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WELCOME FROM THE CHAIR

We wish to extend a warm welcome to all of you attending the 41st IEEE International Conference on Plasma Science (ICOPS 2014) and the 20th IEEE International Conference on High-Power Particle Beams (Beams 2014). This combined ICOPS/Beams 2014 conference is sponsored by the Plasma Science and Applications Committee (PSAC) and the Pulsed Power Science and Technology (PPS&T) Committee, both of the IEEE Nuclear and Plasma Science Society (NPSS). This meeting will be held May 25 - 29, 2014, in Washington, DC at the historic Marriott-Wardman Park Hotel in Northwest DC. It follows the format of previous ICOPS meetings with topics from traditional plasma physics and engineering, but also includes enhanced technical sessions comprising pulsed power technologies, simulations, and diagnostics for intense charged particle beams and their applications.

Against a backdrop of several other plasma and pulsed power conferences to be held within 2-3 weeks of ICOPS/Beams 2014 and recent US government budget cuts forcing reduced travel, we are nonetheless pleased to have accepted 608 abstracts. We would like to thank all plasma scientists and engineers who have submitted their papers to ICOPS/Beams 2014, allowing us to form a very vibrant and strong technical program.

This technical program will be led by seven plenary talks covering a diverse range of important topics such as ultracold neutral plasmas, high-energy-density plasmas, high-power microwaves, inertial confinement fusion, pulsed power applications such as radiography and electromagnetic railguns, plasma modification of biomaterials, and the use of high-powered beams for active detection of special nuclear materials. We are fortunate that Dr. Michael Desjarlais, winner of the 2014 IEEE NPSS PSAC Award has chosen ICOPS/Beams 2014 to give his prize-winning address.

Original papers have been submitted from over 30 countries, giving us a wonderful assembly of technical contributions from around the world; as such, the ICOPS/Beams 2014 technical program is expected to offer an outstanding forum with which to learn about some of the greatest advances in plasma science and technology in recent years and to exchange views of future directions of key plasma applications. Similarly, academic, technological, industrial, and commercial interests in plasma science are likely to make ICOPS/Beams 2014 the ideal place for networking, synergizing, and indeed creating new growth areas.

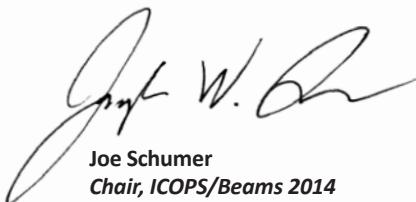
This conference also features two 1.5-day mini-courses entitled “Low Temperature Atmospheric Pressure Plasmas” and “Atomic and Radiation Physics”, respectively, led by 20 technical experts in these fields. Invited and plenary papers will be published in a Special Issue of the IEEE Transactions on Plasma Science and contributed papers will be published in the “Beams” proceedings, open to all attendees of the combined conference.

ICOPS/Beams 2014 is available via social networking such as Facebook, LinkedIn, and Twitter (#icopsbeams). We encourage you to join these groups, create topics, make friends and assist others who can profit from your experience. Conference details for ICOPS/Beams 2014 can be found at the conference website at: <https://www.ece.unm.edu/icops-beams2014/>.



As a long-time resident of the Washington DC area, Dr. Joe Schumer of the Naval Research Laboratory is proud to welcome you to the U.S. Capital region. As the political center of the United States, DC is a great place to visit and live. Situated on 16 breathtaking acres, the conference hotel in NW Washington, DC has hosted a long list of U.S. Presidents, dignitaries and VIPs. The conference hotel is located on the Metro system between Georgetown, the Adams Morgan district, and Dupont Circle, finding a home between ethnic restaurants, the National Zoo, interesting and cosmopolitan neighborhoods, cultural diversity, quirky shops, and offbeat bars and clubs. Washington DC is a perfect place for an international gathering of the world's experts in the technology and science of plasmas and pulsed power.

All of us who helped organize ICOPS/Beams 2014 sincerely hope that all participants will enjoy both the conference and Washington, DC. We look forward to welcoming you all in the exciting politically-charged city of Washington, DC.



Joe Schumer
Chair, ICOPS/Beams 2014

Steve Richardson
Communications Chair, ICOPS/Beams 2014

Don Shiffler
Technical Program Chair, ICOPS 2014

Rick Faehl
Chair, PSAC ExCom, IEEE NPSS

Bruce Weber
Technical Program Chair, Beams 2014

Juergen Kolb
Chair, PPS&T ExCom, IEEE NPSS



COMMITTEES

ICOPS/Beams 2014 Organizing Committee

| | | |
|------------------------------------|------------------------------|-------------------------------|
| General Chair: | Joseph Schumer | Naval Research Laboratory |
| ICOPS 2014 Technical Chair: | Don Shiffler | Air Force Research Laboratory |
| Beams 2014 Technical Chair: | Bruce Weber | Naval Research Laboratory |
| Local Organizing Chair: | Dan Jobe | DOE/NNSA |
| Communications Chair: | Steve Richardson | Naval Research Laboratory |
| External Relations Chair: | Scott Kovaleski | U. Missouri |
| External Relations: | Thomas Hussey | AFOSR, retired |
| Finance Committee, Chair: | Steve Gold | Naval Research Laboratory |
| Finance Committee: | Stuart Jackson | Naval Research Laboratory |
| Mini-course: | John Foster, Natalia Babaeva | U. Michigan |
| Mini-course: | Arati Dasgupta | Naval Research Laboratory |
| Student Paper Awards: | Christine Coverdale | Sandia National Laboratories |
| Conference Secretary: | Tonya Gardner | Naval Research Laboratory |
| Student Grants: | Farhat Beg | U. California-San Diego |
| Conference Management: | Alicia Zupeck | IEEE - MCE |
| Employment Center: | William White | Air Force Research Center |

ICOPS/Beams International Coordinating Committee

| | | |
|-----------------------|--|--------------------------------|
| Chair: | Keith LeChien | DOE/NNSA, USA |
| Co-Chair: | Robert Commissio | Naval Research Laboratory, USA |
| Beams Liaison: | Gerald Cooperstein | Naval Research Laboratory, USA |
| Lay-Kee Ang | Singapore University of Technology & Design, Singapore | |
| Pascal Chabert | Laboratoire de Physique des Plasmas, Ecole Polytechnique, France | |
| Jianjun Deng | Institute of Fluid Physics, China Academy of Engineering Physics | |
| Pietro Favia | University of Bari, Italy | |
| Robert Fedosejevs | University of Alberta Edmonton, Canada | |
| James Fillerup | AFOSR Southern Office of Aerospace Research and Development | |
| Ashild Fredriksen | University of Tromso, Norway | |
| Weihua Jiang | Extreme Energy-Density Research Institute, Nagaoka University of Technology, Japan | |
| Karel Jungwirth | Czech Academy of Sciences, Czech Republic | |
| Michael Kong | Old Dominion University, USA | |
| Yitzhak Maron | Weizmann Institute of Science, Israel | |
| Gennady Mesyats | Russian Academy of Sciences, Russia | |
| Georg Müller | Karlsruhe Institute of Technology, Germany | |
| Lutfi Oksuz | Suleyman Demirel University, Turkey | |
| Valentin Smirnov | Kurchatov Institute, Russia | |
| Manfred Thumm | Karlsruhe Institute of Technology, Germany | |
| August Valfells | Reykjavik University, Iceland | |
| Laurent Veron | Strategy and Assessment Office, Commissariat a l'Energie Atomique, France | |

**NPSS Plasma Science and Applications Committee (PSAC)****Chair:** Rickey Faehl**Vice Chair:** Donald Shiffler**Secretary:** Steven Gold**Past Chair (2014):** Brendan Godfrey**Editor-in-Chief of Transactions on Plasma Science:** Steven Gitomer**ExCom Leadership**

| | | |
|-------------------------------------|---------------------------------|-----------------------------|
| David Abe (2014) | John Giuliani (2015) | Keith Cartwright (2016) |
| Farhat Beg (2014) | Michael Kong (2015) | Tim Grotjohn (2016) |
| Tatyana Sizyuk (2014) | Mark Kushner (2015) | Scott Kovaleski (2016) |
| Michael Mazarakis (2014) | Mounir Laroussi (2015) | Baruch Levush (2016) |
| Donald Shiffler (2014) | Thomas Mehlhorn (2015) | Steve Shannon (2016) |
| Mary Ann Sweeney (2014) | Peter Stoltz (2015) | Manfred Thumm (2016) |
| Christine Coverdale (AdCom 2015) | Brendan Godfrey (AdCom 2016) | Steven Gold (AdCom 2017) |

Beams International Advisory Committee

| | |
|--------------------|--|
| Gerald Cooperstein | Naval Research Laboratory, USA |
| Jianjun Deng | Institute of Fluid Physics, CAEP, China |
| Carl Ekdahl | Los Alamos National Laboratory, USA |
| Vladimir Engelko | Efremov Institute, Russia |
| Timothy Goldsack | Atomic Weapons Establishment, UK |
| Weihua Jiang | Nagaoka University of Technology, Japan |
| Karel Jungwirth | Czech Academy of Sciences, Czech Republic |
| Vasili Koidan | Kurchatov Institute, Russia |
| Keith LeChien | DOE NNSA, USA |
| Alexander Litvak | Institute of Applied Physics, Russia |
| John Maenchen | Sandia National Laboratories, USA |
| Meir Markovits | Ministry of National Infrastructures, Israel |
| Gennady Mesyats | Academy of Sciences, Russia |
| Georg Müller | Karlsruhe Institute of Technology, Germany |
| Bryan Oliver | Sandia National Laboratories, USA |
| Mark Sinclair | Atomic Weapons Establishment, UK |
| Valentin Smirnov | Kurchatov Institute, Russia |
| Manfred Thumm | Karlsruhe Institute of Technology, Germany |
| Laurent Veron | CEA, France |
| Roger White | L-3 Communications Pulse Science, USA |



2013 Pulsed Power Science & Technology

Standing Technical Committee — Voting Members

| | | |
|---------------------|-------------------|-------------------|
| Stephen B. Bayne | Stephen B. Bayne | Susan Heidger |
| Georg Muller | W. Mark Henderson | Andreas A. Neuber |
| Thomas W. Hussey | Bryan V. Oliver | Weihua Jiang |
| Frank Peterkin | Ravi P. Joshi | Mark Rader |
| Juergen Kolb | Luís Redondo | Keith LeChien |
| Jose Rossi | Jane Lehr | Mark Sinclair |
| David Alan Wetz Jr. | | |

Standing Technical Committee — Ex Officio Members

| | | |
|---------------|--------------------|---------------------|
| Raymond Allen | Steven J. Gitomer | Pat Corcoran |
| Lisa Mattox | Gerald Cooperstein | Robert E. Reinovsky |
| Mark Crawford | Edl Schamiloglu | Randy Curry |
| Ian D. Smith | Roger White | |

2014 Nuclear and Plasma Science Society

Officers

| | |
|------------------------|--------------------------|
| President: | Janet Barth |
| Vice President: | John Verboncoeur |
| Treasurer: | Ron Keyser |
| Secretary: | Alberta M. Dawson Larsen |

2014 Administrative Committee

| |
|---------------------------|
| Robert Zwaska (PAST) |
| Ed Lampo (RI) |
| Alberto del Guerra (NMIS) |

2016 Administrative Committee

| |
|------------------------------|
| Ron Jaszcak (NMISC) |
| Brandon Godfrey (PSAC) |
| Patrick LeDü (Transnational) |

2015 Administrative Committee

| |
|-----------------------------|
| Kay Chesnut (RE) |
| Christine Cloverdale (PSAC) |
| Mark Crawford (PPST) |
| Robert Reed (RE) |
| John Sethian (FTC) |

2017 Administrative Committee

| |
|---------------------|
| Steve Gold (PSAC) |
| David Heimstra (RE) |
| Weihua Jiang (PPST) |
| Dick Lanza (RI) |



Past & Future ICOPS Conferences

| | | | |
|------|-------------------|------|--------------------|
| 1974 | Knoxville, TN | 1995 | Madison, WI |
| 1975 | Ann Arbor, MI | 1996 | Boston, MA |
| 1976 | Austin, TX | 1997 | San Diego, CA |
| 1977 | Troy, NY | 1998 | Raleigh, NC |
| 1978 | Monterey, CA | 1999 | Monterey, CA |
| 1979 | Montreal, Canada | 2000 | New Orleans, LA |
| 1980 | Madison, WI | 2001 | Las Vegas, NV |
| 1981 | Santa Fe, NM | 2002 | Banff, Canada |
| 1982 | Ottawa, Canada | 2003 | Jeju, Korea |
| 1983 | San Diego, CA | 2004 | Baltimore, MD |
| 1984 | St. Louis, MO | 2005 | Monterey, CA |
| 1985 | Pittsburg, PA | 2006 | Traverse City, MI |
| 1986 | Saskatoon, Canada | 2007 | Albuquerque, NM |
| 1987 | Arlington, VA | 2008 | Karlsruhe, Germany |
| 1988 | Seattle, WA | 2009 | San Diego, CA |
| 1989 | Buffalo, NY | 2010 | Norfolk, VA |
| 1990 | Oakland, CA | 2011 | Chicago, IL |
| 1991 | Williamsburg, VA | 2012 | Edinburgh, UK |
| 1992 | Tampa, FL | 2013 | San Francisco, CA |
| 1993 | Vancouver, Canada | 2014 | Washington, DC |
| 1994 | Santa Fe, NM | 2015 | Antalya, Turkey |

Past Beams Conferences

| | | | |
|------|---------------------|------|------------------------|
| 1975 | Albuquerque, NM | 1996 | Prague, Czech Republic |
| 1977 | Ithaca, NY | 1998 | Haifa, Israel |
| 1979 | Novosibirsk, Russia | 2000 | Nagaoka, Japan |
| 1981 | Palaiseau, France | 2002 | Albuquerque, NM |
| 1983 | San Francisco, CA | 2004 | St. Petersburg, Russia |
| 1986 | Kobe, Japan | 2006 | Oxford, England |
| 1988 | Karlsruhe, Germany | 2008 | Xi'an, China |
| 1990 | Novosibirsk, Russia | 2010 | Jeju, South Korea |
| 1992 | Washington, DC | 2012 | Karlsruhe, Germany |
| 1994 | San Diego, CA | 2014 | Washington, DC |



UNM

Electrical &
Computer Engineering



AMEREM 2014

www.ece.unm.edu/amerem2014

University of New Mexico

Albuquerque, New Mexico, USA

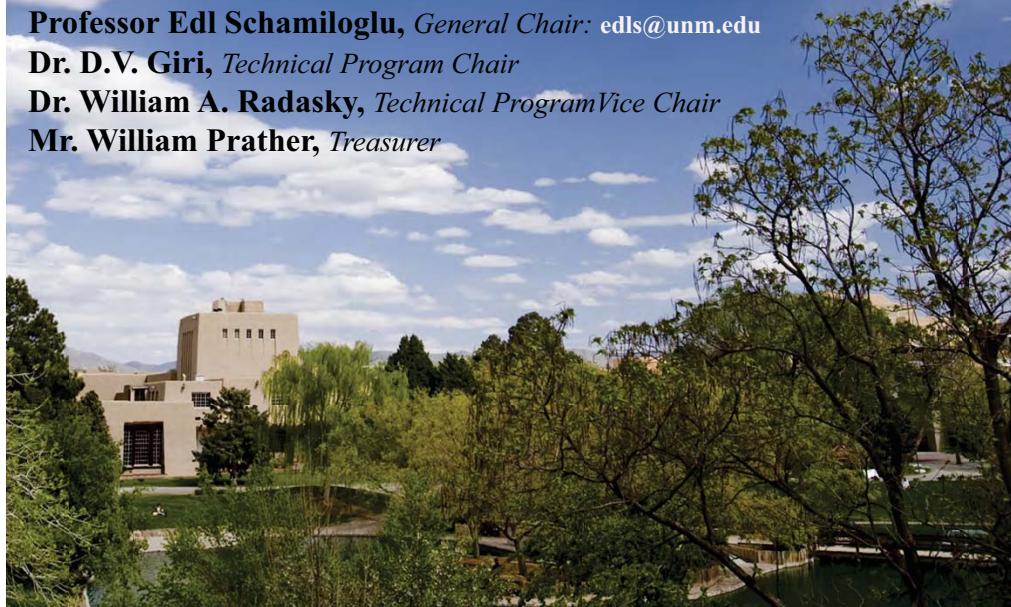
July 27-August 1, 2014

Professor Edl Schamiloglu, General Chair: edls@unm.edu

Dr. D.V. Giri, Technical Program Chair

Dr. William A. Radasky, Technical Program Vice Chair

Mr. William Prather, Treasurer





EAPPC 2014

5th Euro-Asian Pulsed Power Conference

September 8-12, 2014

Kumamoto University, Kumamoto, Japan

<http://www.ipps.kumamoto-u.ac.jp/eappc2014/>

Important Deadlines

| | |
|--------------------------|-------------------|
| Abstract Submission: | June 15, 2014 |
| Acceptance Notification: | July 15, 2014 |
| Full Paper Submission: | September 8, 2014 |
| Early Registration: | August 1, 2014 |

Scope

The conference will provide a forum for the exchange of scientific and technical information between industry, academic institutions and research organizations, on a broad range of current and emerging research areas of pulsed power technology and application, high power microwaves and RF sources, radiation sources, particle beam technology.

Beside basic research the conference will feature the technology, the applications and the commercial opportunities of pulsed power technology, and will address both the state of the art of current and future trends.

Conference Venue

Kumamoto, located at the center of Kyushu, west-end island of Japan, is a historical city surrounded by attractive nature and Mt. Aso, the symbol of the "Land of Fire". Volcanic smoke is pluming up from the mountain and the wind is galloping through the vast caldera grassland. In the distance, picturesque sunset over the islands can be seen. Magnificent Kumamoto Castle soars into the sky.

Melorous view interwoven with the power of nature and long history deeply moves all the visitors. From the sea to the earth, Kumamoto has a treasure-trove of foods, including fish, shellfish, rice, and fruits and vegetables.

Conference Topics

Pulsed Power Technology, Systems and Components

- High Voltage Insulation
- High Energy Density Storage
- Closing and Opening Switches
- Transmission Lines and Transformers
- Modulators and Power Supplies
- Electromagnetic Launchers
- Generators and Networks
- Compact and Repetitive Pulsed Power Systems
- High-Current and High Energy Systems
- Pulsed Power Diagnostics
- Theory and Simulation

Pulsed Power Applications

- Electromagnetic, Plasma, Beam and Laser Applications
- Medical, Biological and Environmental Applications
- Industrial and Commercial Applications
- Space and Emerging Applications
- Theory and Simulation

High Power Microwaves and RF Sources

- High Power Microwave Devices
- Fast Wave Devices, Slow Wave Devices
- Microwave Systems and Sources
- Theory and Simulation

Radiation Sources

- Z, X-Pinches and Imploding Liners
- High Power Diodes
- Lasers
- Theory and Simulation

Particle Beam Technology

- High Current Accelerators
- Plasma, Ion and Electron Sources
- Intense Electron and Ion Beams
- Free Electron Lasers
- Theory and Simulation

Mt. ASO (regarded as the Nahan-zo, the Buddha immediately after his death)

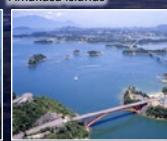
Kumamoto Castle



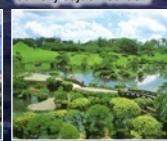
Nakadake Active Crater



Amakusa Islands



Suizenji Jojuen Garden



Onsen Hot Spring





ICOPS 2015

May 24-28, 2015
in Belek, Antalya, Turkey

Turkey

www.ece.unm.edu/icops2015



1 meter long atmospheric pressure
 microwave plasma torch at SDU Isparta

General Chair
Dr. Lütfi Öksüz
 Suleyman Demirel University
 lutfioksuz@sdu.edu.tr

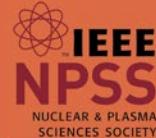
Technical Program Chair
Dr. Don Shiffler
 Air Force Research Laboratory
 don.shiffler@kirtland.af.mil

Liaison
Dr. Edi Schamigloiu
 University of New Mexico
 edi@ece.unm.edu



PULSED POWER CONFERENCE

General Chair – Mark Crawford, LANL
Technical Chair – David Wetz, UT-Arlington
PPC2015@ieee.org

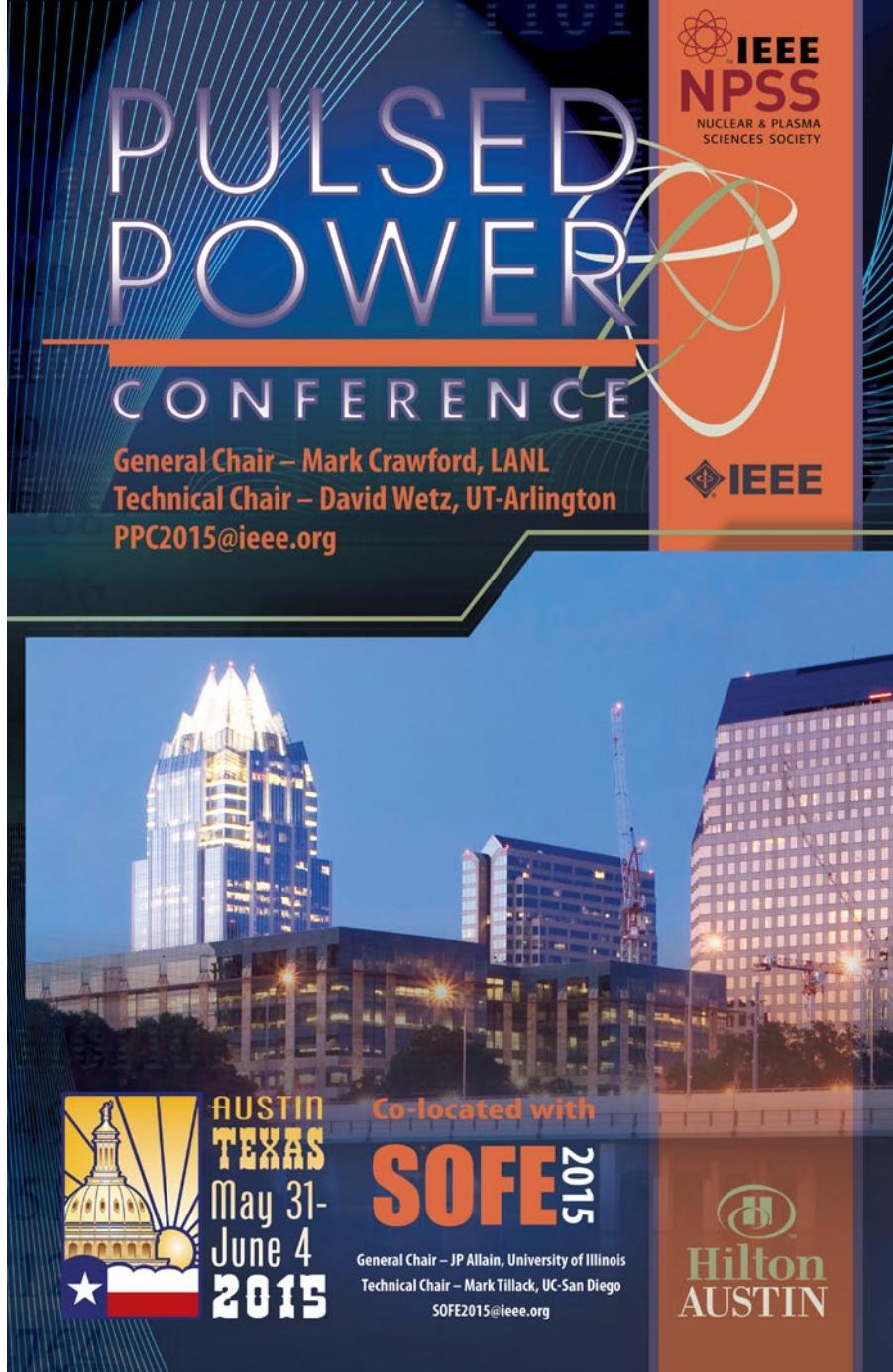


AUSTIN
TEXAS
May 31-
June 4
2015

Co-located with

SOFE
2015

General Chair – JP Allain, University of Illinois
Technical Chair – Mark Tillack, UC-San Diego
SOFE2015@ieee.org





GENERAL INFORMATION

Onsite Registration

Onsite registration for ICOPS/Beams will be available in the Atrium at the Marriott Wardman Park. Registration hours are as follows:

| Day | Time |
|-------------------|--------------------|
| Sunday, May 25 | 4:00 pm – 8:00 pm |
| Monday, May 26 | 7:00 am – 6:00 pm |
| Tuesday, May 27 | 7:30 am – 6:00 pm |
| Wednesday, May 28 | 7:30 am – 6:00 pm |
| Thursday, May 29 | 7:30 am – 12:00 pm |

Coffee Breaks

Coffee breaks will be served at 9:00 am and 2:00 pm daily (Monday, Tuesday, Wednesday, and Thursday morning) in the Exhibit & Poster area. Breaks will also be served Thursday afternoon and Friday for Minicourses.

Presentation Instructions

The following summarizes the formats for Plenary, Invited, and Contributed Oral talks, as well as posters:

Oral Presentations

Presentations must be uploaded onto the central server at least two hours prior to the beginning of your session. Due to the tight schedule, please note that speakers will not be allowed to connect personal computers to the projector, and session chairs will not be able to load presentations during oral sessions. If a talk is not uploaded in a timely manner, the Session Chair will have the option to replace it with a backup talk to ensure session continuity.

At the conference, a “Pre-Loading Center”/Speaker Ready Room will be available for checking the content of your presentation and uploading it to the central server. The “Pre-Loading Center” will be open on Sunday, May 25 from 3 p.m. to 6 p.m. (1600–1800); and Monday–Thursday (May 26–29) from 8 a.m. until 5 p.m. (0800–1700), located in the Tyler Room on the Mezzanine Level, adjacent to the oral sessions.

Presentations may be uploaded from CD, DVD, or USB flash drive. Only Power Point presentations (.ppt/.pptx) and Adobe Acrobat files (.pdf) will be accepted, as the available software includes Microsoft Office and Adobe Acrobat Reader. The presenter is responsible for knowing how to use the software for their file format; a speaker ready room will be available for practice.

A computer, projector, laser pointer, slide advancer, and microphone will be available in each oral session room. Your uploaded presentation will be available from the central server in each session room. Audio Visual Technicians will be available to provide technical support.

Oral sessions will be held on the upper level (Mezzanine) in the Thurgood Marshall area or the Hoover and Coolidge Rooms nearby.



Poster Presentations

The poster sessions will be located on the lower-level in Exhibit C. Posters must fit on a 4 foot high x 8 foot wide poster board (i.e. landscape orientation). Your poster should be displayed by 8:00 am of the day you are scheduled. The poster presenter is expected to remain at the poster during the entire time allotted to the poster session (1400 – 1530). Each poster has been assigned a number, and must be mounted on the appropriately numbered board. (You can check the number by referring to the printed or on-line program once it is posted.) All posters will be displayable the entire week, Monday - Thursday noon, allowing access for technical discussions throughout the week. If this is possible, please display your poster at your earliest convenience. In all cases, posters left on the boards as of Thursday 12:00 p.m. will be disposed and not returned to the author.

Social Events

Badges must be worn for admission to all events; tickets will be collected when necessary.

Sunday, 5/25, 6:00 pm – 8:00pm: Welcome Reception

(Included)

This event is open to all registered conference attendees and companions and will be located in the Atrium & Exhibit C. The welcome reception is included in your registration fee.

Monday, 5/27, 6:30 pm – 8:00 pm: Women in Engineering Reception

(Registration for reception required, there is no cost for this event)

This event is open to those attendees who have pre- registered for the event. The WiE Reception will be located in Wilson ABC. Tickets will be collected at the door.

Wednesday, 5/28, 7:00 pm – 9:00 pm: IEEE Plasma Sciences Awards Banquet

(Ticket purchase required, \$40 for conference attendees, \$55 for companion)

The Banquet is available by ticket purchase as listed above and will be located in Thurgood Marshall SE.

Offsite Excursions:

Monday, 5/26: Mount Vernon and Old Town, Alexandria Tour

Enjoy a guided tour of Mount Vernon, the home of George and Martha Washington followed by an afternoon in famous Old Town, Alexandria. You will have plenty of time to explore the many shops and restaurants along King Street before returning to the hotel. The bus leaves the hotel lobby at 10:00 AM and returns at 3:00 PM.

Cost: \$50 Includes transportation and admission to Mount Vernon

Tuesday, 5/27: Monument and Smithsonian Museums Tour

The bus leaves the hotel at 9:00 AM for the monument tour. The tour includes the Lincoln, Viet Nam, Korea, MLK Roosevelt and WWII Monuments. The bus will then take us to downtown, Washington, DC for lunch and then to the Smithsonian Museums on the National Mall. The return to the hotel will be via the DC Metro. Cost: \$30 includes transportation and DC Metro ticket. (Admission to the monuments and museums are free of charge)



Tuesday, 5/27: Nats vs. Marlins Baseball Game

Those who have purchased tickets will take the Metro to Nat's Stadium.

Cost: \$30 includes game ticket

Wednesday, 5/28: National Air and Space Museum/Udvar-Hazy Center and National Mall Smithsonian/National Gallery

The bus leaves the hotel at 10:00 AM for the National Air and Space Museum, Udvar-Hazy Center. This amazing museum by Dulles Airport is home to some of the world's most amazing air and space craft and is a companion facility to the Museum on the National Mall in Washington, DC. Opened in 2003, its two huge hangars display thousands of aviation and space artifacts, including a Lockheed SR-71 Blackbird, a Concorde, and the Space Shuttle Discovery. The Center also offers the Airbus IMAX Theater and the Donald D. Engen Observation Tower, which gives you a 360-degree bird's-eye view of Washington Dulles International Airport and the surrounding area.

The bus will return to the National Mall for those who wish to continue exploring the museums or the National Gallery of Art.

Cost: \$30 includes transportation and DC Metro ticket. (Admission to the museums are free of charge)

Exhibition

Exhibits will be located on the Exhibition Level during the following dates and times:

| Day | Time |
|-------------------|--------------------|
| Sunday, May 25 | 5:00 pm - 7:00 pm |
| Monday, May 26 | 8:00 am – 5:00 pm |
| Tuesday, May 27 | 8:00 am – 5:00 pm |
| Wednesday, May 28 | 8:00 am – 12:00 pm |

Minicourses

| Day | Time |
|------------------|-------------------|
| Thursday, May 29 | 1:00 pm – 5:00 pm |
| Friday, May 30 | 8:00 am – 5:00 pm |



Atmospheric Pressure, Low Temperature Plasma Mini-Course

at the ICOPS/Beams 2014 Conference
May 29 – 30, 2014, Marriott - Wardman Park, Washington D.C.

Lectures and Speakers

- **Introduction to Low-Temperature Plasmas, Discharges in Water** Prof. John E. Foster,
University of Michigan
- **Microplasma** Prof. J. Gary Eden, *University of Illinois*
- **LTP Diagnostic Techniques** Prof. Walter Lempert, *Ohio State*
- **Weakly Ionized Plasmas Applications in Hypersonics** Prof. Michael Schneider,
Princeton University
- **Atmospheric Pressure Plasma Diagnostics**
Prof. K. Tachibana, Kyoto University
- **Cavity Ring down for Atmospheric Pressure Plasmas** Prof. Chuiji Wang,
Mississippi State University
- **Stratification of Glow Discharges** Prof.
Vladimir Kolobov, *CFD Streamers*) Dr. Natalia Babaeva
University of Michigan
- **High-pressure Filamentary Discharges**
(*Streamers*) Dr. Ed Barnat, *Sandia Laboratories*
- **Laser Collisional Induced Fluorescence**
Dr. Ed Barnat, *Sandia Laboratories*
- **Plasma Stimulated Combustion** Prof.
Andrei Starikovskiy, *Princeton University*



Mini-course: **Atomic and Radiation Physics**

IEEE Pulsed Power & Plasma Science (PPPS) Conference

Thursday, May 29 - Friday, May 30, 2014

Marriott Wardman Park, Washington, DC, USA

Organized by: Arati Dasgupta, NRL

arati.dasgupta@nrl.navy.mil



Topics and Speakers

Atomic and Radiation Physics

Overview of Atomic and Radiation Physics

Arati Dasgupta (NRL)

Radiation transport in Z pinches

John P. Apruzese (NRL)

X-Ray spectroscopic signatures for pinches

Alla Safronova (UNR)

Laboratory Astrophysics

Applied Spectroscopy in Pulsed Power Plasmas

Gregory A. Rochau (SNL)

Opacity; Theoretical and astrophysical aspects

Anil K. Pradhan (OSU)

Non-LTE Atomic Kinetics

Radiation field effects on NLTE plasmas

Steven Rose (Imperial College, UK)

Line Profile & Line broadening;

Richard W. Lee (SLAC/UC-Berkeley)

Non-LTE Atomic Physics for the NIF

Kevin B. Fournier (LLNL)

Atomic models for NLTE simulations

Yuri Ralchenko (NIST)

Atomic Physics of Ultra Fast Lasers

Science at the time scale of electron

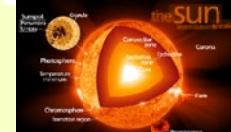
Margaret Murnane (JILA/U. Colorado)

Properties of Ultrafast Laser Heated Plasmas

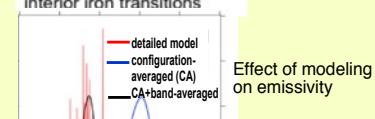
Todd Ditmire (U. Texas)



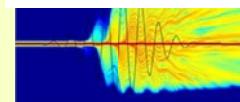
Electrical discharges illuminate the surface of the Z generator at Sandia National Lab.



Fe near CZ boundary:
T~200 eV,
 $n_e \sim 10^{23} \text{ cm}^{-3}$



Effect of modeling on emissivity





Job Placement Center

A job opportunity center will be set up at the 2014 ICOPS/Beams Conference. The placement center serves to facilitate contact between individuals seeking work and prospective employers (including those in private industry, federal labs and universities). The placement center is a free, voluntary service for several related fields including: plasma physics, pulsed power, high power microwaves and fusion.

Job postings will be prominently displayed on this page and will also be posted at the conference on a bulletin board for the Job Opportunity Center. Resumes will be available at the link below to registered job placement center recruiters. Interviews will be possible onsite at ICOPS/Beams in the Taylor Room if candidates/recruiters are available but attendance at the conference is not a requirement to participate in the placement center!

In previous years the placement center has been able to help engineers, physicists, mathematicians and technologists make contact with prospective employers.

Individuals interested in employment opportunities should send their resumes (in pdf format) via email to wmwhite@ieee.org. Please include "2014 ICOPS/BEAMS Jobs" in the subject line. Resumes should include citizenship (needed for positions in certain research labs) and be limited to one page to be most useful. If an individual will not be attending the conference please note this when sending in the resume. Again, participation in the conference is not required to participate in the job fair.

