Covered Plasma Actuator
[Mahoro Sakurai](#), Shintaro Sato, Naofumi Ohnishi
- EW1.00005
9:15AM - 9:30AM
Analysis of Particle Behavior Using Particle-in-cell Method in Discharge and Acceleration Processes of an Air-breathing Electrostatic Ramjet Engine
[Hoshiki Sato](#), Masayuki Takahashi

FW1 Modeling - Plasma Processing and Chemistry IChair: Tomoyuki Murakami (*Seikei University*)FW1.00001
8:00AM - 8:15AM**Particle-in-Cell Modeling of Electron-Beam Generated Low Electron Temperature Plasma**Shahid Rauf, Dmytro Sydorenko, Sierra E Jubin, Willca Villafana, Stephane A Ethier, Alexander V Khrabrov, Igor D KaganovichFW1.00002
8:15AM - 8:30AM**Characterization of a transformer-coupled remote plasma source chamber using a fluids-based, multiphysics plasma model**Scott Polak, Abhra Roy, Jun-Chieh Wang, Kailash Meher, Veera Venkata RaoFW1.00003
8:30AM - 8:45AM**Numerical investigation of vacuum ultraviolet emission in Ar-O₂ inductively coupled plasmas**Michel Osca Engelbrecht, Christopher P Ridgers, Andrew R GibsonFW1.00004
8:45AM - 9:00AM**Effects of amplitude modulation discharge on behavior of oxygen ions in Ar/O₂ capacitively coupled plasma studied by particle-in-cell/Monte Carlo collision model**Iori Nagao, Akihiro Yamamoto, Yuma Yamamoto, Kunihiro Kamataki, Takamasa Okumura, Naoto Yamashita, Naho Itagaki, Kazunori Koga, Masaharu ShirataniFW1.00005
9:00AM - 9:15AM**Plasma species and reaction dynamic-oriented global model studies for microscale argon discharges**De-Qi Wen, Peng Zhang, You-Nian Wang, John P. VerboncoeurFW1.00006
9:15AM - 9:30AM**Kinetics of non-equilibrium plasma in water vapor- and hydrocarbon-containing gaseous mixtures**Andrey Starikovskiy, Nickolay Aleksandrov, Eduard Bazelyan, Alexander Ponomarev**GW1 Electron and Photon Collisions - Ionization**Chair: Sandra Quintanilla (*University of North Texas*)GW1.00001
8:00AM - 8:30AM**Absolute triple differential cross sections for low-energy electron impact ionization of biochemically relevant systems: Water, tetrahydrofuran, and hydrated tetrahydrofuran****Invited Speaker** Xueguang RenGW1.00002
8:30AM - 9:00AM**Progress in research using positronium negative ions****Invited Speaker** Yasuyuki NagashimaGW1.00003
9:00AM - 9:15AM**Fixed-Nuclei Photon Scattering Cross Sections for H₂⁺**Adam J Singor, Igor Bray, Dmitry V FursaGW1.00004
9:15AM - 9:30AM**Application of a complex Gaussian approach to study electron and photon impact ionization of molecules**Lorenzo Ugo Ancarani, Abdallah Ammar, Arnaud Leclerc

10:00AM - 11:00AM

Room: Tachibana

DW2 Will Allis Prize Talk

Chair: Julian Schulze (*Ruhr University Bochum, Germany*)

DW2.00001
10:00AM - 11:00AM

40 years with studies on radiofrequency plasma and related theory

Plenary Speaker [Toshiaki Makabe](#)

11:00AM - 12:00PM

Room: Tachibana

DW3 Reactive Plasma Award Talk

Chair: Fumiyoshi Tochikubo (*Tokyo Metropolitan University*)

DW3.00001
11:00AM - 11:30AM

Evolution of reactive plasma processes by radical control

Plenary Speaker [Masaru Hori](#)

12:00PM - 1:00PM

Room: Tachibana

DW4 GEC Business Meeting

Chair: Julian Schulze (*Ruhr University Bochum, Germany*)

DW4.00001
12:00PM - 1:00PM

GEC Business Meeting

[Julian Schulze](#)

2:30PM - 4:00PM

Room: Tachibana

DW5 Green Plasma Science & Technology II

Chair: Pankaj Attri (*Kyushu University*)

DW5.00001
2:30PM - 3:00PM

Ns Pulse and Hybrid Discharges for Plasma Chemistry and Plasma Catalysis Applications

Invited Speaker [Igor V Adamovich](#)

DW5.00002
3:00PM - 3:30PM

Solar-Plasma Reactors and Processes for Sustainable Chemical Synthesis

Invited Speaker [Juan P Trelles](#)

DW5.00003
3:30PM - 4:00PM

Gas Phase and Surface Infrared Studies of Plasma-catalysis

Invited Speaker [Gottlieb Oehrlein](#)

EW5 Plasma Surface Interaction II**Chair:** Sumit Agarwal (*Colorado School of Mines*)EW5.00001
2:30PM - 2:45PM**A global plasma and surface model of a hydrogen/methane inductively coupled discharges for the purpose of minimal optical transmission loss in Extreme-Ultra-Violet lithography machines**Efe Kemaneci, Achim von Keudell, Andrei Yakunin, Andrey Nikipelov, Mark van de Kerkhof, Vadim BanineEW5.00002
2:45PM - 3:00PM**Implementation of Interatomic Potential for Charged Particle Collision**Yuto Toda, Arimichi Takayama, Atsushi M ItoEW5.00003
3:00PM - 3:30PM**Machine learning plasma-surface interactions: from low to high fidelity surrogate models****Invited Speaker** Jan TrieschmannEW5.00004
3:30PM - 3:45PM**Deep learning model for ion sputtering dynamics with molecular dynamics simulation**Byungjo Kim, Jinkyu Bae, Hyunhak Jeong, Suyoung Yoo, Sang Ki NamEW5.00005
3:45PM - 4:00PM**Transfer Learning Model with Simulation and Experimental Data for Tool Virtualization in Poly-Si Etching**Takeshi Nakayama, Tsutomu Tetsuka, Tomohiro Sekine, Takeshi Ohmori**FW5 Atomic Layer Processes****Chair:** Hiroki Kondo (*Nagoya University, Japan*)FW5.00001
2:30PM - 3:00PM**Optimisation and Understanding of Plasma Enhanced Atomic Layer Deposition Processes Using Quasi In-situ X-ray Photoelectron Spectroscopy****Invited Speaker** Robert O'ConnorFW5.00002
3:00PM - 3:15PM**Damage mitigation in atomic layer etching of GaN by cyclic exposure of BCl₃ gas and F₂ added Ar plasma at high substrate temperature**Shohei Nakamura, Atsushi Tanide, Masafumi Kawagoe, Soichi Nadahara, Kenji Ishikawa, Osamu Oda, Masaru HoriFW5.00003
3:15PM - 3:30PM**Topographically-selective Atomic Layer Etching of SiO₂ using fluorine-containing plasma**Airah P Osonio, Takayoshi Tsutsumi, Bablu Mukherjee, Ranjit Borude, Nobuyoshi Kobayashi, Masaru HoriFW5.00004
3:30PM - 4:00PM**Plasma-assisted thermal-cyclic atomic-layer etching for selective removal of thin films****Invited Speaker** Kazunori Shinoda

GW5 Heavy-Particle Collisions**Chair:** Masamitsu Hoshino (*Sophia University, Japan*)

GW5.00001

2:30PM - 2:45PM

Doubly differential ionization cross sections of proton-helium collisionsKate Spicer, Corey Plowman, Shukhrat Alladustov, Ilkhom Abdurakhmanov, Igor Bray, Alisher Kadyrov

GW5.00002

2:45PM - 3:15PM

Transcending the impact parameter approach by means of a full quantum distorted wave description of ion-atom and ion-molecule collisions**Invited Speaker** Raul Oscar Barrachina

GW5.00003

3:15PM - 3:45PM

Ion-induced differential ionisation of helium at intermediate energies**Invited Speaker** Alisher Kadyrov**HW6 Poster Session II**

4:30PM - 6:30PM

HW6.00001

Transport of electrons and propagation of negative streamers in CF₃I-SF₆ mixturesSasa Dujko, Jasmina Atić, Danko Bošnjaković, Ilija Simonović, Zoran Petrović

HW6.00002

Water you waiting for? - A Complete and Consistent Set of Electron-H₂O Collision Cross Sections for Plasma ModellingMaik Budde, Tiago C Dias, Luca Violetto, Nuno R Pinhao, Vasco Guerra, Tiago Silva

HW6.00003

Investigation of Negative Ion Mobility and Ion-Molecule Reactions in Atmospheric O₂ with a Small Amount of H₂O Based on Ion Mobility MeasurementYui Okuyama, Hirotake Sugawara

HW6.00004

Elastic scattering of electrons on ionsLukasz Klosowski, Mariusz Piwinski

HW6.00005

Ionic Heating of N₂ and O₂ Gas Discharges

Brett Scheiner, Matthew M Hopkins, Mark C Zammit, Christopher H Moore, Eddy M Timmermans

HW6.00006

On the Formation of the Inverse EDF and the Absolute Negative Conductivity of Electrons in a Gas-Discharge PlasmaAnatoly Kudryavtsev, Chengxun o Yuan, Eugene Bogdanov

HW6.00007

Three-dimensional kinetic simulations of the collective processes in beam-plasma interactionJian Chen, Haomin Sun, Andrew T Powis, Igor D Kaganovich

HW6.00008

Plasma Oscillations of Partially Magnetized E×B Discharge with Multiple Ion SpeciesJinyoung Choi, Y. S. Hwang, Kyung-jae Chung, June Young Kim*

- HW6.00009 **Threshold for Switching the Dynamic Pressure Dependence of Plasma Propagation Velocity**
Kiyoyuki Yambe, Iwao Ohyama
- HW6.00010 **low frequency shocks with higher order effects in multicomponent plasma**
Rajneet Kaur, Geetika Slathia, N.S. Saini
- HW6.00011 **Optimization of a negative oxygen ion beam**
Jia Han, Philippe Guittienne, Alan Howling, Ivo Furno, Florent Plane, Anders Meibom, Johanna Marin Carbonne
- HW6.00012 **Study of propagation of nonlinear shock waves in a multicomponent beam plasma**
Geetika Slathia, N. S. Saini, Rajneet Kaur
- HW6.00013 **Collisional damping of surface ion-acoustic wave in semi-bounded plasmas**
Myoung-Jae Lee, Young-Dae Jung
- HW6.00014 **Atomic oxygen interaction with surface materials in oxygen-containing plasmas**
Pedro Viegas, Jorge Silveira, José Afonso, Ana Sofia Morillo-Candas, Luca Vialetto, Vasco Guerra
- HW6.00015 **Langmuir probe PIC dynamic simulation of collisional plasma**
Jakub Palacký, Štěpán Roučka
- HW6.00016 **Advances in IEDF Measurements by Lock-in Detection**
Christian Lütke Stetzkamp, Tsanko V Tsankov, Jonas Thiel, Nikita D Lepikhin, Uwe Czarnetzki
- HW6.00017 **Optical emission spectroscopy of water vapor plasma in DC reactive magnetron sputtering of Zn**
Allen Vincent B Catapang, Jose Gabriel F Abalos, James Edward II A Hernandez, Magdaleno Jr R Vasquez, Motoi Wada
- HW6.00018 **Production of metastable-state argon ions in an electron cyclotron resonance plasma investigated by laser-induced fluorescence spectroscopy**
Ryosuke Takahashi, Seiya Kito, Koji Eriguchi, Keiichiro Urabe
- HW6.00019 **Lamb dip spectrum in cavity ringdown spectroscopy at Balmer- α line of atomic hydrogen: toward sheath electric field measurement in plasmas**
Kimika Fushimi, Shusuke Nishiyama, Satoshi Tomioka, Koichi Sasaki
- HW6.00020 **Two-dimensional images of line integrated electron density for X-pinch plasmas using dark-field Schlieren and interferogram**
Seungmin Bong, H. J. Woo, Seunggi Ham, Jonghyeon Ryu, Kyoung-Jae Chung, Y. S. Hwang, Young-chul Ghim
- HW6.00021 **Development of asymmetric wireless double probe for two-dimensional measurement**
Taewung Hwang, Hyun-Dong Eo, Seong-Joon Park, Chin-Wook Chung
- HW6.00022 **Energy distribution function of substrate incident negative ions in DC magnetron sputtering of metal-doped ZnO target measured by magnetized retarding field energy analyzer**
Yoshinobu Matsuda, Shoma Uzunoe, Koki Watanabe