Employers interested in recruiting should send a job posting (in pdf format) via email to wmwhite@ieee.org. Please include "2014 ICOPS/Beams Jobs" in the subject line. Please make a note on the posting if a position has special requirements such as extended travel duties or the ability to obtain a security clearance. If an employer would like to interview applicants at the conference, please note this when sending in the job posting (space will be provided for interviews). Registration information for the webpage will be sent to the employer contact allowing the resumes on this website to be viewed.

Participants with questions should feel free to contact us at wmwhite@ieee.org

Free Introductory Membership

In order to encourage participation in the activities of the IEEE and the Plasma Science and Applications Section of the IEEE Nuclear and Plasma Science Society, free half-year memberships will be given to all interested non-IEEE members (including students) registering for this conference. This free half-year membership includes a subscription to IEEE Spectrum and the IEEE Transactions on Plasma Science. The regular cost of a full year's membership can be found at www.ieee.org. Membership includes:

- ✓ Subscription to Transactions on Plasma Science, a journal devoted to all aspects of plasma science and technology.
- ✓ Subscription to IEEE Spectrum, a magazine covering engineering topics of general technical, economic, political, and social interest.
- ✓ Subscription to the NPSS Newsletter with news items about the Conference on Plasma Science, the Particle Accelerator Conference, and the Symposium on Fusion Engineering.
- ✓ Eligibility to participate in a broad range of IEEE activities.
- ✓ Opportunities for IEEE educational services such as video-conferences and individual learning packages.

To receive a ½ year free membership, fill out an application at the Registration Desk.



Outstanding Student Paper Awards

The IEEE Nuclear and Plasma Sciences Society will honor the two best student papers presented at the conference. The purpose of these awards is to encourage both outstanding student contributions and greater student participation as principal or sole authors of papers as well as to acknowledge the importance of student contributions to the fields embraced by the NPSS umbrella. The two best submissions will receive cash awards of \$500 and a certificate.

To qualify for consideration the student must have identified their interest for inclusion on registration of their abstract and included a supporting letter from their supervisor sent to the student awards co-ordinator (cacover@sandia.gov). Any student who is the principal author/researcher and the presenter of either an oral or poster paper at the ICOPS/Beams 2014 conference and who has been identified as a student author will be eligible.

The work presented should be the majority work of the student and will be judged on grounds of originality, value to the community, and delivery. A judging panel of 4-7 scientists, chosen to represent the breadth of the ICOPS and Beams communities, will select approximately 12-14 papers from the valid student paper entries. The panel will ask these selected students to present their work in a 15 minute oral presentation to the judges at the conference (which is in addition to the regularly scheduled presentation). After this judging period at the conference, the on-site awards committee will rank the papers, primarily for technical content and originality. Other criteria such as graphic display and clarity of data presentation may be considered. If there is a tie, preference will be given to 1) IEEE NPSS members, 2) IEEE members, and 3) non-IEEE members, in that order.

Oral Presentations for selected “student award” papers:

Tuesday, May 27, 2014

2:00pm – 5:30pm

Truman Room

Marriott Wardman Park (Mezzanine Level)

Proceedings

As per ICOPS tradition, a refereed IEEE Transactions on Plasma Science “Special Issue: Invited and Plenary Speakers of ICOPS/Beams 2014” will be generated from invited and plenary talks at the conference (April 2015). In addition and keeping track with the long tradition of Beams, short non-refereed contributed papers will be solicited from all contributed talks and posters to form the Proceedings for ICOPS-Beams 2014. Those who desire a refereed format for contributed talks and posters are encouraged to submit their papers to IEEE Transactions on Plasma Science. As details emerge, they will be posted at: <http://www.ece.unm.edu/icops-beams2014/proc.html>.

Manuscript Submission Deadline

The deadline for manuscript submission for the “Proceedings for ICOPS-Beams 2014” is July 11, 2014*.

Manuscript Submission Formatting

Once authors have been notified that their abstract is accepted for presentation at ICOPS/Beams 2014, they will be invited to submit a manuscript to be included in the Conference Proceedings. This proceedings is a tradition of the Beams conference and the offer to submit a proceedings paper has been extended to all attendees of the combined ICOPS/Beams 2014 conference. Authors should submit their



manuscripts online at <http://www.npss-confs.org/icops>. To upload a manuscript, log on with the same username and password that was used for abstract submission, and click on the paper submission link. Once you are in the submission site, you will be given step-by-step instructions to submit a paper.

*Note: manuscript upload will not be available until after the session schedules are set.

Internet Access

Wireless internet will be provided throughout all of the ICOPS/Beams meeting space for your convenience.

Username: icopsbeams2014

Passkey: icopsbeams2014

Unauthorized Audio/Video Recording

Attendance at, or participation in, this conference constitutes consent to the use and distribution by IEEE of the attendee's image or voice for informational, publicity, promotional and/or reporting purposes in print or electronic communications media. No flash photography will be used.

Video recording by participants and other attendees during any portion of the conference is not allowed without special prior written permission of IEEE.

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Non Discrimination Policy

IEEE is committed to the principle that all persons shall have equal access to programs, facilities, services, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by IEEE policy and/or applicable laws. For more information on the IEEE policy visit, http://www.ieee.org/about/corporate/governance/p9-26.html?WT.mc_id=hpf_pol

Messages

A message board is available near the Registration Desk in the Atrium.



Women in Science & Engineering Event

Wilson ABC, Monday, 1830 – 2000

Organizer: Dr. Arati Dasgupta, Naval Research Laboratory

Keynote Speaker: Dr. Linda Horton

Prior to joining the Department of Energy, Dr. Linda Horton was the Director for the Center for Nanophase Materials Sciences (CNMS) at Oak Ridge National Laboratory (ORNL), one of the five BES national user facilities for nanoscale science research. Under her leadership, the CNMS grew from its opening in FY2006 to have a strong, interdisciplinary scientific program, which hosts a vibrant user community that reached over 400 users in FY2008. She also was the project director for the CNMS facility construction.

Prior to leading the CNMS, Dr. Horton was the program director for the ORNL BES Materials and Engineering Physics program. During her career at ORNL, she held many management roles, including Deputy Division Director for the Metals and Ceramics Division, Group Leader for Surfaces and Interfaces, and Group Leader for Electron Microscopy. Her personal research emphasized applications of electron microscopy to materials science problems, including investigations of the effects of ion implantation and neutron irradiation on the structure and properties of ferritic alloys and ceramic materials and studies of the growth and characterization of diamond thin films. At ORNL, she was involved in the implementation of research programs that integrated basic and applied research.



Dr. Horton received her Ph.D. from the University of Virginia in Materials Science. She has been active in professional service and has served on the Board of Directors for the Materials Research Society, ASM International, and the Microscopy Society of America. She has also served on both university and international advisory committees, including for Nanotechnology and Energy for the United Kingdom's Engineering and Physical Sciences Research Council (EPSRC). She is a frequent reviewer for the DOE and other agencies, including reviews of Office of Science construction projects and user facility operations. She also served as a past Vice-Chair of the BES Advisory Committee (BESAC). She was involved in a number of assessments and workshops for BES, other parts of DOE, and for other federal agencies. Notably, she served as co-chair of the 2002 BESAC workshop Basic Research Needs to Assure a Secure Energy Future, the first of the BES "Basic Research Needs" workshops.



Conference Venue

Washington Marriott Wardman Park
2660 Woodley Road NW
Washington, DC, 20008 USA

Phone: +1 202 328 2000
Toll Free: +1 800 228 9290

Experience Washington, DC like a local with the Marriott Wardman Park's convenient location in the heart of vibrant Cleveland Park. Situated on 16 garden acres, this hotel in NW Washington, DC has hosted a long list of U.S. Presidents, dignitaries and VIPs.

Accommodations

ICOPS/BEAMS 2014 welcomes you to the Marriott Wardman Park, Washington, DC which is located in the heart of vibrant Cleveland Park. The hotel is steps from dining, shops, Rock Creek Park trails, the National Zoo and a metro station.

Parking

On-site parking: US\$36 daily
Valet parking: US\$41 daily

Transportation information

Washington, DC is served by rail, bus, taxi as well as car and bike share systems listed below. In addition, rental cars are available at various locations including the airports, train station, and at the conference hotel.

Metro Rail and Bus

Metro rail and bus service is provided by the Washington Metropolitan Area Transit Authority. The Conference site is served by the Woodley Park-Zoo station on the Red Line (5 mins walk). For more info please visit their website. A trip planner website is also available for mobile devices.

Bus Station

Union Station: 3.5 miles NW

Subway Station

Woodley Park-Zoo/Adams Morgan Metro Red line: 0.1 miles SE

Train Station

Union Station: 3.5 miles SE
Served by AMTRAK, MARC and VRE systems.
From the Union Station, take the Red Line Metro to the Woodley Park-Zoo station to Marriott Wardman Park.

Taxi Services

Washington DC is served by numerous Taxi services. Taxis are on standby at the hotel but can be booked by phone or online as well as via the links listed below.
Dial 1-800-TAXI-CAB

Car Rentals

Enterprise (located on property at the Marriott Wardman Park)
2660 Woodley Road, NW
Washington, District Of Columbia 20008
Phone: +1 202 232 4443



M System Map

MetroOpenDoor.com
Customer Information Service Phone: 202/637-6000
TTY Phone: 202/638-5000

Legend

- Red Line • Glenmont to Shady Grove
- Orange Line • New Carrollton to Vienna/Fairfax-GMU
- Blue Line • Franconia-Springfield to Largo Town Center
- Green Line • Branch Avenue to Greenbelt
- Yellow Line • Huntington to Fort Totten



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REV 10/21/08

- | | | | | | | | | | | | |
|--|------------|--|-----------------------|--|-------------------------------------|--|------------------------------|--|-----------------------|--|---------------------------------|
| | No Smoking | | No Eating or Drinking | | No Animals (except service animals) | | No Audio (without earphones) | | No Litter or Spitting | | No Dangerous or Flammable Items |
|--|------------|--|-----------------------|--|-------------------------------------|--|------------------------------|--|-----------------------|--|---------------------------------|



Neighborhood Restaurants

(Within five minutes walking distance from the Marriott Wardman Park Hotel)

Afgan Grill

**2309 Calvert St NW
(202)234-5095**

The finest Afgan cuisine in all of Washington. Lamb (that melts in your mouth), chicken, steak and seafood kabobs. Nice vegetarian dishes-serving lunch and dinner daily, Indoor and nice outside dinning. Private parties are welcome

Café Paradiso

**2649 Connecticut Ave
(202) 265-8955**

Intimate dining with a quaint fireplace. Offers Northern and Southern Italian cuisine featuring homemade pasta, fresh breads, desserts and Cappuccino. Open for lunch and dinner. Patio seats (seasonal) and private rooms are available.

Hot and Juicy Crawfish

**2651 Connecticut Ave
(202) 299-9448**

Get down and dirty with Louisiana style cajun seafood! Specializing in crawfish, shrimp, and a variety of seafood, including king and snow crabs. They bring the south right here to DC.

Italian Pizza Kitchen

**2608 Connecticut Ave
(202) 939-2979**

With a menu shaped by the diversity of DC and the uniqueness of the area tastes. Pizza is one of everyone's favorite foods, and they take pride in serving it – using the freshest ingredients and best cheeses available.

Lebanese Taverna

**2641 Connecticut Ave
(202) 265-8681**

Known for authentic Middle Eastern fare, and a "perennial good buzz," where groups can enjoy Mezza specialties. Complimentary parking for lunch and dinner guests

Medaterra

**2614 Connecticut Ave
(202) 797-0400**

Offering Mediterranean cuisine including variety of appetizers, entrees, and desserts in a modern, art deco setting. Carryout and delivery available through Takeout taxi.

Murphy's Irish Pub

**2609 24th Street
(202) 462-7171**

Murphy's offers live Irish music. Serves sandwiches, stew, steaks, and seafood for lunch, dinner and late into the evenings. A sidewalk café and a wood burning fireplace are seasonal attractions.

New Heights

**2317 Calvert Street
(202) 234-4110**

Innovative New American cuisine that combines the best of fresh regional international flavors. Award-winning architecture offers exceptional views of Rock Creek Park and showcases local artists for sale.

**Open City****2331 Calvert Street****(202) 332-2331**

A local favorite. This indoor/outdoor café has a features an espresso bar as well as a full wine and liquor selection. American food that includes a full breakfast menu all day. This is a great place to have a light lunch.

Petit Plats**2653 Connecticut Ave****(202) 518-0018**

Intimate French/American bistro serving steak, fresh seafood, and salads. Private rooms available for small and large groups. Wood burning fireplace. Open 7days with Saturday and Sunday brunch.

Pizze**2653 Connecticut Ave (lower level)****(202) 518-1160**

Small cozy Italian trattoria serving authentic thin crust Neapolitan pizza, homemade fresh pasta, sandwiches, desserts and cappuccino. Open 7 days a week.

Taste of India**2621 Connecticut Ave****(202) 483-1115**

Authentic Indian cuisine, specializing in Tandoori, Curry, Kabobs and a variety of vegetarian dishes offered at reasonable prices. Carryout and delivery are available. Open 7 days a week for lunch and dinner.

Tono Sushi**2605 Connecticut Ave****(202) 332-7300**

Excellent Japanese cuisine offering sushi, teriyaki and tempura. Also offers a variety of appetizers, salads and noodle dishes. Open for lunch and dinner.

Umi Sushi (2nd Floor)**2625 Connecticut Ave****(202) 332-3636**

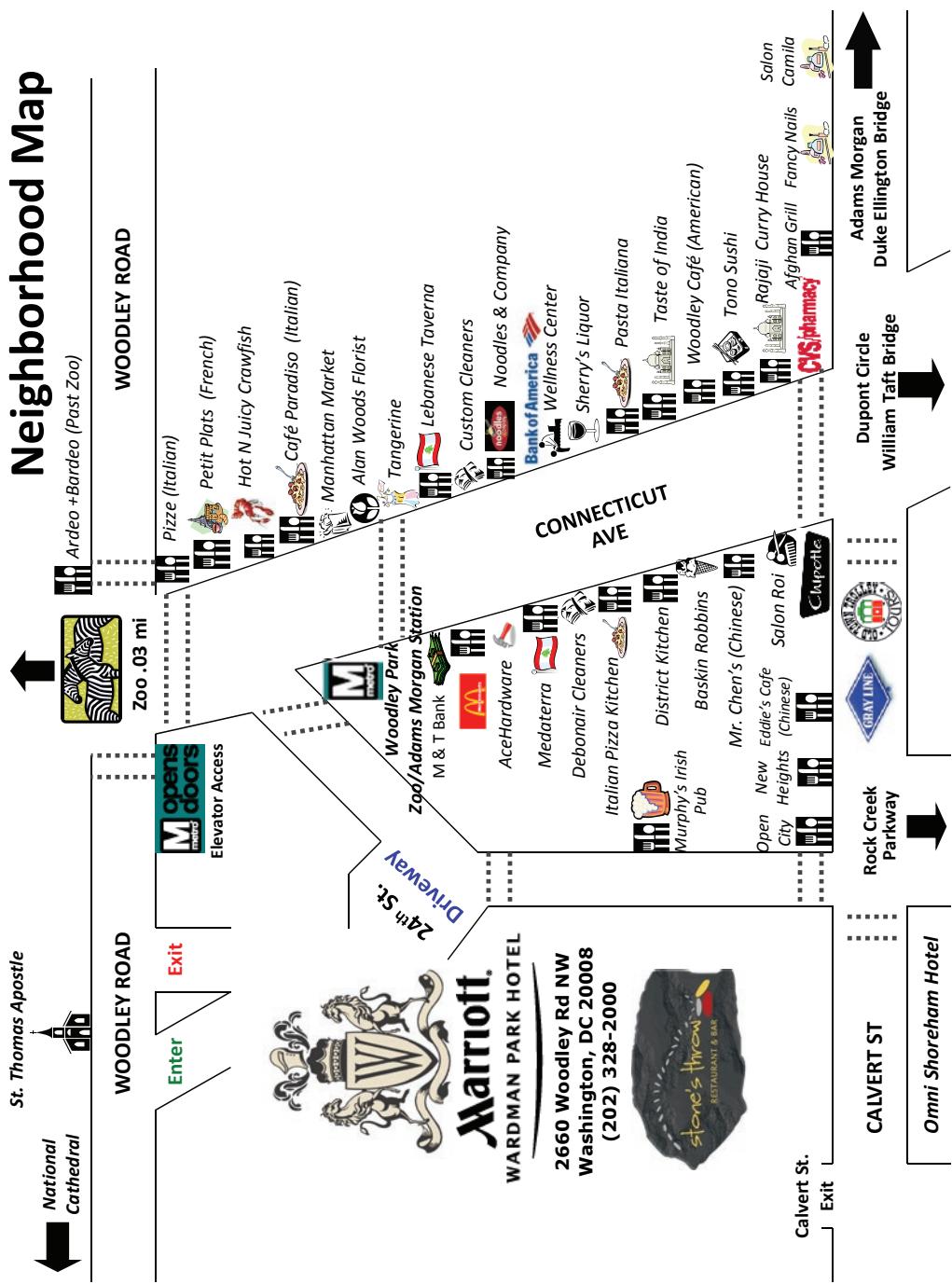
A fusion Japanese restaurant with a Manhattan feel by transforming Japanese dish to modern cuisine.

Woodley Café**2619 Connecticut****(202) 332-5773**

Proudly serving American cuisine in a relaxed dinner-house environment. Something for everyone: including superb steaks, salad, seafood and the best ribs in the area. Lunch and dinner. Also open for breakfast on weekdays and brunch on weekends.



Neighborhood Map





Technical Committee

Technical Committee Chairs

ICOPS 2014 Technical Chair: D. Shiffler, Naval Research Laboratory

Beams 2014 Technical Chair: B. Weber, Naval Research Laboratory

Technical Area Coordinators

| | |
|---|--|
| TAC1 Basic Processes in Fully and Partially Ionized Plasmas: | Andrew Christlieb, Michigan State |
| TAC2 Microwave Generation and Plasma Interactions: | William White Air Force Research Laboratory |
| TAC3 Charged Particle Beams and Sources: | Dave Hinshelwood, Naval Research Laboratory |
| TAC4 High Energy Density Plasmas and Applications: | Farhat Beg, UCSD |
| TAC5 Industrial, Commercial and Medical Plasma Application: | Chunqi Jiang, USC |
| TAC6 Plasma Diagnostics: | Simon Bland, Imperial College, UK |
| TAC7 Pulsed Power and Other Plasma Applications: | Hidenori Akiyama, Kumamoto University |

Technical Advisors

Christine Ann Coverdale, Sandia National Laboratories

Steven H. Gold, Naval Research Laboratory

Edl Schamiloglu, University of New Mexico

Bryan Oliver, Sandia National Laboratories

John Verboncoeur, Michigan State University

John Luginsland, AFOSR

Thomas Mehlhorn, Naval Research Laboratory



Plenary 1: "Ultracold Neutral Plasmas"

Prof. Steven Rolston

University of Maryland



Dr. Steven L. Rolston is a Professor of Physics at the University of Maryland, College Park, and is the co-director of the Joint Quantum Institute, and is a Marquee Professor of Science and Technology. He has been a professor at Maryland since 2003, and before that was a staff scientist at the National Institute of Standards and Technology in Gaithersburg, Maryland for 15 years. He received a B.S. in physics from Wesleyan University in Connecticut, a PhD from SUNY Stony Brook, and was a postdoctoral researcher at the University of Washington in Seattle and Harvard University before joining NIST in 1988. Steve's research interests have spanned a wide range of modern atomic physics, including antiproton trapping and antihydrogen production, laser cooling and trapping, ultracold collisions, precision spectroscopy, Bose Einstein condensation, optical lattices, and quantum information. In 1999 he established the new field of ultracold neutral plasmas, using the atomic physics techniques developed to make cold samples of atoms combined with laser photo-ionization. His research in this area started with the first demonstration of the creation of such plasmas with temperatures in the few Kelvin range, and has continued studying the physics of such fundamental plasma systems. This included measurements of plasma expansion, diffusion, collective modes, collisions at low temperatures, formation of Rydberg atoms through recombination, plasma instabilities.

He is the author of over 125 journal publications, and is a Fellow of the American Physical Society, the Optical Society of America, and the American Association for the Advancement of Science. He has served on numerous committees and panels for the American Physical Society and the Optical Society.

Plenary 2: "High Power Microwave Generation and Mitigation"

Prof. Ron Gilgenbach

University of Michigan



Ronald M. Gilgenbach is Chair and Chihiro Kikuchi Collegiate Professor in the Nuclear Engineering and Radiological Sciences Department at the University of Michigan (UM). He earned his Ph.D. in Electrical Engineering from Columbia University in 1978. His B.S. (1972) and M.S. (1973) degrees were received at the University of Wisconsin. In the early 1970's he spent several years as a Member of the Technical Staff at Bell Labs. From 1978-1980, he performed gyrotron research at the Naval Research Lab (NRL) and performed the first electron cyclotron heating experiments on a tokamak plasma in the USA at Oak Ridge National Laboratory. Dr. Gilgenbach joined the faculty of the University of Michigan in 1980 and became Director of the Plasma, Pulsed Power and Microwave Laboratory.

At UM, Dr. Gilgenbach has supervised 45 graduated Ph.D. students, has published over 160 articles in refereed journals, and has 4 patents granted and a fifth application filed. He originated a new course on particle accelerators and updated the plasma curriculum. His research at Michigan has concentrated on advanced particle accelerators, electron beams, plasma physics, high power microwave generation, as well as biological interactions of radio-frequency and ultrawideband radiation, particularly for killing cancer cells. He has collaborated in research with scientists at Air Force Research Lab, Sandia National Labs, NASA Glenn, Northrop-Grumman, L-3 Communications, General Motors Research Labs, Los Alamos National Lab, Fermilab, Naval Research Lab and Institute of High Current Electronics (Russia). He received the UM College of Engineering Research Award in 1993, the NSF Presidential Young Investigator Award (1984) and the 1997 Plasma Sciences and Applications Committee (PSAC) Award from the IEEE, served as PSAC Chair in 2007-2008 and received an Outstanding Young Engineer Award from the American Nuclear Society. He is a Fellow of the IEEE and the American Physical Society Division of Plasma Physics. He is a past Associate Editor of the journal, Physics of Plasmas.



Plenary 3: "Overview of Pulsed Power Researches at CAEP"

Prof. Jianjun Deng

Director, Institute of Fluid Physics, CAEP



Dr. Jianjun Deng is Director and Professor in the Institute of Fluid Physics, China Academy of Engineering Physics (CAEP). His main research interests include pulsed power technologies, high current accelerators, intense electron beams, Z-pinches, flash X-ray radiography. He is the project leader of the Dragon-I, Dragon-II linear induction accelerators and the Primary Test Stand (PTS).

Dr. Deng has published over 100 articles in refereed journals. He received many awards and honors including the "Qiushi" Outstanding Young S&T Award (1999), Special Award of State Council (1998) of China and two National Scientific Progress Awards (1997 and 2005). He served as Chair of Chinese Pulsed Power Society and originated a new summer school on pulsed power in China. He chaired the 3rd International Symposium on Pulsed Power & Plasma (ISPP2002), the First Euro-Asian Pulsed Power Conference (EAPPC2006), the 17th International Conference on High Power Particle Beams (BEAMS2008), and the 3rd International Workshop on Induction LINACs. He is also a member of the BEAMS International Advisory Committee, EAPPC International Organizing Committee, DZP International Organizing Committee and International Particle Accelerator Conference (IPAC) Scientific Advisory Board.

Plenary 4: The High-Foot Implosion Campaign on the NIF

Dr. Omar Hurricane

Lawrence Livermore National Laboratory



Dr. Omar Hurricane is a Distinguished Member of the Technical Staff at Lawrence Livermore National Laboratory and lead scientist for the High-foot Implosion Campaign on the NIF. His research focuses on weapons physics, high energy density physics science, and plasma instability. Dr. Hurricane has authored 60 journal publications and 60 conference papers, largely in the area of plasma physics and HEDP. He has received several awards and honors, including the U.S. Department of Energy Ernest Orlando Lawrence Award for National Security and Nonproliferation (2009), five U.S. Department of Energy Defense Programs Recognition of Excellence Awards (2002, 2004, 2009 x 2, 2010), and three LLNL Directors Science & Technology awards (2010, 2011, and 2013). Dr. Hurricane received his B.S. in Physics and Applied Mathematics from

Metropolitan State University of Denver, and his M.S. and Ph.D. in Physics from the University of California, Los Angeles (UCLA) where he was also a post-doc for four years. Dr. Hurricane has also been a Visiting Scholar at Stanford University (CISAC).



Plenary 5: “Density Functional Methods for High Energy Density Plasmas and Warm Dense Matter”

Dr. Michael Desjarlais
Sandia National Laboratories



Dr. Mike Desjarlais is a research scientist at the Sandia National Laboratories, Albuquerque, NM. A Senior Scientist at Sandia National Laboratories, Albuquerque, Mike received his B.S. in Electrical Engineering from the University of Massachusetts in 1980 and received his Ph.D. from Cornell University through the Laboratory of Plasma Studies in 1986, upon which he joined Sandia's Pulsed Power Sciences Directorate. From 1986 to 1996, he worked on the theory of magnetically insulated ion diodes in support of Sandia's ion beam fusion program. Following a brief period of research on the physics of wire array Z pinches, he began addressing the need for more accurate wide-range electrical and thermal transport models in simulation codes, and turned to density functional theory for the difficult problem of calculating conductivities for warm

dense matter. The models developed with these methods are now widely used throughout the NNSA labs and internationally. His work with density functional molecular dynamics soon led to collaborations with Sandia's shock physics group, starting with his calculation of the shock properties of liquid deuterium in 2003, the subject of considerable controversy at the time. The success of this early effort precipitated a rapid growth of joint experimental-theoretical dynamic materials research on Z, including equation of state research on beryllium and diamond for the National Ignition Campaign, quartz as a very accurate shock impedance standard, and water and hydrogen for planetary science. In addition to several NNSA Defense Programs Awards of Excellence, he received the 2002 Sandia Employee Recognition Award for Individual Technical Excellence for his wide-range conductivity model for aluminum using *ab initio* methods and the 2006 Sandia LDRD Award for Excellence for his team's development of exact-exchange density functional methods. Dr. Desjarlais is a Fellow of the American Physical Society and an Associate Editor for *Physics of Plasmas*.

PSAC is pleased to announce the 2014 recipient of its **Plasma Science and Applications Award**, Dr Michael Desjarlais, “For pioneering contributions to the understanding of electrical and thermal transport properties, and equations of state for materials at extreme conditions through the use of first-principles density functional calculations, and generating numerous state-of-the-art wide-range conductivity models for use in a broad spectrum of simulation codes.”



Plenary 6: "Application of TW-Level Pulsed Power to the Problem of Finding Fissile Material"

Dr. Robert J. Commisso
Naval Research Laboratory



Dr. Robert J. (Bob) Commisso is in the Pulsed-Power Physics Branch of the Plasma Physics Division at the Naval Research Laboratory (NRL). He has been an NRL employee since December 1983 and a contractor in the same group from 1980 - 1983. Bob's interests include the physics of pulsed, high-temperature, high-density plasmas, x-ray production, intense electron and ion beams, the production of high-power electrical pulses, thermonuclear fusion, and plasma diagnostics. Applications include pulsed-power development and x-ray production for the laboratory simulation of nuclear weapon effects, high-resolution, high-power, flash radiography, and the detection of fissile material. He is an advisor to the Defense Threat Reduction Agency on issues regarding x-ray production for nuclear weapons effects simulation and a co-principal investigator on several Branch programs.

From 1976 to 1980, Bob was with the Controlled Thermonuclear Research Division at Los Alamos National Laboratory (then called Los Alamos Scientific Laboratory). He led experiments to stop end loss of a fusion-grade plasma from a 5-m linear theta pinch and worked on theta-pinch-formed, field-reversed configurations. During his tenure at LANL (spring and summer of 1979), he was on assignment at the Office of Fusion Energy, Department of Energy, in Germantown, Maryland where he developed long-range plans for the magnetic fusion program that were helpful in the passage of the Magnetic Fusion Energy Engineering Act of 1980. Bob completed his Ph.D. at the University of Maryland in 1976 where he investigated the heating and dynamics of a theta-pinch plasma with application to fusion.

Bob has served on many DoD and DOE review panels. He was a Senior Editor for the IEEE Transactions on Plasma Science for the Charged Particle Beams and Sources technical area from 2006 – 2011 and an Associate Editor from 2000 – 2006. He was the Chair of the 31st IEEE International Conference on Plasma Science (2004) and is a Fellow of the IEEE.



Plenary 7: "Plasma Surface Engineering of Biomaterials"

Prof. Paul Chu

City University of Hong Kong



Prof. Paul K Chu received his BS in mathematics from The Ohio State University in 1977 and MS and PhD in chemistry from Cornell University in 1979 and 1982, respectively. He joined Charles Evans & Associates in California after graduation and founded his first company, Evans Asia, in 1990. He joined City University of Hong Kong in 1996 and established the Plasma Laboratory. He is currently Chair Professor of Materials Engineering in the Department of Physics and Materials Science in City University of Hong Kong and holds 14 honorary professorships in China including Peking University, Fudan University, Shanghai Jiaotong University, Nanjing University, and Chinese Academy of Sciences.

He is Chairman of the International Plasma-Based Ion Implantation and Deposition (PBII&D) International Committee and a member of the IEEE NPSS Fellow Evaluation Committee and Ion Implantation Technology (IIT) International Committee. He is guiding senior editor of IEEE Transactions on Plasma Science (after serving as senior editor from 2006 to 2013), associate editor of Materials Science and Engineering Reports, and an editorial board member of 8 international journals including Biomaterials, Advanced Materials Interfaces, and Surface & Coatings Technology.

His research activities are quite diverse spanning plasma science and engineering, surface science and engineering, as well as functional materials. His works have been cited 20,000 times and he is one of the top 100 materials scientists in the world according to Thomson Reuters Essential Science Indicators. He has won many research awards, for example, the IEEE NPSS Merit Award (2007), MRS JW Mayer Lectureship (2008), and Shanghai Natural Science 1st Class Award (2011). He is Fellow of the APS, AVS, IEEE, MRS, and HKIE.

He is also active in industrial applications having founded two other companies, Plasma Technology Ltd. in Hong Kong in 1998 and Chengdu PulseTech Electrical Co. Ltd. in China in 2001. The former company specializes in the design and manufacturing of low-pressure plasma and coatings equipment, whereas the latter produces various types of power supplies for industrial equipment. Plasma Technology Ltd. won the Hong Kong Awards for Industry in 2004 and again in 2011.



ICOPS/Beams 2014 Technical Program

Monday, May 26

Session PL1: Plenary 1

Monday, May 26 08:00-09:00 Thurgood Marshall East-South

Session Chair: Joseph W Schumer, Naval Research Laboratory

8:00 PL1-1 (invited) ULTRACOLD NEUTRAL PLASMAS

S. L. Rolston

Physics, University of Maryland, College Park, MD, United States

Session 1A: Nonequilibrium Plasma Applications I

Monday, May 26 9:30 - 12:00 Thurgood Marshall North

Session Chair: Xinpei Lu, Huazhong University of Science and Technology, China

9:30 1A-1 CONTROL OF ION ENERGY DISTRIBUTIONS USING PHASE SHIFTING IN MULTI-FREQUENCY CAPACITIVELY COUPLED PLASMAS

Y. Zhang¹, M. J. Kushner¹, S. C. Shannon²

¹*Electrical Engineering and Computer Science Department, University of Michigan, Ann Arbor, MI, United States*²*Department of Nuclear Engineering, North Carolina State University, Raleigh, NC, United States*

9:45 1A-2 EXPERIMENTAL AND NUMERICAL STUDIES ON NONLINEAR PLASMA SERIES

RESONANCE EFFECT IN CAPACITIVELY COUPLED RADIO FREQUENCY GLOW DISCHARGE PLASMA BY HOMOGENEOUS DISCHARGE MODEL

B. Bora, L. Soto

Departamento de Plasma Termonuclear, Comision Chilena de Energia Nuclear, Santiago, RM, Chile

10:00 1A-3 ION FLUX UNIFORMITY CONTROL IN LARGE AREA CAPACITIVELY COUPLED DUAL-FREQUENCY DISCHARGES

E. Schuengel¹, J. Schulze¹, S. Mohr², U. Czarnetzki²

¹*Physics, West Virginia University, Morgantown, WV, United States*²*Institute for Plasma and Atomic Physics, Ruhr University Bochum, Bochum, NRW, Germany*

10:15 1A-4 THE EFFECT OF STRUCTURED ELECTRODES ON HEATING AND PLASMA UNIFORMITY IN CAPACITIVE DISCHARGES

N. Schmidt¹, U. Czarnetzki¹, E. Schuengel², J. Schulze²

¹*Physics, Ruhr-University Bochum, Bochum, NRW, Germany*²*Physics, West Virginia University, Morgantown, WV, USA*

10:30 1A-5 HYDROGEN AND METHANE PLASMA ASSISTED IGNITION BY NS DISCHARGE BEHIND REFLECTED SHOCK WAVE

A. Starikovskiy

MAE, Princeton University, Princeton, NJ, United States

10:45 1A-6 COMPARATIVE STUDY ON MICROWAVE PLASMA-ASSISTED COMBUSTION OF PREMIXED AND NONPREMIXED METHANE-AIR FLOWS

W. Wu, C. A. Fuh, C. Wang

Department of Physics and Astronomy, Mississippi State University, Starkville, MS, United States

**11:00 1A-7 MICROPLASMA ASSISTED SYNTHESIS OF GOLD NANOPARTICLES MEDIATED BY ULTRASOUND**

S. Zuo¹, R. Wang¹, J. Zhang^{1,2}, J. Fang^{1,2}, W. Zhu³

¹Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, China²College of Engineering, Peking University, Beijing, China³Department of Applied Science and Technology and Center for Microplasma Science and Technology, Saint Peters College, New Jersey, USA

11:15 1A-8 CO2 DISSOCIATION USING THE VERSATILE ATMOSPHERIC DIELECTRIC BARRIER DISCHARGE EXPERIMENT (VADER)

M. A. Lindon, E. Scime

Physics, West Virginia University, Morgantown, WV, United States

11:30 1A-9 COMPARISON OF PLASMA SOURCES FOR SURFACE TREATMENT APPLICATIONS: RADIOFREQUENCY INDUCTIVELY COUPLED AND SURFACE-WAVE MICROWAVE PLASMA SOURCES

C. Laurent, J. Lo, B. Caillier, L. Therese, P. Guillot

DPHE, Universite de Toulouse, CUFR J. F. Champollion, albi, France

11:45 1A-10 SPECIES GENERATION AND DENSITIES IN ELECTRON BEAM-GENERATED PLASMAS

E. H. Lock¹, R. F. Fernsler¹, S. P. Slinker², I. L. Singer², S. G. Walton¹

¹Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States²Now Retired, Washington, DC, United States

Session 1B: Slow-Wave Devices I

Monday, May 26 9:30 - 12:00 Thurgood Marshall South

Session Chair: John Pasour, Naval Research Laboratory

9:30 1B-1 A STUDY OF ABSOLUTE INSTABILITY IN TWTS

D. M. H. Hung¹, I. M. Rittersdorf¹, Y. Y. Lau¹, D. H. Simon¹, P. Zhang¹, R. M. Gilgenbach¹, D. Chernin², T. M. Antonsen, Jr³

¹Nuclear Engineering and Radiological Sciences, University of Michigan, Ann Arbor, MI, United States²Leidos Corp., Reston, VA, United States³University of Maryland, College Park, MD, United States

9:45 1B-2 DESIGN OF BROADBAND KILO-WATT CLASS W-BAND SERPENTINE TWTS

K. T. Nguyen¹, A. Cook², J. P. Calame², C. Joye², J. A. Pasour², D. Pershing¹, E. Wright¹, S. Cooke², B. Levush², D. K. Abe²

¹Beam-Wave Research, Inc., Bethesda, MD, United States²U.S. Naval Research Laboratory, Washington, DC, United States

10:00 1B-3 94 GHZ OVERMODED TWT EXPERIMENT

E. J. Kowalski, W. C. Guss, M. A. Shapiro, R. J. Temkin

Plasma Science and Fusion Center, Massachusetts Institute of Technology, Cambridge, MA, United States

10:15 1B-4 DIELECTRIC AND ALTERNATIVE-CONFIGURATION-METAL SLOW WAVE STRUCTURES FOR W-BAND TRAVELING WAVE AMPLIFIERS

J. P. Calame¹, A. M. Cook¹, C. D. Joye¹, B. S. Albright Jr¹, K. T. Nguyen², E. L. Wright², R. E. Myers², L. Ludeking³

¹Naval Research Laboratory, Washington, DC, United States²Beam-Wave Research, Inc., Bethesda, MD, United States³ATK Mission Research, Newington, VA, United States

**10:30 1B-5 (invited) DEMONSTRATION OF A WIDEBAND 10-KW KA-BAND SHEET BEAM TWT AMPLIFIER**

D. Pershing¹, K. Nguyen¹, D. K. Abe², E. Wright², P. Larsen³, J. Pasour², S. Cooke², A. Balkcum⁴, F. Woods², R. Myers¹, B. Levush²

¹*Beam-Wave Research, Inc., Bethesda, MD, United States*²*Naval Research Laboratory, Washington, DC, United States*³*ANSYS Inc., Evanston, IL, United States*⁴*CPI, Inc., Palo Alto, CA, United States*

11:00 1B-6 PLANAR SLOW-WAVE STRUCTURE WITH PARASITIC MODE CONTROL

L. B. Nguyen, T. M. Antonsen, G. S. Nusinovich

Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, College Park, Maryland, United States

11:15 1B-7 COMPACT, MULTI-KW SHEET BEAM OSCILLATOR AT 94 GHZ

J. Pasour¹, E. Wright², K. Nguyen², B. Levush¹

¹*Naval Research Laboratory, Washington, DC, United States*²*Beam Wave Research, Inc., Bethesda, MD, United States*

11:30 1B-8 MULTIPACTOR COATINGS FOR SAPPHIRE WINDOWS USING REMOTE PLASMA ASSISTED DEPOSITION

L. Ives¹, D. Marsden¹, G. Collins¹, D. Zeller², G. Lucovsky², E. Schamiloglu³

¹*Calabazas Creek Research, Inc., San Mateo, CA, United States*²*Physics Department, North Carolina State University, Raleigh, NC, United States*³*Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM, United States*

11:45 1B-9 SPECTRAL DYNAMICS OF MM-WAVE RADIATION FROM TWO-CHANNEL PLANAR FEM WITH TWO DIMENSIONAL DISTRIBUTED FEEDBACK

A. V. Arzhannikov¹, N. S. Ginzburg², V. Y. Zaslavsky², P. V. Kalinin³, N. Y. Peskov², A. S. Sergeev², S. L. Sinitzky¹, V. D. Stepanov¹, M. K. A. Thumm⁴

¹*Institute of Nuclear Physics, Siberian Branch of RAS, Novosibirsk, Russia*²*Institute of Applied Physics, RAS, Nizhny Novgorod, Russia*³*Novosibirsk State University, Novosibirsk, Russia*⁴*Karlsruhe Institute of Technology, IHM, Karlsruhe, Germany*

Session 1C: Plasma, Ion, and Electron Sources I

Monday, May 26 9:30 - 12:00 Thurgood Marshall East

Session Chair: Evgeniya H Lock, *Naval Research Laboratory*

9:30 1C-1 POLAR, NON-CENTROSYMMETRIC CRYSTALS FOR THE GENERATION OF ATMOSPHERIC PRESSURE GAS DISCHARGES

M. J. Johnson, D. B. Go

Aerospace and Mechanical Engineering, Notre Dame, Notre Dame, United States

9:45 1C-2 THE GLASS-SILICON-GLASS SANDWICH STRUCTURED MICROPLASMA CHIP AS THE ELECTRON SOURCE OF A MICRO MASS SPECTROMETER

J. Tang, X. Yu, Y. Chen, S. -T. Tu, Z. Wang

Key Laboratory of Pressure Systems and Safety, Ministry of Education, East China University of Science and Technology, Shanghai, China

10:00 1C-3 DEVELOPMENT AND MEASUREMENT OF A MICROWAVE MICROPLASMA SOURCE FOR MICROPROPULSION

R. A. Dextre, K. G. Xu

Mechanical and Aerospace Engineering, University of Alabama in Huntsville, Huntsville, AL, United States

**10:15 1C-4 (invited) TOMSK POLYTECHNIC UNIVERSITY RESEARCH IN DESIGNING NANOSECOND ELECTRON SOURCES AND THEIR APPLICATION**

G. E. Remnev, R. V. Sazonov, I. S. Egorov, V. V. Ezhev, V. S. Esipov, M. I. Kaikanov, D. Y. Kolokolov, E. I. Lukonin, L. R. Merinova, A. V. Nashilevskiy, A. V. Poloskov, D. V. Ponomarev, A. V. Stepanov, G. E. Kholodnaya
Tomsk Polytechnic University, Tomsk, Russian Federation

10:45 1C-5 A GLOBAL MODEL OF HIGH CURRENT NEGATIVE HYDROGEN ION SOURCE

S. N. Averkin¹, N. A. Gatsonis¹, L. Olson²

¹*Worcester Polytechnic Institute, Worcester, MA, United States*²*Busek Co. Inc., Natick, MA, United States*

11:00 1C-6 INFLUENCE OF THE EXCITATION FREQUENCY INCREASE ON A FLUID MODEL OF THE CAPACITIVELY COUPLED ARGON PLASMA

S. Leszczynski¹, C. Strobel¹, M. Albert¹, J. W. Bartha¹, U. Stephan²

¹*Semiconductor and Microsystems Technology Laboratory, Dresden University of Technology, Dresden, Germany*²*Forschungs- und Applikationslabor Plasmatechnik GmbH, Dresden, Germany*

11:15 1C-7 EVALUATING THE PERFORMANCE OF A CARBON-EPOXY CAPILLARY CATHODE AND CARBON FIBER CATHODE IN A SEALED-TUBE VIRATOR UNDER UHV CONDITIONS

E. Rocha, P. Kelly, J. Mankowski, A. A. Neuber, J. C. Dickens, J. M. Parson, C. Lynn

Texas Tech University, Center for Pulsed Power and Power Electronics, Lubbock, Texas, United States

11:30 1C-8 CARBON NANOTUBE FIBER FIELD EMISSION CATHODES

S. B. Fairchild¹, M. A. Lange¹, G. J. Gruen¹, P. T. Murray¹, T. C. Back¹, N. P. Lockwood², M. Pasquali³

¹*Materials and Manufacturing Directorate, Air Force Research Laboratory, Wright-Patterson AFB, OH, United States*²*Directed Energy Directorate, Air Force Research Laboratory, Kirtland AFB, NM, United States*

³*Department of Chemical and Biomolecular Engineering, Rice University, Houston, TX, United States*

Session 1D: X- and Z-pinches I

Monday, May 26 9:30 - 12:00 Thurgood Marshall West

Session Chair: *Brent Jones, Sandia National Laboratory*

9:30 1D-1 (invited) FULLY KINETIC MODELING AND ION PROBE BEAM EXPERIEMNTS IN A DENSE PLASMA FOCUS Z-PINCH

A. Link¹, J. Ellsworth¹, S. Falabella¹, B. Rusnak¹, A. Schmidt¹, J. Sears¹, V. Tang¹, D. Welch²

¹*Lawrence Livermore National Laboratory, Livermore, CA, United States*²*Voss Scientific, Albuquerque, NM, United States*

10:00 1D-2 MEASUREMENTS OF DENSE PLASMA FOCUS PERFORMANCE WITH BOTH DEUTERIUM AND DEUTERIUM-TRITIUM GASSES

E. C. Hagen¹, D. Lowe², S. Molnar³, R. Rundberg⁴

¹*Defense Experimentation, National Security Technologies (NSTec), Las Vegas, NV, USA*²*Keystone International, Albuquerque, NM, USA*³*Powder River Geophysical, Las Vegas, NV, USA*⁴*Los Alamos National Laboratory, Los Alamos, NM, USA*

10:15 1D-3 COMPRESSION OF PUFFING DEUTERIUM BY NEON PLASMA SHEATH ON PLASMA FOCUS DEVICE

P. Kubes¹, M. Paduch², D. Klir¹, J. Kravarik¹, K. Rezac¹, J. Cikhardt¹, J. Kortanek¹, B. Batobolotova¹, E. Zielinska²

¹*Czech Technical University in Prague, FEE, Department of Physics, Prague, Czech Republic*²*IPPLM Warsaw, Poland, Warsaw, Poland*

**10:30 1D-4 D-ON-D AND AR-ON-D GAS PUFF Z-PINCH SIMULATIONS ON ZR FOR NEUTRON SOURCE**

Y. K. Chong¹, A. L. Velikovich¹, J. W. Thornhill¹, J. Giuliani¹, P. Knapp², C. Jennings²

¹*Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States*²*Sandia National Laboratories, Albuquerque, NM, United States*

10:45 1D-5 TRIPLE NOZZLE GAS-PUFF Z-PINCH IMPLOSIONS ON COBRA

P. W. de Grouchy¹, N. Qi¹, B. R. Kusse¹, L. Atoyan¹, A. Cahill¹, P. A. Gourdain¹, J. B. Greenly¹, C. Hoyt¹, W. Potter¹, P. Schraefel¹, D. A. Hammer¹, S. A. Pikuz², T. A. Shelkovenko²

¹*Laboratory of Plasma Studies, Cornell University, Ithaca, United States*²*Lebedev Physical Institute, Moscow, Russia*

11:00 1D-6 SYNTHETIC TIME AND SPACE RESOLVED SPECTRA INCLUDING DOPPLER SPLITTING FROM SIMULATIONS OF STAINLESS STEEL AND ARGON PINCHES ON Z

J. Thornhill¹, J. Giuliani¹, J. Apruzese¹, A. Dasgupta¹, Y. Chong¹, B. Jones², D. Ampleford², A. Harvey-Thompson², S. Hansen², C. Coverdale², C. Jennings², G. Rochau², M. Cuneo²

¹*NAVAL RESEARCH LABORATORY, Washington DC, United States*²*Sandia National Laboratories, Albuquerque, NM, United States*

11:15 1D-7 AVENUES AND CHALLENGES IN MATERIAL PROCESSING AND SYNTHESIS UNDER EXTREME CONDITIONS IN PULSED HIGH ENERGY DENSITY PLASMA FOCUS DEVICE

R. S. Rawat

Natural Sciences and Science Education, National Institute of Education, Nanyang Technological University, Singapore, Singapore

11:30 1D-8 A NONUNIFORM TRANSMISSION LINE CODE FOR PULSED POWER Z-PINCH DRIVERS

C. Mao, X. Zou, X. Wang

Department of Electrical Engineering, Tsinghua University, BEIJING, China

11:45 1D-9 MEASUREMENTS OF THE TIME-DEPENDENT SPATIAL MAGNETIC FIELD DISTRIBUTION AND STRUCTURE OF A Z-PINCH PLASMA THROUGHOUT THE STAGNATION PROCESS

G. Rosenzweig, E. Kroupp, A. Starobinets, A. Fisher, Y. Maron

Weizmann Institute of Science, Rehovot, Israel

Session 1E: Plasma Thrusters I

Monday, May 26 9:30 - 12:00 Hoover

Session Chairs: *Yevgeny Raitses, Princeton Plasma Physics Laboratory, Sedina Tsikata, CNRS*

9:30 1E-1 (invited) RECENT ADVANCES IN HALL THRUSTER MAGNETIC SHIELDING TECHNOLOGY

R. R. Hofer

Jet Propulsion Laboratory, Pasadena, CA, United States

10:00 1E-2 (invited) INFLUENCE OF SIZE SCALING AND PLASMA-WALL INTERACTION ON FEATURES OF HALL THRUSTER MICROTURBULENCE

S. Tsikata¹, A. Heron², C. Honore³, S. Mazouffre¹

¹*ICARE, CNRS, UPR 3021, Orleans, France*²*CPHT, Ecole Polytechnique, CNRS, UMR 7644, Palaiseau, France*³*LPP, Ecole Polytechnique, CNRS, UMR 7648, Palaiseau, France*

10:30 1E-3 PLASMA-WALL INTERACTION IN PRESENCE OF INTENSE ELECTRON EMISSION FROM WALLS

I. D. Kaganovich¹, A. V. Khrabrov¹, M. D. Campanelli¹, H. Wang¹, Y. Raitses¹, D. Sydorenko²

¹*PPPL, Princeton, United States*²*Department of Physics, University of Alberta, Edmonton, Canada*

10:45 1E-4 EFFECTS OF WALL MATERIAL, WALL TEMPERATURE, AND SURFACE ROUGHNESS ON THE PLASMA SHEATH

S. J. Langendorf, M. L. R. Walker

School of Aerospace Engineering, Georgia Institute of Technology, Atlanta, GA, United States

**11:00 1E-5 ATOMIC BORON SPEED DISTRIBUTION MEASUREMENTS IN THE PLUME OF A HALL THRUSTER USING LASER-INDUCED FLUORESCENCE**

B. C. Lee¹, A. P. Yalin²

¹*Physics, Colorado State University, Fort Collins, CO, United States*²*Mechanical Engineering, Colorado State University, Fort Collins, CO, United States*

11:15 1E-6 ELECTRON EMISSION FROM MICRO-ARCHITECTURED MATERIALS FOR PLASMA APPLICATIONS

Y. Raitses, C. Jin

Princeton Plasma Physics Laboratory, Princeton, NJ, United States

11:30 1E-7 INITIAL EXPERIMENTS OF A NEW PERMANENT MAGNET HELICON THRUSTER

J. P. Sheehan, B. W. Longmier, I. M. Reese, T. A. Collard, F. H. Ebersohn, E. T. Dale, B. N. Wachs, M. E. Ostermann

Aerospace Engineering, University of Michigan, Ann Arbor, MI, United States

11:45 1E-8 COUPLED MOLECULAR DYNAMICS-POISSON SIMULATIONS OF IONIC LIQUID ELECTROSPRAY THRUSTERS

A. P. Borner, D. A. Levin

Aerospace Engineering, Penn State University, University Park, PA, United States

12:00 1E-9 MICRO-CATHODE ARC THRUSTER FOR SMALL SATELLITES ATTITUDE CONTROL

A. Shashurin, T. Zhuang, J. Lukas, G. Teel, S. Haque, D. Chiu, M. Keidar

Mechanical and Aerospace Department, George Washington University, Washington, DC, United States

Session 1F: Basic Plasma Phenomena I

Monday, May 26 9:30 - 12:00 Coolidge

Session Chair: *Chris H Moore, Sandia National Labs*

9:30 1F-1 THE EFFECTS OF IN-ELASTIC PROCESSES ON ELECTRON TEMPERATURE IN ELECTRON BEAM GENERATED PLASMAS

D. R. Boris, G. M. Petrov, E. H. Lock, T. B. Petrova, R. F. Fernsler, S. G. Walton

Plasma Physics, Naval Research Laboratory, Washington, DC, United States

9:45 1F-2 PARTICLE-IN-CELL SIMULATIONS OF LOWER-HYBRID WAVES GENERATED BY AN ION-RING VELOCITY DISTRIBUTION

S. B. Swanekamp, A. S. Richardson, M. Mithaiwala, C. Crabtree

Plasma Physics Division, Naval Research Laboratory, Washington, United States

10:00 1F-3 PARTICLE-IN-CELL MODELING OF SPECIES SEPARATION IN TWO-SPECIES PLASMAS

A. S. Richardson¹, S. B. Swanekamp¹, S. L. Jackson¹, D. G. Phipps¹, J. W. Schumer¹, P. F. Ottinger²

¹*Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States*²*Engility, Chantilly, VA, United States*

10:15 1F-4 EXACT SOLUTION OF FLUID MOMENTUM EQUATIONS IN THE ATMOSPHERIC PLASMA-JETS

J.-E. Heo, Y. Kim, S. Jin, G. -H. Han, G. -C. Kwon, E. -H. Choi, H. S. Uhm, G. Cho

Department of Electrophysics, Kwangwoon University, Seoul, South Korea

10:30 1F-5 (invited) EMERGENCE OF SELF-ORGANIZED PATTERNS IN ARC DISCHARGES BY ANODE COOLING

J. P. Trelles

Department of Mechanical Engineering, University of Massachusetts Lowell, Lowell, MA, United States

**11:00 1F-6 THE VALIDITY OF SIMILARITY LAW OF GLOW DISCHARGE AT LOW PRESSURE IN ARGON BY NUMERICAL SIMULATION**

Y. Fu, H. Luo, X. Zou, X. Wang

Department of Electrical Engineering, Tsinghua University, BEIJING, China

11:15 1F-7 COMPREHENSIVE RESEARCHES ON DYNAMICS OF NANOSECOND LASER PRODUCED PLASMAS

X. Li, J. Wu, W. Wei, S. Jia, A. Qiu

State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, Xi'an, Shaanxi, China

11:30 1F-8 BREAKDOWN VOLTAGE CORRELATIONS IN A LARGE DC DISCHARGE TUBE FOR MULTIPLE GASES

T. E. Gebhart¹, M. A. Bourham², A. L. Winfrey¹

¹*Mechanical Engineering, Virginia Tech, Blacksburg, VA, United States*²*Nuclear Engineering, North Carolina State University, Raleigh, NC, United States*

Session PL2: Plenary 2

Monday, May 26 13:00-14:00 Thurgood Marshall East-South

Session Chair: *David French, Air Force Research Laboratory*

13:00 PL2-1 (invited) HIGH POWER MICROWAVE GENERATION AND MITIGATION

R. M. Gilgenbach

Nuclear Engineering & Radiological Sciences Department, University of Michigan, Ann Arbor, MI, United States

Session 1P: 4.1 Fusion (Inertial, Magnetic, & Alternative Concepts) Posters**Poster Session**

Monday, May 26 14:00-15:30 Exhibit C (lower level)

Session Chair: *Scott Wilks, Lawrence Livermore National Laboratory*

1P-1 A PULSE FORMING NETWORK FOR TOROIDAL FIELD SYSTEM FOR TPM-1U TOKAMAK

D. H. Arriaga, M. N. Perez

Alternative Energy, CICATA IPN Queretaro, Queretaro, Mexico

1P-2 EFFECTS OF LITHIUM WALL-COATINGS ON IMPURITY IONS IN THE LITHIUM TOKAMAK EXPERIMENT (LTX)

D. P. Boyle¹, R. E. Bell¹, R. Kaita¹, R. Majeski¹, T. M. Biewer², T. K. Gray²

¹*Princeton Plasma Physics Lab, Princeton, NJ, United States*²*Oak Ridge National Lab, Oak Ridge, TN, United States*

1P-3 NUMERICAL ANALYSIS OF TEMPERATURE DISTRIBUTION FOR ISOCHORIC HEATING WITH INTENSE PULSED POWER DISCHARGE USING ELECTRON BEAM DIODE BASED IMPEDANCE CONTROLLER

R. Hayashi¹, F. Tamura¹, T. Kudo¹, K. Takahashi¹, T. Sasaki¹, T. Kikuchi¹, T. Aso¹, N. Harada¹, W. Jiang¹, K. Kashine², A. Tokuchi^{1,3}

¹*Nagaoka University of Technology, Nagaoka, Niigata, Japan*²*Yuge National College of Maritime Technology, Kamijima, Ehime, Japan*³*Pulsed Power Japan Laboratory Ltd., Kusatsu, Shiga, Japan*

1P-4 OPTIMIZATION OF CAPILLARY SOURCE GEOMETRY FOR MAXIMUM PELLET EXIT VELOCITY IN ELECTROTHERMAL PLASMA LAUNCHERS

M. J. Esmond, S. S. Mostaghim, T. E. Gebhart, A. L. Winfrey

Nuclear Engineering Program, Virginia Polytechnic Institute and State University, Blacksburg, VA, United States

**1P-5 INVESTIGATION OF IGNITOR TIME BEHAVIOR ON THE SHOCK IGNITION PERFORMANCE**

M. J. Jafari, S. Rezaei, A. H. Farahbod

Laser and Optics Research School, Tehran, Iran

Session 1P: 4.2 Particle Acceleration with Lasers and Beams Posters**Poster Session**

Monday, May 26 14:00-15:30 Exhibit C (lower level)

Session Chair: *George M Petrov, Naval Research Laboratory*

1P-6 TRANSVERSE DYNAMICS OF ACCELERATED BUNCHES IN A PLASMA-DIELECTRIC WAKEFIELDS

R. R. Kniaziev¹, G. V. Sotnikov²

¹*V. N. Karazin Kharkiv National University, Kharkov, Ukraine*²*National Science Center Kharkov Institute of Physics and Technology, Kharkov, Ukraine*

1P-7 SELF-MODULATION OF ULTRA-RELATIVISTIC SLAC ELECTRON AND POSITRON BUNCHES

P. Muggli¹, O. Reimann¹, N. Lopes², L. Silva², J. Vieira², L. D. Amorim², N. Vafeai-Najafabadi³, C. Joshi³, W. Mori³, K. Marsh³, V. K. Berglyd Olsen⁴, E. Adli^{5,6}, S. Gessner⁵, M. J. Hogan⁵, S. Li⁵, M. Litos⁵, Y. Fang⁶

¹*Max Planck Institute for Physics, Munich, Germany*²*Instituto Superior Técnico, Lisbon, Portugal*³*University of California, Los Angeles, USA*⁴*University of Oslo, Oslo, Norway*⁵*SLAC, Menlo Park, USA*⁶*University of Southern California, Los Angeles, USA*

1P-8 INVESTIGATION OF HIGH-INTENSITY LASER-PLASMA INTERACTION IN MULTI-PICOSECOND LASER PULSE LENGTH REGIME

A. Sorokovikova¹, B. Qiao¹, M. S. Wei², R. B. Stephens², S. Krasheninnikov¹, P. Patel³, H. S. McLean³, A. P. L. Robinson⁴, F. N. Beg¹

¹*University of California, San Diego, San Diego, CA, United States*²*General Atomics, San Diego, CA, United States*³*Lawrence Livermore National Laboratory, Livermore, CA, United States*⁴*Central Laser Facility, Oxfordshire, United Kingdom*

1P-9 TRANSVERSE FOCUSING OF AN ELECTRON BEAM BY RELATIVISTIC PLASMA WAVES AND LASER BEAMS

R. L. Williams, A. L. Bowman

Physics Department, Florida A. and M. University, Tallahassee, FL, United States

1P-10 3-D PIC SIMULATION OF QUASI-PHASE MATCHED DIRECT LASER ELECTRON ACCELERATION WITH INTRODUCTION OF A PRECURSOR ELECTRON BUNCH

M. -W. Lin¹, I. Jovanovic¹, S. -H. Chen²

¹*Department of Mechanical and Nuclear Engineering, The Pennsylvania State University, University Park, Pennsylvania, USA*²*Department of Physics, National Central University, Jhongli, Taiwan*

1P-11 ION ACCELERATION FROM LASER-IRRADIATED THIN TARGETS

E. A. Govras^{1,2}, V. Y. Bychenkov^{1,2}, A. V. Brantov^{1,2}

¹*Lebedev Physics Institute, Moscow, Russian Federation*²*Center for Fundamental and Applied Research, VNIIA, Moscow, Russian Federation*

1P-12 ELECTRON SELF-INJECTION IN THE PROTON-DRIVEN-PLASMA-WAKEFIELD ACCELERATION

Z. -H. Hu, Y. -N. Wang

Dalian University of Technology, Dalian, China

**Session 1P: 4.4 High Energy Density Matter, Posters****Poster Session**

Monday, May 26 14:00-15:30 Exhibit C (lower level)

Session Chair: Victor L Kantsyrev, *University of Nevada, Reno***1P-13 VISRAD, 3-D TARGET DESIGN AND RADIATION SIMULATION CODE**I. E. Golovkin, J. J. MacFarlane, S. Kulkarni*Prism Computational Sciences, Inc., Madison, WI, United States***1P-14 SPECTROSCOPIC NON-LTE MODELING OF HIGHLY CHARGED GOLD PLASMA**A. Dasgupta¹, N. D. Quart¹, R. W. Clark², Y. Aglitskiy³, J. L. Giuliani¹, S. P. Obenschain¹¹*Plasma Physics, Naval Research Laboratory, Washington, DC, United States*²*Berkeley Research Associates, Beltsville, MD, United States*³*Science Applications International Corporation, McLean, VA, United States***1P-15 HYBRID MODEL OF CHEMICAL EQUILIBRIUM EQUATION OF STATE FOR NONIDEAL PLASMAS IN UNDERWATER WIRE EXPLOSION SIMULATION**D. -K. Kim, J. Jung*R&D Institute - Division 4, Agency for Defense Development, Daejeon, South Korea***1P-16 SHOCK STUDY WITH EXTENDED-MHD MODEL USING A DISCONTINUOUS GALERKIN SCHEME**X. Zhao, C. E. Seyler, J. B. Greenly*Cornell University, Ithaca, NY, United States***1P-17 AC CONDUCTIVITY AND ELECTRON TRANSPORT STUDIES IN NON-EQUILIBRIUM WARM DENSE GOLD**Y. Tsui¹, Z. Chen¹, B. Holst², V. Recoules², A. Ng³¹*Electrical & Computer Engineering, University of Alberta, Edmonton, Alberta, Canada*²*CEA, Cedex, France*³*Physics & Astronomy, University of British Columbia, Vancouver, British Columbia, Canada***1P-18 INVESTIGATION OF MAGNETIZED, RADIATIVE BOW-SHOCKS IN MAGNETICALLY ACCELERATED PLASMA FLOWS**S. C. Bott-Suzuki¹, S. Cordaro¹, L. S. Caballero Bendixsen¹, J. Chittenden², N. Niassé², I. Blesener³, C. Hoyt³, A. Cahill³, B. Kusse³, D. Hammer³, J. Greenly³, P. Gourdain³, C. Seyler³, K. Blesener³¹*University of California San Diego, La Jolla, CA, United States*²*Imperial College London, London, UK, United Kingdom*³*Cornell University, Ithaca, NY, United States***1P-19 ZEEMAN SPLITTING MEASUREMENTS OF LOCAL MAGNETIC FIELDS IN WIRE Z-PINCH PLASMAS**S. G. Patel, D. A. Yager-Elorriaga, A. M. Steiner, N. M. Jordan, Y. Y. Lau, R. M. Gilgenbach*Nuclear Engineering, University of Michigan, Ann Arbor, United States***1P-20 GENERATING MAGNETIC FIELDS STRONGER THAN 100 TESLAS USING SOLENOIDS ON COBRA**H. F. Moore, R. Duggan, G. N. Tabak, L. Ransohoff, L. Mehr, E. Bell, D. Liang, W. Potter, P. -A. Gourdain, J. Greenly, A. Novick*Laboratory of Plasma Studies, Cornell University, Ithaca, NY, United States***1P-21 MEASURING MAGNETIC FIELDS STRONGER THAN 100 TESLAS USING MINIATURE B-DOT PROBES ON COBRA**G. N. Tabak, E. Bell, R. Duggan, D. Liang, L. Mehr, H. F. Moore, A. Novick, L. Ransohoff, P. -A. Gourdain, W. Potter, J. Greenly*Laboratory of Plasma Studies, Cornell University, Ithaca, NY, United States*

**1P-22 SPECTROSCOPIC STUDIES OF X-RAY LINE POLARIZATION IN HED PLASMAS ILLUSTRATED USING Z-PINCHES**

A. S. Safronova, V. L. Kantsyrev, U. I. Safronova, I. Shrestha

Department of Physics, University of Nevada, Reno, Reno, NV, United States

1P-23 NEON SOFT X-RAY LITHOGRAPHY SOURCE BASED ON LOW ENERGY FAST MINIATURE PLASMA FOCUS DEVICE

K. Shenbaga Manogara Pandian

NIE, Nanyang Technological University, Singapore, Singapore

Session 1P: 4.5 Laser Produced Plasmas Posters**Poster Session**

Monday, May 26 14:00-15:30 Exhibit C (lower level)

Session Chair: Zulfikar Najmudin, Imperial College London

1P-24 VISCOUS EFFECTS IN ICF TARGET IMPLOSIONS

R. J. Mason, R. J. Faehl, R. C. Kirkpatrick

Research Applications Corporation, Los Alamos, NM, United States

1P-25 DIAGNOSTICS OF LASER INDUCED PLASMAS IN DIFFERENT PHASES AND AT PHASE BOUNDARIES USING LASER SHADOWGRAPHY, TWO-WAVELENGTH LASER INTERFEROMETRY, SCHLIEREN IMAGING AND OPTICAL EMISSION SPECTROSCOPY*

M. Thiagarajan

Plasma Engineering Research Lab (PERL), Texas A&M University - Corpus Christi, Corpus Christi, Texas, United States

1P-26 FEMTOSECOND LASER ABLATION PLASMA FLOWS DYNAMICS EXPERIMENTAL INVESTIGATION

E. Y. Loktionov¹, A. V. Ovchinnikov², Y. S. Protasov¹, Y. Y. Protasov¹, D. S. Sitnikov²

¹Bauman Moscow State Technical University, Moscow, Russian Federation²Joint Institute for High Temperatures of RAS, Moscow, Russian Federation

1P-27 MAGNETIC FIELD MEASUREMENT IN MAGNETIZED LASER PLASMAS USING ZEEMAN BROADENING DIAGNOSTICS

S. Haque, R. Presura, M. S. Wallace, A. Arias

University of Nevada, Reno, Reno, NV, United States

1P-28 LIGHT SCATTERING MEASUREMENTS OF ENERGY PARTITIONING IN LASER AIR SPARKS

C. M. Limbach, R. B. Miles

Mechanical and Aerospace Engineering, Princeton University, Princeton, NJ, United States

Session 1P: 4.6 Fast Z-Pinches Poster**Poster Session**

Monday, May 26 14:00-15:30 Exhibit C (lower level)

Session Chair: Brent Jones, Sandia National Laboratory

1P-29 NUMERICAL SIMULATION OF RADIATING Z PINCH ON GAMMA

K. V. Strabykin, V. S. Gordeev, A. V. Grishin, A. P. Orlov, A. L. Mozgovoy, B. G. Repin, S. Y. Puchagin, S. L. Glushkov

RFNC-VNIIEF, Sarov, Nizhny Novgorod region, Russian Federation

1P-30 THE MAGNETIZED NOH PROBLEM WITH BOTH AXIAL AND AZIMUTHAL MAGNETIC FIELDS

J. L. Giuliani¹, A. L. Vekikovich¹, Y. K. Chong¹, W. Thornhill¹, S. T. Zalesak², P. Tzeferacos³, D. Lamb³

¹Plasma Physics Division, Naval Research Laboratory, Washington, DC, USA²Berkeley Research Associates, Beltsville, MD, USA³Flash Center for Computational Science, University of Chicago, Chicago, IL, USA

**1P-31 GENERATION OF CUMULATIVE JETS DURING UNDERWATER EXPLOSION OF COPPER WIRES IN THE X-PINCH CONFIGURATION**

D. Shafer, G. R. Toker, V. T. Gurovich, Y. E. Krasik

Physics Department, Technion Israel Institute of Technology, Haifa, Israel

1P-32 PULSED POWER PRODUCED COUNTER-PROPAGATING PLASMA FLOWS AND THE STUDY OF SHOCK WAVE FORMATION FOR LABORATORY ASTROPHYSICAL PHENOMENA

J. C. Valenzuela, G. W. Collins IV, T. Zick, J. Narkis, I. Krasheninnikov, F. N. Beg

Center for Energy Research, University of California San Diego, La Jolla, CA, United States

1P-33 ANGULAR DISTRIBUTION MEASUREMENTS OF ENERGY SPECTRA OF PROTONS EMITTED FROM HYDROGEN PLASMA FOCUS

H. Ito, R. Kishimoto, H. Ohashi

University of Toyama, Toyama, Japan

1P-34 PHOTO-IONISATION OF GAS BY X-RAYS FROM A WIRE ARRAY Z-PINCH

J. D. Hare, S. V. Lebedev, M. Bennett, S. N. Bland, G. C. Burdiak, L. Suttle, F. Suzuki-Vidal, G. F. Swadling

Department of Physics, Imperial College, London, United Kingdom

1P-35 STABILIZATION OF GAS PUFF Z-PINCH IMPLOSIONS BY USING EXTERNAL BZ FIELD ON COBRA

N. Qi^{1,2}, P. DeGrouchy¹, P. C. Shraefel¹, L. Atoyan¹, W. M. Potter¹, A. D. Cahill¹, P. A. Gourdain¹, J. B. Greenly¹, D. A. Hammer¹, C. L. Hoyt¹, B. R. Kusse¹, S. A. Pikuz¹, T. A. Shelkovenko¹

¹Laboratory of Plasma Studies, Cornell University, Ithaca, NY, United States²Applied Technologies, L-3 Communications, San Leandro, CA, United States

1P-36 GAS-FILLED LINER Z-PINCH EXPERIMENTS ON THE MAGPIE FACILITY

G. C. Burdiak, S. V. Lebedev, S. Bland, F. Suzuki-Vidal, L. Suttle, M. Bennet, J. Hare, G. F. Swadling

Plasma Physics Group, Imperial College London, London, United Kingdom

1P-37 EARLY TIME STUDIES OF CYLINDRICAL LINER IMPLOSIONS ON COBRA

L. Atoyan, W. M. Potter, T. Byvank, P. De Grouchy, P. A. Gourdain, J. B. Greenly, B. R. Kusse, D. A. Hammer

Laboratory of Plasma Studies, Cornell University, Ithaca, NY, United States

1P-38 COAXIAL VACUUM GAP BREAKDOWN FOR PULSED POWER LINERS

S. W. Cordaro, S. C. Bott-Suzuki, L. S. Caballero Bendixsen

University California San Diego, La Jolla, United States

1P-39 THE INFLUENCE OF INSULATING COATINGS UPON SINGLE WIRE EXPLOSIONS

R. Presura, L. O'Brien, S. Haque

University of Nevada, Reno, Reno, NV, United States

1P-40 PARAMETER EFFECTS OF INSULATING COATING ON THE ELECTRICAL EXPLoding WIRES

J. Wu¹, X. Li¹, Y. Li^{1,2}, L. Sheng²

¹State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, Xi'an, China²State Key Laboratory of Intense Pulsed Radiation Simulation and Effect, Northwest Institute of Nuclear Technology, Xi'an, China