- HW6.00023 **Development of sensitive electric-field measurement method via electric-field-induced coherent anti-Stokes Raman scattering**
Takeru Koike, Hitoshi Muneoka, Kazuo Terashima, Tsuyohito Ito
- HW6.00024 **Measurements of Spatial profiles of electron density and EEDF in a positive air-streamer discharge using laser Thomson scattering**
Toma Miyazawa, Kentaro Tomita, Atsushi Komuro, Ryo Ono
- HW6.00025 **Characterization of a low power 13.56 MHz RF atmospheric pressure plasma source for ion mobility spectroscopy**
Keith Nealson N Penado, Allen Vincent B Catapang, James Edward II A Hernandez, Motoi Wada
- HW6.00026 **Spectral investigations of discharges on complex structured cathodes**
Roman W Schrittwieser, florin Enescu, Claudia T Konrad-Soare, Dan G Dimitriu, Codrina Ionita
- HW6.00027 **Investigation on the harmonic currents in an asymmetric double Langmuir probe when AC voltage is applied**
Hyundong Eo, Chin-Wook Chung, NaYeon Kim, JaeHwi Kim, HyoJun Choi, Jeonghyun Lee
- HW6.00028 **An Improved Calculation Scheme of Electron Flow in Propagator Method for Solving the Boltzmann Equation**
Tsukasa Kobayashi, Hirotake Sugawara, Kei Ikeda
- HW6.00029 **Best impedance matching seeking of capacitively coupled plasmas by numerical simulations**
Shimin Yu, Hao Wu, Zhijiang Wang, Wei Jiang, Ya Zhang
- HW6.00030 **Azimuthal structures and turbulent transport in Penning discharge**
Mikhail Tyushev, Mina Papahn Zadeh, Vedanth Sharma, Meghraj Sengupta, Yevgeny Raitses, Andrei Smolyakov
- HW6.00031 **Numerical Simulation of a High-Repetition Nanosecond Pulsed Glow Nitrogen Discharge Plasma**
Masayuki Iida, Yusuke Kikuchi
- HW6.00032 **Modeling of a (sub-)atmospheric pressure ns-pulsed plasma jet**
Jan Kuhfeld, Nikita D Lepikhin, Dirk Luggenhölscher, Uwe Czarnetzki, Zoltan Donko
- HW6.00033 **Particle-In-Cell Simulation for Electron Velocity Dispersion in a Vacuum Tube for RF-DC Conversion**
Maho Matsukura, Kohei Shimamura, Shigeru Yokota
- HW6.00034 **Computational fluid dynamics modelling of a post-discharge in low-temperature argon plasma jets**
Duarte Gonçalves, Stéphane Pasquiers, Joao Santos Sousa, Mário Lino da Silva, Luís L Alves
- HW6.00035 **Surface Diffusion of Adatom on Tungsten Material Evaluated by Density Functional Theory Calculation**
Arimichi Takayama, Atsushi M Ito
- HW6.00036 **Evaluation of microwave propagation control by plasma-metamaterial composite using pattern comparison**
Yota Noyori, Chui Inami, Alexandre Bambina, Shigeyuki Miyagi, Osamu Sakai

- HW6.00037 **Numerical simulation of atmospheric-pressure helium DC glow discharge considering gas dynamics**
Takaki Goto, Fumiyoshi Tochikubo, Yusuke Nakagawa
- HW6.00038 **High density plasma activated by resonance properties of metamaterials and measurements of spatial distribution of plasma parameters**
Takuya Mizutomi, Youhei Sanami, Shigeyuki Miyagi, Osamu Sakai
- HW6.00039 **Electron drift velocity in acetylene and carbon dioxide determined from rf breakdown curves**
Valeriy Lisovskiy, Stanislav Dudin, Pavlo Platonov, Vladimir Yegorenkov
- HW6.00040 **Investigating the plasma dynamics of capacitive discharges driven by pulsed radio-frequency (RF) at low-pressure using particle-in-cell simulation**
 Sarveshwar Sharma, Soham Banerjee, Peng Tian, Jason Kenney, Shahid Rauf, Dmytro Sydorenko, Alexander Khrabrov, Igor D Kaganovich, Andrew T Powis, Willca Villafana
- HW6.00041 **The influence of transverse magnetic field on the properties of a 13.56 MHz cylindrical CCRF device**
Swati Swati, Pawandeep Singh, Shantanu Karkari
- HW6.00042 **Spatial distributions of hydrogen RF discharge plasma using a hollow cathode with double toroidal grooves combined with magnets**
Yasunori Ohtsu, Hokuto Hiwatashi, Julian Schulze
- HW6.00043 **Enhancement of photoresist ashing by controlling the impedance between bias electrode and ground in an inductively coupled plasma**
You He, Chin-Wook Chung
- HW6.00044 **Modulation of IEADs by different bias waveforms in an ICP reactor: A fast hybrid simulation approach**
Ming-Liang Zhao, Jian-Kai Liu, Yu-Ru Zhang, You-Nian Wang
- HW6.00045 **Plasma Density Enhancement of an Electron Cyclotron Resonance Plasma with Pulse-biased stage**
Ikumi Hamaguchi, Kensuke Sasai, Haruka Suzuki, Hirotaka Toyoda
- HW6.00046 **Phase-resolved electron characteristics in a pulse-modulated RF plasma jet**
Sanghoo Park, Sung-Young Yoon
- HW6.00047 **Synthesis of ZnO Tetrapods by Atmospheric Pressure Microwave Plasma Jet and Their Enhanced Photocatalytic Performance**
 Goo-Hwan Jeong, Seong-Gyu Heo, Jong-Min Seo
- HW6.00048 **Quantification of molecular impurity ratio in high-pressure helium dielectric barrier discharge by laser absorption spectroscopy**
Keiichiro Urabe, Minami Toyoda, Yasunori Matsuoka, Koji Eriguchi
- HW6.00049 **TALIF Measurements of Spatial Distribution of Atomic Oxygen in Sub-Atmospheric Pressure Oxygen Discharges**
Jion Oogaki, Yusuke Nakagawa, Fumiyoshi Tochikubo
- HW6.00050 **Airflow impact on the collective behavior of microdischarges in DBD**
Azamat I Ashirbek
- HW6.00051 **Measurement of spatio-temporal behavior of surface electrical potential in a dielectric creeping discharge using Pockels effect**
Mami Ogata, Akira Ando

- HW6.00052 **Enhancing the Decomposition of Polluted Air Streams with Additional Metal Plates in a Multi-Electrode Twin Surface Dielectric Barrier Discharge System**
Arisa Bodnar, Alexander Böddecker, Lars Schücke, Peter Awakowicz, Andrew R. Gibson
- HW6.00053 **Calculation of SF₆ Gas Contamination Rate Caused by Gas Flow Velocity with Changing Function of Gas Bluster Angle in Double-Flow Gas Circuit Breaker**
Wataru Fuse, Yuki Suzuki, Honoka Morishita, Masahiro Takagi, Yusuke Nemoto, Zhenwei Ren, Gustilo C Reggie, Toru Iwao
- HW6.00054 **Analysis of Radiation Distribution Effected by Interelectrode Distance in Arc Lamps Using 3D Electromagnetic Three-Dimensional Electromagnetic Thermal Fluid Simulation**
Kazumasa Minamisawa, Taisei Kudo, Hiroto Suzuki, Yuki Suzuki, Honoka Morishita, Masahiro Takagi, Zhenwei Ren, Yusuke Nemoto, Gustilo C Reggie, Toru Iwao
- HW6.00055 **Calculation of Object Heating Affected by Radiation Distribution of Arc as Function of Current in Arc Lamp**
Taisei Kudo, Kazumasa Minamisawa, Hiroto Suzuki, Yuki Suzuki, Yusuke Nemoto, Zhenwei Ren, Gustilo C Reggie, Toru Iwao
- HW6.00056 **High Temperature Gas Reflection as Function of Distance between Arc and Wall in Sealed Arc Extinguishing Chamber**
Akira Kono, Zhenwei Ren, Honoka Morishita, Masahiro Takagi, Yuki Suzuki, Yusuke Nemoto, Gustilo C Reggie, Toru Iwao
- HW6.00057 **High-viscous Ar plasma generation for plasma window application to electron beam welding in atmosphere**
Ohshi Yanagi, Kosuke Okuda, Yuta Sunada, Junya Kono, Daisuke Mori, Ayumu Saito, Makoto Takagi, Noriyasu Ohno, Naoki Tamura, Yuki Hayashi, Yukinori Hamaji, Suguru Masuzaki, Hiroki Okuno, Kotaro Yamasaki, Shinichi Namba
- HW6.00058 **Carrier avalanche multiplication quenching and pulse width control of nonlinear gallium arsenide photoconductivity switches**
Wei Shi, Cheng Ma, Lei Hou, Yue Wang, Hong Liu, Liqiang Tian, Lei Yang, Meilin Wu, Zhiyuan Chen, Haiqing Wang, Zhiqun Wang, Zhi Jin
- HW6.00059 **The effect of radiation trapping on the ambient gas pressure in a stationary high-density He arcjet plasma**
Kosuke Okuda, Ohshi Yanagi, Yuta Sunada, Junya Kono, Daisuke Mori, Ayumu Saito, Makoto Takagi, Noriyasu Ohno, Naoki Tamura, Yuki Hayashi, Yukinori Hamaji, Suguru Masuzaki, Hiroki Okuno, Kotaro Yamasaki, Shinichi Namba
- HW6.00060 **Time Transition of Temperature Distribution in Cross Section of Contact Wire Contacted with Disconnection Arc on Its Surface**
Asuka Kawasaki, Honoka Morishita, Masahiro Takagi, Yuki Suzuki, Zhenwei Ren, Yusuke Nemoto, Gustilo C Reggie, Takamasa Hayasaka, Toru Iwao
- HW6.00061 **Absolute intensity of luminol chemiluminescence induced in vicinity of water surface irradiated with atmospheric pressure helium dc glow discharge**
Shogo Uebayashi, Toshiaki Miyazaki, Yoshinobu Inagaki, Naoki Shirai, Koichi Sasaki
- HW6.00062 **Numerical analysis of negative corona discharge from the tip of Taylor cone in electrospray**
Sohto Katsuno, Fumiyoshi Tochikubo, Yusuke Nakagawa

- HW6.00063 **Analysis of polymerization and nanoparticle formation in silane plasma by unsupervised learning method and statistics in complex chemical network**
Osamu Sakai, Yota Noyori, Takuya Mizutomi, Satoru Kawaguchi, Tomoyuki Murakami
- HW6.00064 **Kinetics of O and H radicals in a nanosecond pulsed He+H₂O pin-pin discharge**
Alexandra Brisset, Matthew S Bieniek, James L Walsh, Mohammad I Hasan, Erik Wagenaars
- HW6.00065 **Shock-Waves Generated-Plasmas-Discharges Gaseous Electronics: Electrical-Discharges(EDS) Principles/Devices/Glow-Discharges Applied-Voltage DC/Low-Frequency AC Cataphoresis-Applications: Gas-Lasers/ Electron-Beams/...**
E Carl-Ludwig Siegel, Norman March, Paul Butcher, Ruben Braunstein, Peter Franken, Walter Munk, Mario Molina, Colin Maiden, Sidney Green, Victor Gregson Jr.
- HW6.00066 **Update on Sandia National Laboratories Plasma Research Facility**
Shane M Sickafoose, Brian Z Bentz, Jonathan H Frank, Nils Hansen, Matthew M Hopkins, Christopher J Kliewer, Amanda M Lietz, Dirk van den Bekerom
- HW6.00067 **Surface Plasmon Resonance Excited by Super-aligned Multi-walled Carbon Nanotube Film Metasurfaces**
Yue Wang, Xiaoju Zhang, Zijian Cui, Xiang Zhang, Wei Shi
- HW6.00068 **A study on the generation and control of electron beams and ultra-low electrons temperature plasma using two DC-biased grids.**
Minseok Kim, Chin-Wook Chung
- HW6.00069 **Plasma cleaning of front-end optical mirrors of ITER diagnostic system using low-pressure high-frequency discharge**
Andrey Ushakov, Ad Verlaan, Eiichi Yatsuka, Corné Rijnsent, André Rijfers, Ulf Stephan, Olaff Steinke, Masahito Yokoyama, Lucas Moser, Michele Bassan, Matthew Maniscalco, Erik van Beekum, Takaki Hatae
- HW6.00070 **Etch Profile Analysis on Taper angle using Convolution Neural Network in Narrow Gap VHF+LF driven CCP**
Jihoon Park, Jaemin Song, Taejun Park, Sung Hyun Son, Hyunju Lee, Gon-Ho Kim
- HW6.00071 **Properties of vanadium oxide film prepared using pulsed magnetron sputtering**
Yoshinobu Takagi, Takashi Kimura
- HW6.00072 **Effect of Mixture Ratio of Ar Gas and C₂H₂ Gas on Gas-Injection Pulsed Plasma CVD Method for Ultra-High-Rate DLC Deposition**
Hikaru Ohhira, Naoto Nagata, Takahiro Bando, Hirofumi Takikawa, Toru Harigai, Shinsuke Kunitsugu, Hidenobu Gonda
- HW6.00073 **Investigation of atmospheric pressure nitrogen plasma assistance on mist CVD of zinc oxide thin films**
Hiroya Kobayashi, Keigo Takeda, Mineo Hiramatsu
- HW6.00074 **Plasma Uniformity and Stability in Large Area Intermediate Pressure Capacitive Coupled Plasma (CCP) Reactors with N₂/NH₃ Chemistry**
Emi Kawamura, Michael A Lieberman
- HW6.00075 **Low-Temperature Formation of High-Mobility IGZO Thin Films Transistors Fabricated with Plasma-Assisted Reactive Processes**
Yuichi Setsuhara, Hibiki Komatsu, Susumu Toko, Kosuke Takenaka, Akinori Ebe