1P-41 3-D ELECTROMAGNETIC SIMULATION OF MONOLITHIC RADIAL TRANSMISSION LINES FOR Z-PINCH

C. Mao, X. Zou, X. Wang

Department of Electrical Engineering, Tsinghua University, BEIJING, China

1P-42 THE EFFECTS OF TIN DROPLETS ON THE EUV EMISSION AFTER LASER-TRIGGERED DISCHARGE FOR EUVL

S. Lim, S. Kitajima, T. Sakugawa, H. Akiyama, S. Katsuki

Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan



Session 1P: 4.7 Plasma Material Interactions Posters

Poster Session

Monday, May 26 14:00-15:30 Exhibit C (lower level)

Session Chair: Ahmed Hassanein, *Purdue University*

1P-43 OEDGE MODELING OF OUTER WALL EROSION IN NSTX AND THE EFFECT OF CHANGES IN NEUTRAL PRESSURE

J. H. Nichols, M. A. Jaworski, R. Kaita, T. Abrams, C. H. Skinner, D. P. Stotler
Princeton Plasma Physics Laboratory, Princeton, NJ, United States

1P-44 RE-DEPOSITION OF LITHIUM AND BORON COATINGS UNDER HIGH-FLUX PLASMA BOMBARDMENT AT NORMAL AND GRAZING MAGNETIC INCIDENCE

T. Abrams¹, M. A. Jaworski¹, R. Kaita¹, J. H. Nichols¹, D. P. Stotler¹, G. De Temmerman², M. A. van den Berg², H. J. van der Meiden², T. W. Morgan²

¹*Princeton Plasma Physics Laboratory, Princeton, NJ, United States*²*FOM Institute DIFFER, Nieuwegein, The Netherlands*

1P-45 TUNGSTEN RESPONSE TO TRANSIENT HEAT LOADS GENERATED BY LASER PULSES

S. Harilal, A. Suslova, O. Et-awani, N. Farid, A. Hassanein

Center for Materials Under Extreme Environment, School of Nuclear Engineering, Purdue University, West Lafayette, IN, United States

1P-46 LOW-ENERGY D+ RETENTION IN C AND O CONTAINING LI FILMS ON MO(110)

J. P. Roszell¹, A. M. Capece², C. H. Skinner², B. E. Koel¹

¹*Chemical and Biological Engineering, Princeton University, Princeton, NJ, United States* ²*Princeton Plasma Physics Lab, Princeton, NJ, United States*

1P-47 FILM CONDENSATION STUDY OF LIQUID LITHIUM ON MATERIALS RELEVANT TO FUSION REACTORS

C. Sandoval Rios, M. J. Nieto Perez, J. A. Huerta Ruelas

Tecnologa Avanzada, CICATA, Queretaro, Mexico

1P-48 CHARACTERIZATION OF ATMOSPHERIC PRESSURE RF DISCHARGES WITH AQUEOUS PLASMA FACING SURFACES

A. Lindsay, B. Byrns, D. Knappe, S. Shannon

North Carolina State University, Raleigh, NC, United States

1P-49 ATMOSPHERIC PRESSURE PLASMA JETS OF FINE-POINT DOPING FOR THE SELECTIVE Emitter OF SOLAR CELL

S. Jin, H. Kim, S. Kim, M. Yun, G. -C. Kwon, G. Cho

Department of Electrophysics, Kwangwoon University, Seoul, South Korea

1P-50 LASER-INDUCED FLUORESCENCE MEASUREMENTS OF XENON ION VELOCITY DISTRIBUTIONS NEAR CERAMIC SURFACES

S. P. Walsh, J. L. Rath, A. P. Yalin

Mechanical Engineering, Colorado State University, Fort Collins, United States

1P-51 WATER VAPOR PLASMA TORCH FOR SYNTHESIS GAS PRODUCTION FROM ORGANIC WASTE

V. Grigaitienė, A. Tamaiūnas, V. Valinčius, P. Valatkevičius

Plasma Processing Laboratory, Lithuanian Energy Institute, Kaunas, Lithuania

1P-52 PLASMA PROCESSING OF PET IN AN OXYGEN DECOUPLED PLASMA SOURCE

M. L. Brake, R. L. Rhoton

School of Engineering Technology, Eastern Michigan University, Ypsilanti, MI, United States

**Session 1P: 6.1 Microwave, FIR, Optical and X-ray Diagnostics Posters****Poster Session**

Monday, May 26 14:00-15:30 Exhibit C (lower level)

Session Chairs: *Simon Bott-Suzuki, U. C. San Diego, Simon Bland, Imperial College***1P-53 STUDY ON ARGON METASTABLE AND 4P STATE NEUTRAL ATOMS IN MAGNETIZED ICP AND HELICON PLASMAS MEASURED BY LASER INDUCED FLUORESCENCE AND PLASMA EMISSION**J. -H. Kim¹, B. -H. Seo², S. -J. You¹, D. -J. Seong¹, Y. -H. Shin¹¹*Industrial Metrology, Korea Research Institute of Standards and Science, Daejeon, South Korea* ²*Physics Department, Korea Advanced Institute of Science and Technology, Daejeon, South Korea***1P-54 SPATIAL CORRELATION BETWEEN EMITTING SPECIES AND PLASMA BULLET PROPAGATION IN LOW TEMPERATURE PLASMA JETS**H. Razavi, S. Mohades, M. Laroussi*Old Dominion University, Norfolk, VA, United States***1P-55 CORRELATING METASTABLE-ATOM DENSITY, REDUCED ELECTRIC FIELD, AND ELECTRON ENERGY DISTRIBUTION IN A 1-TORR ARGON DISCHARGE**J. B. Franek¹, S. H. Nogami¹, M. E. Koepke¹, V. I. Demidov¹, E. V. Barnat²¹*Physics, West Virginia University, Morgantown, United States* ²*Lasers, Plasmas and Remote Sensing, Sandia National Labs, Albuquerque, United States***1P-56 LASER INDUCED FLORESCENCE AND CONTINUOUS WAVE RING DOWN SPECTROSCOPY: MEASUREMENTS OF ARGON ION VELOCITY DISTRIBUTION FUNCTIONS IN A HELICON PLASMA**D. W. McCaren, G. Lusk, E. E. Scime, M. Soderholm, R. Vandervort*Physics Dept., West Virginia University, Morgantown, United States***1P-57 LARGE VOLUME PENNING PLASMA DISCHARGE SOURCE: AN EFFICIENT LIGHT EMITTING SOURCE FOR THE VISIBLE AND VUV RADIATIONS SIMULTANEOUSLY**G. L. Vyas*Central Electronics Engineering Research Institute, Rajasthan, India***1P-58 X-RAY ABSORPTION SPECTROSCOPY UTILIZING AN ELLIPSOIDAL CRYSTAL**A. D. Cahill, C. L. Hoyt, S. A. Pikuz, T. A. Shelkovenko, D. A. Hammer*ECE, Cornell University, Ithaca, NY, United States***1P-59 CHARACTERIZING A POLARIZATION SPLITTING QUARTZ CRYSTAL**M. S. Wallace¹, N. R. Pereira², A. L. Kastengren³, R. Presura¹¹*Physics, University of Nevada, Reno, Reno, NV, United States* ²*Ecopulse Inc., Springfield, VA, United States*³*Advanced Photon Source, Argonne National Laboratory, Argonne, IL, United States***1P-60 OPTICAL DIAGNOSTICS FOR QUANTITATIVE ANALYSES OF PLASMA PARAMETERS IN HIGH-ENERGY ELECTRON-BEAM DIODES**M. D. Johnston¹, M. L. Kiefer¹, P. W. Lake¹, N. Bennett², D. W. Droeber², Y. Maron³¹*Sandia National Laboratories, Albuquerque, NM, United States* ²*National Security Technologies, LLC, Las Vegas, NV, United States* ³*Weizmann Institute on Science, Rehovot, Israel***1P-61 DETECTION OF POWERFUL TERAHERTZ PULSES WITH USE OF TERMOACOUSTIC PROBE**V. A. Vdovin¹, V. G. Andreev², Y. K. Kalynov³¹*Kotel'nikov Institute of Radioengineering and Electronics of RAS, Moscow, Russian Federation* ²*Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russian Federation* ³*Institute of Applied Physics of RAS, Nizhny Novgorod, Russian Federation*

**1P-62 WARM AND HARD X-RAY DIAGNOSTICS FOR THE Z FACILITY***

C. A. Coverdale, L. A. McPherson, K. S. Blesener, G. A. Rochau, M. Kernaghan, V. Harper-Slaboszewicz, T. Flanagan, S. Hansen, G. Dunham, D. J. Ampleford, B. Jones, M. E. Cuneo
Sandia National Labs, Albuquerque, NM, United States

Session 1P: 6.2 Particle Diagnostics Posters**Poster Session**

Monday, May 26 14:00-15:30 Exhibit C (lower level)

Session Chairs: *Simon Bott-Suzuki, U. C. San Diego, Simon Bland, Imperial College*

1P-63 LANGMUIR PROBES FOR PLASMA PLUME DIAGNOSTICS

A. A. Arias, N. Quiros, R. Presura
Physics, University of Nevada Reno, Reno, NV, United States

1P-64 DISTANT DIAGNOSTICS OF NONEQUILIBRIUM PLASMAS

A. Mustafaev¹, A. Grabovskiy¹, I. Kaganovich², V. Demidov³, A. Strakhova¹

¹National Mineral - Resource University (Mining University), Saint-Petersburg, Russian Federation²Plasma Physics Laboratory, Princeton, USA³West Virginia University, Morgantown, USA

1P-65 XENON TWO-PHOTON LASER INDUCED FLUORESCENCE: A NEUTRAL DENSITY MEASUREMENT AND CALIBRATION TOOL

D. B. Elliott¹, E. Scime¹, R. Vandervort¹, M. Soderholm¹, M. Galante²

¹Physics, West Virginia University, Morgantown, West Virginia, United States²Physics, University of Wisconsin Madison, Madison, Wisconsin, United States

1P-66 MAGNETIC DIAGNOSTICS OF PLASMA - SURFACE INTERACTIONS

A. Mustafaev¹, I. Kaganovich², Y. Raitses², V. Demidov³, M. Ainov¹, A. Grabovskiy¹

¹National Mineral - Resource University (Mining University), Saint-Petersburg, Russian Federation²Plasma Physics Laboratory, Princeton, USA³West Virginia University, Morgantown, USA

Session 1P: 6.3 Pulsed Power Diagnostics Poster**Poster Session**

Monday, May 26 14:00-15:30 Exhibit C (lower level)

Session Chairs: *Simon Bott-Suzuki, U. C. San Diego, Simon Bland, Imperial College*

1P-67 THE RESEARCH OF PULSED PLASMA ACCELERATOR OPERATION AT CONTINUOUSLY FILLED MODE

A. Zhukeshov, A. Amrenova, A. Gabdullina, B. Ibraev

Plasma physics division, Research Institute of Experimental and Theoretical Physics, Almaty, Kazakhstan

Session 1P: 7.1 INSULATION AND DIELECTRIC BREAKDOWN POSTERS**Poster Session**

Monday, May 26 14:00-15:30 Exhibit C (lower level)

Session Chair: *Luis Redondo, Lisbon Superior Engineering Institute (ISEL)*

1P-68 A STUDY OF COAXIAL PULSE CAPACITORS AGING

H. Ruoyu¹, W. Jiawei¹, Z. Haibin¹, L. Qiaoju¹, J. Yan¹, Z. Yongmin¹, Z. Youzhi², L. Meijuan²

¹Electrical Engineering, Xi'an Jiaotong University, Xi'an, China²Xian GuanTong Energy Technology Company, Xi'an, China

1P-69 MODELING VACUUM AND GASEOUS BREAKDOWN IN DIELECTRIC-LOADED SYSTEMS

M. T. P. Aldan¹, J. P. Verboncoeur²

¹Nuclear Engineering, UC Berkeley, Berkeley, CA, United States²Electrical and Computer Engineering, Michigan State University, East Lansing, MI, United States

**1P-70 A CERAMIC INSULATED, HIGH-ELECTRIC FIELD PULSED POWER INTERFACE**

T. Xun, H. -W. Yang, J. -D. Zhang, Z. -C. Zhang

College of Opto-electric Science and Engineering, National University of Defense Technology, changsha, China

Session 1P: 7.2 Opening & Closing Switches Posters**Poster Session**

Monday, May 26 14:00-15:30 Exhibit C (lower level)

Session Chair: Luis Redondo, Lisbon Superior Engineering Institute (ISEL)

1P-71 RESEARCH OF HIGH-POWER REPETITIVE SPARK-GAP SWITCH UNDER ADVERSE CONDITIONS

J. Wu

State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China, Xi'an, Shaanxi, China

1P-72 ELECTRODE EROSION CHARACTERISTICS AND FAILURE PREDICTION OF HIGH-POWER REPETITIVE TWO-ELECTRODE SPARK-GAP SWITCH UNDER ADVERSE CONDITIONS

J. Wu

State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China, Xi'an, Shaanxi, China

1P-73 STUDY ON THE BREAKDOWN CHARACTERISTICS OF UV ILLUMINATION SWITCH UNDER MICROSECOND PULSE

Y. F. Liu, M. W. Yan, J. W. Wu, H. B. Zhou, C. Fan, W. D. Ding

State Key Laboratory of Electrical Insulation for Power Equipment, Xi'an Jiaotong University, Xi'an, Shaanxi, China

1P-74 EFFECT OF ELECTRODE GEOMETRY ON THE RISE TIME OF SPARK GAP PEAKING SWITCH

M. G. Parekh, S. Umbarakar, H. A. Mangalvedekar

Electrical engineering, Veermata jijabai technological institute, Mumbai, India

1P-75 EXPERIMENTAL STUDY ON MULTICHANNEL DISCHARGE CHARACTERISTICS OF A PLASMA-JET TRIGGERED GAS SWITCH

W. Tie, X. Liu, S. Liu, Q. Zhang

Xi'an Jiaotong University, Shaanxi, China

1P-76 TRIGGERED DISCHARGE CHARACTERISTICS OF A PLASMA-JET TRIGGERED GAS SWITCH OPERATED AT LOW WORKING COEFFICIENTS

Q. Zhang

Xi'an Jiaotong University, Xi'an Shaanxi, China

Session 1P: 7.3 Generators & Networks Posters**Poster Session**

Monday, May 26 14:00-15:30 Exhibit C (lower level)

Session Chair: Luis Redondo, Lisbon Superior Engineering Institute (ISEL)

1P-77 INVESTIGATION OF RF GENERATOR RESPONSE TO PLASMA INSTABILITIES

A. Eroglu¹, H. Kirkici²

¹Purdue University, Fort Wayne, IN, United States²Auburn University, Auburn, Alabama, United States

1P-78 PULSE GENERATOR DEVELOPMENT FOR LOW IMPEDANCE LOADS

M. B. Walls, J. Dickens, J. Mankowski, A. Neuber

Electrical and Computer Engineering, Texas Tech University, Lubbock, TX, United States

**1P-79 DESIGN OF SYNCHRONIZATION SYSTEM OF ELECTROPHYSICAL FACILITY**

S. L. Glushkov, A. V. Grishin, S. T. Nazarenko, A. V. Kozachek, D. A. Kalashnikov, B. P. Mironychev, V. M. Martynov, V. V. Turutin, D. A. Kuldyushov, V. S. Pavlov, V. A. Demanov, T. F. Shikhanova, Y. A. Yesaieva
Institute of Nuclear and Radiation Physics, Russian Federal Nuclear Center - The All-Russian Research Institute of Experimental Physics, Sarov, Russian Federation

1P-80 PRELIMINARY TEST OF THE AZIMUTHAL UNIFORMITY OF FEED CURRENTS OF A 1-MV PROTOTYPE INDUCTION VOLTAGE CAVITY

H. Wei

State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, Xi'an, China

Session 1P: 7.4 Compacts and Rep-Rated Pulsed Power Posters**Poster Session**

Monday, May 26 14:00-15:30 Exhibit C (lower level)

Session Chair: Luis Redondo, Lisbon Superior Engineering Institute (ISEL)

1P-81 NANOSECOND PULSED ELECTRIC FIELDS ENHANCE INHIBITION AND REVERSE RESISTANCE OF MOLECULAR TARGETING DRUG IN HUMAN MELANOMA CELL LINES

S. Wu¹, J. Dai², Y. Kong², J. Guo², J. Zhang³, J. Fang³

¹College of Engineering, Peking University, Beijing, China ²Peking Cancer Hospital and Institute, Beijing, China ³Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, China

1P-82 THE HIGH VOLTAGE POWER SUPPLY BASED ON PULSE STEP MODULATION FOR AUXILIARY HEATING SYSTEM ON FUSION DEVICE

W. Xu

College of Electrical and Power Engineering, Taiyuan University of Technology, Taiyuan, Shanxi province, China

1P-83 STUDY OF MECHANISM OF PLASMA HOLLOW CATHODE DISCHARGE FOR INTENSE ELECTRON BEAM SOURCE IN THE FIELD OF PULSED POWER TECHNOLOGY

X. Gu

Zhejiang Sci-Tech University, Hangzhou, China

1P-84 DEVELOPMENT OF SOLID-STATE MARX PULSE GENERATOR FOR TRIGATRON GAS SWITCH APPLICATION

W. Ding, C. Fan, Y. Wang, Y. Liu

State Key Lab. of Electr. Insulation & Power Equip., Xi'an Jiaotong Univ., Xi'an, China

1P-85 THE HV WITHSTANDS TEST AND LEAKAGE CURRENT INDUCED BY STRAW CAPACITANCE IN THE PULSED MAGNET SYSTEM

Y.-H. Liu, C. -S. Chen

Utility, National Synchrotron Radiation Research Center, Hsinchu, Taiwan

1P-86 VARIABLE HIGH VOLTAGE, HIGH FREQUENCY NANOSECOND PULSER FOR PLASMA COMBUSTION

A. Vadlamani, A. J. Fairbanks, S. P. M. Bane, A. L. Garner

Nuclear Engineering, Purdue University, West Lafayette, IN, United States

1P-87 TRIBOLUMINESCENCE X-RAY SOURCE FOR ROENTGEN DIAGNOSIS

S. Furuya

Saitama Institute of Technology, Fukaya, Japan

1P-88 DESIGN AND PROJECTED PERFORMANCE OF A COMPACT, PORTABLE PLASMA-RADIATION-SOURCE GENERATOR AT THE IDAHO ACCELERATOR CENTER

R. V. Shapovalov, R. B. Spielman, W. Beezhold

Physics, Idaho State University, Pocatello, United States

**1P-89 SIMULTANEOUS TWO-FREQUENCY EXCITATION OF A TESLA COIL**

J. K. Reed, J. Jevtic

Milwaukee School of Engineering, Milwaukee, WI, United States

Session 2A: Computational Physics and Techniques I

Monday, May 26 15:30-17:30 Thurgood Marshall North

Session Chair: *Peter Stoltz, TechX Corporation*

15:30 2A-1 (invited) NUMERICAL THERMALIZATION OF TWO-DIMENSIONAL PLASMAS IN THE PRESENCE OF BINARY COLLISIONS WITH THE PARTICLE-IN-CELL METHOD

W. S. Koh¹, W. J. Ding¹, P. -Y. Lai², S. -H. Chen², Y. -R. Lin-Liu²

¹*Institute of High Performance Computing, Singapore, Singapore, Singapore*²*Department of Physics, National Central University, Jung-Li, Taiwan*

16:00 2A-2 FRONT TRACKING SCHEME FOR DIRECT KINETIC SIMULATIONS

K. Hara, I. D. Boyd

Department of Aerospace Engineering, University of Michigan, Ann Arbor, United States

16:15 2A-3 A HYBRID FINITE ELEMENT-FINITE DIFFERENCE ELECTROMAGNETIC PARTICLE-IN-CELL SIMULATION FRAMEWORK

C. S. Meierbach¹, A. D. Greenwood¹, J. P. Verboncoeur², B. Shanker², A. J. Christlieb³

¹*Directed Energy Directorate, Air Force Research Laboratory, Kirtland AFB, NM, United States*

²*Department of Electrical and Computer Engineering, Michigan State University, East Lansing, MI, United States*

³*Department of Mathematics, Michigan State University, East Lansing, MI, United States*

16:30 2A-4 FULLY IMPLICIT SOLUTION METHODS FOR FLUID PLASMA EQUATIONS WITH PHYSICS-BASED PRE-CONDITIONING

K. Beckwith¹, J. King¹, E. Hallman¹, S. F. McCormick², J. W. Ruge²

¹*Tech-X Corp., Boulder, CO, United States*²*Front Range Scientific Computations, Inc., Lake City, CO, United States*

16:45 2A-5 SUPPRESSING NUMERICAL CHERENKOV INSTABILITIES IN FDTD PIC CODES

B. B. Godfrey^{1,2}, J. -L. Vay²

¹*IIREAP, University of Maryland, College Park, MD, United States*²*Accelerator and Fusion Research, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

17:00 2A-6 A HIGH-ORDER POSITIVITY PRESERVING METHOD FOR THE VLASOV-POISSON EQUATION ON UNSTRUCTURED GRIDS

J. A. Rossmanith¹, D. C. Seal², A. J. Christlieb²

¹*Mathematics, Iowa State University, Ames, IA, United States*²*Mathematics, Michigan State University, East Lansing, MI, United States*

17:15 2A-7 HIGH ORDER PARAMETRIZED MAXIMUM-PRINCIPLE-PRESERVING AND POSITIVITY-PRESERVING WENO SCHEMES ON UNSTRUCTURED MESHES

Y. Liu¹, A. Christlieb¹, Q. Tang¹, Z. Xu²

¹*Michigan State University, East Lansing, United States*²*Michigan Technological University, Houghton, United States*



Session 2B: Fast Wave Devices

Monday, May 26 15:30-17:30 Thurgood Marshall South

Session Chair: *Jeffrey P Calame, Naval Research Laboratory*

15:30 2B-1 (invited) PROGRESS ON THE DEVELOPMENT OF THE EU-1MW GYROTRON FOR ITER

S.Iilly¹, K. Avramidis¹, G. Gantenbein¹, K. Hesch¹, J. Jelonnek¹, J. Jin¹, I. Pagonakis¹, B. Piosczyk¹, T. Rzesnicki¹, M. Thumm¹, S. Alberti², J.-P. Hogge², M. Q. Tran², V. Hermann³, F. Legrand³, Y. Rozier³, J. L. Vomoridis⁴, J. Chelis⁴, Z. C. Ioannidis⁵, G. P. Latsas⁵, I. G. Tigelis⁵, F. Albajar⁶, T. Bonicelli⁶, F. Cismondi⁶

¹IHM, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany ²EPFL-CRPP, Lausanne, Switzerland ³Thales Electron Devices, Velizy-Villacoublay, France ⁴SECE, Nat. Technical Univ. of Athens, Athens, Greece ⁵Faculty of Physics, Nat. and Kapodistrian Univ. of Athens, Athens, Greece ⁶F4E, Barcelona, Spain

16:00 2B-2 TESTING OF MEGAWATT-CLASS GYROTRONS

S.Cauffman, M. Blank, P. Borchard, K. Felch

CPI, Palo Alto, CA, United States

16:15 2B-3 OUTPUT COUPLERS AND WINDOWS FOR HIGH POWER, BROADBAND GYROTRONS

L.Ives¹, M. Read¹, D. Marsden¹, J. Neilson², R. Temkin³, B. Guss³

¹Calabazas Creek Research, Inc., San Mateo, CA, United States ²Lexam Research, Redwood City, CA, United States ³Massachusetts Institute of Technology, Cambridge, MA, United States

16:30 2B-4 SEPARATION OF THERMAL EXPANSION AND BEAM CHARGE NEUTRALIZATION EFFECTS IN HIGH POWER 140 GHZ CW GYROTRONS

A.Schlaich^{1,2}, C. Wu¹, I. Pagonakis¹, K. A. Avramidis¹, S. Illy¹, G. Gantenbein¹, J. Jelonnek^{1,2}, M. Thumm^{1,2}

¹Institute for Pulsed Power and Microwave Electronics (IHM), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany ²Institut fuer Hochfrequenztechnik und Elektronik (IHE), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

16:45 2B-5 SECOND HARMONIC TE15,2 550 GHZ GYROTRON EXPERIMENT AT NRL

B.Y. Rock, A. W. Fliflet

Plasma Physics Division, The U.S. Naval Research Laboratory, Washington, DC, United States

17:00 2B-6 COLLECTOR LIFETIME ESTIMATIONS FOR THE EU-1MW, 170GHZ CW GYROTRON FOR ITER

S.Iilly, F. Kahl, J. Jelonnek

IHM, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

17:15 2B-7 CONTROL OF PROFILE OF HEAT DISSIPATION DENSITY IN A HIGH POWER GYROTON

A.Singh¹, L. R. Ives², W. B. Herrmannsfeldt³, H. J. Singh⁴

¹IREAP (Retired), University of Maryland, College Park, MD, United States ²Corporate, Calabazas Creek Research, San Mateo, CA, United States ³Retired, Stanford Linear Accelerator Center, Stanford, CA, United States ⁴Corporate Development, Utopia Global, Inc., Morgan Hill, CA, United States

Session 2C: Plasma, Ion, and Electron Sources II

Monday, May 26 15:30-17:30 Thurgood Marshall East

Session Chair: *Stuart L Jackson, Naval Research Laboratory*

15:30 2C-1 DIELECTRIC RESONATOR ANTENNA FOR HIGH-POWER RF PLASMA APPLICATIONS

J.Jevtic¹, A. Menon², V. Pikelja²

¹EECS Department, Milwaukee School of Engineering, Milwaukee, WI, United States ²Radom Corporation, Milwaukee, WI, United States

15:45 2C-2 ION ENERGIES FROM A PERMANENT-MAGNET HELICON THRUSTER

F. F. Chen

EE, UCLA, Los Angeles, CA, United States



16:00 2C-3 A MEGAVOLT TEST STAND FOR MEASURING CATHODE AND ANODE EMISSIONS WITH NANOSECOND PULSES

R. J. Allen, D. D. Hinshelwood, J. W. Schumer, I. M. Rittersdorf

Plasma Physics, Naval Research Laboratory, Washington, DC, United States

16:15 2C-4 (invited) ROBUST, LONG-LIFE PHOTOCATHODES

L. Ives¹, E. Montgomery², B. Riddick², D. Marsden¹, G. Collins¹, L. Falce³

¹*Calabazas Creek Research, Inc., San Mateo, CA, United States*²*Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD, United States*³*Consultant, Surprise, AZ, United States*

16:45 2C-5 TIME-RESOLVED ARGON THETA-PINCH PLASMA PROPERTIES BY LINE RATIO METHOD WITH COLLISIONAL-RADIATIVE MODEL

W. C. Meeks, J. L. Rovey

Mechanical and Aerospace Engineering, Missouri University of Science and Technology, Rolla, Missouri, United States

17:00 2C-6 COMPARISON OF TRANSIENT PLASMA PARAMETERS IN MULTI-SOURCE PULSED RF CCP CONFIGURATIONS

T. Kummerer¹, S. Shannon¹, D. Coumou²

¹*North Carolina State University, Raleigh, United States*²*MKS Instruments, Rochester, United States*

17:15 2C-7 UNIFORMITY CONTROL WITH PHASE-LOCKED RF SOURCE ON A HIGH DENSITY PLASMA SYSTEM

D. J. Coumou¹, D. M. Brown¹, S. Shannon²

¹*MKS, ENI Products, Rochester, NY, United States*²*MKS, ENI Products, Rochester, NY, United States*

Session 2D: Fusion (Inertial, Magnetic, and Alternative Concepts)

Monday, May 26 15:30-17:30 Thurgood Marshall West

Session Chair: Edward M Campbell, Sandia National Laboratory

15:30 2D-1 (invited) EXPERIMENTAL VERIFICATION OF THE MAGNETIZED LINER INERTIAL FUSION (MAGLIF) CONCEPT*

M. R. Gomez, S. A. Slutz, A. B. Sefkow, T. J. Awe, G. A. Chandler, M. E. Cuneo, M. Geissel, K. D. Hahn, S. B. Hansen, E. C. Harding, A. J. Harvey-Thompson, M. C. Herrmann, C. A. Jennings, P. F. Knapp, D. C. Lamppa, M. R. Martin, R. D. McBride, K. J. Peterson, J. L. Porter, G. A. Rochau, D. C. Rovang, C. L. Ruiz, P. F. Schmit, D. B. Sinars, I. C. Smith

Sandia National Laboratories, Albuquerque, NM, United States

16:00 2D-2 ALTERNATIVE PREHEATING MECHANISMS FOR MAGLIF.

J. Chittenden, S. Lebedev, J. Pecover, N. Niasse

Centre for Inertial Fusion Studies, Imperial College, London, United Kingdom

16:15 2D-3 MAGNETIC FLUX AND HEAT LOSSES BY DIFFUSIVE, CONVECTIVE, AND NERNST EFFECTS IN MAGLIF-LIKE PLASMA

A. L. Velikovich¹, J. L. Giuliani¹, S. T. Zalesak²

¹*Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States*²*Berkeley Research Associates, Beltsville, MD, United States*

16:30 2D-4 EARLY TIME INSTABILITY GROWTH FOR MAGLIF SEEDED BY ELECTRO-THERMAL AND MATERIAL STRENGTH EFFECTS

J. Pecover, M. Weinwurm, J. Chittenden

Blackett Laboratory, Imperial College, London, United Kingdom

**16:45 2D-5 ACTIVE FEEDBACK STABILIZATION OF FLUTE INSTABILITY IN A MIRROR TRAP**

I. Be'ery, O. Seemann, A. Fisher

Physics department, Technion - Israel institute of technology, Haifa, Israel

17:00 2D-6 SPECTROSCOPIC MEASUREMENTS OF ION TEMPERATURE AND ROTATION OF TWO ION COMPONENTS IN C-2 FRC PLASMA.

D. Osin, D. Gupta, S. Korepanov, T. A.E. Team

Tri Alpha Energy Inc., Ranch Santa Margarita, Ca, United States

17:15 2D-7 HIGH HEAT FLUX REMOVAL MEASUREMENTS IN A SINGLE-SIDE HEATED MONOBLOCK FLOW CHANNEL WITH A HELICAL WIRE INSERT

R. D. Boyd, A. M. May, R. J. Martin, P. S. Cofie

Perry College of Engineering, Prairie View A&M University, Prairie View, United States

Session 2E: Microwave, Particle and Pulsed Power Diagnostics

Monday, May 26 15:30-17:30 Hoover

Session Chair: *Simon Bland, Imperial College*

15:30 2E-1 MAGNETIC MOMENTUM PROBE FOR PLASMA STUDIES WITH APPLICATION TO HIGH PRESSURE PLASMAS

F. F. Dyer, I. Alexeff

BioTech Engineering, Tazewell, TN, United States

15:45 2E-2 DIAGNOSIS OF DISCHARGE PLASMAS TEMPERATURE BY LIFBASE USING ATMOSPHERIC PRESSURE PULSED DISCHARGE IN AIR

M. Sun

Institute of Electrostatics, Shanghai Maritime University, Shanghai, China

16:00 2E-3 PLASMA PROPAGATION SPEED AND ELECTRON TEMPERATURE OF AR IN ATMOSPHERIC PRESSURE NON-THERMAL INDIRECT BIOPLASMA JET

P. Suanpoot^{1,2}, G. -H. Han², H. S. Uhm², G. Cho², E. H. Choi²

¹*General Education, Maejo University Phrae Campus, Phrae, Thailand*²*Electro Biological Physics, Kwangwoon University, Seoul, Korea*

16:15 2E-4 MICROWAVE PLASMA DIAGNOSTICS

D. R. Scott, A. Shashurin, M. Keidar

Mechanical and Aerospace Engineering, The George Washington University, Washington DC, United States

16:30 2E-5 COMPUTATIONAL STUDY OF A COMPACT NON-INVASIVE BUNCH LENGTH MONITOR AND SHAPER

C. Leach¹, B. Roberts², E. Schamiloglu¹

¹*Electrical and Computer Engineering Dept., University of New Mexico, Albuquerque, United States*

²*Electrodynamics, Albuquerque, United States*

16:45 2E-6 DIGITAL PULSE ANALYZER FOR ITER VERTICAL NEUTRON CAMERA

A. A. Ivanova^{1,2}, V. N. Amosov³, D. A. Skopintsev³, A. D. Khilchenko^{1,2}, A. N. Kvashnin¹, P. V. Zubarev^{1,2}, S. V. Ivanenko¹, A. I. Kotelnikov¹, E. A. Puryga^{1,2}

¹*Budker Institute of Nuclear Physics, Novosibirsk, Russian Federation*²*Novosibirsk State Technical*

*University, Novosibirsk, Russian Federation*³*Troitsk Institute for Innovation and Fusion Research, Troitsk, Russian Federation*



17:00 2E-7 ION BEAM PROFILE DIAGNOSIS METHOD FOR VACUUM ARC ION SOURCE IN SEALED TUBE NEUTRON GENERATOR

Y. Zhen

China Academy of Engineering Physics (CAEP), Institute of Fluid Physics, Mianyang, China

17:15 2E-8 AUTOMATED HEALTH MONITORING OF A PULSED POWER SYSTEM

B. M. Huhman¹, C. W. Peters², C. Breuninger², J. Carto², C. Child², C. Green², J. Stanley², L. Mili³

¹*Plasma Physics Division, US Naval Research Laboratory, Washington, DC, United States*²*Electrical Engineering Dept., Drexel University, Philadelphia, PA, United States*³*Electrical Engineering and Computer Engineering Dept., Virginia Polytechnic Institute and State University, Blacksburg, VA, United States*



Tuesday, May 27

Session PL3: Plenary 3

Tuesday, May 27 08:00-09:00 Thurgood Marshall East-South

8:00 PL3-1 (invited) OVERVIEW OF PULSED POWER RESEARCHES AT CAEP

J. Deng

Institute of Fluid Physics, CAEP, Mianyang, Sichuan, China

Session 3A: Plasma for Lighting, Displays, & Microdischarges

Tuesday, May 27 9:30 - 12:00 Thurgood Marshall North

Session Chairs: Weidong Zhu, Saint Peters University, Chunqi Jiang, Old Dominion University

9:30 3A-1 (invited) MERCURY-FREE, FLAT MICROCAVITY PLASMA LIGHTING TILES: EFFICIENT VUV-UVC GENERATION FOR ENVIRONMENTAL APPLICATIONS

S.-J. Park^{1,2}, C. M. Herring¹, J. G. Eden^{1,2}

¹*Eden Park Illumination, Champaign, IL, United States*²*Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL, United States*

10:00 3A-2 PULSED MICRODISCHARGE, 121.6 NM VUV SOURCE WITH 40 WATT PEAK POWER

J. C. Stephens, A. S. Fierro, J. C. Dickens, A. A. Neuber

Center For Pulsed Power and Power Electronics, Texas Tech Center for Pulsed Power and Power Electronics, Lubbock, TX, United States

10:15 3A-3 BREAKDOWN LAW AND POST-BREAKDOWN CURRENT-VOLTAGE CHARACTERISTICS OF EMISSION-DRIVEN MICROPLASMAS

A. Venkattraman

School of Engineering, University of California Merced, Merced, CA, United States

10:30 3A-4 PLASMA DYNAMICS OF MICROWAVE EXCITED MICROPLASMAS IN A SUB-MILLIMETER CAVITY

P. Tian¹, M. J. Kushner¹, M. Denning², M. Vahidiipour², R. Urdahl²

¹*Electrical Engineering and Computer Science Dept., University of Michigan, Ann Arbor, MI, United States*²*Agilent Technologies, Santa Clara, CA, United States*

10:45 3A-5 NEW SELF-ORGANIZATION PATTERNS OBSERVED IN CATHODE BOUNDARY LAYER DISCHARGES IN HIGH PURITY XE GAS

W. Zhu¹, P. Niraula¹, K. H. Becker²

¹*Applied Science and Technology, Saint Peters University, Jersey City, NJ, United States*²*Applied Physics, NYU Polytechnic School of Engineering, Brooklyn, NY, United States*

11:00 3A-6 SPATIALLY RESOLVED OPTICAL EMISSION SPECTROSCOPY OF A NANOSECOND PULSED MICROPLASMA JET

J. Lane¹, C. Jiang¹, J. Sanders², A. Kuthi², M. Gundersen²

¹*Frank Reidy Research Center for Bioelectrics, Old Dominion University, Norfolk, VA, United States*²*Department of Electrical Engineering-Electrophysics, University of Southern California, Los Angeles, CA, United States*

11:15 3A-7 NOVEL REACTIVE SPECIES ENVIRONMENT CREATED BY MICROPLASMA JET ARRAYS IN COMBINATION WITH A CONTROLLED GAS FEED SYSTEM

P. P. Sun^{1,2}, J. Rivera¹, H. Chen², M. G. Kong², S.-J. Park¹, J. G. Eden¹

¹*Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL, United States*²*Department of Electrical and Computer Engineering, Old Dominion University, Norfolk, Virginia, United States*

**11:30 3A-8 FORMATION OF FUNCTIONAL METALLIC PATTERNS IN DOWNGLOW OF ARGON-DILUTED AMMONIA MICROPLASMAS AT ATMOSPHERIC PRESSURE**O. Sakai, N. Kihara, Y. Nishio, Y. Hiraoka*Department of Electronic Science and Engineering, Kyoto University, Kyoto, Japan***11:45 3A-9 PLASMA PROPERTIES OF AN INDUCTIVELY-COUPLED ATMOSPHERIC MICROPLASMA**W. W. Harlow, K. Kolasinski, K. G. Xu*University of Alabama- Huntsville, Huntsville, AL, United States***Session 3B: Intense Beam Microwave Generation**

Tuesday, May 27 9:30 - 12:00 Thurgood Marshall South

Session Chair: Wilkin Tang, Air Force Research Laboratory**9:30 3B-1 (invited) EMITTANCE, SURFACE STRUCTURE, AND ELECTRON EMISSION FOR THERMAL, PHOTO, AND FIELD EMISSION PROCESSES**K. L. Jensen¹, D. A. Shiffler², J. J. Petillo³, Z. Pan⁴, J. W. Luginsland⁵¹*Code 6843, Naval Research Laboratory, Washington, DC, United States*²*Air Force Research Lab., Kirtland AFB, NM, United States*³*Leidos, Billerica, MA, United States*⁴*IREAP, University of Maryland, College Park, MD, United States*⁵*Air Force Office of Scientific Research, Arlington, VA, United States***10:00 3B-2 (invited) ELECTRON BEAM EXCITATION ON DOPED GRAPHENE PLASMON FOR GENERATION COHERENT RADIATION**K. J. A. Ooi, L. K. Ang*Engineering Product Development, Singapore University of Technology and Design, Singapore, Singapore***10:30 3B-3 DESIGN OF A PROTOTYPE MULTI-FREQUENCY RECIRCULATING PLANAR MAGNETRON**G. Greening, M. Franzi, Y. Y. Lau, N. Jordan, R. Gilgenbach*Nuclear Engineering and Radiological Sciences, University of Michigan, Ann Arbor, MI, United States***10:45 3B-4 MICROWAVE EXTRACTION IN THE RECIRCULATING PLANAR MAGNETRON**M. A. Franzini¹, R. M. Gilgenbach¹, G. Greening¹, N. M. Jordan¹, B. W. Hoff², D. H. Simon¹, Y. Y. Lau¹, J. Luginsland³¹*University of Michigan, Ann Arbor, MI, United States*²*Air Force Research Lab, Albuquerque, NM, United States*³*Air Force Office of Scientific Research, Arlington, VA, United States***11:00 3B-5 ACHIEVEMENT OF GW-CLASS SINGLE MODE OUTPUT IN AN X-BAND LONG-PULSE OVERMODED RELATIVISTIC BACKWARD WAVE OSCILLATOR**J. Zhang, D. Zhang, H. Zhong, Z. Jin*National University of Defense Technology, Changsha, China***11:15 3B-6 DYNAMICS OF TRANSIENT PROCESSES IN RELATIVISTIC BACKWARD WAVE TUBE DRIVEN WITH AN EXTERNAL ELECTROMAGNETIC SIGNAL**A. Konyushkov, E. Abubakirov, A. Denisenko, A. Gromov, A. Palitsin, E. Soluyanov, V. Yastrebov*Institute of Applied Physics RAS, Nizhny Novgorod, Russian Federation***11:30 3B-7 KEY ISSUES IN DESIGN OF NONLINEAR TRANSMISSION LINES***J. O. Rossi, L. P. Silva, F. S. Yamasaki*Plasma Laboratory, National Institute for Space Research, Sao Jose dos Campos, Brazil***11:45 3B-8 INTENSIVE MULTIPLE-VELOCITY ELECTRON BEAMS (FORMATION METHODS, USING FOR BROADBAND GENERATION)**A. V. Starodubov, Y. A. Kalinin, A. S. Fokin*Department of Physics of nonlinear systems, Saratov State University, Saratov, Russian Federation*

**Session 3C: Particle Acceleration with Lasers and Beams**

Tuesday, May 27 9:30 - 12:00 Thurgood Marshall East

Session Chair: George M Petrov, Naval Research Laboratory

9:30 3C-1 (invited) LASER WAKEFIELD BETATRON X-RAY PROBE FOR FEMTOSECOND TIME-RESOLVED MEASUREMENTS OF WARM DENSE MATTERM. Mo¹, Z. Chen¹, Y. -Y. Tsui¹, R. Fedosejevs¹, S. Fourmaux², A. Saraf², J. -C. Kieffer², A. Ng³¹*Electrical and Computer Engineering, University of Alberta, Edmonton, AB, Canada*²*INRS-EMT, University of Quebec, Varennes, QC, Canada*³*Department of Physics & Astronomy, University of British Columbia, Vancouver, BC, Canada***10:00 3C-2 REGIMES OF INTERACTION BETWEEN CHARGES PARTICLE BUNCHES AND PLASMAS**

P. Muggli

*Max Planck Institute for Physics, Munich, Germany***10:15 3C-3 LASER-WAKEFIELD ELECTRON ACCELERATOR WITH INDEPENDENT BEAM-PARAMETER CONTROL**G. Golovin¹, S. Chen¹, N. Powers¹, C. Liu¹, S. Banerjee¹, J. Zhang¹, M. Zeng², Z. -M. Sheng², D. Umstadter¹¹*University of Nebraska-Lincoln, Lincoln, United States*²*Shanghai Jiao Tong University, Shanghai, China***10:30 3C-4 OPTICAL CONTROL OF ELECTRON TRAPPING AND ACCELERATION IN PLASMA CHANNELS: APPLICATION TO TUNABLE, PULSED SOURCES OF MULTI-COLOR THOMSON GAMMA-RAYS**S. Y. Kalmykov¹, I. Ghebregziabher¹, X. Davoine², B. A. Shadwick¹¹*Department of Physics and Astronomy, University of Nebraska - Lincoln, Lincoln, NE, United States*²*CEA, DAM, DIF, Arpajon, France***10:45 3C-5 LASER-WAKEFIELD ACCELERATORS AS X-RAY SOURCES FOR MEDICAL IMAGING**Z. Najmudin¹, J. M. Cole¹, N. M. C. Lopes¹, J. Wood¹, K. Poder¹, J. Bryant¹, S. Alatabi¹, M. Katalin¹, M. P. D. Stuart¹, D. Bucker¹, P. A. Abel², R. L. Abel², M. Winkler³, N. Ngo³, D. Symes⁴¹*The John Adams Institute for Accelerator Science, Imperial College London, London, United Kingdom*²*Department of Cancer and Surgery, Imperial College London, London, United Kingdom*³*Imperial College Healthcare NHS Trust, Imperial College London, London, United Kingdom*⁴*Central Laser Facility, STFC Rutherford-Appleton Lab., Didcot, United Kingdom***11:00 3C-6 QUASI-MONOENERGETIC ELECTRON BUNCH GENERATION FROM LASER DRIVEN DOUBLE-LAYER ULTRATHIN FILMS**C. Wang, E. McCary, A. R. Meadows, J. Blakeney, K. Serratto, D. Kuk, C. Chester, R. Roycroft, L. Gao, I. Pomerantz, A. Bernstein, H. Quevedo, G. Dyer, E. Gaul, T. Ditmire, B. M. Hegelich
*Physics, University of Texas at Austin, Austin, TX, United States***11:15 3C-7 LASER-DRIVEN IONACCELERATION BEYOND 100MEV/AMU**D. Jung^{1,2}, D. C. Gautier¹, S. Letzring¹, S. Palaniyappan¹, L. Yin¹, B. Albright¹, B. Dromey², J. C. Fernandez¹, B. M. Hegelich¹¹*Plasma Physics, Los Alamos National Laboratory, Los Alamos, NM, United States*²*Plasma Physics, Queen's University Belfast, Belfast, United Kingdom***11:30 3C-8 FOCUSING AND SELF-MODIFIED TRANSPORT OF HIGH INTENSITY PROTON BEAMS**C. McGuffey¹, J. Kim¹, B. Qiao¹, F. N. Beg¹, M. Wei², R. B. Stephens², J. Fuchs³, S. N. Chen³, P. Nilson⁴, M. E. Foord⁵, H. S. McLean⁵¹*Center for Energy Research, University of California San Diego, La Jolla, CA, United States*²*General Atomics, San Diego, CA, United States*³*Ecole Polytechnique, Paris, France*⁴*Laboratory for Laser Energetics, Rochester, NY, United States*⁵*Lawrence Livermore National Laboratory, Livermore, CA, United States*

**11:45 3C-9 AWAKE: PLASMA WAKEFIELD ACCELERATION EXPERIMENTS WITH CERN PROTON BUNCHES**

P. Muggli, C. Awake

Max Planck Institute for Physics, Munich, Germany

Session 3D: Insulation and Dielectric Breakdown, Opening and Closing Switches (combined)

Tuesday, May 27 9:30 - 12:00 Thurgood Marshall West

Session Chair: Luis Redondo, Lisbon Superior Engineering Institute (ISEL)

9:30 3D-1 (invited) DYNAMICS AND PHYSICS CONSIDERATIONS OF EXTENDED DURATION REP-RATE OPERATION OF LASER TRIGGERED GAS SWITCHES

M. F. Wolford¹, M. C. Myers¹, J. D. Sethian¹, F. Hegeler²

¹Plasma Physics Division, Code 6733, U.S. Naval Research Laboratory, Washington, DC, United

States ²Commonwealth Technology, Inc., Alexandria, VA, United States

10:00 3D-2 A SURVEY OF LASER INITIATED GASEOUS DISCHARGE STUDIES FOR PULSED POWER

M. Domonkos

Directed Energy Directorate, AFRL, Kirtland AFB, NM, United States

10:15 3D-3 MAGNETIC FIELD PENETRATION AND MAGNETOHYDRODYNAMIC ACCELERATION IN OPENING SWITCH PLASMAS

S. L. Jackson¹, D. G. Phipps¹, A. S. Richardson¹, J. R. Angus¹, S. B. Swanekamp¹, J. W. Schumer¹, D. P. Murphy¹, B. V. Weber¹, D. D. Hinshelwood¹, R. J. Commissio¹, C. N. Boyer²

¹Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States ²Engility Corporation, Chantilly, VA, United States

10:30 3D-4 PLASMA INJECTION TECHNIQUE FOR SPECIES SEPARATION AND MAGNETIC FIELD PENETRATION EXPERIMENTS

D. Phipps¹, A. S. Richardson¹, S. L. Jackson¹, S. B. Swanekamp¹, B. V. Weber¹, D. D. Hinshelwood¹, R. J. Commissio¹, C. N. Boyer²

¹Plasma Physics Div, US Naval Research Laboratory, Washington, DC, United States ²Engility Corporation, Chantilly, VA, United States

10:45 3D-5 PULSED HIGH-VOLTAGE INSULATION EXPERIMENTS

J. Z. Gleizer¹, U. Dai², J. G. Leopold³, Y. E. Krasik³

¹Applied Physics, RAFAEL Labs, Haifa, Israel ²MoD/DDR&D, Tel-Aviv, Israel ³Physics Dept., TECHNION, Israel Institute of Technology, Haifa, Israel

11:00 3D-6 INFLUENCE OF SF6 ADMIXTURES TO NITROGEN ON CRITICAL PARAMETERS OF SURFACE STREAMER INCEPTION

A. Chvyreva, A. J. M. Pemen

Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands

11:15 3D-7 MECHANISMS FOR THE EFFECT OF RESIDUAL PRESSURE ON FIELD EMISSION IN VACUUM

M. J. Kirkpatrick¹, K. Almaksour², E. Odic¹, P. Dessante¹, P. Teste²

¹Power and Energy Systems, SUPELEC, Gif-sur-Yvette, France ²LGEF, Gif-sur-Yvette, France

11:30 3D-8 NONELECTRODE AND POSTBREAKDOWN IONIZATION PROCESSES IN WATER WITH SCREENED ELECTRODES

S. M. Korobeynikov¹, A. V. Melekhov²

¹Power Eng. Faculty, Novosibirsk State Technical University, Novosibirsk, Russian Federation ²Laser Plasma Dept., Institute of Laser Physics, Novosibirsk, Russian Federation

**11:45 3D-9 ELECTRIC EXPLODING WIRE TRIGGERING OF THE MEGAVOLT GAS SPARK GAP SWITCH**

Z. Zhang, H. Yang, D. Chen, J. Zhang, J. Xu

College 7, National University of Defense Technology, Changsha, Hunan Province, China

Session 3E: Plasma Material Interactions

Tuesday, May 27 9:30 - 12:00 Hoover

Session Chair: Ahmed Hassanein, Purdue University

9:30 3E-1 (invited) ADDRESSING THE CHALLENGES OF PLASMA-SURFACE INTERACTIONS IN NSTX-U

R. Kaita¹, T. Abrams¹, M. Lucia¹, M. Jaworski¹, J. Nichols¹, C. H. Skinner¹, D. Stotler¹, J. -P. Allain², F. Bedoya²

¹Princeton Plasma Physics Laboratory, Princeton, NJ, United States²Dept. of Nuclear, Plasma, and Radiological Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, United States

10:00 3E-2 (invited) PLASMA SPUTTERING EROSION/REDEPOSITION IN FUSION TOKAMAKS-MODELING STATUS AND CHALLENGES

J. N. Brooks

Purdue University, West Lafayette, IN, United States

10:30 3E-3 LITHIUM WETTING OF STAINLESS STEEL STUDIED VIA SCANNING AUGER MICROSCOPY

C. H. Skinner¹, A. M. Capece¹, B. E. Koel², J. P. Roszell²

¹Princeton Plasma Physics Laboratory, Princeton University, Princeton, United States²Department of Chemical and Biological Engineering, Princeton University, Princeton, United States

10:45 3E-4 DEVELOPMENT ANTI-DAIRY FOULING SURFACE OF 316L 2B STAINLESS STEEL BY ATMOSPHERIC PRESSURE PLASMA TREATMENT

G. S. D. Al-ogaili

ENSCL, UMIT, Lille, France

11:00 3E-5 INVESTIGATION ON NANOPARTICLES FORMATION IN WIRE EXPLOSION PROCESS BY FAST IMAGING AND OPTICAL EMISSION SPECTROSCOPY

B. Bora¹, S. S. Kausik², C. S. Wong², S. L. Yap², L. Soto¹

¹Departamento de Plasma Termonuclear, Comision Chilena de Energia Nuclear, Santiago. RM,

²Plasma Technology Research Centre, Physics Department, University of Malaya, Kuala Lumpur, Malaysia

11:15 3E-6 BEHAVIOUR OF DISPERSED CERAMIC PARTICLES IN DC ARC PLASMA JET DURING THE SPRAY DEPOSITION OF COATINGS

V. Valinčius, V. Grigaitienė, R. Kėzelis

Plasma Processing Laboratory, Lithuanian Energy Institute, Kaunas, Lithuania

11:30 3E-7 EFFECT OF EDGE PLASMA RADIATION ON EROSION AND DAMAGE TO ITER PLASMA FACING AND NEARBY COMPONENTS

V. Sizuk, A. Hassanein

Purdue University, West Lafayette, IN, United States

11:45 3E-8 NOVEL APPROACH FOR ZINC OXIDE NANOMATERIALS FUNCTIONALIZATION BASED ON DRY PLASMA PROCESSING

M. A. Ciolan^{1,2}, I. Motrescu³, D. Luca², M. Nagatsu¹

¹Nanovision Department, Shizuoka University, Hamamatsu, Japan²Department of Physics, Alexandru Ioan Cuza University, Iasi, Romania³Department of Science, University of Agricultural Science and Veterinary Medicine, Iasi, Romania

**Session 3F: Nonequilibrium Plasma Applications II**

Tuesday, May 27 9:30 - 12:00 Coolidge

Session Chair: Alan R Hoskinson, Tufts University

9:30 3F-1 (invited) INTRODUCTION TO THE PROTO-TYPE PLASMA JETS OF AC, RF, AND MW-DISCHARGES IN KOREA PLASMA-BIO RESEARCH CENTER

Y. Kim, G. Cho, G. -H. Han, G. -G. Kwon, J. -J. Choi, Y. -H. Na, H. S. Uhm, E. -H. Choi

Department of Electrophysics, Kwangwoon University, Seoul, South Korea

10:00 3F-2 PLASMA POLYMERIZED THIOPHENE USING INTENSE AND HIGHLY ENERGETIC ATMOSPHERIC PRESSURE MICRO PLASMA JET FOR POLYMERIC BATTERIES

C. -S. Park, S. -O. Kim

Department of Electrical and Computer Engineering, Clemson University, Clemson, United States

10:15 3F-3 DEPOSITION OF ANTIBACTERIAL NANOCOMPOSITE FILMS USING AN ATMOSPHERIC PRESSURE NONEQUILIBRIUM PLASMA JET

X. Deng, A. Nikiforov, C. Leys

Department of Applied Physics, Ghent University, Gent, Belgium

10:30 3F-4 COMPARISON OF SPATIAL AND TEMPORAL CHARACTERISTICS BETWEEN MICROPLASMA JET ARRAYS AND A SINGLE MACROPLASMA JET

P. P. Sun, J. H. Cho, S. -J. Park, J. G. Eden

Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL, United States

10:45 3F-5 PLASMA DIAGNOSTICS OF NON-EQUILIBRIUM ATMOSPHERIC PLASMA JETSA. Shashurin¹, D. Scott¹, M. Keidar¹, M. N. Shneider²¹Mechanical and Aerospace Engineering, George Washington University, Washington, DC, United States²Mechanical and Aerospace Engineering, Princeton University, Princeton, NJ, United States**11:00 3F-6 EFFECT OF GROUND ELECTRODES ON STABILITY OF PLASMA JET**J. F. Tang¹, D. S. Zhou², Y. X. Huo³, C. H. Zhang⁴¹Harbin Institute of Technology, Harbin, China²Harbin Institute of Technology, Harbin, China³Harbin Institute of Technology, Harbin, China⁴Harbin Institute of Technology, Harbin, China**11:15 3F-7 AN ATMOSPHERIC NEON PLASMA JET IN AIR DRIVEN BY PULSE-WAVE-MODULATED SINUSOIDAL HIGH VOLTAGE**

L. Yang, Y. Tu, Y. Yu, J. Zhan, D. Hu, Q. Li

School of Electronic Science and Engineering, Southeast University, Nanjing, Jiangsu, China

11:30 3F-8 THRESHOLDS FOR MICROBUBBLE AND MICROPLASMA GENERATION IN LIQUID

P. Xiao, D. Staack

Mechanical Engineering Department, Texas A&M University, College Station, TX, United States

11:45 3F-9 SPATIALLY - AND TEMPORALLY- RESOLVED INVESTIGATION OF DISCHARGE IN WATER IN PIN-TO-PIN GEOMETRY

S. Yatom, A. Kedaya, P. Bruggeman

Mechanical Engineering, University of Minnesota, Minneapolis, MN, USA

Session PL4: Plenary 4

Tuesday, May 27 13:00-14:00 Thurgood Marshall East-South

Session Chair: Farhat Beg, University of California-San Diego

13:00 PL4-1 (invited) THE HIGH-FOOT IMPLOSION CAMPAIGN ON THE NIF

O. A. Hurricane

Lawrence Livermore National Laboratory, Livermore, CA, United States

**Session 2P: 1.1 Basic Plasma Phenomena Posters****Poster Session**

Tuesday, May 27 '14:00-15:30 Exhibit C (lower level)

Session Chair: *Keith Cartwright, Sandia National Laboratories***2P-1 NUMERICAL STUDY ON PULSED-DC ATMOSPHERIC-PRESSURE PLASMA JET**X. Liu, D. Liu*National State Key Lab of Advanced Electromagnetic Engineering and Technology, Huazhong University of Science and Technology, Wuhan, China***2P-2 INVESTIGATION ON ATMOSPHERIC AIR DIELECTRIC BARRIER DISCHARGE UNIFORMITY**C. Liu^{1,2}, A. Fridman^{1,3}, D. Dobrynin¹¹*A. J. Drexel Plasma Institute, Drexel University, Camden NJ 08103, Camden, New Jersey, United States*²*Electrical and Computer Engineering Department, Drexel University, Philadelphia, PA, United States*³*Mechanical Engineering and Mechanics Department, Drexel University, Philadelphia, PA, United States***2P-3 TRANSITION OF BRANCHED POSITIVE STREAMER TO NON-BRANCHED POSITIVE STREAMER WITH INCREASE OF DISCHARGE-REPETITION RATE**Y. Inada¹, D. Shimizu¹, T. Omori², T. Matsumoto², Y. Izawa², K. Nishijima²¹*Graduate school of Electrical Engineering, Fukuoka University, Fukuoka, Japan*²*Department of Electrical Engineering, Fukuoka University, Fukuoka, Japan***2P-4 STOCHASTIC PHENOMENON OF STREAMER BRANCHING IN INSULATING OIL**Y. Li, H. -B. Mu, Z. -S. Chang, J. -B. Deng, G. -J. Zhang*Xi'an Jiaotong University, Xi'an, China***2P-5 DETERMINATION OF ELECTRON-PLASMA TEMPERATURE BY MEASURING THE PROPAGATION VELOCITY OF PLASMA-DIFFUSION WAVES WITH THE MIXTURE GASES OF AR-N2 IN THE ATMOSPHERIC PRESSURE PLASMA JETS**G. -H. Han¹, P. Suanpoot², G. Cho¹¹*Department of Electrophysics, Kwangwoon University, Seoul, South Korea*²*Maejo University Phrae Campus, Phrae Province, Thailand***2P-6 VARIABILITY OF L-BAND GPS SCINTILLATION OVER AURORAL REGION, MAITRI, ANTARCTICA**P. K. Purohit¹, P. Khatarkar², P. A. Khan², R. Atulkar¹¹*Space Science Laboratory, Department of Physics & Electronics, Barkatullah, Bhopal, India* ²*National Institute of Technical Teachers™ Training and Research, Shamla Hills, Bhopal, 462002 India, Bhopal, India***2P-7 ADVANCES IN IMPEDANCE PROBE APPLICATIONS AND DESIGN IN THE NRL SPACE PHYSICS SIMULATION CHAMBER**D. Blackwell¹, C. Cothran², D. Walker², G. Gatling¹, W. Amatucci¹¹*U.S. Naval Research Laboratory, Washington DC, United States*²*Sotera Defense Solutions, Inc., Herndon VA, United States***2P-8 OPTIMIZATION OF SHOCK INTENSITIES GENERATED BY HIGH CURRENT EXPLODING WIRES**J. C. Stephens, D. Ryberg, J. C. Dickens, A. A. Neuber*Center For Pulsed Power and Power Electronics, Texas Tech Center for Pulsed Power and Power Electronics, Lubbock, TX, United States*

**2P-9 MICROSTRUCTURE AND CORROSION BEHAVIORS OF XC48 TREATED BY RF MAGNETRON SPUTTERING TIALN ALLOYING**

N. Madaoui^{1,2}, N. Saoula¹, A. Z. Ait Djafer³, A. Zerizer³

¹Division Milieux Ionises, Centre de De developpement des Technologies Avances, Cit du 20 aot 1956, Baba Hassen, BP n17,, Algeria²Faculte de Chimie. Universit Des Sciences et de la Technologie Houari Boumediene., Laboratoire d'Electrochimie-Corrosion, Mtallurgie et Chimie Minrale., B.P 32, El Alia, Bab Ezzouar, Alger 16111, algeria³Faculte des sciences d'ingenieur, universit Mhamed bougara, Laboratoire des matriaux minraux et composite, Avenue de l'Indpendance, 35000, algeria

2P-10 KINETIC SIMULATIONS OF PLASMA ENHANCED PHOTONIC CRYSTALS

J. Trieschmann, T. Mussenbrock

Department of Electrical Engineering and Information Science, Ruhr University Bochum, Bochum, Germany

2P-11 MAGNETOSONIC WAVES IN PLASMA

K. Annou

CDTA, baba hassen, Algeria

2P-12 EFFECT OF GRAZING ANGLE WITH THE MAGNETIC FIELD ON ION SPUTTERING AT THE TUNGSTEN SURFACE OF DIVERTOR PLATE

K. S. Goswami¹, S. Adhikari²

¹Centre of Plasma Physics-Institute for Plasma Research, Assam, India²Centre of Plasma Physics-Institute for Plasma Research, Assam, India

2P-13 EXAMINATION OF ELECTRON TEMPERATURE AND ION VELOCITY DISTRIBUTION IN PLASMA GENERATED IN THE MADHEX HELICON SOURCE

Y. -T. Sung, Y. Li, J. Scharer, M. DeVinney

Department of Electrical and Computer Engineering, University of Wisconsin-Madison, Madison, WI, United States

2P-14 ENHANCED OPTICAL EMISSION OF LASER PRODUCED PLASMA BY A PULSED POWER DISCHARGE

W. Wei¹, J. Wu¹, Q. Wang²

¹State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, Xi'an, Shaanxi, China

²School of Sciences, Xi'an University of Technology, Xi'an, Shaanxi, China

2P-15 ELECTRON-ACOUSTIC SOLITONS IN AN ELECTRON-BEAM PLASMA SYSTEM WITH KAPPA-DISTRIBUTED ELECTRONS

A. Danehkar¹, I. Kourakis², M. A. Hellberg³

¹Department of Physics and Astronomy, Macquarie University, Sydney, NSW 2109, Australia²Department of Physics and Astronomy, Queen's University Belfast, Belfast, BT7 1NN, United Kingdom³Department of Physics, University of KwaZulu-Natal, Durban 4000, South Africa

2P-16 EFFECTS OF DIFFERENT ELECTRON PRESSURE ON PLASMA EXPANSION

B. R. Lee¹, S. E. Clark², D. H. H. Hoffmann¹, C. Niemann²

¹Institut fuer Kernphysik, Technische Universitaet Darmstadt, Darmstadt, Germany²Physics and Astronomy, University of California, Los Angeles, Los Angeles, USA

2P-17 ION ACOUSTIC SOLITONS IN MAGNETIZED DENSE PLASMAS WITH NON-RELATIVISTIC AND ULTRA-RELATIVISTIC DEGENERATE ELECTRONS

S. Mahmood, S. Sadiq, Q. ul-Haque

Theoretical Physics Division, PINSTECH, Islamabad, Pakistan

2P-18 COHERENT STRUCTURE IN CONFINED MAGNETOFLUIDS

J. V. Shebalin

Astromaterials Research Office, NASA Johnson Space Center, Houston, Texas, United States

**2P-19 SPATIALLY-RESOLVED SPECTRAL ANALYSIS OF AR-NH₃ PLASMA JET**

Z. Chang, G. Zhang, C. Yao

School of Electrical Engineering, Xi'an Jiaotong University, Xi'an, Shaanxi, China

Session 2P: 1.2 Computational Physics and Techniques Posters**Poster Session**

Tuesday, May 27 14:00-15:30 Exhibit C (lower level)

Session Chair: *Keith Cartwright, Sandia National Laboratories*

2P-20 VERIFICATION OF EMISSION MODELS FOR FINITE ELEMENT AND FINITE DIFFERENCE TIME DOMAIN PARTICLE-IN-CELL CODES

K. L. Cartwright, M. T. Bettencourt, M. M. Hopkins, L. C. Musson, G. A. Radtke

Sandia National Laboratories, Albuquerque, NM, United States

2P-21 ACCURATE DETERMINATION OF SURFACE ELECTRIC FIELDS FOR CONFORMAL FINITE DIFFERENCE TIME DOMAIN SIMULATIONS

M. C. Lin, C. Zhou

Tech-X Corporation, Boulder, CO, United States

2P-22 DRIFT KINETIC FLUID PARTICLE METHODS FOR MAGNETIZED VLASOV EMISSION EQUILIBRIA*

R. E. Terry

Enig Associates, Inc., Bethesda, MD, United States

2P-23 A HIGH ORDER UNCONDITIONALLY STABLE MAXWELL SOLVER FOR PLASMA SIMULATIONS IN COMPLEX GEOMETRIES

Y. Güclü, M. F. Causley, A. J. Christlieb

Department of Mathematics, Michigan State University, East Lansing, MI, United States

2P-24 POSITIVITY-PRESERVING WENO SCHEMES WITH CONSTRAINED TRANSPORT FOR IDEAL MHD

Q. Tang¹, A. Christlieb^{1,2}, Y. Liu¹, Z. Xu³

¹*Department of Mathematics, Michigan State University, East Lansing, MI, United States*²*Department of Electrical and Computer Engineering, Michigan State University, East Lansing, MI, United States*³*Department of Mathematical Science, Michigan Technological University, Houghton, MI, United States*

2P-25 A PARTICLE IN CELL METHOD WITH AN UNCONDITIONALLY STABLE FIELD SOLVER

E. Wolf, M. Causley, A. Christlieb

Michigan State University, East Lansing, MI, United States

2P-26 EFFICIENCY OF MONTE CARLO COLLISIONAL DYNAMICS ON GPUs

C. Bardel¹, J. Verboncoeur¹, M. Y. Hur², H. J. Lee²

¹*Electrical and Computer Engineering, Michigan State University, East Lansing, United States* ²*Electrical Engineering, Pusan National University, Busan, Korea*

2P-27 A HIGHER ORDER A-STABLE MAXWELL SOLVER USING SUCCESSIVE CONVOLUTION

M. F. Causley, A. J. Christlieb, Y. Guclu

Mathematics, Michigan State University, East Lansing, MI, United States

2P-28 COMPACT, HIGH-POWER TERAHERTZ SOURCE USING CYLINDRICAL GRATINGS

J. Gardelle¹, P. Modin¹, J. T. Donohue², H. Bluem³, J. Jarvis³, A. M. M. Todd³, R. H. Jackson³

¹*CEA/CESTA, Le Barp, France*²*Centre d' Etudes Nucleaires de Bordeaux, University of Bordeaux, Gradignan, France*³*Advanced Energy Systems, Princeton, NJ, United States*

**2P-29 COMPARISON OF SIMULATION AND EXPERIMENT FOR CONCENTRATIONS OF RADICALS IN A PLASMA TREATED AIR STREAM**

P. Stoltz¹, M. Golkowski²

¹TechX Corporation, Boulder, CO, United States²Electrical Engineering, University of Colorado, Denver, Denver, CO, United States

2P-30 THE APPLICATION OF KIUTTUS FORMULATION TO STUDY COAXIAL FLUX COMPRESSION GENERATORS

J. B. Javedani, T. L. Houck, B. R. Poole

Engineering/NSED, Lawrence Livermore National Laboratory, Livermore, CA, United States

2P-31 NEUTRON YIELD DETECTORS CHARACTERIZED WITH MCNP

E. S. McKee, T. Darling

Physics, University of Nevada, Reno, Reno, United States

2P-32 MULTIPACTOR CURRENT MODELLING USING AN AVERAGED VERSION OF FURMAN'S SEY MODEL

S. Rice, J. Verboncoeur

Electrical and Computer Engineering, Michigan State University, East Lansing, MI, United States

2P-33 EXAMINATION OF TWO-STREAM INSTABILITY FOR HIGH POWER BROADBAND RF AMPLIFIERS

P. Mardahl, M. Haworth, M. Lambrecht

Air Force Research Laboratory, Kirtland AFB, United States

2P-34 SIMULATION OF A FACETED MAGNETRON USING DISCRETE MODULATED CURRENT SOURCES

S. A. Fernandez-Gutierrez¹, J. Browning¹, D. Smithe², M. -C. Lin², J. Watrous³

¹Department of Electrical and Computer Engineering, Boise State University, Boise, ID, United States

²Tech-X Corporation, Boulder, CO, United States³TechFlow, Albuquerque, NM, United States

2P-35 DEVELOPMENT OF PIC-FDTD CODE FOR BEAM-WAVE INTERACTION STUDY IN 'PASOTRON'

N. Pareek¹, N. Sarkar², M. Ahmad¹, U. N. Pal¹, N. Kumar¹, R. P. Lavaniya¹

¹M.W.T., Ceeri pilani, pilani, Rajasthan, India²Physics Department, Bits PILANI, pilani, Rajasthan, India

2P-36 MODELING FAILURES OF THE SNS H- ION SOURCE ANTENNA

S. A. Veitzer, K. R. C. Beckwith, J. Loverich

Tech-X Corporation, Boulder, CO, United States

2P-37 GENERAL-PURPOSE KINETIC GLOBAL MODELING FRAMEWORK FOR MULTI-PHASE CHEMISTRY

G. Parsey, Y. Güçlü, J. Verboncoeur, A. Christlieb

Michigan State University, East Lansing, MI, United States

Session 2P: 1.3 Space Plasmas Posters**Poster Session**

Tuesday, May 27 14:00-15:30 Exhibit C (lower level)

Session Chair: John E Foster, University of Michigan

2P-38 TWO-DIMENSIONAL SIMULATIONS FOR EM WAVE PROPAGATING IN SPACE

G. Wang¹, P. Ee², Y. Ren³

¹Department of Physics, Dalian Maritime University, Dalian, Liaoning, China²Department of Electrical Engineering, Harbin Institute of Technology, Harbin, Heilongjiang, China³Princeton Plasma Physics Laboratory, Princeton University, Princeton, NJ, United States