- HW6.00076 **An Optical Emission Spectroscopic Study of Deep Oscillation Magnetron Sputtering of Titanium**
Eisuke Yokoyama, Masaomi Sanekata, Nobuo Nishimiya, Masahide Tona, Hiroaki Yamamoto, Keizo Tsukamoto, Kiyokazu Fuke, Keijiro Ohshimo, Fuminori Misaizu
- HW6.00077 **Pulsed microwave plasma coupled with MoO₃-based heterogeneous catalysts for nitrogen fixation**
Babak Sadeghi, Omid Samadi Bahnamiri, Marie-Paule Delplancke, Rony Snyders
- HW6.00078 **Study of ozone oxidation of dimethyl sulfide and surface analysis of iodine catalysts**
Yoshinori Mizuno, Ahmad Y Guji, Jaroslav Kristof, Eizo Murakami, Kazuo Shimizu
- HW6.00079 **Auto-methanation using plasma catalysis at room temperature**
Shuya Xu, Chunyuan Zhan, Tomohiro Nozaki, Hyun-Ha Kim
- HW6.00080 **Dependence of structure of carbon nanowalls anode electrode on property of lithium-ion batteries**
Jumma Kagami, Mineo Hiramatu, Keigo Takeda
- HW6.00081 **Polyaniline-Crystalline Rubrene nanosystem Synthesis by One-step Plasma Based Route: Application in Optoelectronics by Plasmonic Functionalization**
Deepshikha Gogoi
- HW6.00082 **Inhibition of recurrence of mouse melanoma B16F10 tumors in mice using streamer discharge**
Ryuichiro Ito, Atsushi Komuro, Hideyuki Yanai, Ryo Ono
- HW6.00083 **Molecular introduction into barley seed growth point using plasma**
Ryosuke Ueshima, Yuki Hamada, Yoshihisa Ikeda, Yugo Kido, Takashi Yaeno, Masafumi Jinno
- HW6.00084 **Inactivation of Breast Cancer Cells using Nitrogen-Oxygen-Radical-Activated Lactate Ringer's Solution**
Taiga Nishida, Naoyuki Iwata, Tomiyasu Murata, Hiromasa Tanaka, Masaru Hori, Masafumi Ito
- HW6.00085 **Plant disease suppression through the activation of plant immunity using N₂O₅ gas generated from air by atmospheric-pressure plasma device**
Daiki Tsukidate, Keisuke Takashima, Shota Sasaki, Shuhei Miyashita, Toshiro Kaneko, Hideki Takahashi, Sugihiko Ando
- HW6.00086 **Degradation of lignin model compounds using ambient-air glow discharge**
Ryuichi Ohashi, Naoyuki Iwata, Hiroyuki Kato, Motoyuki Shimizu, Masashi Kato, Masaru Hori, Masafumi Ito
- HW6.00087 **Investigation on Reaction of Plasma-generated Dinitrogen Pentoxide Gas with Amino Acids**
Yuto Oba, Shota Sasaki, Keisuke Takashima, Toshiro Kaneko
- HW6.00088 **Viscous reduction of carboxymethyl cellulose treated with ambient-air glow discharge using peristaltic pumps**
Kazuma Okamoto, Masahiro Maebayashi, Motoyuki Shimizu, Masashi Kato, Masaru Hori, Masafumi Ito

- HW6.00089 **Calcium Based Systemic Activation of Plant Defense by Exposure to Plasma-generated N_2O_5**
Hiroto Iwamoto, Shota Sasaki, Keisuke Takashima, Atsushi Higashitani, Masatsugu Toyota, Toshiro Kaneko
- HW6.00090 **Growth promotion of *Arabidopsis thaliana* using oxygen-radical-treated L-tryptophan solution**
Araki Shota, Tomomichi Ota, Hironaka Tsukagoshi, Naoyuki Iwata, Masaru Hori, Masafumi Ito
- HW6.00091 **Atmospheric pressure plasma generation at liquid interface for nitrogen fixation**
Ritsuki Fujita, Keisuke Takashima, Toshiro Kaneko
- HW6.00092 **Development of Gene Transfection Method Using Combined Plasma and Pulsed Electric Field in Liquid**
Ryosuke Honda, Shota Sasaki, Keisuke Takashima, Makoto Kanzaki, Takehiko Sato, Toshiro Kaneko
- HW6.00093 **Nitrogen fertilization effects of Plasma Generated Dinitrogen Pentoxide**
Shouki Takeshi, Keisuke Takashima, Shota Sasaki, Atsushi Higashitani, Toshiro Kaneko
- HW6.00094 **Spatiotemporal distribution measurements of ozone in the gas and liquid phases generated by non-equilibrium atmospheric pressure radical source**
Hiromi Alwi Yamamoto, Masaru Hori, Masafumi Ito
- HW6.00095 **Measurement of Reactive Species Produced by Discharge in Medium for Highly Efficient Gene Transfer**
Kazuki Oikawa, Shota Sasaki, Ryosuke Honda, Toshiro Kaneko
- HW6.00096 **Numerical modeling on cell death induction by low-temperature plasma**
Hayata Kanda, Tomoyuki Murakami
- HW6.00097 **Numerical modeling on the dynamic behavior of immune cells**
Chihiro Takazawa, Tomoyuki Murakami
- HW6.00098 **Characterization and Comparison of Atmospheric Pressure Plasma Sources for Medical and Biological Applications**
Sophia Gershman, Oliver Huang, Henry L Fetsch, Shurik Yatom, Yevgeny Raitses
- HW6.00099 **Effect of the magnetic field topology on azimuthal spoke oscillations in Hall thruster**
Yevgeny Raitses, Andrei Smolyakov
- HW6.00100 **High-enthalpy portable RF plasmatron for nonequilibrium flow analysis**
Andrey Starikovskiy
- HW6.00101 **Measurement of thrust induced by a water-fueled magnetron sputtering source**
Sota Shimizu, Kazunori Takahashi
- HW6.00102 **Numerical Simulations of the Plasma Dynamics in an ECR Thruster Experiment**
Subhasish Bag, Vikrant Saxena
- HW6.00103 **Plasma-CVD Enabling Seeded Growth of Nanocarbons from a Single Carbon-Nanoring**
Rikizo Hatakeyama, Hiroshi Ueno, Eunsang Kwon, Fuminori Misaizu

- HW6.00104 **Effects of minor addition of N₂/O₂ impurities on silicon nanostructure formation behavior in hydrogen plasma process**
Toshimitsu Nomura, Naoki Tamura, Ken Sakamoto, Hiroaki Kakiuchi, Hiromasa Ohmi
- HW6.00105 **Investigation of optical property of tungsten-doped zinc oxide films deposited by sputtering**
Sho Kakuta, Takeru Okada, Katsuyoshi Washio
- HW6.00106 **Elucidation of Ignition-Area Extension of Barrier Discharge under High Temperature and its Application to Precise Control of Nitridable Area**
Kaito Yakushiji, Saki Wakabayashi, Ryuta Ichiki, Kosuke Tachibana, Takashi Furuki, Seiji Kanazawa
- HW6.00107 **Synthesis of nanographene-Si composite material using gas-liquid interface plasma**
Kazushi Masuda, Keigo Takeda, Mineo Hiramatsu
- HW6.00108 **Comparative Study on Formation of Boride Thin Films Deposited by Co-sputtering with Molybdenum**
Kazuki Nashimoto, Yoshiko Horiguchi, Akichika Kumatani, Takeru Okada
- HW6.00109 **Infrared absorption spectroscopy of astronomically relevant reddish substances produced by cryoplasma irradiation of ice surface**
Shota Ide, Phua Yu Yu, Noritaka Sakakibara, Hitoshi Muneoka, Tsuyohito Ito, Kazuo Terashima
- HW6.00110 **Plasma Carburizing and Nitrocarburizing for Composite Austenitic Stainless Steel with Tungsten Carbide Fabricated by LMD**
Shinichiro Adachi, Takuto Yamaguchi, Keigo Tanaka, Nobuhiro Ueda
- HW6.00111 **Relationship between vibrational temperature and CO₂ methanation with plasma catalysis**
Susumu Toko, Taiki Hasegawa, Takamasa Okumura, Kunihiro Kamataki, Kosuke Takenaka, Kazunori Koga, Masaharu Shiratani, Yuichi Setsuhara
- HW6.00112 **Plasma application to the fabrication of solid photocatalysts**
Muneaki Yamamoto, Tetsuo Tanabe
- HW6.00113 **Extraordinary field emission of diamond film developed by microwave plasma jet chemical vapor deposition**
Chun-Yu Lin, Jing-Shyang Yen, Kaviya Aranganadin, Chi-Wen Liu, Chii-Ruey Lin, Jwo-Shiun Sun, Hua-Yi Hsu, Ming-Chieh Lin

Thursday, October 6th, 2022

8:00AM - 9:30AM

Room: Tachibana

DR1 Model Validation & Verification

Chair: Kallol Bera (*Applied Materials, Inc.*)

DR1.00001
8:00AM - 8:15AM

Simulation of an inductively coupled RF discharge using fluid moment models

Alejandro Alvarez Laguna, Adnan Mansour, Yusuke Yamashita, Kentaro Hara, Benjamin Esteves, Anne Bourdon, Pascal Chabert

DR1.00002
8:15AM - 8:30AM

Coupling Finite Element and Finite Volume within the Plasma Fluid Code: Zapdos

Corey Dechant, Casey T Icenhour, Grayson Gall, Shane Keniley, Alexander D Lindsay, Davide Curreli, Steven Shannon

DR1.00003
8:30AM - 8:45AM

Important role of excited state atoms in low pressure capacitive rf argon discharges

De-Qi Wen, Janez Krek, Jon T Gudmundsson, Emi Kawamura, Michael A Lieberman, Peng Zhang, John P Verboncoeur

DR1.00004
8:45AM - 9:00AM

Space-charge limited current flow: An analytical verification solution for kinetic and fluid simulations

Trevor Lafleur

DR1.00005
9:00AM - 9:15AM

Benchmarking between fluid and global models for low-pressure oxygen DC glow discharges

Pedro Viegas, Dmitry Voloshin, Tiago C Dias, Chloé Fromentin, Tiago Silva, Alexander Chukalovsky, Yuri Mankelevich, Tatyana Rakhimova, Vasco Guerra

DR1.00006
9:15AM - 9:30AM

Simulation benchmarks of the XPDP1 PIC-MCC code on capacitively coupled plasma helium discharges

Guoning Wang, Kaviya Aranganadin, Hua-Yi Hsu, John P. Verboncoeur, Ming-Chieh Lin

8:00AM - 9:30AM

Room: Hagi

ER1 Thermal and Arc Plasma II

Chair: Masaya Shigeta (*Tohoku University*)

ER1.00001
8:00AM - 8:15AM

Numerical Simulation of Time Evolution of Cathode Sheath Voltage Contributing to Evaporation of Fe Cathode in Vacuum Arc

Masahiro Takagi, Hiroto Suzuki, Honoka Morishita, Yuki Suzuki, Yusuke Nemoto, Zhenwei Ren, Reggie C Gustilo, Toru Iwao

ER1.00002
8:15AM - 8:30AM

Investigation of the electro-thermal dynamics of a low pressure DC plasma spray torch