2P-39 EFFECTS OF INDUCED SCATTERING OF LOWER-HYBRID WAVES BY PLASMA PARTICLES ON THE LIFETIME OF PLASMA-SHEET TURBULENCE

M. Mithaiwala¹, L. Rudakov², G. Ganguli¹, C. Crabtree¹

¹*Plasma Physics, Naval Research Laboratory, Washington, DC, United States*²*Icarus Research Inc., Bethesda, MD, 20824*

2P-40 INVESTIGATION OF EFFECTS OF GEOMAGNETIC STORMS PRODUCED BY DIFFERENT SOLAR SOURCES ON THE TOTAL ELECTRON CONTENT (TEC)

P. K. Purohit¹, A. A. Mansoori², P. A. Khan³, P. Bhawre², S. C. Tripathi², A. M. Aslam², M. A. Waheed², A. K. Gwal²

¹*Physics, National Institute of Technical Teachers™ Training and Research, Shamla Hills, Bhopal, 462002 India, Bhopal, India*²*Physics, Barkatullah University, Bhopal, Bhopal, India*³*Physics, Rajiv Gandhi Technical University, Bhopal, India*

2P-41 EXTENDED ENERGY DEPOSITION SCENARIO IN COLLISIONLESS SOLAR POLAR CORONAL HOLE

M. Bose¹, A. Chakravarty², R. Bondyopadhyaya²

¹*Department of Physics, Jadavpur University, Kolkata, Kolkata, India*²*Department of Mathematics, Jadavpur University, Kolkata, Kolkata, India*

2P-42 SPATIALLY RESOLVED OBSERVATIONS OF IONIZED GAS IN PLANETARY NEBULAE

A. Danehkar¹, Q. A. Parker^{1,2}

¹*Department of Physics and Astronomy, Macquarie University, Sydney, NSW 2109, Australia*²*Australian Astronomical Observatory, Epping, NSW 1710, Australia*

Session 2P: 1.4 Partially Ionized Plasmas Posters

Poster Session

Tuesday, May 27 14:00-15:30 Exhibit C (lower level)

Session Chair: John E Foster, University of Michigan

2P-43 ON THE I-V CHARACTERISTICS IN A REACTIVE HIGH POWER IMPULSE MAGNETRON SPUTTERING (HIPIMS)

J. T. Gudmundsson¹, F. Magnus^{1,2}, T. K. Tryggvason¹, S. Shayestehaminzade¹, O. B. Sveinsson¹, S. Olafsson¹

¹*Science Institute, University of Iceland, Reykjavik, Iceland*²*Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden*

2P-44 KINETIC SIMULATION OF MODE TRANSITIONS AND HYSTERESIS EFFECTS IN LOW PRESSURE CAPACITIVE DISCHARGES

S. Wilczek¹, J. Trieschmann¹, R. P. Brinkmann¹, T. Mussenbrock¹, A. Derzsi², I. Korolov², Z. Donko², E. Schuengel³, J. Schulze³

¹*Ruhr University Bochum, Bochum, Germany*²*Wigner Research Center for Physics, Budapest, Hungary*³*West Virginia University, Morgantown, USA*

2P-45 THE INFLUENCE OF THE SECONDARY ELECTRON INDUCED ASYMMETRY ON THE ELECTRICAL ASYMMETRY EFFECT IN CAPACITIVELY COUPLED PLASMAS

J. Schulze¹, E. Schuengel¹, I. Korolov², A. Derzsi², Z. Donko²

¹*Physics, West Virginia University, Morgantown, WV, United States*²*Solid State Physics and Optics, Hungarian Academy of Sciences, Budapest, Hungary*

2P-46 LOW-FREQUENCY WAVE PROPAGATION IN PARTIALLY IONIZED PLASMAS AND A STRONG DENSITY GRADIENT IN THE HOT HELICON EXPERIMENT (HELIX)

S. H. Sears¹, J. Carr Jr.², R. W. VanDervort¹, G. Lusk¹, E. E. Scime¹

¹*Physics, West Virginia University, Morgantown, WV, United States*²*Physics, Texas Lutheran University, Seguin, TX, United States*

**2P-47 ELECTRON ENERGY DISTRIBUTION FUNCTION OF CAPACITIVE COUPLED ELECTRONEGATIVE PLASMA: THE ROLE OF FLOW RATE OF ELECTRONEGATIVE GAS IN AR**

Y. Xin

*School of Physical Science and Technology, Soochow University, Suzhou City, China***2P-48 MEASUREMENT OF EFFECTIVE SHEATH WIDTH AROUND CUTOFF PROBE IN LOW-PRESSURE PLASMAS**S. You¹, D. Kim², J. H. Kim¹, W. Y. Oh²¹Vacuum Center, Kriss, Daejeon, South Korea ²Mechanical Eng, KAIST, Daejeon, South Korea**Session 2P: 1.5 Dusty & Strongly-Coupled Plasmas Posters****Poster Session**

Tuesday, May 27 14:00-15:30 Exhibit C (lower level)

Session Chair: *Keith Cartwright, Sandia National Laboratories***2P-49 A STUDY ON DUST ION ACOUSTIC WAVES: FROM THEORY TO LABORATORY EXPERIMENT**N. C. Adhikary, H. Bailung*Physical Sciences Division, Institute of Advanced Study in Science and Technology, Guwahati, India***2P-50 MAGNETIC SHEAR DRIVEN E X B INSTABILITY**M. Bose¹, R. Bhattacharyya¹, S. K. Das²¹Physics, Jadavpur University, , Kolkata-700032, India ²Mathematics, Prince Georges Community College, Largo, Maryland 20774, United States**2P-51 EFFECTS OF DOUBLE TEMPERATURE IONS ON CYLINDRICAL AND SPHERICAL DUST-AcouSTIC SHOCK WAVES IN COMPLEX PLASMAS**K. -E. Hasin^{1,2}, I. Tasnim², M. M. Masud¹, A. A. Mamun²¹Physics, Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh ²Physics, Jahangirnagar University, Dhaka, Bangladesh**2P-52 EXTERNALLY CONTROLLED CHARGED PARTICLES AND MEASUREMENT THEIR COLLECTIVE RESPONSE**Y. Nishio, O. Sakai*Electronic Science and Engineering, Kyoto University, Kyoto, Japan***2P-53 DUST PARTICLES CHARGE EXPERIMENTAL EVALUATION IN LASER INDUCED HIGH PRESSURE COLLOID PLASMA FLOWS**E. Y. Loktionov, Y. S. Protasov, Y. Y. Protasov*Bauman Moscow State Technical University, Moscow, Russian Federation***2P-54 SCATTERING AND BOUND-STATE TRAJECTORIES WITH EFFECTIVE QUANTUM POTENTIALS**G. Dharuman¹, J. Verboncoeur¹, A. Christlieb², M. S. Murillo³¹Department of Electrical and Computer Engineering, Michigan State University, East Lansing, MI, United States²Department of Mathematics, Michigan State University, East Lansing, MI, United States³Computational Physics and Methods Group, Los Alamos National Laboratory, East Lansing, MI, United States**2P-55 THE EFFECT OF HEAT RELEASE ON RADIAL SUSTENANCE OF DUST PARTICLES IN GLOW DISCHARGE**D. N. Polyakov, V. V. Shumova, L. M. Vasilyak*Joint Institute for High Temperatures RAS, Moscow, Russian Federation*

**2P-56 FORMATION OF STRUCTURES FROM DUSTY CLUSTERS IN CRYOGENIC PLASMA OF GLOW DISCHARGE**

D. N. Polyakov, V. V. Shumova, L. M. Vasiliyak

Joint Institute for High Temperatures RAS, Moscow, Russian Federation

2P-57 BREATHING MODE OF DUST CLOUD IN A COGENERATED DUSTY PLASMA

M. Bose¹, S. Sarkar¹, J. K. Atul¹, M. Mondal¹, S. Mukherjee²

¹Associate Professor, Department of Physics, Jadavpur University, Kolkata, Kolkata, India²FCIPT, Institute for Plasma Research, Gandhinagar, 382428, Gandhinagar, India

Session 2P: 3.1 Plasma, Ion, and Electron Sources Posters**Poster Session**

Tuesday, May 27 14:00-15:30 Exhibit C (lower level)

Session Chair: *Evgeniya H Lock, Naval Research Laboratory*

2P-58 CHARACTERIZATION OF NON-THERMAL ATMOSPHERIC PRESSURE PLASMA JET IN HELIUM, ARGON AND OXYGEN GAS MIXTURES*

M. Thiagarajan, C. Nicula, A. Sarani

Plasma Engineering Research Lab (PERL), Texas A&M University - Corpus Christi, Corpus Christi, Texas, United States

2P-59 PIEZOELECTRIC SYSTEM FOR THE GENERATION OF ENERGETIC PARTICLES

B. B. Gall¹, S. D. Kovaleski¹, P. Norgard¹, J. A. VanGordon¹, J. W. Kwon¹, G. E. Dale²

¹Electrical and Computer Engineering, University of Missouri, Columbia, MO, United States²High Power Electrodynamics Group, Los Alamos National Laboratory, Los Alamos, NM, United States

2P-60 AMPLITUDE- AND FREQUENCY-MODULATED PIEZOELECTRIC TRANSFORMER FOR CHARGED PARTICLE BEAM ACCELERATION

B. B. Gall¹, S. D. Kovaleski¹, P. Norgard¹, J. A. VanGordon¹, J. W. Kwon¹, G. E. Dale²

¹Electrical and Computer Engineering, University of Missouri, Columbia, MO, United States²High Power Electrodynamics Group, Los Alamos National Laboratory, Los Alamos, NM, United States

2P-61 LOW-RESISTANCE HIGH-CURRENT DISCHARGE INITIATION IN A VACUUM DIODE

A. Zherlitzyn, B. Kovalchuk, N. Pedin

Institute of High Current Electronics, Tomsk, Russian Federation

2P-62 PLASMA-FILLED DIODE POWER INCREASE DUE TO THE GROWTH OF THE CURRENT RISE RATE

A. Zherlitzyn, B. Kovalchuk, N. Pedin

Institute of High Current Electronics, Tomsk, Russian Federation

2P-63 EVALUATION OF RADIATION DOSE PARAMETERS OF ELECTROPHYSICAL FACILITY GAMMA-4

K. V. Strabykin, N. V. Zavyalov, V. S. Gordeev, A. V. Grishin, S. Y. Puchagin, A. L. Mozgovoy, Y. S. Berdnikov, D. O. Mansurov, M. A. Moisejevskikh

RFNC-VNIIEF, Sarov, Nizhny Novgorod region, Russian Federation

2P-64 VAPOR SHIELD MODELS IN ELECTROTHERMAL CAPILLARY DISCHARGES AND COMPARISON WITH EXPERIMENTS

N. M. Almousa, M. A. Bourham

Nuclear Engineering, North Carolina State University, Raleigh, NC, United States

2P-65 CHARACTERIZATION OF CESIUM VAPOR DELIVERY SYSTEM FOR NEGATIVE ION SOURCES

G. Bansal, K. Pandya, J. Soni, A. Gahlaut, M. Bandyopadhyay, A. Chakraborty

Institute for Plasma Research, Gandhinagar, Gujarat, India

**2P-66 STUDY ON THE PHYSICAL MECHANISM OF A PLASMA THRUSTER WITH WIDE RANGE OF THRUST**

H. Liu, H. Wu, H. Li, X. Li, S. Xie, T. Huang, D. Yu

Harbin Institute of Technology, Harbin, China

**2P-67 THE ATMOSPHERIC PLASMA OF THE GROUND DURING THE DOPING PROCESS TREND ANALYSIS
STUDY ON THE CURRENT PASS**

S. Kim, M. S. Yun, T. H. Jo, J. I. Park, H. J. Park, G. Cho, E. Choi, G. -C. Kwon

Department of Electrical and Biological Physics, Seoul, South Korea

**2P-68 INDIRECT ONLINE PLASMA CHARACTERIZATION THROUGH ELECTRICAL PARAMETERS FOR
INDUCTIVELY COUPLED PLASMA SOURCES**

D. Sudhir, M. Bandyopadhyay, A. Chakraborty

ITER-India, Institute for Plasma Research, Gandhinager, India

2P-69 DESIGN OF ELECTROPHYSICAL FACILITY GAMMA-4

K. V. Strabykin, N. V. Zavyalov, V. S. Gordeev, V. T. Punin, A. V. Grishin, S. T. Nazarenko, V. S. Pavlov, V. A. Demanov, T. F. Shihanova, A. V. Kozachev, D. A. Kalashnikov, S. L. Glushkov, S. Y. Puchagin, D. O. Mansurov, R. A. Mayorov, V. L. Mayornikova, B. P. Mironychev

RFNC-VNIIEF, Sarov, Nizhny Novgorod region, Russian Federation

2P-70 REP-RATE OPERATION OF A ~200 KV SEALED-TUBE REFLEX-TRIODE VIRCATOR AT ~200 A/CM²

J. M. Parson, J. -W. B. Bragg, M. Taylor, D. Barnett, P. Kelly, C. F. Lynn, S. Holt, J. C. Dickens, A. A. Neuber, J. J. Mankowski

Electrical and Computer Engineering, Texas Tech University, Lubbock, TX, United States

2P-71 MICROWAVE PLASMA SOURCES BY USING PULSE MODE SSPA

H. S. Lee¹, J. J. Choi¹, G. S. Cho², E. H. Choi²

¹*Department of wireless Communications Engineering, Kwangwoon University, Seoul, South Korea*

²*Department of Electrophysics, Kwangwoon University, Seoul, South Korea*

2P-72 THE DISCHARGE MODE TRANSITION OF VACUUM ARC INDUCED BY A TRIGGER RESISTANCE

C. Lan, L. Zheng, J. Long, Y. Peng, J. Li, Z. Yang, P. Dong

Institute of Fluid Physics, China Academy of Engineering Physics, Mianyang, Sichuan, China

**2P-73 ROLE OF POSITIVE IONS ON THE SURFACE PRODUCTION OF NEGATIVE IONS IN A FUSION
PLASMA REACTOR TYPE NEGATIVE ION SOURCE - INSIGHTS FROM A 3D PARTICLE-IN-CELL MONTE-
CARLO COLLISIONS MODEL**

G. Fubiani, J. -P. Boeuf

GREPHE, CNRS/LAPLACE University of Toulouse 3, Toulouse, France

**2P-74 EFFECT OF A DC PREIONIZATION SOURCE ON ENERGY DEPOSITION IN A PULSED INDUCTIVE
PLASMA**

R. A. Pahl, J. L. Rovey

Aerospace Engineering, Missouri University of Science and Technology, Rolla, MO, United States

2P-75 A MICROWAVE MICROGAP PLASMA SOURCE FOR USE IN A PLASMA LINE SYSTEM

T. R. Brubaker¹, S. G. Bilen¹, S. D. Knecht²

¹*Electrical Engineering, The Pennsylvania State University, State College, PA, United States* ²*Applied Research Laboratory, The Pennsylvania State University, State College, PA, United States*

2P-76 PERVEANCE OF A HIGH-IMPEDANCE DIODE WITH BLADE EXPLOSIVE EMISSION CATHODES

G. E. Remnev, M. I. Kaikanov

Tomsk Polytechnic University, Tomsk, Russian Federation

**Session 2P: 3.2 Intense Electron and Ion Beams Posters****Poster Session**

Tuesday, May 27 14:00-15:30 Exhibit C (lower level)

Session Chair: *Mark Sinclair, Atomic Weapons Establishment***2P-77 SELF-MAGNETIC PINCH DIODE EXPERIMENTS AT 2.0 MV**

J. J. Leckbee, M. D. Johnston, M. L. Kiefer, B. V. Oliver, T. J. Webb
Sandia National Laboratories, Albuquerque, NM, United States

2P-78 SPECTRAL CHARACTERISTICS OF THE SMP DIODE FOR RADIOPHOTOGRAPHIC APPLICATIONS

T. J. Webb¹, J. J. Leckbee¹, M. L. Kiefer¹, M. D. Johnston¹, D. R. Welch²

¹*Sandia National Laboratories, Albuquerque, NM, United States*²*Voss Scientific, Albuquerque, NM, United States*

2P-79 EFFECT OF ROD MATERIAL ON THE IMPEDANCE BEHAVIOR OF SMALL ASPECT RATIO ROD PINCHES

V. J. Harper-Slaboszewicz, J. Leckbee, P. W. Lake, A. L. McCourt
Sandia National Laboratories, Albuquerque, NM, United States

2P-80 REDESIGN OF THE MINI B LARGE AREA DIODE

D. W. Goude
HTC, Atomic Weapons Establishment, Reading, United Kingdom

2P-81 EXPERIMENTAL AND SIMULATION STUDY OF ELECTRIC FIELD SCREENINGS OF CARBON FIBER FIELD EMITTERS

W. Tang¹, D. Shiffler¹, M. LaCour², K. Golby², T. Knowles³

¹*Directed Energy Directorate, Air Force Research Laboratory, Albuquerque, NM, United States*²*SAIC, Inc., Albuquerque, NM, United States*³*Energy Science Laboratories, Inc., San Diego, CA, United States*

2P-82 SELF-FOCUSED TRANSPORT OF A HIGH NU/GAMMA ELECTRON BEAM FOR MATERIALS SURFACE MODIFICATION

M. C. Myers¹, D. V. Rose², F. Hegeler³, M. F. Wolford¹, J. D. Sethain¹

¹*Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States*²*Voss Scientific, Albuquerque, NM, United States*³*Commonwealth Technology, Inc., Alexandria, VA, United States*

2P-83 INVESTIGATION OF RADIALLY CONVERGING ELECTRON BEAMS GENERATED BY GESA IV

W. An¹, A. Weisenburger¹, R. Fetzer¹, V. Engelko², A. Shlapakovski³

¹*Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany*²*Efremov Institute of Electrophysical Apparatus, St. Petersburg, Russia*³*Physics Department, Technion, Haifa, Israel*

2P-84 THERMAL EFFECT OF LOW-ENERGY HIGH-CURRENT PULSED ELECTRON BEAM ON TITANIUM ALLOY STRUCTURE

O. M. Stepanova^{1,2}, A. V. Panin³, M. S. Kazachenok³, O. M. Kretova³

¹*National Research Tomsk Polytechnic University, Tomsk, Russia*²*Saint-Petersburg State University, Saint-Petersburg, Russia*³*Institute of Strength Physics and Materials Science SB RAS, Tomsk, Russia*

2P-85 EVALUATION OF ELECTRON BEAM FOR FLYER ACCELERATION BY INTENSE PULSED POWER SUPPLY

F. Tamura, N. Takakura, T. Itoh, T. Kudo, R. Hayashi, K. Takahashi, T. Sasaki, T. Aso, T. Kikuchi, N. Harada, W. Jiang, K. Kashine, A. Tokuchi

Electrical, Electronics and Information Engineering, Nagaoka University of Technology, Nagaoka, Niigata, Japan

**2P-86 IMPROVEMENT IN THE PERFORMANCE STATISTICS OF A BLUMLEIN IN DOUBLE PULSE MODE**

Y. I. Isakova, A. I. Pushkarev, I. P. Khaylov

High Technology Physics Institute, Tomsk Polytechnic University, Tomsk, Russian Federation

2P-87 SECTIONED VACUUM INSULATOR OF GAMMA-4 FACILITY MODULE

K. V. Strabykin, N. V. Zavyalov, V. S. Gordeev, A. V. Grishin, S. Y. Puchagin, Y. S. Berdnikov, S. T. Nazarenko, V. S. Pavlov, V. A. Demanov

RFNC-VNIIEF, Sarov, Nizhny Novgorod region, Russian Federation

2P-88 THE ABLATION EFFECTS OF NI TARGET IRRADIATED BY INTENSE-PULSED ION BEAM

D. Wu, J. Y. Du, J. Wang, C. D. Bu, Q. C. Ji, W. Wang

College of Physical Science and Technology, Dalian University, Dalian, China

2P-89 OPTIMIZATION OF TWO-DIMENSIONAL GRID ELECTRODE GEOMETRY FOR BALLISTIC-MODE PLASMA IMMERSION ION IMPLANTATION

C. Yi¹, W. Namkung², M. Cho³

¹*Dept. physics, Pohang University of Science and Technology, Pohang, Gyeongbuk, South Korea* ²*Pohang Accelerator Laboratory, Pohang, Gyeongbuk, South Korea* ³*Dept. of physics and Division of Advanced Nuclear, Pohang University of Science and Technology, Pohang, Gyeongbuk, South Korea*

2P-90 ENERGY DISSIPATION ON LONGITUDINAL-TRANSVERSE DIRECTIONS IN ELECTRON BEAM COMPACT SIMULATOR FOR ENERGY DRIVER RESEARCHES IN HEAVY ION INERTIAL FUSION

T. Kikuchi¹, Y. Sakai², K. Horioka², K. Takahashi¹, T. Sasaki¹, N. Harada¹

¹*Nagaoka University of Technology, Nagaoka, Niigata, Japan* ²*Tokyo Institute of Technology, Yokohama, Kanagawa, Japan*

2P-91 CHARACTERISTICS OF INTENSE PULSED HEAVY ION BEAM BY BIPOLAR PULSE ACCELERATOR

K. Okajima, H. Ohashi, H. Ito

University of Toyama, Toyama, Japan

2P-92 EXPERIMENTAL INVESTIGATION OF STRUCTURE, SPECTRAL AND ENERGY CHARACTERISTICS OF INTENSE MULTIPLE-VELOCITY ELECTRON BEAMS

Y. A. Kalinin, A. V. Starodubov

Department of Physics of nonlinear systems, Saratov State University, Saratov, Russian Federation

2P-93 WAKEFIELD EXCITATION IN DIELECTRIC WAVEGUIDES BY A SEQUENCE OF RELATIVISTIC ELECTRON BUNC HES

I. N. Onishchenko, V. A. Kiselev, G. V. Sotnikov

NSC/KIPT, Kharkov, Ukraine

2P-94 GENERATION, TRANSFORMATION AND TRANSPORT OF SUB-MICROSECOND LOW ENERGY HIGH POWER ION BEAMS

A. V. Petrov¹, P. S. Anan' in¹, A. A. Sinebrukhov¹, Y. P. Usov¹, I. F. Isakov², V. M. Matvienko², M. Anderson², P. Feng², V. M. Bystriskii³, J. Yampolsky³, J. K. Walters³

¹*Tomsk Polytechnic University, Tomsk, Russian Federation* ²*University of California, Irvine, CA, USA*

³*TriAlpha Energy Inc., Foothill Ranch, CA, USA*

**Session 4A: High Energy Density Matter**

Tuesday, May 27 15:30-17:30 Thurgood Marshall North

Session Chair: Alla Safronova, University of Nevada, Reno

15:30 4A-1 (invited) LABORATORY MODELING OF ROTATION IN ACCRETING ASTROPHYSICAL OBJECTS USING PULSED POWER PLASMA ACCELERATORS

A. S. Chuvatin¹, A. S. Safronova², V. L. Kantsyrev², A. A. Esaulov², I. Shrestha², V. V. Shlyaptseva², M. E. Weller², A. Stafford², V. A. Gasilov³, A. S. Boldarev³, O. G. Olkhovskaya³, G. A. Bagdasarov³, I. V. Gasilova³, E. Y. Dorofeeva³, F. Zucchini⁴, J. Grunenwald⁴, T. Maillard⁴

¹Laboratoire de Physique des Plasmas, Ecole Polytechnique, 91128 Palaiseau, France ²University of Nevada Reno, NV 89557, USA ³Keldysh Institute of Applied Mathematics, 125047 Moscow, Russia ⁴CEA, DAM, 46500 Gramat, France

16:00 4A-2 DIAGNOSTICS OF A CONVERGING STRONG SHOCK WAVE GENERATED BY UNDERWATER EXPLOSION OF SPHERICAL WIRE ARRAY

O. Antonov, S. Efimov, V. T. Gurovich, Y. E. Krasik
Physics, Technion- Israel Institute of Technology, Haifa, Israel

16:15 4A-3 THE DYNAMICS OF STRONGLY MAGNETIZED PLASMA JETS ON COBRA

P. A. Gourdain, L. Atoyan, T. Byvank, P. DeGrouchy, J. B. Greenly, D. A. Hammer, B. R. Kusse, W. Potter, S. A. Pikuz, P. C. Schrafel, C. E. Seyler, T. A. Shelkovenko
Laboratory of Plasma Studies, Cornell University, Ithaca, NY, United States

16:30 4A-4 EMISSION SPECTRA OF WARM DENSE MATTER PLASMAS

G. Miloshevsky, A. Hassanein
Purdue University, West Lafayette, United States

16:45 4A-5 X-RAY SPECTROSCOPY OF HIGH-Z ELEMENTS ON NIKE

Y. Aglitskiy¹, J. Weaver², M. Karasik², V. Serlin², S. Obenschain², Y. Ralchenko³

¹Leidos @ Naval Research Laboratory, Reston, VA, United States ²Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States ³National Institute of Standards and Technology, Gaithersburg, MD, United States

17:00 4A-6 ANALYSIS AND COMPARISON OF X-RAY IMAGE AND X-RAY BURST FEATURES OF HIGH INTENSITY LASER BEAM JETS INTERACTION EXPERIMENTS ON THE LEOPARD LASER AT UNR

K. A. Schultz, V. L. Kantsyrev, A. S. Safronova, J. J. Moschella, V. V. Shlyaptseva, M. E. Weller, E. E. Petkov, I. K. Shrestha, A. Stafford, M. C. Cooper
University of Nevada, Reno, NV, United States

17:15 4A-7 COMPUTATIONAL STUDY OF LASER-ACCELERATED PROTON BEAM TRANSPORT IN SOLID DENSITY MATTERS

J. Kim¹, B. Qiao¹, C. McGuffey¹, F. Beg¹, M. Wei², M. Foord³

¹University of California, San Diego, La Jolla, CA, United States ²General Atomics, San Diego, CA, United States ³Lawrence Livermore National Laboratory, Livermore, CA, United States

**Session 4B: FIR, Optical and X-ray Diagnostics**

Tuesday, May 27 15:30-17:30 Thurgood Marshall South

Session Chair: *Simon Bott-Suzuki, U. C. San Diego***15:30 4B-1 (invited) MEASUREMENTS OF ELECTRON DENSITY AND ELECTRIC FIELD IN PLASMA PRODUCED IN NANOSECOND DISCHARGE IN PRESSURIZED GASES**S. Yatom¹, E. Stambulchik², S. Tskhai³, Y. E. Krasik¹¹*Department of Physics, Technion- Israel Institute of Technology, Haifa, Israel*²*Faculty of Physics, Weizmann Institute of Science, Rehovot, Israel*³*Lebedev Physics Institute, Russian Academy of Sciences, Moscow, Russia***16:00 4B-2 ACTIVE SPECTROSCOPIC METHODS MONITORING OF ACTIVE SPECIES IN ATMOSPHERIC RADIO FREQUENCY PLASMA**

L. Li

*Department of Applied Physics, Research Unit Plasma Technology, Ghent University, gent, Belgium***16:15 4B-3 CHARACTERIZATION OF DYNAMIC AND STRUCTURED PLASMA USING LASER-COLLISION INDUCED FLUORESCENCE**E. V. Barnat¹, B. R. Weatherford¹, V. I. Kolobov², A. A. Hubble³, J. E. Foster³¹*Sandia National Laboratories, Albuquerque, New Mexico, United States*²*CFD Research Corporation, Huntsville, Alabama, United States*³*University of Michigan, Ann Arbor, Michigan, United States***16:30 4B-4 CHARACTERIZING THE PHOTON SPECTRUM GENERATED IN THE DARHT AXIS-I DIODE**J. E. Coleman, D. C. Moir, C. A. Ekdahl, J. B. Johnson, B. T. McCuistain, M. T. Crawford*Los Alamos National Laboratory, Los Alamos, NM, United States***16:45 4B-5 HARD X-RAY SPECTRAL ENERGY DISTRIBUTIONS FROM PULSED POWER GENERATORS MEASURED BY TRANSMISSION CRYSTAL SPECTROMETERS**J. F. Seely¹, U. Feldman¹, B. Weber², J. Schumer²¹*Artep Inc., Ellicott City, MD, United States* ²*Naval Research Laboratory, Washington, DC, United States***17:00 4B-6 TALBOT-LAU MOIRE X-RAY DIAGNOSTIC FOR HIGH ENERGY DENSITY PLASMAS**M. P. Valdivia, D. Stutman, M. Finkenthal*Physics and Astronomy, The Johns Hopkins University, Baltimore, MD, United States***17:15 4B-7 STUDY OF 1 MA WIRE ARRAY Z PINCHES USING X-RAY RADIOGRAPHY AND UV LASER DIAGNOSTICS**A. A. Anderson, V. V. Ivanov, A. L. Astanovitskiy, P. Wiewior, O. Chalyy*Department of Physics, University of Nevada Reno, Reno, NV, United States***Session 4C: Dusty & Strongly-Coupled Plasmas**

Tuesday, May 27 15:30-17:30 Thurgood Marshall East

Session Chair: *Michael Murillo, Los Alamos National Laboratory***15:30 4C-1 MOBILITY IN A STRONGLY COUPLED DUSTY PLASMA**J. Goree, B. Liu*Physics and Astronomy, University of Iowa, Iowa City, Iowa, United States***15:45 4C-2 EFFECTIVE QUANTUM POTENTIALS FOR MOLECULAR DYNAMICS SIMULATION OF NON-IDEAL PLASMAS**G. Dharuman¹, J. Verboncoeur¹, A. Christlieb², M. S. Murillo³¹*Department of Electrical and Computer Engineering, Michigan State University, East Lansing, MI, United States*²*Department of Mathematics, Michigan State University, East Lansing, MI, United*³*Computational Physics and Methods Group, Los Alamos National Laboratory, Los Alamos, NM, United States*

**16:00 4C-3 MOLECULAR DYNAMICS INVESTIGATIONS OF THE ABLATOR/FUEL INTERFACE DURING EARLY STAGES OF INERTIAL CONFINEMENT FUSION**

L. G. Stanton¹, M. S. Murillo², J. N. Glosli¹

¹Lawrence Livermore National Laboratory, Livermore, CA, United States ²Los Alamos National Laboratory, Los Alamos, NM, United States

16:15 4C-4 EXPERIMENTAL MEASUREMENT OF VELOCITY CORRELATIONS FOR TWO MICROPARTICLES WITH ION WAKES

A. K. Mukhopadhyay, J. Goree

Physics & Astronomy, University of Iowa, Iowa City, IA, United States

16:30 4C-5 MICROPARTICLE INJECTION EFFECTS ON MICROWAVE TRANSMISSION THROUGH AN OVERLY DENSE PLASMA LAYER

E. D. Gillman, B. Amatucci

U.S. Naval Research Laboratory, Washington, DC, United States

16:45 4C-6 TIME DEPENDENT NONPLANAR DIA SHOCK WAVES IN MULTI-COMPONENT DUSTY PLASMAS WITH DISTINCT TEMPERATURE SUPERTHERMAL ELECTRONS

M. M. Masud

Department of Physics, Bangladesh University of Engineering & Technology (BUET), Dhaka, Bangladesh

17:00 4C-7 MATCHING BETWEEN AIRFLOW AND ELECTRIC FIELD DISTRIBUTION IN ELECTROSTATIC PRECIPITATORS

Z. Kexin, Z. Chaohai, T. Jingfeng

School of Electrical Engineering and Automation, Harbin Institute of Technology, Heilongjiang, China

Session 4D: Laser Produced Plasmas and Fusion Concepts (combined)

Tuesday, May 27 15:30-17:30 Thurgood Marshall West

Session Chair: Zulfikar Najmudin, Imperial College London

15:30 4D-1 MODELING OF NON-LTE ATOMIC PHYSICS PROCESSES DURING THE INTERACTION OF THIN FOILS WITH SHORT PULSE LASER

G. M. Petrov, J. Davis

Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States

15:45 4D-2 TIME-RESOLVED SPECTROSCOPY AND MODELING OF UNDERWATER LASER IONIZATION AND FILAMENTATION FOR ELECTRICAL DISCHARGE GUIDING

T. G. Jones, M. H. Helle, D. Kaganovich, J. Penano, T. Ting

Plasma Physics Div., U.S. Naval Research Laboratory, Washington, DC, United States

16:00 4D-3 PLASMA KINETICS IN ULTRASHORT PULSE LASER FILAMENT: TIME RESOLVED SPECTRAL MEASUREMENT

A. Schmitt-Sodyn¹, A. Lucero², W. White¹, D. Shiffner¹

¹Air Force Research Laboratory, Kirtland AFB, NM, United States ²Boeing, Kirtland AFB, NM, United States

16:15 4D-4 BETATRON X-RAY SPECTRA RECORDED BY A TRANSMISSION CRYSTAL SPECTROMETER IN THE 10 KEV TO 70 KEV PHOTON ENERGY RANGE

J. F. Seely¹, U. Feldman¹, L. Hudson², J. Glover², A. Henins², D. Neely³, D. Rusby³, Z. Najmudin⁴, N. Lopes⁴, J. Woods⁴

¹Artep Inc., Ellicott City, United States ²National Institute of Standards and Technology, Gaithersburg, United States ³Rutherford Appleton Laboratory, Chilton, UK ⁴Imperial College London, London, UK

**16:30 4D-5 COMPREHENSIVE 3D SIMULATION OF LASER/TARGET INTERACTIONS FOR VARIOUS APPLICATIONS**

T. Sizyuk, A. Hassanein

NE, Purdue University, West Lafayette, IN, United States

16:45 4D-6 USING THE STRONG MAGNETIC FIELD TO PROMOTE THE IGNITION PROCESS IN MAGNETO-INERTIAL FUSION

X.-J. Yang, S.-C. Wang

1 Department, Institute of Applied Physics & Computational Mathematics, Beijing, China

17:00 4D-7 SIMULATION OF SADDLE COIL AND HELICAL WINDING MAGNETIC FIELD PERTURBATION IN THE IR-T1 TOKAMAK

Y. Adlalab, P. Khorshid, E. Abizi Moghaddam

Department of Physics, Mashhad Branch, Islamic Azad University, Mashhad, Iran

17:15 4D-8 VLASOV-FOKKER-PLANCK MODELING OF PLASMA NEAR HOHLRAUM WALLS HEATED WITH NANOSECOND LASER PULSES CALCULATED USING THE RAY TRACING EQUATIONS

A. S. Joglekar, A. G. R. Thomas

Dept. of Nuclear Eng. & Rad. Sciences, University of Michigan, Ann Arbor, MI, United States

Session 4E: Generators and Networks, Compact and Rep-Rated Pulsed Power

Tuesday, May 27 15:30-17:30 Hoover

Session Chair: Juergen Kolb, INP Greifswald

15:30 4E-1 (invited) DEVELOPMENT OF AN AIR INSULATED LTD PULSER FOR RADIOGRAPHY APPLICATION

F. Bayol¹, C. Gaston¹, P. Mouly¹, V. Zacharewicz¹, K. Van de Wiel¹, M. Sinclair², S. Briscall², S. Hill², A. Jones², L. Rickard², M. Weeks²