Ram K Mohanta

October
6th

- ER1.00003
8:30AM - 9:00AM
Generation of stationary high-density cascade arc plasmas and its application to plasma windows
Invited Speaker [Shinichi Namba](#)
- ER1.00004
9:00AM - 9:15AM
Arc resistance increasing during DC interruption using SiO₂/Si₃N₄ mixture powder as arc interruption medium
[Naoto Kodama](#), Yasunobu Yokomizu, Waku Takenaka, Kaito Hasegawa
- ER1.00005
9:15AM - 9:30AM
Bidirectional vortex stabilization of a supersonic ICP torch
[Ashley Pascale](#), Trevor Lafleur, Cormac Corr

8:00AM - 9:30AM

Room: Shirakashi 1

FR1 Magnetron Plasmas

Chair: Yevgeny Raitses (*Princeton Plasma Physics Laboratory*)

- FR1.00001
8:00AM - 8:30AM
Electron power absorption in magnetron sputtering discharges
Invited Speaker [Bocong Zheng](#)
- FR1.00002
8:30AM - 8:45AM
Modeling of high power impulse magnetron sputtering (HiPIMS) discharges with graphite target
Henrik Eliasson, Martin Rudolph, Kateryna Barynova, Nils Brenning, Michael A Raadu, Hamidreza Hajihoseini, Tiberiu M Minea, Daniel Lundin, [Jon T Gudmundsson](#)
- FR1.00003
8:45AM - 9:00AM
Study of ac magnetically enhanced capacitively coupled plasma argon discharges using particle-in-cell simulations
Kaviya Aranganadin, Guoning Wang, Hua-Yi Hsu, John P. Verboncoeur, [Ming-Chieh Lin](#)
- FR1.00004
9:00AM - 9:15AM
Electron energization via E×B drift generation in rf magnetrons operated at a low pressure
[Denis Eremin](#), Birk Berger, Jens Kallähn, Kevin Köhn, Dennis Krueger, Liang Xu, Peter Awakowicz, Julian Schulze, Ralf Peter Brinkmann
- FR1.00005
9:15AM - 9:30AM
Formation and sustainment of spokes in planar dc magnetrons
[Denis Eremin](#), Liang Xu, Jens Kallaehn, Kevin Koehn, Dennis Krueger, Ralf Peter Brinkmann

8:00AM - 9:30AM

Room: Shirakashi 2

GR1 Plasma Propulsion I

Chair: Kazuma Emoto (*Yokohama National University*)

- GR1.00001
8:00AM - 8:15AM
Plasma Creation and Evaluation of Flight Performance on Multi-parabola Laser Thruster Propelled by Repetitive Pulses
[Yuya Hayadate](#), Masayuki Takahashi, Koichi Mori
- GR1.00002
8:15AM - 8:30AM
Effect of Flow Velocity on Generation Conditions of Argon LSP using Diode Laser
[Seiichiro Takano](#), Kota Okamoto, Yamato Homme, Makoto Matsui

GR1.00003
8:30AM - 8:45AM

Electron properties comparison of microwave cathode and hollow cathode by incoherent laser Thomson scattering

Takuya Koiso, Yusuke Yamashita, Ryudo Tsukizaki, Kazutaka Nishiyama

GR1.00004
8:45AM - 9:00AM

Beam Focusing Performance of Microwave-Driven In-Tube Accelerator

Toshiki Yamada, Masayuki Takahashi, Kohei Shimamura

GR1.00005
9:00AM - 9:15AM

Investigation of Generating Conditions of Fiber Laser-Sustained Plasma using Argon

Kota Okamoto, Seiichiro Takano, Yamato Homme, Makoto Matsui

GR1.00006
9:15AM - 9:30AM

Numerical modeling and evaluation of 8.2-GHz microwave electrothermal thruster (MET) performance using atomic and molecular gases

Juyeon Lee, Laxminarayan L Raja

8:00AM - 9:30AM

Room: Sakura 2

IR1

Plasma Liquid Interaction I

Chair: Wonho Choe (KAIST, Korea)

IR1.00001
8:00AM - 8:15AM

Analysis of Key Factor of Higher Hydrogen Peroxide Production Performance of Diaphragm Discharge Plasma Based on Time-Resolved Observation

Taichi Watanabe, Shungo Zen, Nozomi Takeuchi

IR1.00002
8:15AM - 8:30AM

Analysis of OH Emission Spectra Using Deep Learning

Shuhei Takamatsu, Kenichi Inoue, Hitoshi Muneoka, Tsuyohito Ito, Kazuo Terashima

IR1.00003
8:30AM - 8:45AM

Ultrafast x-ray phase contrast imaging of pulsed plasma initiation in water and hydrocarbons

Mirza R Akhter, Christopher S Campbell, Kamel Fezzaa, Samuel J Clark, Zhehui Wang, David Staack

IR1.00004
8:45AM - 9:00AM

Electrical Properties of Plasma Formation in Organic Solution and the Structure of the Resulting Carbon Material

Niu Jiangqi, Chayanaphat Chokradjaroen, Nagahiro Saito

IR1.00005
9:00AM - 9:15AM

Imaging Electric Breakdown over the Rise and Fall of ns Pulses in Water and Free-flowing Bubbles

Nicholas L Sponse, Sophia Gershman, Maria J Herrera Quesada, Jacob T Mast, Katharina Stapelmann

IR1.00006
9:15AM - 9:30AM

Plasmas-in-Liquids heating in a mm-sized bubbles multiphase thermochemical reactor

Ahmed M Hala

October 6th

DR2 Plasma Surface Interaction III**Chair:** Shinya Kumagai (*Meijo University*)

- DR2.00001**
10:00AM - 10:30AM
The interplay of surface processes and negative ions in radio-frequency driven oxygen and hydrogen plasmas
Invited Speaker [Timo Gans](#)
- DR2.00002**
10:30AM - 10:45AM
Investigation of oxygen permeation enhancement with He/O₂ plasma and SOEC interaction
[Richard van de Sanden](#), Xingyu Chen, Floran Peeters, Felix Smits, Waldo Bongers
- DR2.00003**
10:45AM - 11:00AM
Propagation of Ionization Waves on Dielectric Substrates in Atmospheric Pressure Plasma Jets (APPJ)
[Joshua Morsell](#), Kseniia Konina, Mark J Kushner, Steven Shannon
- DR2.00004**
11:00AM - 11:15AM
An in-situ technique for the estimation of surface coefficients based on characteristics in the ion energy distribution of capacitively coupled plasmas
[Christian Schulze](#), Zoltan Donko, Jan Benedikt
- DR2.00005**
11:15AM - 11:30AM
Hydrogen accumulation and surface bubbling of liquidized Sn-Bi-Li-Er alloy under hydrogen plasma exposure
[Kota Tamura](#), Haruka Suzuki, Junichi Miyazawa, Suguru Masuzaki, Masayuki Tokitani, Hirotaka Toyoda
- DR2.00006**
11:30AM - 11:45AM
Plasmonic plasma process for low temperature growth of high-quality ultra-thin dielectric films
[Takeshi Kitajima](#), Kazuyasu Watanabe, Mahiko Miyake, Toshiki Nakano
- DR2.00007**
11:45AM - 12:00PM
Atmospheric Pressure Plasma with Micro Interdigitated Electrode for Polymer Surface Modification.
[Yoshito Manabe](#), Kaishu Imanaka, Tatsuru Shirafuji, Jun-Seok Oh

ER2 Plasma Etching**Chair:** Hirotaka Toyoda (*Nagoya University*)

- ER2.00001**
10:00AM - 10:15AM
Low Bias Frequencies for High Aspect Ratio Plasma Etching
[Evan Litch](#), Hyunjae Lee, Sang Ki Nam, Mark J Kushner
- ER2.00002**
10:15AM - 10:30AM
Effects of the focus ring on uniformity in capacitively coupled plasma etching reactors
[Fang-Fang Ma](#), Quan-Zhi Zhang, Jing-Yu Sun, You-Nian Wang
- ER2.00003**
10:30AM - 10:45AM
Development of validated fluorocarbon plasma chemistry for multi-dimensional modeling of semiconductor plasma etch processes
Invited Speaker [Dmitry Levko](#)

- ER2.00004
11:00AM - 11:15AM
Development of virtual metrology using plasma information to predict mask shape in HAR etch process
Jaemin Song, Namjae Bae, Jihoon Park, Taejun Park, Ji-Won Kwon, Sangwon Ryu, Ingyu Lee, Gon-Ho Kim
- ER2.00005
11:15AM - 11:30AM
Electron-assisted photoresist etching in an inductively coupled oxygen plasma via low-energy electron beam
Jiwon Jung, Chin-Wook Chung
- ER2.00006
11:30AM - 11:45AM
Ar plasma nanostructuring of PTFE for the wettability transition from hydrophobic to superhydrophobic and hydrophilic surfaces
Vivek Pachchigar, Umesh K Gaur, Sooraj K. P., Sukriti Hans, Mukesh Ranjan
- ER2.00007
11:45AM - 12:00PM
Achieving selective etching of SiN and SiO₂ over amorphous carbon during CF₄/H₂ by controlling substrate temperature
Shih-Nan Hsiao, Thi-Thuy-Nga Nguyen, Takayoshi Tsutsumi, Kenji Ishikawa, Makoto Sekine, Masaru Hori

10:00AM - 12:00PM

Room: Shirakashi 1

FR2 Low Pressure Plasmas

Chair: Kazunori Takahashi (*Tohoku University*)

- FR2.00001
10:00AM - 10:30AM
Instabilities and turbulent processes in low-temperature magnetized plasmas
Invited Speaker Kentaro Hara
- FR2.00002
10:30AM - 10:45AM
Initial Characterization of the EEDF of an ECR-based Plasma Cathode Operating on Molecular Gases
Anil Bansal, John E Foster, Michael S McDonald
- FR2.00003
10:45AM - 11:00AM
Analyses of enhancement of energy deposition to electrons by partial resonance in an inductively coupled plasma under confronting divergent magnetic fields
Ryota Okazaki, Hirotake Sugawara
- FR2.00004
11:00AM - 11:15AM
Diagnosing hydrogen plasma in a high power helicon device
Campbell Strachan
- FR2.00005
11:15AM - 11:30AM
Surrogate models of capacitively-coupled plasmas by machine learning
Kazumasa Ikuse, Masakazu Ichikawa, Kuan-Lin Chen, Jong-Shinn Wu, Fatima Jenina T Arellano, Zoltan Donko, Satoshi Hamaguchi
- FR2.00006
11:30AM - 11:45AM
Study of the collisional effects and increasing perpendicular magnetic field on the expansion of a laser produced plasma.
Zachary K White, Gabe Xu
- FR2.00007
11:45AM - 12:00PM
Novel Transport Properties of Strongly Magnetized Plasmas
Scott D Baalrud, Louis Jose, Trevor Lafleur

GR2 Atomic and Molecular PhysicsChair: Alisher Kadyrov (*Curtin University, Australia*)GR2.00001
10:00AM - 10:30AM**Atomic and Molecular data activities at the IAEA in support of nuclear fusion energy research****Invited Speaker** [Christian Hill](#)GR2.00002
10:30AM - 11:00AM**Positron binding in molecules****Invited Speaker** [Masanori Tachikawa](#)GR2.00003
11:00AM - 11:15AM**Ab initio Electron-scattering data for perfluorocyclobutane (c-C₄F₈)**[Harindranath B Ambalampitiya](#), [Sebastian Mohr](#), [Anna Dzarasova](#), [Jonathan Tennyson](#)GR2.00004
11:15AM - 11:30AM**Calculations of positron scattering from atomic Carbon**[Nicolas Mori](#), [Igor Bray](#), [Dmitry V Fursa](#)GR2.00005
11:30AM - 12:00PM**Low-Temperature Lanthanide Spectroscopy Applied to Neutron Star Mergers****Invited Speaker** [Christopher J Fontes](#)**IR2 Plasma Liquid Interaction II**Chair: Nozomi Takeuchi (*Tokyo Institute of Technology*)IR2.00001
10:00AM - 10:30AM**Electric wind and water surface stabilization under impingement of an atmospheric pressure plasma jet****Invited Speaker** [Wonho Choe](#)IR2.00002
10:30AM - 10:45AM**Change in surface tension of water in atmospheric pressure plasma-liquid interaction**[Naoki Shirai](#), [Yuto Takamura](#), [Takuma Kaneko](#), [Koichi Sasaki](#)IR2.00003
10:45AM - 11:00AM**Atmospheric Pressure Plasma in Contact with High-speed Water Flow for Evaluating Liquid-phase OH Transport**[Kazuki Takeda](#), [Shota Sasaki](#), [Keisuke Takashima](#), [Toshiro Kaneko](#)IR2.00004
11:00AM - 11:15AM**Detection of pulsed current induced by laser-induced desolvation of hydrated electrons in water jet immersed in low-pressure plasma**[Yoshinobu Inagaki](#), [Koichi Sasaki](#)IR2.00005
11:15AM - 11:30AM**Plasma self-organization in DC discharges with liquid anode: effect of electrode separation, liquid type and working gas**[Bhagirath Ghimire](#), [Gabe Xu](#), [Vladimir I Kolobov](#)IR2.00006
11:30AM - 11:45AM**Plasma Discharge Morphology in a Thin Stream Packed Bed DBD with Turbulence Effects**[Roxanne Z Pinsky](#), [John E Foster](#)

HR3 Student Networking**Chair:** Takeru Okada (*Tohoku University*)HR3.00001
12:00PM - 1:30PM**Student Networking**
Takeru Okada, Hidemasa Takana**DR4 Plasma Propulsion II****Chair:** Naofumi Ohnishi (*Tohoku University*)DR4.00001
1:30PM - 1:45PM**Data-Driven Estimation of Electrical Facility Effects on Anomalous Electron Transport in Hall Effect Thrusters**Daniel E Troyetsky, Christine Greve, Sedina Tsikata, Kentaro HaraDR4.00002
1:45PM - 2:00PM**Implementation of a xenon collisional radiative model with neural network for non-invasive determination of plasma parameters in Hall effect thrusters**Tarek Ben Slimane, Alexandre Leduc, Loic Schiesko, Anne Bourdon, Pascal ChabertDR4.00003
2:00PM - 2:30PM**Radiofrequency plasma thrusters and related studies****Invited Speaker** Christine CharlesDR4.00004
2:30PM - 2:45PM**Effect of electron-neutral collisions on plasma transport enhancement by kinetic instability in a Hall-effect thruster**Naoki Tsunozawa, Masayuki TakahashiDR4.00005
2:45PM - 3:00PM**Investigation of cross-field electron transport in Hall Effect Thrusters using 1D axial PIC/MCC simulation**Yusuke Yamashita, Kentaro HaraDR4.00006
3:00PM - 3:15PM**Facility Effects Associated with Ion Beam Neutralization**Tyler Topham, John E FosterDR4.00007
3:15PM - 3:30PM**Investigation of ion back flow by Hybrid-PIC simulation considering experimental current density distribution at the conductive surface for microwave discharge ion thruster**Ayumu Nono, Yusuke Yamashita, Ryudo Tsukizaki, Kazutaka Nishiyama

ER4 Capacitively Coupled Plasmas II**Chair:** Li Wang (*Ruhr University Bochum, Germany*)ER4.00001
1:30PM - 1:45PM**Experimental and computational study of the electron power absorption in capacitively coupled neon-oxygen plasmas**Aranka Derzsi, Peter Hartmann, Mate Vass, Benedek Horvath, Marton Gyulai, Ihor Korolov, Julian Schulze, Zoltan DonkoER4.00002
1:45PM - 2:00PM**Effect of voltage waveform tailoring and an additional 60 MHz frequency on the ion flux energy distribution function in a low pressure capacitively coupled radio frequency plasma**Gerrit Hübner, Ihor Korolov, Stefan Ries, Soheil Karimi Aghda, Jochen M Schneider, Jan Trieschmann, Thomas Mussenbrock, Julian Schulze, Peter Awakowicz, Tobias GergsER4.00003
2:00PM - 2:15PM**Stratification of Capacitively Coupled Plasma in Noble Gases**Vladimir I Kolobov, Robert ArslanbekovER4.00004
2:15PM - 2:30PM**The mechanism of frequency coupling in low pressure dual-frequency capacitively coupled plasmas revisited based on the Boltzmann term analysis**Máté Vass, Li Wang, Sebastian Wilczek, Trevor Lafleur, Ralf Peter Brinkmann, Zoltan Donko, Julian SchulzeER4.00005
2:30PM - 2:45PM**Pressure dependence on spatio-temporal distribution of excitation rates of Ar 2p_i and Ne 2p_i in Ar and Ar/Ne capacitively coupled plasmas**

Michihiro Otaka, Toshiaki Arima, Jian-syun Lai, Kizuki Ikeda, Kunihiro Kamataki, Naoto Yamashita, Takamasa Okumura, Naho Itagaki, Kazunori Koga, Masaharu Shiratani

ER4.00006
2:45PM - 3:00PM**Generation of surface modes and plasma uniformity in VHF CCP reactors studied with a EM PIC code**Denis Eremin, Efe Kemaneci, Masaaki Matsukuma, Thomas Mussenbrock, Ralf Peter BrinkmannER4.00007
3:00PM - 3:15PM**Current and voltage (I-V) characteristics of intermediate pressure plasma**
Shadhin Hussain, Matthew GoecknerER4.00008
3:15PM - 3:30PM**Wave Characteristics in E×B Source: Pressure-Dependent Evolution of Plasma Oscillation Phenomena**June Young Kim, Cheongbin Cheon, Jinyoung Choi, Y. S. Hwang, Kyoung-Jae Chung, Hae June Lee**FR4 Gas Phase Plasma Chemistry****Chair:** Hiroshi Akatsuka (*Tokyo Institute of Technology*)FR4.00001
1:30PM - 2:00PM**Control of reactive species formation in atmospheric pressure plasmas using pulsed power deposition****Invited Speaker** Andrew R Gibson

FR4.00002
2:00PM - 2:30PM

The Promise of Data-Driven Methods for Characterization, Diagnostics and Control of Plasma Processing of Complex Surfaces

Invited Speaker [Ali Mesbah](#)

FR4.00003
2:30PM - 2:45PM

Controlling O₃ production in low-temperature He+O₂ atmospheric-pressure plasmas using tailored voltage waveforms

Ben Harris, [Erik Wagenaars](#)

FR4.00004
2:45PM - 3:00PM

Selectivity Control in an Atmospheric Pressure Plasma Source for Point-of-Use Water Disinfection

[Chelsea M Tischler](#), Roxanne Z Pinsky, John E Foster

FR4.00005
3:00PM - 3:15PM

Plasma-assisted Deflagration to Detonation Transition of Dimethyl Ether in a Microchannel

[Madeline Vorenkamp](#), Scott Steinmetz, Timothy Chen, Andrey Starikovskiy, Christopher J Kliwer, Yiguang Ju

1:30PM - 3:30PM

Room: Shirakashi 2

GR4

Modeling - New Algorithms and Machine Learning

Chair: Satoshi Hamaguchi (*Osaka University*)

GR4.00001
1:30PM - 1:45PM

High-order moment closure for partially-ionized plasmas

[Alejandro Alvarez Laguna](#), Kentaro Hara

GR4.00002
1:45PM - 2:00PM

Development of a 10-Moment Multi-Fluid Model for Low-Temperature Magnetized Plasmas

[Derek Kuldinow](#), Kentaro Hara

GR4.00003
2:00PM - 2:15PM

Recent progress on asymptotic preserving finite-volume methods for fluid models in low-temperature partially-magnetized plasma applications involving instabilities.

[Louis Reboul](#), Alejandro Alvarez Laguna, Anne Bourdon, Marc Massot

GR4.00004
2:15PM - 2:30PM

Plasma Chamber Design Method Combined with Plasma Deep Learning Model and Optimization Algorithm

[JungMin Ko](#), Jinkyu Bae, Byungjo Kim, Hyunjae Lee, Younghyun Jo, Sangki Nam

GR4.00005
2:30PM - 2:45PM

Exploring Physics Informed Neural Networks for Solving an Anisotropic Diffusion Equation Arising in Plasma Kinetics

Vladimir I Kolobov, [Lucius Schoenbaum](#)

GR4.00006
2:45PM - 3:00PM

An Open Source, Three-Dimensional, Kinetic Code for Modelling Low-Temperature Plasmas on Modern Supercomputing Architectures

[Andrew T Powis](#), Johan A Carlsson, Stephane A Ethier, Alexander Khaneles, Grant Johnson, Maxwell Rosen, Igor D Kaganovich

GR4.00007
3:00PM - 3:15PM

N-body charged particle simulation in two- and three-dimensional systems

[Yasutaro Nishimura](#)

GR4.00008
3:15PM - 3:30PM

The LibOn Kinetics Monte Carlo solver

[Tiago C C Dias](#), Antonio Tejero-del-Caz, Luis L Alves, Carlos D Pintassilgo, Vasco Guerra

October
6th

IR4 Plasma Liquid Interaction III**Chair:** Naoki Shirai (*Hokkaido University*)

- IR4.00001**
1:30PM - 2:00PM
Generating enhanced chemical reactions inside highly charged microscale droplets for remote delivery of reactive radicals and high purity nanomaterials
Invited Speaker Paul Maguire
- IR4.00002**
2:00PM - 2:15PM
Analyses of chemical reactions in plasma generated within humid oxygen bubbles with highly concentrated ozone
Nozomi Takeuchi, Ryota Kazama, Taichi Watanabe, Shungo Zen
- IR4.00003**
2:15PM - 2:30PM
Measurement of Radicals Generated by Plasma in Contact with Dilute Sulfuric Acid by Using Electron Spin Resonance (ESR) Method
Kosuke Tachibana, Nao Murata, Kaede Saito, Seiji Kanazawa, Katsuyuki Takahashi, Junko Hieda, Nozomi Takeuchi, Oi Lun Li
- IR4.00004**
2:30PM - 2:45PM
Creation of reaction species by an atmospheric pressure plasma jet when treating liquids
Nikola Skoro, Olivera Jovanović, Anđelija Petrović, Gordana Malović, Nevena Puac
- IR4.00005**
2:45PM - 3:00PM
Numerical simulation of chemical reactions in PBS-like solution exposed to atmospheric-pressure plasmas
Enggar Alfianto, Kazumasa Ikuse, Zoltan Donko, Satoshi Hamaguchi
- IR4.00006**
3:00PM - 3:15PM
Experimental study of the plasma chemistry in atmospheric pressure plasma contacts with dilute sulfuric acid
Siqi Deng, Nozomi Takeuchi, Junko Hieda, Katsuyuki Takahashi, Kosuke Tachibana, Oi Lun Li
- IR4.00007**
3:15PM - 3:30PM
Polymerization of EDOT on H₂O by DBD treatment
Tomohiro Okamoto, Tatsuru Shirafuji, Jun-Seok Oh

DR5 Optical Diagnostics**Chair:** Holger Kersten (*Kiel University, Germany*)

- DR5.00001**
4:00PM - 4:15PM
Coupled Electrical and Optical Characterization of Electrostatic Discharges
Claudia A Schrama, Sarah Hinnegan, Jonathan Barolak, Daniel Adams, Alex Wilhelm, Charles G Durfee
- DR5.00002**
4:15PM - 4:30PM
Locally-resolved temperature and electron number density measurements in the VKI inductively-coupled plasma wind tunnel
Andrea Fagnani, Diana Luis, Damien Le Quang, Alan Viladegut, Bernd Helber, Olivier Chazot
- DR5.00003**
4:30PM - 5:00PM
Optical Emission Spectroscopy Measurement for Plasma Parameter Identification — from Kinetic Modeling to Data Science
Invited Speaker Hiroshi Akatsuka

DR5.00004
5:00PM - 5:15PM

Spatially and temporally resolved Optical Emission Spectroscopy of a nanosecond Atmospheric Pressure Plasma Jet

Nikita D Lepikhin, Jan Kuhfeld, Zoltán Donkó, Dirk Luggenhölscher, Uwe Czarnetzki

DR5.00005
5:15PM - 5:30PM

Diagnostics of Electron Density and Temperature of Atmospheric Pressure Helium Plasma with Revise Collisional-Radiative Model Includes Atomic Collision Processes

Keren Lin, Atsushi Nezu, Hiroshi Akatsuka

DR5.00006
5:30PM - 5:45PM

Spectroscopic characterization of a He/N₂ dielectric barrier discharge for determination of plasma parameters and estimation of impurity content

Niklas Nawrath, Gregor Welling, Nikita Bibinov, Peter Awakowicz, Andrew R Gibson

DR5.00007
5:45PM - 6:00PM

Imaging of Hydrogen Peroxide and Methyl in Nanosecond Pulsed Plasmas by Photofragmentation Laser-Induced Fluorescence

Dirk van den Bekerom, Caleb Richards, Malik M Tahiyat, Erxiong Huang, Igor V Adamovich, Tanvir I Farouk, Jonathan H Frank