¹ITHPP, Thegra, France²AWE, Reading, United Kingdom

16:00 4E-2 INDUCTIVE STORAGE MACHINES: THEORETICAL PREDICTIONS AND EXPERIMENTAL REALITY

B. M. Novac¹, A. Neuber², J. H. Goforth³

¹School of Electronics, Electrical and Systems Engineering, Loughborough University, Loughborough, United Kingdom²Department of Electrical & Computer Engineering, Texas Tech University, Lubbock, TX, USA³Los Alamos National Laboratory, Los Alamos, NM, USA

16:15 4E-3 CHARACTERIZATION AND ANALYSIS OF A PULSE FORMING NETWORK BASED 11 STAGE MARX SYSTEM FOR A HIGH POWER MICROWAVE, PLASMA AND BEAM PHYSICS TEST STAND

A. Kuskov, S. Horne, E. Schamiloglu, J. Lehr, S. Portillo

University of New Mexico, Albuquerque, NM, United States

16:30 4E-4 SOLID-STATE LTD AND ITS APPLICATION TO GAS DISCHARGE

W. Jiang, T. Sugai, H. Sugiyama, A. Tokuchi

Extreme Energy-Density Research Institute, Nagaoka University of Technology, Nagaoka, Japan

16:45 4E-5 DESIGN FEATURES AND OPERATION EXPERIENCE OF A HIGH REPETITION RATE PULSED ELECTRON ACCELERATOR

I. Egorov, A. Poloskov, V. Esipov

Institute of high technology physics, Tomsk polytechnic university, Tomsk, Russian Federation

**17:00 4E-6 COMPACT HIGH-VOLTAGE, LOW-IMPEDANCE NANOSECOND PULSE GENERATORS FOR BIOMEDICAL APPLICATIONS**Y. Liang¹, K. Zocher², F. Koch², J. Zhuang², J. Zhang¹, J. Fang¹, J. Kolb²¹Bio-Med-X Center, Peking University, Beijing, China²Leibniz Institute for Plasma Science and Technology, Greifswald, Germany**17:15 4E-7 NANOSECOND PULSED ELECTRIC FIELDS INDUCE INTRACELLULAR OXIDATION**S. Wu¹, B. Su², J. Zhang², J. Fang²¹College of Engineering, Peking University, Beijing, China²Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, China**Session 4F: Robert Barker Memorial Session**

Tuesday, May 27 15:30-17:30 Coolidge

Session Chairs: John W Luginsland, Air Force Office of Scientific Research, Brendan B. Godfrey, University of Maryland

15:30 4F-1 (invited) ROBERT BARKER MEMORIAL SESSION

J. Luginsland, B. Godfrey

AFOSR/RTB, Air Force Office of Scientific Research, Arlington, VA, United States

16:00 4F-2 (invited) PLASMA MEDICINE: THE ADVENT OF THE PLASMA KILL - PLASMA HEAL PARADIGM

M. Laroussi

ECE Department, Old Dominion University, Norfolk, United States

16:20 4F-3 (invited) ATMOSPHERIC-PRESSURE PLASMA AND PLASMA RAMPARTSK. Becker¹, E. Kunhardt²¹Applied Physics and Mechanical and Aerospace Engineering, NYU Polytechnic School of Engineering, Brooklyn, NY, United States ²Applied Physics, NYU Polytechnic School of Engineering, Brooklyn, NY, United States**16:50 4F-4 (invited) HIGH POWER MICROWAVE SCIENCE**

E. Schamigloiu

Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM, United States

17:20 4F-5 (invited) SELECTED PULSED POWER EFFORTS IN US ACADEMIA OVER THE PAST TWO DECADES

A. A. Neuber, J. C. Dickens, J. J. Mankowski, L. Hatfield, H. Krompholz, M. Kristiansen

Center for Pulsed Power & Power Electronics, Texas Tech University, Lubbock, TX, United States

17:40 4F-6 (invited) A SHORT RETROSPECTIVE ON THE IMPACT OF DR ROBERT BARKER ON PLASMA SCIENCE THE MAGIC USERS GROUP AND PLASMA SIMULATION

L. D. Ludeking, A. J. Woods

Alliant Techsystems, LLC, Newington, VA, United States



Wednesday, May 28

Session PL5: Plenary 5: PSAC Award

Wednesday, May 28 08:00-09:00 Thurgood Marshall East-South

Session Chair: *Bryan V. Oliver, Sandia National Laboratories*

8:00 PL5-1 (invited) DENSITY FUNCTIONAL METHODS FOR HIGH ENERGY DENSITY PLASMAS AND WARM DENSE MATTER

M. P. Desjarlais

Sandia National Laboratories, Albuquerque, NM, United States

Session 5A: Partially Ionized Plasmas

Wednesday, May 28 9:30 - 12:00 Thurgood Marshall North

Session Chair: *Nathaniel Lockwood*

9:30 5A-1 A PARTICLE-IN-CELL/MONTE CARLO SIMULATION OF A CAPACITIVELY COUPLED CHLORINE DISCHARGE

S. Huang¹, J. T. Gudmundsson^{1,2}

¹*University of Michigan - Shanghai Jiao Tong University Joint Institute, Shanghai Jiao Tong University, Shanghai, China*²*Science Institute, University of Iceland, Reykjavik, Iceland*

9:45 5A-2 ELECTRON HEATING AND CONTROL OF ION PROPERTIES IN CAPACITIVE DISCHARGES DRIVEN BY CUSTOMIZED VOLTAGE WAVEFORMS

J. Schulze¹, E. Schuengel¹, A. Derzsi², I. Korolov², Z. Donko²

¹*Physics, West Virginia University, Morgantown, WV, United States*²*Solid State Physics and Optics, Hungarian Academy of Sciences, Budapest, Hungary*

10:00 5A-3 (invited) Nonlocal Kinetic Theory Of Plasma Discharges

I. D. Kaganovich¹, A. V. Khrabrov¹, Y. Raitses¹, D. Sydorenko², V. I. Demidov³, I. Schweigert⁴, A. S. Mustafaev⁵

¹*PPPL, Princeton, NJ, United States*²*University of Alberta, Edmonton, Alberta, Canada*³*West Virginia University, Morgantown, WV, United States*⁴*Institute of Theoretical and Applied Mechanics, Novosibirsk, Russia*⁵*National Mineral Resources University, Saint-Petersburg, Russia*

10:30 5A-4 GLOBAL MODELING OF HIPIMS SYSTEMS: TRANSITION FROM HOMOGENEOUS TO SELF ORGANIZED DISCHARGES

S. Gallian¹, J. Trieschmann¹, T. Mussenbrock¹, W. N. G. Hitchon², R. P. Brinkmann¹

¹*Theoretical Electrical Engineering, Ruhr University Bochum, Bochum, Germany*²*Electrical and Computer Engineering, University of Wisconsin-Madison, Madison, USA*

10:45 5A-5 2D PIC-DSMC SIMULATION OF MICROSCALE BREAKDOWN AFTER VACUUM SEAL FAILURE

C. H. Moore, M. M. Hopkins, J. J. Boerner, S. G. Moore, P. S. Crozier, L. C. Musson

Sandia National Labs, Albuquerque, NM, United States

11:00 5A-6 NOBLE GAS META-STABLE STATE EXCITATION USING CARBON NANO-TUBE FIBER CATHODES

N. P. Lockwood¹, G. A. Pitz¹, S. B. Fairchild¹, M. A. Lange²

¹*Air Force Research Laboratory, Kirtland AFB, NM, United States*²*TechFlow Scientific, Albuquerque, NM, United States*

11:15 5A-7 CONTROL OF PLASMA UNIFORMITY WITH DUAL PHASE VERY HIGH FREQUENCY CAPACITIVELY COUPLED PLASMAS

J. S. Kim, H. -J. Lee, H. J. Lee

Department of Electrical Engineering, Pusan National University, Busan, South Korea



11:30 5A-8 COMPARISON OF ION VELOCITY SPECTRA OF PLASMA BUNCHES EJECTING FROM THE CHANNELS OF NANOSECOND BREAKDOWN AND VACUUM SURFACE FLASHOVER IN KCL SINGLE CRYSTALS

I. F. Punanov¹, R. V. Emlin¹, P. A. Morozov¹, S. O. Cholakh²

¹Dielectrics Physics Group, Institute of Electrophysics of the Ural Division of the Russian Academy of Sciences, Yekaterinburg, Russian Federation, ²Institute of Physics and Technology, Ural Federal University, Yekaterinburg, Russian Federation

11:45 5A-9 CONTINUUM RADIATION AS AN ELECTRON DENSITY DIAGNOSTIC IN MICROWAVE-GENERATED MICROPLASMAS

A. R. Hoskinson

Electrical & Computer Engineering, Tufts University, Medford, MA, United States

Session 5B: Radiation Physics, X-ray lasers

Wednesday, May 28 9:30 - 12:00 Thurgood Marshall South

Session Chair: Arati Dasgupta, Naval Research Laboratory

9:30 5B-1 (invited) THE EFFECT OF ADDING A CENTER JET TO ARGON GAS PUFF IMPLOSIONS AT THE Z FACILITY

A. J. Harvey-Thompson¹, B. Jones¹, C. A. Jennings¹, D. J. Ampleford¹, D. C. Lamppa¹, S. B. Hansen¹, C. A. Coverdale¹, M. R. Gomez², G. A. Rochau¹, D. W. Johnson¹, M. C. Jones¹, N. W. Moore¹, T. Flanagan¹, J. Reneker¹, M. R. Jober¹, L. Lucero¹, M. E. Cuneo¹, J. W. Thornhill², J. L. Giuliani², A. Dasgupta²

¹Sandia National Laboratories, Albuquerque, NM, United States²Naval Research Laboratory, Washington, DC, United States

10:00 5B-2 X-RAY GENERATION FROM GAS-PUFF JETS IRRADIATED BY UNR LEOPARD LASER

V. L. Kantsyrev, A. S. Safronova, I. Shrestha, J. J. Moschella, V. V. Shlyaptseva, K. A. Schultz, W. Cline, P. Wiewior, M. E. Weller, E. E. Petkov, A. Stafford, M. C. Cooper, O. Chalyy, V. Nalajala

Department of Physics, University of Nevada, Reno, Reno, NV, United States

10:15 5B-3 SCALING AND ENHANCEMENT OF NON-THERMAL LINE EMISSION ON Z TO $h\nu \sim 22$ KEV*

D. J. Ampleford¹, S. B. Hansen¹, C. A. Jennings¹, B. Jones¹, T. C. Webb¹, V. Harper-Slaboszewicz¹, M. E. Cuneo¹, G. A. Rochau¹, C. A. Coverdale¹, A. J. Harvey-Thompson¹, D. B. Sinars¹, J. K. Moore¹, T. M. Flanagan¹, N. Quart², A. Dasgupta², J. Giuliani², A. L. Velikovich², J. P. Apruzese², J. P. Chittenden³, N. Niasse³, B. Appelbe³

¹Sandia National Laboratories, Albuquerque, NM, United States²Naval Research Laboratory, Washington, DC, United States³Imperial College London, London, United Kingdom

10:30 5B-4 CHARACTERISTICS OF THE ELECTRON BEAM DRIVEN K-SHELL EMISSION FROM BRASS WIRE ARRAY IMPLOSIONS ON THE ZEBRA GENERATOR

N. Quart¹, J. Giuliani¹, A. Dasgupta¹, G. Petrov¹, A. Safronova², V. Kantsyrev², A. Esaulov², I. Shrestha², M. Weller², V. Shlyaptseva², K. Schultz², A. Stafford², M. Cooper², D. Ampleford³, S. Hansen³, J. Apruzese⁴, R. Clark⁵

¹Naval Research Laboratory, Washington DC, United States²University of Nevada, Reno, Reno, NV, United States³Sandia National Laboratories, Albuquerque, NM, United States⁴Engility Corp., Chantilly, VA, United States⁵Berkeley Research Associates, Beltsville, MD, United States

10:45 5B-5 ALUMINUM K-ALPHA EMISSION FROM AN INTENSE UHF LASER-GENERATED PLASMA

T. B. Petrova¹, J. Davis¹, G. M. Petrov¹, N. Quart¹, J. L. Giuliani¹, A. L. Velikovich¹, K. G. Whitney², A. Mak-simchuk³, A. G. R. Thomas³, K. Krushelnik³

¹Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States²Berkeley Research Scholars, Beltsville, MD, United States³Center for Ultrafast Optical Science, University of Michigan, Ann Arbor, MI, United States

**11:00 5B-6 RADIATIVE PRECURSORS DRIVEN BY CONVERGING BLAST WAVES IN NOBLE GASES**

G. C. Burdiak¹, S. V. Lebedev¹, S. Bland¹, F. Suzuki-Vidal¹, G. F. Swadling¹, L. Suttle¹, M. Bennet¹, R. J. R. Williams², K. Blesener³

¹*Plasma Physics Group, Imperial College London, London, United Kingdom*²*Atomic Weapons Establishment, Aldermaston, United Kingdom*³*Laboratory of Plasma Studies, Cornell University, New York, USA*

11:15 5B-7 ANALYSIS OF K-SHELL HED PLASMAS IN X-PINCH AND LASER EXPERIMENTS AT UNR

A. Stafford¹, A. S. Safranova¹, V. L. Kantyrev¹, M. E. Weller¹, V. V. Shlyaptseva¹, P. Wiewior¹, I. Shrestha¹, G. C. Osborne¹, S. F. Keim¹, A. S. Chuvatin²

¹*University of Nevada, Reno, Reno, NV, United States*²*Laboratoire de Physique des Plasmas, Ecole Polytechnique, Palaiseau, France*

11:30 5B-8 GENERATION AND CONTROL OF STRONG HALF CYCLE THZ RADIAITON WITH ULTRASHORT LASER

W. J. Ding, W. S. Koh

A*STAR, Institute of High Performance Computing, Singapore, Singapore

Session 5C: High Pressure and Thermal Plasma Processing

Wednesday, May 28 9:30 - 12:00 Thurgood Marshall East

Session Chair: Tim Grotjohn, Michigan State University

9:30 5C-1 SIMPLE MODEL FOR ATMOSPHERIC MICROPLASMA SHEATH

K. G. Xu¹, L. T. Williams²

¹*Mechanical & Aerospace Engineering, University of Alabama in Huntsville, Huntsville, AL, United States*, ²*Self, Alexandria, VA, United States*

9:45 5C-2 DYNAMICS OF REPETITIVE PLASMA BULLETS IN He PLASMA JETS INTO AIR

N. Y. Babaeva¹, S. Norberg², M. J. Kushner¹

¹*Electrical Engineering and Computer Science Department, University of Michigan, Ann Arbor, MI, United States*, ²*Mechanical Engineering Department, University of Michigan, Ann Arbor, MI, United States*

10:00 5C-3 EXPERIMENTAL METHODS ENABLING THE EFFICIENT CONTROL OF HIGH PRESSURE MICROWAVE DISCHARGES

J. Asmussen¹, S. Nad^{1,2}

¹*Electrical and Computer Engineering, Michigan State University, East Lansing Michigan, United States*, ²*Physics and Astronomy, Michigan State University, East Lansing Michigan, United States*

10:15 5C-4 CONTROL OF SPECTRUM FOR IMPROVEMENT OF COLOR RENDERING AFFECTED BY METAL VAPOR MIXED WITH WALL-STABILIZED ARGON ARC

T. Iwao, E. Mitsuyasu, S. Yamamoto, M. Yumoto

Tokyo City University, Tokyo, Japan

10:30 5C-5 REATTACHMENT MODEL OF THE ANODE SPOT OF A NON-TRANSFERRED DC ARC

V. Nemchinsky

Keiser University, Fort Lauderdale, FL, United States

10:45 5C-6 PENETRATION DEPTH IN WELDING POOL AFFECTED BY CURRENT INCREMENT RATIO IN PULSED ARC

S. Yamamoto, T. Momii, T. Iwao, M. Yumoto

Tokyo City University, Tokyo, Japan

11:00 5C-7 MODES OF OSCILLATION IN DC DRIVEN HIGH PRESSURE MICROPLASMA DISCHARGE

R. Mahamud, T. Farouk

Mechanical Engineering, University of South Carolina, Columbia, SC, United States

**Session 5D: Plasma Thrusters II**

Wednesday, May 28 9:30 - 12:00 Thurgood Marshall West

Session Chairs: *John E Foster, University of Michigan, Konstantin Matyash, Greifswald University***9:30 5D-1 (invited) OVERVIEW OF VARIOUS MECHANISMS LEADING TO OSCILLATIONS AND INSTABILITIES IN HALL PLASMAS: APPLICATIONS TO HALL THRUSTERS**

A. Smolyakov

*University of Saskatchewan, Saskatoon, Saskatoon, Canada***10:00 5D-2 (invited) MODE TRANSITION CHARACTERISTICS AND OSCILLATION FREQUENCIES IN HALL EFFECT THRUSTERS**

M. J. Sekerak, B. W. Longmier, A. D. Gallimore

*Aerospace Engineering, University of Michigan, Ann Arbor, MI, United States***10:30 5D-3 DISCHARGE OSCILLATION MODE TRANSITION OF A HALL THRUSTER**

K. Hara, I. D. Boyd, M. J. Sekerak, A. D. Gallimore

*Department of Aerospace Engineering, University of Michigan, Ann Arbor, United States***10:45 5D-4 DRIVING LOW FREQUENCY AZIMUTHAL OSCILLATIONS IN A HALL THRUSTER**

S. Keller, Y. Raitses, A. Diallo, Y. Shi

*Princeton Plasma Physics Laboratory, Princeton, NJ, United States***11:00 5D-5 3D PIC simulation of the rotating spoke in a Hall thruster**

K. Matyash, R. Schneider, O. Kalentev

*Greifswald University, Greifswald, 17487, Germany***11:15 5D-6 TIME-RESOLVED LASER-INDUCED FLUORESCENCE MEASUREMENTS IN THE PLUME OF A 6 KW HALL THRUSTER WITH UNPERTURBED OSCILLATIONS**

C. J. Durot, A. D. Gallimore

*University of Michigan, Ann Arbor, United States***11:30 5D-7 THEORETICAL MODEL OF SUPPRESSION OF ELECTRON INSTABILITY IN HALL THRUSTERS BY BOUNDARY FEEDBACK SYSTEM**A. Kapulkin¹, E. Behar²¹*Asher Space Research Institute of Technion-Israel Institute of Technology, Haifa, Israel*²*Asher Space Research Institute of Technion-Israel Institute of Technology, Haifa, Israel***11:45 5D-8 PARTICLE-IN-CELL MODELING OF THE HEATERLESS HOLLOW CATHODE OPERATION: KEEPER REGION**V. Vekselman¹, D. Levko², I. Haber³, Y. E. Krasik⁴¹*Department of Material Science & Eng., Clemson University, Clemson, SC, United States*²*Laboratoire Plasma et Conversion d'Energie, Universit' Paul Sabatier, Toulouse, France*³*College Park, University of Maryland, Maryland, United States*⁴*Department of Physics, Technion, Haifa, Israel***12:00 5D-9 UNDERSTANDING THE DISCHARGE CURRENT DISTRIBUTION AND UPPER OPERATIONAL LIMIT OF A HIGH POWER, GRIDDED ION THRUSTER**J. E. Foster¹, E. Viges², C. Davis², N. Arthur¹¹*Nuclear Engineering, University of Michigan, Ann Arbor, MI, United States*²*Electrodynamics Applications Inc., Ann Arbor, MI, United States***Session 5E: Intense Electron and Ion Beams I**

Wednesday, May 28 9:30 - 12:00 Hoover

Session Chair: *Aled Jones, Atomic Weapons Establishment*

**9:30 5E-1 POWER POSITRON BEAMS AS A NEW BRANCH OF BEAMING**

V. V. Gorev

*Kurchatov Institute, Moscow, Russian Federation***9:45 5E-2 BREAKDOWN CHARACTERISTICS OF PSEUDOSPARK UNDER NANOSECOND PULSED VOLTAGES**

Z. Jia

*Xi'an Jiaotong University, Xi'an, Shaanxi, China***10:00 5E-3 (invited) INVESTIGATION OF THE ANGULAR SCATTERING MODEL ON THE ELECTRON RUNAWAY CONDITION**S. B. Swanekamp¹, A. S. Richardson¹, J. Angus¹, K. L. Cartwright², T. D. Pointon², B. V. Oliver², D. Mosher³¹*Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States*²*Sandia National Laboratories, Albuquerque, NM, United States*³*Engility Corp, Chantilly, VA, United States***10:30 5E-4 DESIGN OF ELECTRON GUN AND NOVEL PPM FOCUSING SYSTEM FOR W-BAND SHEET BEAM TWT**P. C. Panda^{1,2}, V. Srivastava¹, A. Vohra²¹*Microwave Tubes Division, CSIR-Central Electronics Engineering Research Institute, Pilani, Rajasthan, Pilani, Rajasthan, India*²*Department of Electronic Science, Kurukshetra University, Kurukshetra, Haryana, India***10:45 5E-5 POWER OF MICROWAVE RADIATION OF THE RELATIVISTIC ELECTRON BEAM WITH VIRTUAL CATHODE IN THE EXTERNAL MAGNETIC FIELD**S. A. Kurkin¹, A. E. Hramov², A. A. Koronovskii¹¹*Faculty of Nonlinear Processes, Saratov State University, Saratov, Russian Federation*²*Saratov State Technical University, Saratov, Russian Federation***11:00 5E-6 EQUILIBRIUM OF HIGH-CURRENT ELECTRON BEAM IN HYBRID COAXIAL MAGNETOSTATIC UNDULATOR**T. Yatsenko¹, K. Illyenko²¹*Department of Vacuum Electronics, Institute for Radiophysics and Electronics, NAS of Ukraine, Kharkiv, Ukraine*²*Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM, United States***11:15 5E-7 MIXING IN PHASE--SPACE DUE TO THE TWO-STREAM INSTABILITY OF ION AND ELECTRON BEAMS PROPAGATING IN BACKGROUND PLASMA**I. D. Kaganovich¹, D. Sydorenko², E. Tokluoglu¹, E. A. Startsev¹¹*Princeton Plasma Physics Laboratory, Princeton, NJ, United States*²*University of Alberta, Edmonton, Alberta, Canada***11:30 5E-8 EMITTANCE GROWTH IN LINEAR INDUCTION ACCELERATORS**

C. Ekdahl, M. Schulze

*Los Alamos National laboratory, Los Alamos, NM, United States***11:45 5E-9 ADVANCED GAS CHEMISTRY MODEL FOR GASSES DISTURBED BY AN INTENSE ELECTRON BEAM**J. R. Angus¹, S. A. Richardson¹, J. W. Schumer¹, S. B. Swanekamp¹, D. Mosher², P. F. Ottinger²¹*Plasma Physics, Naval Research Laboratory, Washington, DC, United States*²*Engility Corporation, Chantilly, VA, United States***Session 5F: Codes & Modeling I**

Wednesday, May 28 9:30 - 12:00

Coolidge

Session Chair: John J Petillo, Leidos

**9:30 5F-1 NONUNFIROM SPACE CHARGE LIMITED CURRENT FROM A PROTRUSIVE CATHODE**

Y.-B. Zhu, L. K. R. Ang

Engineering Product Development, Singapore University of Technology and Design, Singapore, Singapore

9:45 5F-2 MODELING HIGH AVERAGE CURRENT AND HIGH BUNCH CHARGE BEAMS IN MICHELLE-EBEAM

S. Ovtchinnikov¹, J. Petillo¹, B. Koltenbah²

¹*Leidos Corporation, Billerica, MA, United States*²*The Boeing Company, Seattle, WA, United States*

10:00 5F-3 NONLINEAR HEAT TRANSFER IN BEAM OPTICS ANALYZER

T. Bui, R. L. Ives, M. Read, D. Marsden, P. Ferguson

Calabazas Creek Research, Inc., Mountain View, CA, United States

10:15 5F-4 MODELING FIELD EMISSION ARRAY TIPS USING THE MICHELLE GUN CODE ALGORITHM

J. J. Petillo¹, D. N. Panagos¹, K. L. Jensen²

¹*Center for Electromagnetics, Leidos Corp, Billerica, MA, United States*²*Electromagnetics Technology Branch, Naval Research Laboratory, Washington, DC, United States*

10:30 5F-5 BACKSCATTERED ELECTRONS FROM X-RAY TARGET

T. Bui¹, R. L. Ives¹, D. Hart²

¹*Calabazas Creek Research, Inc., Mountain View, United States*²*King's College, London, England*

10:45 5F-6 ON THE IMPORTANCE OF N4+ IONS IN THE CHEMISTRY OF A HE-N MICROJET DISCHARGE.

D. Eremin, T. Hemke, R. P. Brinkmann, T. Mussenbrock

Ruhr-University Bochum, Bochum, Germany

11:00 5F-7 OBSERVATION OF ELECTROMAGNETIC EFFECT IN LARGE-AREA CAPACITIVELY COUPLED DISCHARGES

H. Bae, H. -J. Lee, H. J. Lee

Department of Electrical Engineering, Pusan National University, Busan, South Korea

11:15 5F-8 NUMERICAL STUDY OF THE MODE PROPAGATION IN A MICROWAVE DRIVEN PLASMA DISCHARGE

D. Szeremley, T. Mussenbrock, R. P. Brinkmann, D. Eremin

Ruhr Universitt Bochum Lehrstuhl Theoretische Elektrotechnik, Bochum, Germany

11:30 5F-9 ELECTRO MAGNETIC WAVE PROPAGATION IN THE PLASMA LAYER OF A REENTRY VEHICLE

M. Kundrapu¹, J. Loverich¹, K. Beckwith¹, P. Stoltz¹, A. Shashurin², M. Keidar²

¹*Tech-X Corporation, Boulder, CO, USA*²*Department of Mechanical and Aerospace Engineering, The George Washington University, Washington, DC, USA*

11:45 5F-10 METHOD OF THE CALCULATION OF SPECTRUM OF LYAPUNOV EXPONENTS FOR THE ANALYSIS OF DYNAMICS OF BEAM-PLASMA SYSTEMS

S. A. Kurkin¹, N. S. Frolov¹, V. A. Maximenko¹, A. E. Hramov², A. A. Koronovskii¹

¹*Faculty of Nonlinear Processes, Saratov State University, Saratov, Russian Federation* ²*Saratov State Technical University, Saratov, Russian Federation*

Session PL6: Plenary 6

Wednesday, May 28 13:00-14:00 Thurgood Marshall East-South

Session Chair: Bruce V Weber, Naval Research Laboratory

**13:00 PL6-1 (invited) APPLICATION OF TW-LEVEL PULSED POWER TO THE PROBLEM OF FINDING FISSILE MATERIAL**

R. J. Commissio

*Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States***Session 3P: 2.1 Intense Beam Microwave Generation Posters****Poster Session**

Wednesday, May 28 14:00-15:30 Exhibit C (lower level)

Session Chair: *Wilkin Tang, Air Force Research Laboratory***3P-1 INVESTIGATION AND OPTIMIZATION OF THE DOUBLE-GAP VIRCATOR IN CST PARTICLE STUDIO**S. A. Kurkin¹, A. E. Hramov², A. A. Koronovskii¹, A. O. Rak³¹*Faculty of Nonlinear Processes, Saratov State University, Saratov, Russian Federation* ²*Saratov State Technical University, Saratov, Russian Federation* ³*Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus***3P-2 RADIATION OF A WAKEFIELD EXCITED BY AN ELECTRON BUNCH TRAIN IN A SECTION OF A DIELECTRIC WAVEGUIDE**G. V. Sotnikov, K. V. Galaydych, R. R. Kniaziev, P. I. Markov, I. N. Onishchenko
*NSC Kharkov Institute of Physics and Technology, Kharkov, Ukraine***3P-3 HOMOGENIZATION OF AN ELECTRON BEAM BY SCATTERING IN AN ALUMINUM FOIL**K. Pepitone, J. Gardelle, P. Modin
*CEA/CESTA, Le Barp, France***3P-4 BRILLOUIN FLOW IN RECIRCULATING PLANAR MAGNETRON**D. H. Simon, Y. Y. Lau, M. Franz, G. Greening, R. M. Gilgenbach
*Nuclear Engineering and Radiological Sciences, University of Michigan, Ann Arbor, MI, United States***Session 3P: 2.2 Fast Wave Devices Posters****Poster Session**

Wednesday, May 28 14:00-15:30 Exhibit C (lower level)

Session Chair: *Jeffrey P Calame, Naval Research Laboratory***3P-5 A COMPUTATIONAL EFFICIENT SIMULATION TOOL FOR GYROTRONS**X. Li¹, Y. Alfadhl¹, X. Chen¹, S. Yu², Q. Zhao², Y. Zhang²¹*School of Electronic Engineering and Computer Science, Queen Mary University of London, London, United Kingdom* ²*School of Physical Electronics, University of Electronic Science and Technology of China, Chengdu, China***3P-6 STUDIES ON BOUNDARY CONDITIONS FOR GYROTRON INTERACTION MODELING**K. A. Avramidis¹, T. -M. Tran², S. Brunner², C. Wu¹, S. Alberti², J. Jelonnek¹¹*IHM, Karlsruhe Institute of Technology, Karlsruhe, Germany* ²*CRPP, Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland***Session 3P: 2.3 Slow-Wave Devices Posters****Poster Session**

Wednesday, May 28 14:00-15:30 Exhibit C (lower level)

Session Chair: *John Pasour, Naval Research Laboratory*

**3P-7 GIGAWATT-CLASS RADIATION OF TM01 MODE FROM A KU-BAND OVERMODED CERENKOV-TYPE HIGH POWER MICROWAVE GENERATOR**

H. Zhang, T. Shu, J. Ju

College of Optoelectronic Science and Engineering, National University of Defense Technology, Changsha, China

3P-8 EXPERIMENTAL VERIFICATION PLAN FOR A 70% EFFICIENT RELATIVISTIC MAGNETRON WITH DIFFRACTION OUTPUT (MDO)

C. Leach, S. Prasad, M. Fuks, J. Buchenauer, J. McConaha, E. Schamiloglu

Electrical and Computer Engineering Dept., University of New Mexico, Albuquerque, United States

3P-9 EXPERIMENTAL STUDY OF TRANSPARENT TWT WITH THE MODULATION OF AN ELECTRON BEAM NEAR THE CATHODE

Y. A. Kalinin, A. V. Starodubov

Department of Physics of nonlinear systems, Saratov State University, Saratov, Russian Federation

3P-10 A DUAL-FREQUENCY SLOW WAVE AMPLIFIER

P. Zhang¹, D. Simon¹, Y. Y. Lau¹, G. Greening¹, M. Franzl¹, R. M. Gilgenbach¹, B. Hoff²

¹*Nuclear Engineering and Radiological Sciences, University of Michigan - Ann Arbor, Ann Arbor, MI, United States* ²*Air Force Research Laboratory, Albuquerque, NM, United States*

3P-11 ENHANCEMENT OF SMITH-PURCEL RADIATIONS BY SELF-BUNCHED ELECTRON BEAMS IN OVERRSIZED BACKWARD WAVE OSCILLATORS

K. Ogura, K. Yambe, T. Iwasaki, S. Magori, J. Kojima

Graduate School of Science and Technology, Niigata University, Niigata, Japan

3P-12 DESIGN OF PHASE VELOCITY TAPERING OF W-BAND FOLDED WAVEGUIDE TRAVELLING WAVE TUBES FOR EFFICIENCY ENHANCEMENT

Y. Hu, J. Feng, J. Liu, T. Li, J. Cai, X. Wu

Beijing Vacuum Electronics Research Institute, Beijing, China

Session 3P: 2.4 Vacuum Microelectronics & THz Devices Posters**Poster Session**

Wednesday, May 28 14:00-15:30 Exhibit C (lower level)

Session Chair: *Wilkin Tang, Air Force Research Laboratory*

3P-13 SYNCHRONIZATION OF THz SPACE-CHARGE OSCILLATION IN ARRAYS OF VACUUM MICRODIODES

K. Torfason, M. Ilkov, A. Manolescu, A. Valfells

School of Science and Engineering, Reykjavik University, Reykjavik, Iceland

3P-14 REACHING HIGH FREQUENCIES IN A SMITH-PURCELL FEL WITH A MULTI-CHANNEL GRATING

J. Gardelle¹, P. Modin¹, J. T. Donohue²

¹*CEA/CESTA, Le Barp, France* ²*CNRS/IN2P3, Gradignan, France*

3P-15 MOLECULAR DYNAMICS SIMULATIONS OF FIELD EMISSION FROM A PLANAR NANODIODE AND PROLATE SPHEROIDAL TIP

K. Torfason, A. Manolescu, A. Valfells

School of Science and Engineering, Reykjavik University, Reykjavik, Iceland

3P-16 FEATURES OF WAVE PROCESSES IN PREMODULATED ELECTRON BEAM AND ITS INTERACTION WITH ELECTROMAGNETIC FIELD

G. M. Krasnova

Saratov State University, Saratov, Russian Federation

**Session 3P: 2.5 Codes & Modeling Posters****Poster Session**

Wednesday, May 28 14:00-15:30 Exhibit C (lower level)

Session Chair: *Wilkin Tang, Air Force Research Laboratory***3P-17 NUMERICAL INVESTIGATIONS ON THE NANOSECOND ELECTRICAL EXPLOSION OF SINGLE ALUMINUM WIRE IN VACUUM**K. Wang, Z. Shi, Y. Shi, J. Wu, S. Jia*Dept. of Electrical Engineering, Xi'an Jiaotong University, Xi'an, China***3P-18 COLLISIONAL-RADIATIVE MODEL FOR THE DIAGNOSTICS OF LOW PRESSURE INDUCTIVELY COUPLED KRYPTON PLASMA**R. Srivastava¹, D. Goyal¹, R. K. Gangwar², L. Stafford²¹*Physics Department, Indian Institute of Technology Roorkee, Roorkee-247667, India* ²*Dpartement de Physique, Universit de Montral, Montral (Qubec)-H3C 3J7, Canada***3P-19 PERFORMANCE AND SCALABILITY OF PARALLEL PIC AND FLUID CODES ON XEON PHI BASED SUPERCOMPUTERS**E. Hallman, K. Beckwith, P. Stoltz*Tech-X Corporation, Boulder, CO, United States***3P-20 RF MODELS FOR PLASMA-SURFACE INTERACTIONS: SHEATH BOUNDARY CONDITIONS WITH DIELECTRICS**T. G. Jenkins, D. N. Smithe*Tech-X Corporation, Boulder, CO, United States***3P-21 FIELD EMISSION CURRENT FROM SINGLE WALLED CARBON NANOTUBES WITH ADSORBATES AND DEFECTS FOR SEVERAL CHIRALITIES: A DENSITY FUNCTIONAL STUDY**T. P. Fleming*Directed Energy Directorate, Air Force Research Lab, Albuquerque, NM, United States***3P-22 APPLICATION OF VORPAL SOFTWARE TO CARRIER MODELING IN SOLID STATE DEVICES**D. Smithe, D. Dimitrov, D. Meiser*Tech-X Corporation, Boulder, CO, United States***3P-23 NUMERICAL STUDIES OF ELECTRODE PLASMA FORMATION AND EXPANSION IN HIGH POWER CHARGED PARTICLE BEAM DIODES**I. M. Rittersdorf, S. B. Swanekamp, R. J. Allen, J. W. Schumer*Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States***Session 3P: 2.7 Microwave Plasma Interaction Posters****Poster Session**