4:00PM - 6:00PM

Room: Hagi

ER5 Jets and Gliding Arcs

Chair: Zuka-ul-Islam Mujahid (*Ruhr University Bochum, Germany*)

ER5.00001
4:00PM - 4:15PM

N₂ vibrational kinetics in near atmospheric pressure nanosecond-pulsed plasma jet: simulations validated against measurements

Youfan He, Jan Kuhfeld, Nikita D Lepikhin, Dirk Luggenhoelscher, Uwe Czarnetzki, Vasco Guerra, Ralf Peter Brinkmann, Andrew R Gibson, Efe Kemaneci

ER5.00002
4:15PM - 4:30PM

Optical diagnostic and reactive species characterization of atmospheric pressure argon plasma jet under various operating conditions

Pnsnr R Srikar, Shaik Mahamad Allabakshi, Shihabudheen M Maliyekkal, Reetesh K Gangwar

ER5.00003
4:30PM - 4:45PM

Investigation of multi-periodic self-trigger plasma in a AC-driven Atmospheric Pressure Plasma Jet

Hang Yang, Antoine Rousseau

ER5.00004
4:45PM - 5:00PM

O₂ influence on the spatio-temporal density of Ar(1s_g) in micro-plasma jets with varying shieldings

Duarte Gonçalves, Gérard Bauville, Pascal Jeanney, Luis L Alves, Mário Lino da Silva, João Santos Sousa, Stéphane Pasquiers

ER5.00005
5:00PM - 5:15PM

Influence of Voltage Pulse Off-Time on the Discharge Characteristics in Surface-Launched Plasma Bullets

Koki Sasaki, Atsumu Matsumoto, Jun-Seok Oh, Tatsuru Shirafuji

ER5.00006
5:15PM - 5:30PM

Experiments and numerical simulation on the plasma bullets launched vertically from a dielectric surface

Tatsuru Shirafuji, Jun-Seok Oh

ER5.00007
5:30PM - 5:45PM

Properties of an atmospheric He-based nanosecond jet discharge

Nikolay Britun, Peterraj Dennis Christy, Vladislav Gamaleev, Shih-Nan Hsiao, Masaru Hori

ER5.00008
5:45PM - 6:00PM

Micro electric fields detection improvements: Steps toward tailoring cold atmospheric pressure plasma

Stephan Reuter

4:00PM - 6:00PM

Room: Shirakashi 1

FR5

Modeling - Plasma Processing and Chemistry II

Chair: Margherita Altin (*Maastricht University*)

FR5.00001
4:00PM - 4:15PM

Two and Three Dimensional Inductive Coupled Plasma Remote Source Modeling with Single and Gas mixtures with Experimental Validation

Abhra Roy, Shawming Ma, Luke Zhang, Yun Yang

FR5.00002
4:15PM - 4:30PM

Kinetic Study of Effects of RF Pulsing in Dual Frequency Capacitively Coupled Plasma

Abhishek Verma, Kallol Bera, Shahid Rauf, Dmytro Sydorenko, Igor D Kaganovich, Willca Villafana

FR5.00003
4:30PM - 5:00PM

Insights from Modeling Low-Pressure High-Voltage Dual-Frequency Capacitively Coupled Plasmas

Invited Speaker Amanda M Lietz

FR5.00004
5:00PM - 5:15PM

Particle-in-Cell Techniques for Simulations of Magnetron Sputtering

Joseph G Theis, Gregory R Werner, Thomas G Jenkins, Daniel Main, John R Cary

FR5.00005
5:15PM - 5:30PM

Hybrid Plasma Modeling of Low-Pressure Oxygen Plasma in Capacitively Coupled Plasma Reactors

Sathya S Ganta, Han Luo, Shahid Rauf, Kallol Bera

FR5.00006
5:30PM - 5:45PM

Hybrid Plasma Simulation of RF Hollow Cathode Discharge at Moderate Pressure

Kallol Bera, Abhishek Verma, Sathya S Ganta, Shahid Rauf, Ken Collins

FR5.00007
5:45PM - 6:00PM

Modelling of a Toroidal Wave Heated Plasma Source for the Remote Generation of Neutral Radicals

Scott J Doyle, Amanda M Larson, Guy Rosenzweig, Keith Koai, Mark J Kushner

4:00PM - 6:00PM

Room: Shirakashi 2

GR5

Diamond Like Carbon Deposition

Chair: Kunihiro Kamataki (*Kyushu University*)

GR5.00001
4:00PM - 4:15PM

Effect of pulse width on deposition of diamond-like carbon on high power pulsed magnetron sputtering

Takayuki Ohta, Jo Matsushima, Sota Okumura, Akinori Oda, Hiroyuki Kousaka

GR5.00002
4:15PM - 4:30PM

Gas phase diagnostics on high power pulsed magnetron sputtering using double-pulse target-voltage

Hiro Kunieda, Akinori Oda, Kousaka Hiroyuki, Ohta Takayuki

GR5.00003
4:30PM - 4:45PM

Effect of xenon gas on deposition of diamond-like carbon film using high power pulsed magnetron sputtering

Keita Takeda, Akinori Oda, Hiroyuki Kousaka, Ohta Takayuki

GR5.00004
4:45PM - 5:00PM

Deposition of hydrogenated diamond-like carbon using high power impulse magnetron sputtering

Sota Okumura, Akinori Oda, Hiroyuki Kousaka, Takayuki Ohta

GR5.00005
5:00PM - 5:15PM

Optimization of hexagonal boron nitride deposition by micro hollow cathode discharge

Claudia Lazzaroni, Alice Remigy, Manoel Jacquemin, Vianney Mille, Ovidiu Brinza, Xavier Aubert, Swaminathan Prasanna, Kristaq Gazeli, Guillaume Lombardi

GR5.00006
5:15PM - 5:30PM

Evaluation of carbon bonding of DLC films using HF-HiPIMS method by Raman spectroscopy

Hiroyuki Fukue, Tatsuyuki Nakatani, Tadayuki Okano, Masahide Kuroiwa, Shinsuke Kunitsugu, Hiroki Oota, Ken Yonezawa

GR5.00007
5:30PM - 5:45PM

Single Crystal Diamond Growth by High-Flow Ar/CH₄/H₂ Modulated Induction Meso-Plasmas at Reduced Pressures

Taizo Higashi, Yasunori Tanaka, Tatsuo Ishijima, Yusuke Nakano

GR5.00008
5:45PM - 6:00PM

Deposition mechanism of hydrogenated amorphous carbon film by C₃H₆/H₂ mixture gas plasma

Hiroki Kondo, Jumpei Kurokawa, Takayoshi Tsutsumi, Makoto Sekine, Kenji Ishikawa, Masaru Hori

4:00PM - 6:00PM

Room: Sakura 2

IR5

Plasma Liquid Interaction IV

Chair: Toshiro Kaneko (*Tohoku University*)

IR5.00001
4:00PM - 4:30PM

Production of nanomaterials by pulsed electrical discharges in dielectric liquid

Invited Speaker Ahmad Hamdan

IR5.00002
4:30PM - 4:45PM

Plasma Discharge Inside Liquid: A Novel Single-step Green Approach to Fabricate Metal/Metal Oxide Nanocomposites

Palash J Boruah, Rakesh R Khanikar, Parismita Kalita, Heremba Bailung

IR5.00003
4:45PM - 5:00PM

Carbon-doped TiO₂ via Solution Plasma

Chayanaphat Chokradjaroen, Jiangqi Niu, Satita Thiangtham, Gasidit Panomsuwan, Nagahiro Saito

IR5.00004
5:00PM - 5:30PM

Continuous liquid treatment by high-density microwave plasma in flowing liquid

Invited Speaker Haruka Suzuki

IR5.00005
5:30PM - 6:00PM

Plasma / liquid (P/L) interfacial reaction for gas reduction reaction

Invited Speaker Tetsuya Haruyama

7:00PM - 9:00PM

Room: Westin Hotel Sendai

DR6

Banquet

* See the Attendee Instructions page

Friday, October 7th, 2022

8:00AM - 9:00AM

Room: Tachibana

DF1 Plasmas and Nanotechnology III

Chair: Renato Camata (*University of Alabama*)

DF1.00001
8:00AM - 8:30AM

Microplasma Engineering of Functional Nanomaterials: Synthesis and Applications

Invited Speaker [Wei-Hung Chiang](#)

DF1.00002
8:30AM - 8:45AM

Multiscale transport modeling of reactive sputtering for fabrication of neuromorphic hardware

[Luca Vialetto](#), Rouven Lamprecht, Christian Stuewe, Torben Hemke, Finn Zahari, Hermann Kohlstedt, Thomas Mussenbrock, Jan Trieschmann

DF1.00003
8:45AM - 9:00AM

Ion fluxes in EUV-induced plasma and their applications for optical components tests

[Andrey Ushakov](#), Jacqueline van Veldhoven, Chien-Ching Wu, Michel van Putten, Joop Meijlink

8:00AM - 9:30AM

Room: Hagi

EF1 Plasma Medical & Agricultural Application I

Chair: Kazunori Koga (*Kyushu University*)

EF1.00001
8:00AM - 8:30AM

Air discharge plasma used for preventing SARS-CoV-2 infections

Invited Speaker [Dingxin Liu](#)

EF1.00002
8:30AM - 8:45AM

Investigation of Plasma-generated Reactive Species Responsible for Human Coronavirus Inactivation

[Shota Sasaki](#), Shion Osana, Mutsuo Yamaya, Hidekazu Nishimura, Ryoichi Nagatomi, Toshiro Kaneko

EF1.00003
8:45AM - 9:00AM

Optimized treatment approach for inactivation of Escherichia coli and Klebsiella pneumoniae through non-thermal plasma

[Milad Rasouli](#), Elham Hamidi, Bizhan Farokhi, Majid Mahdieh, Mahmood Ghoranneviss

EF1.00004
9:00AM - 9:15AM

Characterization of Novel Flexible Surface Dielectric Barrier Discharge Electrodes for the Purpose of In-Package Microbe Deactivation on the Surface of Fresh Produce

[Duncan P Trosan](#), Patrick D Walther, Qingyang Wang, Stephen D McLaughlin, Aaron Mazzeo, Deepti Salvi, Katharina Stapelmann

EF1.00005
9:15AM - 9:30AM

An Efficient Two-stage Type Electrostatic Precipitator for Aerosol Collection Operated by Compact Pulsed Power Generator

[Katsuyuki Takahashi](#), Ryo Saito, Takuto Kikuchi, Riku Yamaguchi, Koichi Takaki, Akinori Zukeran, Tatsuya Terazawa, Yasuyuki Ito

October 7th

FF1 Inductively Coupled Plasmas**Chair:** Mate Vass (*Ruhr University Bochum, Germany*)FF1.00001
8:00AM - 8:15AM**Formation of atomic hydrogen and negative ions in low-pressure inductively coupled hydrogen plasmas: two-dimensional simulations incorporating vibrational kinetics and gas heating**James Dedrick, Gregory J Smith, Paola Diomede, Andrew R Gibson, Scott J Doyle, Vasco Guerra, Mark J Kushner, Timo GansFF1.00002
8:15AM - 8:30AM**Spatial electromagnetic diagnostics of overshoot phenomenon in pulsed inductively coupled Ar plasmas**Xiangyun Lv, Kai Zhao, Quan-Zhi Zhang, Fei Gao, You-Nian WangFF1.00003
8:30AM - 8:45AM**Hardware design and process optimization of industrial ICP N₂ reactor using Two and Three Dimensional CFD models**Meihua Zhang, Abhra Roy, Ryong Hwang, Jeonghee Jo, Amir Kiaee, David Solomon, Yun YangFF1.00004
8:45AM - 9:00AM**An introduction to the role of chemical models in the enthalpy rebuilding procedure of Inductively Coupled Plasma facilities**Enrico Anfuso, Andrea Fagnani, Olivier Chazot**GF1 Dissociative Electron Attachment and Distribution Functions****Chair:** Mariusz Piwiński (*Nicolaus Copernicus University in Toruń*)GF1.00001
8:00AM - 8:30AM**Dissociative Electron Attachment to Amides****Invited Speaker** Sylvia PtasinskaGF1.00002
8:30AM - 8:45AM**An Analytic Electron-Impact Ionization Anisotropic Scattering Model for Monte Carlo Plasma and Swarm Applications**Mark C Zammit, James Colgan, Ryan Park, Christopher J Fontes, Brett S Scheiner, Eddy M Timmermans, Xianzhu Tang, Nathan GarlandGF1.00003
8:45AM - 9:00AM**Electron Energy Deposition in Molecular Hydrogen : A Simulation Using Molecular Convergent Close Coupling Cross Sections**Reese K Horton, Liam H Scarlett, Mark C Zammit, Igor Bray, Dmitry V FursaGF1.00004
9:00AM - 9:15AM**A General Analytic Electron-Impact Ionization Electron Energy Sharing Model for Monte Carlo Plasma and Swarm Applications**Mark C Zammit, Ryan Park, Brett S Scheiner, James Colgan, Christopher J Fontes, Eddy M Timmermans, Xianzhu Tang, Nathan Garland

IF1

Green Plasma Science and Technology III

Chair: Keiichiro Urabe (*Kyoto University*)IF1.00001
8:00AM - 8:30AM**Non-equilibrium plasma discharges for combustion applications: experiments and diagnostics****Invited Speaker** [Deanna A Lacoste](#)IF1.00002
8:30AM - 8:45AM**Probing the Detailed Chemistry of Plasma-Assisted Processes: Opportunities for Mass Spectrometry**[Nils n Hansen](#), Angie Zang, Christopher Burger, Yiguang Ju, Jinhoon Choe, Wenting SunIF1.00003
8:45AM - 9:00AM**Improvement of the cleaning performance of different waste incineration plants after conversion to three-phase generators**[Daniel Szeremley](#)

DF2

Laser Diagnostics II

Chair: Uwe Czarnetzki (*Ruhr University Bochum, Germany*)DF2.00001
10:00AM - 10:15AM**Low temperature plasma diagnostics using Brewster angle-cavity ringdown spectroscopy**[Rongrong Wu](#), [Chuji Wang](#)DF2.00002
10:15AM - 10:30AM**Optical trapping and manipulation of single particles in dusty plasma**Pubuduni AK Ekanayaka MEW, [Chuji Wang](#), Saikat Chakraborty Thakur, Edward ThomasDF2.00003
10:30AM - 11:00AM**Plasma sheath diagnostic using microscopic particle probes manipulated in laser tweezers****Invited Speaker** [Holger Kersten](#)DF2.00004
11:00AM - 11:15AM**Probing plasma-chemistry interactions through novel ultrafast nonlinear laser diagnostics**[Christopher J Klierer](#), Madeline Vorenkamp, Scott Steinmetz, Timothy Chen, Yiguang Ju, Peter BruggemanDF2.00005
11:15AM - 11:30AM**Investigation of the early-stage dynamics of laser-produced plasma using collective Thomson scattering**[Yiming Pan](#), Kentaro Tomita, Atsushi Sunahara, Katsunobu NishiharaDF2.00006
11:30AM - 11:45AM**Time resolved CO₂ ro-vibrational excitation in a nanosecond discharge measured with quantum cascade laser absorption spectroscopy**[Dirk Luggenhölscher](#), Yanjun Du, Tsanko V Tsankov, Uwe CzarnetzkiDF2.00007
11:45AM - 12:00PM**Ro-vibrational kinetics in CO₂-N₂ ns pulsed discharge**[Yanjun Du](#), Tsanko Vaskov Tsankov, Jan Kuhfeld, Nikita D Lepikhin, Dirk Luggenhölscher, Uwe Czarnetzki

EF2 Plasma Medical & Agricultural Application IIChair: Nevena Puac (*Institute of Physics Belgrade Serbia*)

- EF2.00001**
10:00AM - 10:30AM
Plasma-based in situ functionalization based on functional nitrogen science
Invited Speaker Kenji Ishikawa
- EF2.00002**
10:30AM - 10:45AM
Plasma Activated Water Developments for Lunar and Martian Applications
Ryan P Gott, Kenneth Engeling, Joel Olson, Carolina Franco, Christina Johnson, Mary Hummerick
- EF2.00003**
10:45AM - 11:00AM
Influence of COST-Jet produced Short-lived RONS on Cellular Responses
Maria J Herrera Quesada, Cameron Wagoner, Katharina Stapelmann
- EF2.00004**
11:00AM - 11:15AM
Effective Area of Relatively Short-lived Reactive Oxygen Species Generated by Atmospheric-pressure Helium Microplasma Jet
Jun-Seok Oh, Yuta Matsumoto, Shunya Hashimoto, Tatsuru Shirafuji
- EF2.00005**
11:15AM - 11:30AM
Influence of Skin Temperature Increase During Helium Plasma Jet Irradiation
Shunya Hashimoto, Yuta Matsumoto, Tatsuru Shirafuji, Hideo Fukuhara, Chiaki Kawada, Keiji Inoue, Masayuki Tsuda, Endre J Szili, Jun-Seok Oh
- EF2.00006**
11:30AM - 11:45AM
Biological effects of the combination with low temperature plasmas and nanoparticles-platinum and gold-
Kenji Ishikawa, Takashi Kondo, Hiromasa Tanaka, Masaru Hori, Shinya Toyokuni, Masaaki Mizuno

FF2 Green Plasma Science & Technology IVChair: Tomohiro Nozaki (*Tokyo Institute of Technology*)

- FF2.00001**
10:00AM - 10:15AM
Interplay of Transport, Plasma Concentration, and Chemistry in Microwave Discharges
Gerard J Van Rooij, Alex W van der Steeg, Omar Biondo, Ashley J Hughes, Annemie Bogaerts, M.C.M. van de Sanden
- FF2.00002**
10:15AM - 10:30AM
High Efficiency CO₂ Conversion in the Rotating Argon Flow using Microwave Plasma at Atmospheric Pressure.
Masuhiko Kogoma, Tomu Kobayashi, Kunihiro Tanaka, Kazuo Takahashi
- FF2.00003**
10:30AM - 10:45AM
Direct non-oxidative methane conversion in arc plasma reactor: Physical and chemical solutions to lower energy cost
Duy Khoe Dinh, Dae Hoon Lee
- FF2.00004**
10:45AM - 10:55AM
Effect of pulse repetition rate on filamentary discharge assisted low-temperature ignition in methane-air flows
Ravi B Patel, Jeroen van Oijen, Nico Dam, Sander Nijdam
- FF2.00005**
11:00AM - 11:15AM
Plasma induced conversion of CO₂ with water to useful compounds
Pankaj Attri, Takamasa Okumura, Kazunori Koga, Kunihiro Kamataki, Naho Itagaki, Masaharu Shiratani, Nozomi Takeuchi

FF2.00006
11:15AM - 11:30AM

Plasma-enhanced Carbon Capture and Utilization in CO₂ Methanation
Chunyuan Zhan, Shuya Xu, Hyun-Ha Kim, Tomohiro Nozaki

FF2.00007
11:30AM - 11:45AM

Chemical Feedback and Control of Chemical Processes Using Non-Equilibrium Plasmas

Charan R Nallapareddy, Thomas C Underwood

FF2.00008
11:45AM - 12:00PM

Photo-plasma: A new approach for efficient and enhanced mineralization of organic molecules

Shaik Mahamad M Allabakshi, Pnsnr R Srikar, Reetesh K Gangwar, Shihabudheen M Maliyekkal

10:00AM - 12:00PM

Room: Shirakashi 2

GF2

Plasmas for Energy Applications

Chair: Ahmad Hamdan (*University de Montreal*)

GF2.00001
10:00AM - 10:15AM

Facile synthesis of sulfonated cellulose derived from sugarcane bagasse via solution plasma process toward bio-filler separator membrane for lithium-ion battery

Satita Thiangtham, Nagahiro Saito, Hathaikarn Manuspiya

GF2.00002
10:15AM - 10:30AM

Reduction of iron phthalocyanine/ graphene oxide composites using atmospheric pressure plasma

Fuka Hayakawa, Ikumi Ohsawa, Takahiro Saida, Takayuki Ohta

GF2.00003
10:30AM - 10:45AM

Fabrication of highly-transparent solar cell in centimeter scale based on atomically thin 2D materials

Kohei Kanaya, Xing He, Toshiro Kaneko, Toshiaki Kato

GF2.00004
10:45AM - 11:00AM

The Selectivity-Conversion Tradeoff in Partial Methane Oxidation Using Non-Equilibrium Plasmas

Charan R Nallapareddy, Thomas C Underwood

GF2.00005
11:00AM - 11:15AM

A Mask-free and Contactless Patterned Plasma Processing Technique for Interdigitated Back Contact Silicon Heterojunction Solar Cells Fabrication

Junkang WANG, Pavel Bulkin, Monalisa Ghosh, Dmitri Daineka, Pere Roca i Cabarrocas, Sergej Filonovich, José Alvarez, Erik Johnson

GF2.00006
11:15AM - 11:45AM

Plasma-induced electronic defects: formation and recovery kinetics for advanced processing

Invited Speaker Shota Nunomura

GF2.00007
11:45AM - 12:00PM

Electron Properties and Reaction Mechanisms in Plasma-Assisted Catalysis of Ammonia Synthesis

David D Caron, Ahmed Diallo, Bruce E Koel, Shurik Yatom

October 7th

IF2 Discharge Physics**Chair:** Daisuke Ogawa (*Chubu University*)

- IF2.00001**
10:00AM - 10:15AM
Rotating Surface Wave Excitation by Time-varying Phase Agitation and Amplitude Modulation using Cylindrical Resonator
Ju-Hong Cha, Seong-Tae Han, DoHan Kim, Jong-Soo Kim, Chae-Hwa Shon
- IF2.00002**
10:15AM - 10:30AM
Numerical Simulation of Frequency Dependence of Millimeter-wave Discharge at Subcritical Condition
Soichiro Suzuki, Masayuki Takahashi
- IF2.00003**
10:30AM - 10:45AM
Characterization of DC driven moderate pressure water vapor glow discharge
Md Ebrahim Khalil Bhuiyan, Tanvir Farouk
- IF2.00004**
10:45AM - 11:00AM
Time evolution of NO X $^2\Pi$ (ground), A $^2\Sigma^+$ state and O 3P atomic ground state density in downstream of a nitrogen-oxygen pulsed microwave surfaguide discharge
Abhyuday Chatterjee, Omid Samadi, Kseniia Leonova, Nikolay Britun, Rony Snyders
- IF2.00005**
11:00AM - 11:15AM
Investigation of conditions necessary for inception of positive corona in air based on differential formulation of photoionization
Victor P Pasko, Reza Janalizadeh, Jaroslav Jansky
- IF2.00006**
11:15AM - 11:30AM
Repetitively pulsed positive streamer discharge in electronegative gas mixtures at high pressure
Zheng Zhao, Xinlei Zheng, Anbang Sun, Jiangtao Li
- IF2.00007**
11:30AM - 11:45AM
Streamer discharge development in long air gaps
Andrey Starikovskiy, Eduard Bazelyan, Nickolay Aleksandrov
- IF2.00008**
11:45AM - 12:00PM
Fluid modeling and coherent Rayleigh-Brillouin scattering measurements of gas temperature in a xenon DC glow discharge plasma
Shigemitsu Suzuki, Robert Randolph, Alexandros Gerakis, Kentaro Hara

DF3 Plasma Propulsion III**Chair:** Justin Little (*University of Washington*)

- DF3.00001**
1:30PM - 1:45PM
Electrostatic instabilities in E×B discharges: comparison of the linear theory dispersion relation with the reconstructed power spectrum
Federico Petronio, Alejandro Alvarez Laguna, Anne Bourdon, Pascal Chabert
- DF3.00002**
1:45PM - 2:00PM
Observation of Instability driven propagating localized patterns in E×B discharges in 2D-axial azimuthal PIC-MCC simulations
Bhaskar Chaudhury, Teja V Reddy, Durgesh Mishra, Miral Shah, Mainak Bandyopadhyay
- DF3.00003**
2:00PM - 2:30PM
Plasma flow and acceleration in the magnetic nozzle
Invited Speaker Andrei Smolyakov

DF3.00004
2:30PM - 2:45PM

Assessment of cross-field electron transport in a magnetic nozzle
Kazunori Takahashi, Christine Charles, Roderick W Boswell

DF3.00005
2:45PM - 3:00PM

Numerical investigation on plasma expansion and particle energy in a magnetic nozzle
Kazuma Emoto, Kazunori Takahashi, Yoshinori Takao

DF3.00006
3:00PM - 3:15

Identification of plasma fluctuations and energy flow in hall thruster
Kouki Teshima, Naoji Yamamoto, Daisuke Kuwabara

DF3.00007
3:15PM - 3:30PM

Characterization of a 2 MHz magnetically expanding RF plasma source for thruster development
Thanatith Naku^l, Kazunori Takahashi

1:30PM - 3:15PM

Room: Hagi

EF3

Plasma Medical & Agricultural Application III

Chair: Jun-Seok Oh (*Osaka Metropolitan University*)

EF3.00001
1:30PM - 2:00PM

Role of atmospheric pressure plasma in triggering of cell mechanisms in plant cells
Invited Speaker Nevena Puac

EF3.00002
2:00PM - 2:15PM

Reproducibility in plasma agriculture
Masaharu Shiratani, Teruki Anan, Takumi Nakao, Takamasa Okumura, Pankaj Attri, Kazunori Koga

EF3.00003
2:15PM - 2:30PM

Various approaches of cold plasma treatment to brewer's rice plant for improvement of grain quality
Hiroshi Hashizume, Hidemi Kitano, Hiroko Mizuno, Akiko Abe, Kaoru Sanda, Genki Yuasa, Satoe Tohno, Shih-Nan Hsiao, Hiromasa Tanaka, Kenji Ishikawa, Shogo Matsumoto, Hitoshi Sakakibara, Yoji Hirose, Masayoshi Maeshima, Masaaki Mizuno, Masaru Hori

EF3.00004
2:30PM - 2:45PM

Surface Modification Analysis of the Closed Containers that are used in Plasma Treatments of Food, Agriculture, and Biomedical Samples
Naman Bhatt, Joshua Morsell, Duncan P Trosan, Patrick D Walther, Katharina Stapelmann, Steven Shannon

EF3.00005
2:45PM - 3:00PM

Effect of plasma irradiation on germination of lettuce seeds with fluctuating dormancy
Teruki Anan, Takumi Nakao, Takamasa Okumura, Pankaj Attri, Kunihiro Kamataki, Naoto Yamashita, Naho Itagaki, Kazunori Koga, Masaharu Shiratani

EF3.00006
3:00PM - 3:15PM

Plasma irradiation-introduced RONS amount into plant seeds and their response analysis
Takamasa Okumura, Teruki Anan, Pankaj Attri, Yuichi Tsukada, Kunihiro Kamataki, Naoto Yamashita, Naho Itagaki, Kazunori Koga, Masaharu Shiratani, Yushi Ishibashi

October 7th

FF3 Modeling - Thrusters and Wave-Plasma Interactions

Chair: Scott Doyle (*University of Michigan*)

- FF3.00001
1:30PM - 1:45PM
Dielectric boundary for an unstructured 2D radial-axial fluid simulation of a Hall thruster
Guillaume Bogopolsky, Olivier Vermorel, Bénédicte Cuenot
- FF3.00002
1:45PM - 2:15PM
Chemistry of low-pressure iodine plasmas
Invited Speaker Anne Bourdon
- FF3.00003
2:15PM - 2:30PM
Deep Learning based approach for investigating Electromagnetic Wave Propagation in Plasmas
Mihir Desai, Pratik Ghosh, Ahlad Kumar, Bhaskar Chaudhury
- FF3.00004
2:30PM - 2:45PM
PIC simulation of plasma sources for the on-ground reproduction of orbital flows
Pietro Parodi, Thierry Magin, Giovanni Lapenta
- FF3.00005
2:45PM - 3:00PM
Development and validation of iodine plasma models for electric propulsion systems
Trevor Lafleur, Lui Hahl, Elena Zorzoli Rossi, Dmytro Rafalskyi
- FF3.00006
3:00PM - 3:15PM
PIC modeling of iodine plasma for electric propulsion conditions
Nicolas Lequette, Benjamin Esteves, Alejandro Alvarez Laguna, Anne Bourdon, Pascal Chabert
- FF3.00007
3:15PM - 3:30PM
2D axisymmetric Particle-In-Cell study of a hollow cathode and its near plume region
Willca Villafana, Svetlana Selezneva, Andrew Tasman Powis, David Smith, Alexander V Khrabrov, Dmytro Sydorenko, Igor D Kaganovich

GF3 Plasma Deposition

Chair: Masaru Hori (*Nagoya University*)

- GF3.00001
1:30PM - 2:00PM
Deposition of silicon-based thin films with atmospheric-pressure plasmas
Invited Speaker Matteo Gherardi
- GF3.00002
2:00PM - 2:15PM
Process analysis of cracking a-C:H/CNP/a-C:H sandwich films under stress using nanoindentation
Shinjiro Ono, Takamasa Okumura, Kunihiro Kamataki, Naoto Yamashita, Naho Itagaki, Kazunori Koga, Masaharu Shiratani
- GF3.00003
2:15PM - 2:30PM
Deposition of zinc oxide film using high power impulse magnetron sputtering
Katsunori Nagahashi, Takayuki Ohta
- GF3.00004
2:30PM - 2:45PM
Sputter epitaxy of Mg-doped ZnO films on sapphire substrates using inverted Stranski-Krastanov mode
Masaharu Shiratani, Daichi Takahashi, Naoto Yamashita, Naho Itagaki

GF3.00005
2:45PM - 3:00PM

Deposition of Rutile TiO₂ Thin Films Using high power pulsed magnetron sputtering

Miyuki Nishimura, Takayuki Ohta

GF3.00006
3:00PM - 3:30PM

Next-generation Li-ion battery achieved by the low temperature plasma processes

Invited Speaker Giichiro Uchida

1:30PM - 3:15PM

Room: Sakura 2

IF3 Probe Diagnostics

Chair: Yasunori Ohtsu (*Saga University*)

IF3.00001
1:30PM - 1:45PM

A novel approach for calculating the plasma resonance behavior excited by wall-integrated planar diagnostic probes with arbitrary geometry

Michael Friedrichs, Peng Liang, Chun Jie Wang, Ralf Peter Brinkmann, Jens Oberrath

IF3.00002
1:45PM - 2:00PM

Second harmonic currents in rf-biased, inductively coupled plasmas

Mark Sobolewski

IF3.00003
2:00PM - 2:15PM

The performance of the pulse bias hairpin resonator probe for negative ion diagnostic

Pawandeep Singh, Swati Swati, Jay K Joshi, Nageswara R Epuru, Yashshri Patil, Shantanu Karkari

IF3.00004
2:15PM - 2:45PM

Power law parametrization of the ion collecting area for a planar Langmuir probe diagnostic

Invited Speaker Yegeon Lim

IF3.00005
2:45PM - 3:00PM

Analysis of temperature dependency of the resonant frequency for electron density measurement with curling probe

Daisuke Ogawa, Keiji Nakamura, Hideo Sugai

IF3.00006
3:00PM - 3:15PM

Langmuir probe and Laser Photodetachment Study of Afterglow Phase in Dual RF Frequency Pulsed Plasma Etching Processes Operated with Synchronized DC Bias

Makoto Sekine, Bibhuti B Sahu, Shogo Hattori, Takayoshi Tsutsumi, Nikolay Britun, Kenji Ishikawa, Hirohiko Tanaka, Taku Gohira, Noriyasu Ohno, Masaru Hori

4:00PM - 5:15PM

Room: Tachibana

DF4 Fundamental Processes

Chair: Ahmed Hala (*Gaseous Electronics, LLC*)

DF4.00001
4:00PM - 4:15PM

Study of the effect of a longitudinal magnetic field on streamer properties following Juno's observation of possible transient luminous events on Jupiter

Reza Janalizadeh, Victor P Pasko

- DF4.00002
4:15PM - 4:30PM **Dressed ion acoustic solitons with electron beam in Earth's magnetosphere**
Sunidhi Singla, N. S. Saini
- DF4.00003
4:30PM - 4:45PM **Reconfigurable Mode coupling between Bragg and Surface Plasmon Modes in Super Three-dimensional Microplasma Photonic Crystals**
Xinhang Song, Wenyuan Chen, Peter Sun, J. Gary Eden
- DF4.00004
4:45PM - 5:00PM **Effect of Preheating Temperature of Al_2O_3 on Reduction Ratio by Laser Diode Ablation under Hydrogen Atmosphere**
Kanta Ishiguro, Ryohei Oishi, Makoto Matsui
- DF4.00005
5:00PM - 5:15PM **KP Burgers equation in Beam Plasma with Non-Maxwellian Electrons**
Manveet Kaur, N.S. Saini, Sunidhi Singla

4:00PM - 5:30PM

Room: Hagi

EF4

Plasma Medical & Agricultural Application IV

Chair: Kenji Ishikawa (*Nagoya University*)

- EF4.00001
4:00PM - 4:30PM **Cold Atmospheric Plasmas in Biology and Medicine: The Fundamentals**
Invited Speaker Mounir Laroussi
- EF4.00002
4:30PM - 4:45PM **Numerical modeling of how plasma interferes with cell fate**
Tomoyuki Murakami
- EF4.00003
4:45PM - 5:00PM **Medical plasma gas improves corneal burn ulcers in rabbits**
Milad Rasouli, Maryam Amini, Amir Hossein Toghraee, Alireza Jahandideh
- EF4.00004
5:00PM - 5:15PM **Analysis of cell exposed to non-thermal atmospheric pressure plasma for effective gene transfer**
Tatsuya Kitazaki, Linhao Sun, Han N GIA, Shinji Watanabe, Shinya Kumagai
- EF4.00005
5:15PM - 5:30PM **Transdermal Administration of Adenosine and Eosin Y Using Microplasma**
Maliha Marium, Jaroslav Kristof, Ahmad Guji Yahaya, Sadia Afrin Rimi, Kazuo Shimizu

4:00PM - 5:00PM

Room: Shirakashi 1

FF4

Basic Plasma Phenomena

Chair: Atsushi Komuro (*University of Tokyo*)

- FF4.00001
4:00PM - 4:15PM **Transient phenomena during dense argon micro-plasma formation**
Dmitry Levko, Vivek Subramaniam, Laxminarayan L Raja
- FF4.00002
4:15PM - 4:30PM **Study on Light Emission of Arcing Before Arcing Explosion in a Low-Temperature Plasma**
SiJun Kim, Chul-hee Cho, Min-su Choi, Young-seok Lee, In-ho Seong, Won-nyoung Jeong, Ye-bin You, Byeong-yeop Choi, Jang-jae Lee, Shin-jae Yu

FF4.00003
4:30PM - 4:45PM

One-dimensional Particle-based Kinetic Simulations of DC and RF gas breakdown

Yusuke Yamashita, Kentaro Hara, Saravanapriyan Sriraman

FF4.00004
4:45PM - 5:00PM

Numerical modeling of ns discharge development in inhomogeneous magnetic field

Andrey Starikovskiy, Nickolay Aleksandrov, Mikhail N Shneider

4:00PM - 5:30PM

Room: Sakura 2

IF4

Dielectric Barrier and Corona Discharges

Chair: Keisuke Takashima (*Tohoku University*)

IF4.00001
4:00PM - 4:15PM

Consequences of Photoelectron and Electric Field Emission on Propagation of Surface Ionization Waves

Kseniia Konina, Mackenzie Meyer, Mark J Kushner

IF4.00002
4:15PM - 4:30PM

Interactions between adjacent surface streamers in a packed bed dielectric barrier discharges (PBDBDs)

Zaka-ul-Islam Mujahid, Ihor Korolov, Yue Liu, Thomas Mussenbrock, Julian Schulze

IF4.00003
4:30PM - 4:45PM

Numerical simulation of discharge process in surface dielectric-barrier-discharge on split covered electrode

Hideto Tamura, Shintaro Sato, Naofumi Ohnishi

IF4.00004
4:45PM - 5:00PM

Plasma Characteristics of Atmospheric DBD Argon Discharges Simulated by Fluid Model

Zehui Zhang, Yue Liu, Wei Wang, Yinan Wang, Yuanzhen Wang, Nannan Li, Dezheng Yang

IF4.00005
5:00PM - 5:15PM

Influence of dielectric shape on the propagation speed and selectivity of cathode or anode directed surface ionization waves in dielectric barriers discharges

Constantin Neuroth, Zaka-ul-Islam Mujahid, Ihor Korolov, Quan-Zhi Zhang, Thomas Mussenbrock, Julian Schulze

IF4.00006
5:15PM - 5:30PM

Multi-inception patterns of emitter array/collector systems in DC corona discharge

Corentin Marion, Franck Plouraboue, David Fabre, Julien Lemetayer

5:30PM - 6:00PM

Room: Tachibana

DF5

Closing Ceremony

Chair: Toshiro Kaneko (*Tohoku University*)

DF5.00001
5:30PM - 5:40PM

Closing Remarks

Toshiro Kaneko

DF5.00002
5:40PM - 5:50PM

GEC Chair Closing Remarks

Julian Schulze

DF5.00003
5:50PM - 6:00PM

GEC New Chair Closing Remarks

Shahid Rauf

MEMO



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11th International Conference on Reactive Plasmas