Wednesday, May 28 14:00-15:30 Exhibit C (lower level)

Session Chair: *Wilkin Tang, Air Force Research Laboratory*

**3P-24 OPERATION CHARACTERISTICS OF A 12-CAVITY RELATIVISTIC MAGNETRON WITH DIFFRACTION OUTPUT WHEN CONSIDERING SECONDARY AND BACKSCATTERED ELECTRONS EMISSION**

M. Liu¹, E. Schamiloglu², M. Fuks², B. Li¹, C. Liu¹

¹Key Laboratory of Physical Electronics and Devices of the Ministry of Education, xi'an jiaotong

university, xi'an, China ²Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, USA

3P-25 AXIAL LEAKAGE CURRENT REDUCTION IN A 12-CAVITY RISING-SUN RELATIVISTIC MAGNETRON WITH A "F" TRANSPARENT CATHODE

M. Liu¹, E. Schamiloglu², F. Mikhail², B. Li¹, C. Liu¹

¹Key Laboratory of Physical Electronics and Devices of the Ministry of Education, xi'an jiaotong university,

xi'an, China ²Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, USA

3P-26 RAPID FORMATION OF DISTRIBUTED PLASMA DISCHARGES USING X-BAND MICROWAVES

X. Xiang, P. Carrigan, J. Booske, J. Scharer

Electrical and Computer Engineering, University of Wisconsin-Madison, Madison, United States

3P-27 ELECTRON EXCURSION VERSUS SCATTERING MECHANISM IN A CROSS-FIELD DIODE

B. S. Stutzman¹, J. P. Verboncoeur²

¹Science, US Coast Guard Academy, New London, CT, United States ²Electrical and Computer Engineering, Michigan State University, East Lansing, MI, United States

3P-28 INTERACTION OF MICROWAVES GENERATED IN AIR

M. M. Kekez

2104, Alta Vista Drive, HEFTI - High-Energy Frequency Tesla Inc., Ottawa, Canada

3P-29 MICROWAVE BREAKDOWN OF AIR AT LOW PRESSURE WITH A 5 NS, 35 GHZ PULSE

S. Prasad, J. McConaha, C. Leach, E. Schamiloglu

Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM, United States

Session 3P: 5.1 Nonequilibrium Plasma Applications Posters**Poster Session**

Wednesday, May 28 14:00-15:30 Exhibit C (lower level)

Session Chairs: Xinpei Lu, Huazhong University of Science and Technology, China, Paul Chu, City University of Hong Kong

3P-30 EFFECT OF AIRFLOWS ON A REPETITIVE

J. Tang¹, Y. Huo², N. Li³

¹Harbin Institute of Technology, Harbin, China ²Harbin Institute of Technology, Harbin, China ³Harbin Institute of Technology, Harbin, China

3P-31 ELECTROPHYSICAL METHODS OF BACTERIOLOGICAL DISINFECTION OF WATER MEDIUM

E. J. Gurbanov

Science and techniques, Azersu OJSC, Baku, Azerbaijan

3P-32 MODELING OF AN ELECTRON BEAM GENERATED AR-N2 PLASMA FOR PLASMA PROCESSING

G. M. Petrov, D. R. Boris, T. B. Petrova, E. H. Lock, R. F. Fernsler, S. G. Walton

Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States

3P-33 A BATTERY-OPERATED ATMOSPHERIC-PRESSURE PLASMA WAND FOR BIOMEDICAL APPLICATIONS

X. Lu, X. Pei

CEEE, HuaZhong University of Science & Technology, WuHan, China

**3P-34 DEPOSITION OF THE SILICON FILMPS FROM PLASMA ABLATION FORMED BY A HIGH POWER ION BEAM**

G. Remnev, G. Kholodnaya, R. Sazonov, D. Ponomarev
Tomsk Polytechnic University, Tomsk, Russian Federation

3P-35 ELECTRICAL AND OPTICAL CHARACTERIZATION OF DBD BASED XECL UV EXCIMER SOURCE

P. Gulati¹, U. N. Pal¹, M. Kumar¹, R. Prakash¹, V. Vyas²

¹*Plasma Devices, Central Electronic Engineering Research Institute, Rajasthan, India*²*Physics Department, Banasthali University, Rajasthan, India*

3P-36 ELECTRON HEATING, MODE TRANSITIONS, AND ASYMMETRY EFFECTS IN DUSTY SINGLE- AND DUAL-FREQUENCY CAPACITIVE DISCHARGES

E. Schuengel¹, S. Mohr², S. Iwashita², J. Schulze¹, U. Czarnetzki²

¹*Physics, West Virginia University, Morgantown, WV, United States*²*Institute for Plasma and Atomic Physics, Ruhr University Bochum, Bochum, Germany*

3P-37 VOLUME PROCESSING OF GAS USING TWO-DIMENSIONAL MICROPLASMA ARRAYS

Y. Wu, A. R. Hoskinson, J. Hopwood
Electrical and Computer Engineering, Tufts University, Medford, United States

3P-38 A HIGH VOLTAGE NANOSECOND PULSER WITH VARIABLE PULSE WIDTH AND PULSE REPETITION FREQUENCY CONTROL FOR NONEQUILIBRIUM PLASMA APPLICATIONS

T. M. Ziemba, K. E. Miller, J. R. Prager, J. G. Carscadden, I. Slobodov
Eagle Harbor Technologies, Inc, Seattle, WA, United States

Session 3P: 5.2 High Pressure and Thermal Plasma Processing Posters**Poster Session**

Wednesday, May 28 14:00-15:30 Exhibit C (lower level)

Session Chairs: Xinpei Lu, *Huazhong University of Science and Technology, China*, Paul Chu, *City University of Hong Kong*

3P-39 SPECTRUM AND NUMBER FOR CATHODE SPOT WITH CHANGING CURRENT

K. Ogura, S. Yamamoto, T. Iwao, M. Yumoto
Tokyo City University, Tokyo, Japan

3P-40 ELECTRICAL FIELD AFFECTED BY CURRENT DECREMENT RATIO AT BASE CURRENT

D. Suzuki, T. Iwao, M. Yumoto
Tokyo City University, Tokyo, Japan

3P-41 HEAT FLUX AFFECTED BY CURRENT INCREMENT RATIO IN PULSED ARC MIXED OXYGEN

K. Sone, Y. Goto, T. Iwao, M. Yumoto
Tokyo City University, Tokyo, Japan

3P-42 TEMPERATURE DIFFERENCE BETWEEN CONSTANT AND PULSED ARC AFFECTED BY CURRENT INCREMENT RATIO AT PEAK CURRENT NEAR ANODE

H. Mitsubori, Y. Saito, T. Iwao, M. Yumoto
Tokyo City University, Tokyo, Japan

Session 3P: 5.3 Plasma Thrusters Posters**Poster Session**

Wednesday, May 28 14:00-15:30 Exhibit C (lower level)

Session Chairs: JP Sheehan, *University of Michigan*, Alexander Kapulkin, *Asher Space Research Institute of Technion-Israel Institute of Technology*

**3P-43 EXPERIMENTAL INVESTIGATION OF RECOIL MOMENTUM GENERATION EFFICIENCY UNDER NIR FEMTOSECOND LASER ABLATION OF REFRACTORY METALS IN VACUUM**

E. Y. Loktionov¹, A. V. Ovchinnikov², Y. S. Protasov¹, Y. Y. Protasov¹, D. S. Sitnikov²

¹Bauman Moscow State Technical University, Moscow, Russian Federation²Joint Institute for High Temperatures of RAS, Moscow, Russian Federation

3P-44 PLASMA MEASUREMENTS OF THE PLUME OF A NEW MINIATURE HELICON THRUSTER

J. Reese¹, J. P. Sheehan², B. Longmier²

¹Applied Physics, University of Michigan, Ann Arbor, MI, United States²Aerospace Engineering, University of Michigan, Ann Arbor, MI, United States

3P-45 QUASI-ONE-DIMENSIONAL SIMULATIONS OF MAGNETIC NOZZLES FOR PLASMA THRUSTER APPLICATIONS

F. H. Ebersohn¹, J. P. Sheehan¹, B. W. Longmier¹, J. V. Shebalin²

¹Aerospace Engineering, University of Michigan, Ann Arbor, MI, United States²Astromaterials Research Office, NASA Johnson Space Center, Houston, TX, United States

3P-46 PLASMA-BASED THRUSTER: ELECTROSTATIC AND ELECTROMAGNETIC COUPLING

M. Jugroot, A. Christou

Mechanical and Aerospace Eng., Royal Military College of Canada, Kingston, ON, Canada

3P-47 PLUME CONTROL OF A PLASMA THRUSTER

H. Liu, H. Wu, H. Li, X. Li, S. Xie, T. Huang, D. Yu

Harbin Institute of Technology, Harbin, China

3P-48 STUDY ON DISCHARGE OSCILLATION IN A CUSPED FIELD THRUSTER

S. Xu, H. Liu, H. Wu, H. Li, S. Xie

Harbin Institute of Technology, Harbin, China

3P-49 MAGNETIC FIELD ANGLE EFFECTS ON SHEATH FORMATION NEAR A FLAT PLATE SURFACE WITH APPLICATIONS TO HALL THRUSTERS

J. N. Lukas, M. Keidar

The George Washington University, Washington, DC, United States

3P-50 PLASMA ADIABATICITY IN A DIVERGING MAGNETIC NOZZLE

J. P. Sheehan¹, B. W. Longmier¹, E. A. Bering², C. S. Olsen³, J. P. Squire³, M. D. Carter³, L. D. Cassady³, F. R. Chang Diaz³, T. W. Glover³, A. V. Ilin³, M. G. Ballenger⁴

¹Aerospace Engineering, University of Michigan, Ann Arbor, MI, United States²Physics, University of Houston, Houston, TX, United States³Ad Astra Rocket Company, Webster, TX, United States⁴Space Exploration Technologies, McGregor, TX, United States

Session 3P: 5.4 Plasma for Lighting, Displays, & Microdischarges Posters**Poster Session**

Wednesday, May 28 14:00-15:30 Exhibit C (lower level)

Session Chairs: Xinpei Lu, Huazhong University of Science and Technology, China, Paul Chu, City University of Hong Kong

**3P-51 IGNITION DYNAMICS IN MICROWAVE-GENERATED MICROPLASMAS**

A. R. Hoskinson, A. Yared, J. Hopwood

Electrical & Computer Engineering, Tufts University, Medford, MA, United States

3P-52 FREE CONVECTION IN A ELECTRODELESS MICROWAVE LAMP

T. I. Frolova, G. I. Churyumov

Department Physical Foundations of Electronic Engineering, Kharkiv National University of Radio Electronics, Kharkiv, Ukraine

3P-53 MODELING AND CHARACTERIZATION OF AN INDIUM(I)IODIDE-ARGON LOW PRESSURE LAMP

C. M. Oeguen, K. Haehre, R. Kling

Light Technology Institute, Karlsruhe Institute of Technology, Karlsruhe, Germany

3P-54 UV EMISSION AND PROBE DIAGNOSTICS AND COMPUTATIONAL MODELING OF A LOW PRESSURE MICROWAVE EXCITED MICROPLASMA SOURCE

M. Denning¹, M. Vahidpour¹, R. Urdahl¹, P. Tian², M. Kushner²

¹*Agilent Technologies, Santa Clara, CA, United States*²*Electrical Engineering and Computer Science Dept., University of Michigan, Ann Arbor, MI, United States*

3P-55 CONTROLLING SURFACE DISCHARGE PATTERNS AND PLASMA CHEMISTRY WITH A HEXAGONAL ELECTRODE STRUCTURE AND GAS COMPOSIITON

L. Gao¹, H. Ding¹, M. Kong²

¹*School of Physics and Optoelectronic Engineering, Key Laboratory of Materials Modification by Laser, Ion and Electron Beams, Chinese Ministry of Education, Dalian University of Technology, Dalian, China*²*Frank Reidy Research Center for Bioelectronics, Old Dominion University, Norfolk, VA, USA*

3P-56 PLASMA PACKET PROPAGATION IN MICROCHANNELS

H. J. Yang, J. H. Cho, S. -J. Park, J. G. Eden

Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL, United States

3P-57 DIAGNOSTICS OF ATMOSPHERIC PRESSURE MICROWAVE GENERATED MICRO-PLASMA BY USING OPTICAL EMISSION SPECTROSCOPY

P. Liu, T. A. Grotjohn

Electrical & Computer Engineering, Michigan State University, East Lansing, MI, United States

3P-58 INVESTIGATION OF POWER BALANCE IN MICRO DIELECTRIC BARRIER GLOW DISCHARGE WITH ULTRA-HIGH DRIVING FREQUENCY

J. Y. Lee¹, H. Bae¹, J. P. Verboncoeur², H. J. Lee^{1,2}

¹*Department of Electrical Engineering, Pusan National University, Busan, South Korea*²*Department of Electrical and Computer Engineering, Michigan State University, East Lansing, USA*

Session 3P: 5.5 Environmental and Industrial Applications Posters**Poster Session**

Wednesday, May 28 14:00-15:30 Exhibit C (lower level)

Session Chairs: Xinpei Lu, Huazhong University of Science and Technology, China, Paul Chu, City University of Hong Kong

**3P-59 SHOCKWAVE GENERATION BY A SEMICONDUCTOR BRIDGE OPERATION IN WATER**

E. Zvulun, G. R. Toker, V. T. Gurovich, Y. E. Krasik

Physics, Technion - Israel Institute of Technology, Haifa, Israel

3P-60 BLAST-HOLE ELECTRO-FRACTURE OF CONCRETE LUMPS

N. S. Kuznetsova, A. S. Yudin, V. V. Lopatin

Department of High Voltage Engineering and Electrophysics, National Research Tomsk Polytechnic University, Tomsk, Russian Federation

3P-61 CONCRETE MONOLITH SPLITTING OFF BY MULTI-BOREHOLE ELECTRO-BLAST

A. Yudin, N. Kuznetsova, V. Lopatin

Department of High Voltage Engineering and Electrophysics, National Research Tomsk Polytechnic University, Tomsk, Russian Federation

3P-62 APPLICATION OF SHOCK WAVE GENERATED WITH UNDERWATER DISCHARGE IN MINE GAS DRAINAGE

Y. Z. Zhao¹, H. H. Zhou², M. J. Liu¹, Y. M. Zhang²

¹Xian GuanTong Energy technology co., LTD, Xi'an, Shaanxi, China²State Key Laboratory of Electrical Insulation for Power Equipment, Xi'an Jiaotong University, Xi'an, Shaanxi, China

3P-63 AMELIORATION OF PETROPHYSICAL PROPERTY WITH SHOCK WAVES GENERATED BY UNDERWATER ELECTRICAL WIRE EXPLOSION

H. B. Zhou¹, Y. Z. Zhao², J. W. Wu¹, Q. J. Liu², Y. M. Zhang¹

¹State Key Laboratory of Electrical Insulation for Power Equipment, Xi'an Jiaotong University, Xi'an Shaanxi, China²Xian GuanTong Energy technology co., LTD, Xi'an Shaanxi, China

3P-64 BREAKDOWN VOLTAGE SCALING RELATION OF ISOLATED GAS BUBBLES IN LIQUID WATER

S. N. Gucker, J. E. Foster

University of Michigan, Ann Arbor, MI, United States

3P-65 NUMERICAL SIMULATION OF ENERGY DEPOSITION IMPROVEMENTS IN EXPLODING WIRE BY USING PARALLEL WIRE

H. T. Shi, X. B. Zou, S. Zhao, X. L. Zhu, X. X. Wang

Department of Electrical Engineering, Tsinghua University, Beijing, China

3P-66 DEPOSITION OF CRYSTALLINE SILICON THIN FILMS IN ELECTRICALLY ASYMMETRIC CAPACITIVELY COUPLED PLASMAS

E. Schuengel¹, R. Hofmann², S. Mohr², J. Schulze¹, U. Czarnetzki²

¹Physics, West Virginia University, Morgantown, WV, United States²Institute for Plasma and Atomic Physics, Ruhr University Bochum, Bochum, Germany

3P-67 CRYSTALLIZING COMPOUND FILM ON PLASTICS BY ION IRRADIATION IN PLASMA

N. Sakudo, N. Ikenaga, K. Matsui, N. Sakumoto, Y. Kishi, Z. Yajima

Kanazawa Institute of Technology, Hakusan, Ishikawa, Japan

3P-68 OPTIMIZATION OF DIELECTRIC BARRIER DISCHARGE REACTORS FOR HIGH-SPEED SURFACE TREATMENT OF POLYMER SUBSTRATE

M. Hur, D. J. Kim, W. S. Kang, Y. -H. Song

Korea Institute of Machinery & Materials, Daejeon, South Korea

3P-69 COMPARATIVELY PLASMA DEPOSITION OF PEDOT THIN FILMS

M. Kiristi¹, F. Bozduman², E. Teke², A. Uygun Oksuz¹, L. Oksuz²

¹Chemistry Department, Suleyman Demirel University, Isparta, Turkey²Physics Department, Suleyman Demirel University, Isparta, Turkey

**3P-70 INVESTIGATION ON ENDURANCE OF HYDROPHILIC PROPERTY OF CARBON FIBERS TREATED BY AIR DIELECTRIC BARRIER DISCHARGE**

T. Kitagawa, T. Kakami, N. Osawa, M. Tanaka, H. Saito, Y. Yoshioka
Kanazawa Institute of Technology, Nonoichi, Ishikawa, Japan

3P-71 UNIFORM DEPOSITION OF ZIRCONIUM DIOXIDE LAYERS BY ATMOSPHERIC-PRESSURE PLASMA-ENHANCED CHEMICAL VAPOR DEPOSITION

J.-O. Lee, W. S. Kang, M. Hur, Y. -H. Song
Korea Institute of Machinery and Materials, Daejeon, South Korea

3P-72 EFFECT OF PULSE REPETITION ON PULSED PLASMA NITRIDING OF AISI 4340 STEEL AND ITS FATIGUE CRACK GROWTH (FCG) AND POLARIZATION STUDIES

J. P. Arul Mozhi Varman¹, M. Balasubramanian¹, U. Huchel²

¹*MME, Indian Institute of Technology - Madras, Chennai, Tamilnadu, India*²*Design, Eltropuls, GmbH, Germany*

3P-73 RADIOMETRIC AND ELECTRICAL CHARACTERIZATION OF MEDIUM-POWER INDUCTIVELY COUPLED UV-RADIATION SOURCE

K. Haehre, C. M. Oeguen, R. Kling

Light Technology Institute, Karlsruhe Institute of Technology, Karlsruhe, Baden-Wuerttemberg, Germany

3P-74 NEW SEMICONDUCTOR BASED BLUMLEIN MODULATOR FOR NON-THERMAL PLASMA DISCHARGES IN WATER

J. Mendes^{1,2}, L. Redondo^{1,2}, M. Pereira³

¹*Lisbon Engineering Superior Institute, ISEL, Lisbon, Portugal*²*Pulsed Power Advanced Applications Research Group, Lisbon, Portugal*³*EnergyPulse Systems, Lisbon, Portugal*

3P-75 HEAVY-ION MICRO-BEAM USE FOR TRANSIENT FAULT INJECTION IN VLSI CIRCUITS

S. M. Sondon
GISEE, Universidad Nacional del Sur, Bahia Blanca, Argentina

3P-76 REMOVAL OF CARBON MONOXIDE BY LOW TEMPERATURE PLASMA-CATALYSIS

K. -T. Kim, S. Jo, J. O. Lee, D. H. Lee, Y. H. Song

Department of Plasma Engineering, Korea Institute of Machinery & Materials, Daejeon, South Korea

3P-77 REMOVAL OF DILUTE HYDROGEN SULFIDE GAS IN AIR ON A LARGE SCALE USING WET-ELECTROSTATIC PRECIPITATOR SYSTEM

H. W. Park¹, S. Choi², D. W. Park¹

¹*Department of Chemistry and Chemical Engineering, INHA University, Incheon, South Korea* ²*Regional Innovation Center for Environmental Technology of Thermal Plasma, Incheon, South Korea*

3P-78 DECREASE IN DINITROGEN MONOXIDE (N_2O) GENERATION OF AIR-FED OZONE GENERATOR USING ATMOSPHERIC PRESSURE TOWNSEND DISCHARGE

T. Tsuji, Y. Morimoto, D. Funaki, N. Osawa, Y. Yoshioka
Kanazawa Institute of Technology, Nonoichi, Ishikawa, Japan

3P-79 ATMOSPHERIC PRESSURE RESISTIVE BARRIER LOW TEMPERATURE PLASMA TREATMENT FOR FOOD INDUSTRY*

M. Thiagarajan, X. Gonzales

Plasma Engineering Research Lab (PERL), Texas A&M University - Corpus Christi, Corpus Christi, Texas, United States

**Session 3P: 5.6 Plasma Medicine & Biological Effects Posters****Poster Session**

Wednesday, May 28 14:00-15:30 Exhibit C (lower level)

Session Chair: *Magesh Thiyagarajan, Texas A&M University - Corpus Christi***3P-80 STORAGE AT LOW TEMPERATURE OF WATER ACTIVATED BY ALTERNATING CURRENT COLD PLASMA**Y. Tian¹, R. Ma¹, Q. Zhang¹, J. Zhang^{1,2}, J. Fang^{1,2}¹*Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, China*²*College of Engineering, Peking University, Beijing, China***3P-81 IN VITRO ANTICANCER ACTIVITY OF A NOVEL COMPOUND FROM THE PHYSICALLY ENGINEERED CANDIDA ALBICANS WITH NANOSECOND PULSED ELECTRIC FIELDS (NSPEFS)**J. Guo¹, X. Yang¹, Y. Han¹, J. Li¹, J. Zhang^{1,2}, J. Fang^{1,2}¹*Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, China*²*College of Engineering, Peking University, Beijing, China***3P-82 CELL APOPTOSIS INDUCED BY ATMOSPHERIC PRESSURE PLASMA**Y. Yang, Z. Xiong, F. Zou, X. Lu*School of Electrical and Electronics Engineering, Huazhong University of Science and Technology, Wuhan, China***3P-83 INDUCTION OF APOPTOSIS IN HUMAN MYELOID LEUKEMIA CELLS BY REMOTE EXPOSURE OF RESISTIVE BARRIER COLD PLASMA***M. Thiyagarajan, H. Anderson, X. Gonzales*Plasma Engineering Research Lab (PERL), Texas A&M University - Corpus Christi, Corpus Christi, Texas, United States***3P-84 A GENOME-WIDE PROFILING OF CELL RESPONSE MECHANISMS TO NON-THERMAL PLASMA TREATMENT**H. Feng¹, F. Li¹, R. Ma¹, Y. Tian¹, F. Suo², W. Zhu³, J. Fang¹, L. -L. Du², J. Zhang¹¹*Peking University, Beijing, China*²*National Institute of Biological Sciences, Beijing, China*³*SaintPeter's University, NJ, USA***3P-85 EFFECTS OF GROWTH MEDIUM TREATED BY PLASMA PENCIL ON THE VIABILITY OF SCABER CANCER CELLS**S. Mohades, N. Barekzi, H. Razavi, M. Laroussi*Laser and Plasma Engineering Institute, Old Dominion University, Norfolk, VA, United States***3P-86 STERILIZATION OF MICRO-ORGANISM SPORES USING ATMOSPHERIC-PRESSURE PLASMA WITHOUT HARMFUL BY-PRODUCTS**K. Matsui, N. Ikenaga, N. Sakudo*Research Laboratory for Integrated Technological Systems, Kanazawa Institute of Technology, Hakusan, Ishikawa, Japan***3P-87 MOLECULAR DYNAMICS SIMULATIONS OF COLD ATMOSPHERIC PLASMA INTERACTIONS WITH LIPID BILAYERS**R. S. Brayfield II¹, P. Oroskar², K. Hinkle², S. Murad², A. Y. Grama³, A. L. Garner¹¹*School of Nuclear Engineering, Purdue University, West Lafayette, IN, United States*²*Department of Chemical Engineering, University of Illinois, Chicago, IL, United States*³*Department of Computer Sciences, Purdue University, West Lafayette, IN, United States*

**3P-88 SIMULATION OF A CAPACITIVELY COUPLED ATMOSPHERIC PRESSURE WATER VAPOR PLASMA**

Z. Kechidi¹, W. G. B. Graham², A. H. Belbachire³

¹Faculty of Sciences and technology, LREA laboratory university of Medea, Algeria, Medea, Algeria²Centre for Plasma Physics, Queen's University Belfast, Belfast, Northern Ireland, UK³Dpartement de Physique, USTO, Laboratoire d'Analyse et d'Application des Rayonnements(LAAR), Oran, Algeria

3P-89 RF PLASMA NANOCOATING OF PEDOT ONTO CHITOSAN POWDERS FOR NANOFIBER APPLICATIONS

M. Kiristi¹, F. Bozduman², E. Teke², A. Uygun Oksuz¹, L. Oksuz²

¹Chemistry Department, Suleyman Demirel University, Isparta, Turkey²Physics Department, Suleyman Demirel University, Isparta, Turkey

Session 6A: Basic Plasma Phenomena II

Wednesday, May 28 15:30-17:30 Thurgood Marshall North

Session Chair: *Keith Cartwright, Sandia National Laboratories*

15:30 6A-1 SPATIAL DISTRIBUTION MEASUREMENT OF PLASMA PARAMETERS USING SPECTRAL IMAGE PROCESSING

T. Matsumoto, Y. Izawa, K. Nishijima

Faculty of Electrical Engineering, Fukuoka University, Fukuoka, Japan

15:45 6A-2 STROBOSCOPIC IMAGING OF STREAMERS PROPAGATING ALONG DIELECTRIC SURFACES

D. J. M. Triesenekens¹, S. Nijdam¹, T. Christen², G. M. W. Kroesen¹, U. M. Ebert³

¹Elementary Processes in Gas Discharges, Eindhoven University of Technology, Eindhoven, Netherlands²ABB Switzerland Ltd., Baden-Datwill, Switzerland³Multiscale Dynamics, CWI, Amsterdam, Netherlands

16:00 6A-3 (invited) DYNAMICS OF FORMATION OF THE BLUE CORE MODE IN ARGON HELICON PLASMAS

S. C. Thakur, C. Brandt, L. Cui, J. Gosselin, G. R. Tynan

Center for Energy Research, University of California at San Diego, La Jolla, United States

16:30 6A-4 NANOSECOND PULSED DISCHARGE IN LIQUID: INITIATION MECHANISM AND DIAGNOSTICS

Y. Seepersad, D. Dobrynin, A. Fridman, M. Pekker

Drexel Plasma Institute, Camden, NJ, United States

16:45 6A-5 PRESHEATH AND DOUBLE LAYER-LIKE STRUCTURES IN THE CORE OF AN ARGON HELICON PLASMA SOURCE WITH UNIFORM MAGNETIC FIELDS

M. U. Siddiqui, N. Hershkowitz

Engineering Physics, University of Wisconsin - Madison, Madison, WI, United States

17:00 6A-6 EXPERIMENTAL OBSERVATION OF STANDING WAVE EFFECT IN LOW-PRESSURE 200 MHZ CAPACITIVE DISCHARGES

Y. Liu, F. Gao, J. Liu, Y. Wang

School of Physics and Optoelectronic Technology, Dalian University of Technology, Dalian, China

17:15 6A-7 INVESTIGATION OF POSSIBLE SHEATH DISAPPEARANCE NEAR AN ELECTRODE BIASED AT THE PLASMA POTENTIAL

C. -S. Yip¹, N. Hershkowitz¹, G. Severn²

¹Engineering Physics, University of Wisconsin - Madison, Madison, WI, United States²Physics, University of San Diego, San Diego, CA, United States



Session 6B: Slow-Wave Devices II

Wednesday, May 28 15:30-17:30 Thurgood Marshall South

Session Chair: Khanh T Nguyen, Beam-Wave Research, Inc.

15:30 6B-1 (invited) 1.7 KW POWER BOOSTER TWT AT 35 GHZ

B. Levush¹, D. Abe¹, A. Vlasov¹, I. Chernyavskiy¹, S. Cooke¹, J. Pasour¹, J. Legarra², K. Nguyen², D. Pershing², E. Wright², J. Hanna², A. Garcia³, T. Kimura³, P. Lugos³, C. Meyer³, J. Ramirez-Aldana³, R. Stockwell³, R. Begum³, D. Chernin⁴

¹Electronics Scince and Technology Division, Naval Research Laboratory, Washington, DC, United

States²Beam-Wave Research, Bethesda, MD, United States³Communications and Power Industries, Palo Alto, CA, Unites States⁴Leidos, Reston, VA, United States

16:00 6B-2 DESIGN OF A HIGH POWER S-BAND BACKWARD-WAVE OSCILLATOR WITH A METAMATERIAL INTERACTION CIRCUIT

J. S. Hummelt, S. M. Lewis, W. C. Guss, M. A. Shapiro, R. J. Temkin

MIT, Cambridge, MA, United States

16:15 6B-3 RELATIVISTIC BWO WITH GAUSSIAN BEAM EXTRACTED RADIALLY USING AN ELECTROMAGNETIC BANDGAP MEDIUM

A. Elfrgani, E. Schamiloglu

Department Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM 87131, United States

16:30 6B-4 INITIAL CHARACTERIZATION OF A MODULAR MAGNETICALLY INSULATED LINE OSCILLATOR TEST BED

S. Portillo, A. Kuskov, S. Horne, J. Lehr, E. Schamiloglu

Electrical Engineering, University of New Mexico, Albuquerque, NM, United States

16:45 6B-5 NOVEL ASYMMETRIC HIGH EFFICIENT MULTI-STAGE DEPRESSED COLLECTOR FOR SPACE TRAVELING WAVE TUBES

A. M. Latha^{1,2}, S. K. Ghosh^{1,2}

¹Academy of Scientific and Innovative Research, New Delhi, India²CSIR-Central Electronics Engineering Research Institute, Pilani, India

17:00 6B-6 DESIGN AND SIMULATION OF CLOVERLEAF TWT SLOW WAVE STRUCTURE

P. D. Gensheimer¹, R. W. Ziolkowski², D. A. Shiffler¹

¹RDH, AFRL, Kirtland AFB, NM, United States²ECE, University of Arizona, Tucson, AZ, United States

Session 6C: X- and Z-Pinches II

Wednesday, May 28 15:30-17:30 Thurgood Marshall East

Session Chair: Adam J Harvey-Thompson, Sandia National Laboratories

15:30 6C-1 EFFECTS OF AXIAL MAGNETIC FIELD ON MHD INSTABILITIES IN CYLINDRICAL LINERS

Y. Y. Lau¹, M. R. Weis¹, P. Zhang¹, R. M. Gilgenbach¹, M. Hess², K. J. Peterson²

¹Nuclear Engineering and Radiological Sciences, University of Michigan, Ann Arbor, MI, United States²Sandia National Laboratories, Albuquerque, NM, United States

15:45 6C-2 FEEDTHROUGH OF THE MAGNETO-RAYLEIGH-TAYLOR INSTABILITY IN THE PRESENCE OF A SHOCK

M. R. Weis¹, Y. Y. Lau¹, R. M. Gilgenbach¹, M. Hess², K. J. Peterson²

¹Nuclear Engineering and Radiological Sciences, University of Michigan, Ann Arbor, MI, United States²Sandia National Laboratories, Albuquerque, NM, United States



16:00 6C-3 STUDY OF MAGNETIC FIELDS IN THE DENSE Z PINCH USING UV FARADAY ROTATION DIAGNOSTICS

V. V. Ivanov¹, A. A. Anderson¹, D. Papp¹, B. R. Talbot¹, J. P. Chittenden², N. Niassé²

¹*University of Nevada, Reno, Reno, United States* ²*Imperial College, London, London, Great Britain*

16:15 6C-4 DOUBLE PLANAR WIRE ARRAYS AT ENHANCED CURRENT ON ZEBRA

A. S. Safronova¹, V. L. Kantsyrev¹, I. Shrestha¹, M. E. Weller¹, V. V. Shlyaptseva¹, A. Stafford¹, M. Lorance¹, A. A. Esaulov¹, A. S. Chuvatin², C. A. Coverdale³, B. Jones³, D. J. Ampleford³

¹*Department of Physics, University of Nevada, Reno, Reno, NV, United States* ²*Laboratoire de Physique des Plasmas, Ecole Polytechnique, Palaiseau, France* ³*Sandia National Laboratories, Albuquerque, NM, United States*

16:30 6C-5 THOMSON SCATTERING MEASUREMENTS OF SUPERSONIC TUNGSTEN PLASMA FLOW INTERPENETRATION IN WIRE ARRAY Z-PINCHES

G. F. Swadling¹, S. V. Lebedev¹, G. Burdiak¹, L. Suttle¹, S. Patankar¹, R. A. Smith¹, M. Bennett¹, G. N. Hall¹, F. Suzuki-Vidal¹, J. Yuan¹, A. J. Harvey-Thompson², W. Rozmus³

¹*Imperial College London, London, United Kingdom* ²*Sandia National Laboratories, Albuquerque, NM, USA* ³*University of Alberta, Edmonton, Alberta, Canada*

16:45 6C-6 NUMERICAL AND EXPERIMENTAL INVESTIGATIONS ON THE INTERACTION OF LIGHT WIRE-ARRAY Z-PINCHES WITH EMBEDDED HEAVY FOAM CONVERTERS

D. Xiao¹, N. Ding¹, F. Ye², J. Ning², Q. Hu², F. Chen², Y. Qin², R. Xu², Z. Li², S. Sun¹

¹*Institute of Applied Physics and Computational Mathematics, Beijing, China* ²*Institute of Nuclear Physics and Chemistry, China Academy of Engineering Physics, Mianyang, China*

Session 6D: Plasma Medicine & Biological Effects I

Wednesday, May 28 15:30-17:30 Thurgood Marshall West

Session Chair: Allen L Garner, Purdue University

15:30 6D-1 DIELECTRIC BARRIER DISCHARGE LAMP FOR DECONTAMINATION PURPOSE

B. Caillier¹, C. Muja¹, A. S. Kone¹, P. Guillot¹, J. Dexpert-Ghys², J. M. A. Caiut³

¹*DPHE, Université de Toulouse, CUFR J.-F. Champollion, Albi, France* ²*CEMES, Université de Toulouse, Toulouse, France* ³*Department of Chemistry, University of São Paulo, Ribeiro Preto-SP, Brazil*

15:45 6D-2 CONTROLLING FILAMENT PATTERING BY MICROSECOND-PULSED DIELECTRIC BARRIER DISCHARGE PLASMA FOR BIOMEDICAL APPLICATIONS

N. Chernets¹, E. Silagi², G. Fridman¹, G. Friedman¹, A. Fridman¹, T. A. Freeman²

¹*A.J. Drexel Plasma Institute, A.J. Drexel Plasma Institute, Philadelphia, United States* ²*Orthopaedic Surgery, Thomas Jefferson University, Philadelphia, United States*

16:00 6D-3 LONG TERM EXPOSURE OF ATMOSPHERIC DIELECTRIC BARRIER DISCHARGES ONTO WET TISSUE

W. Tian¹, M. J. Kushner²

¹*Nuclear Engineering and Radiological Sciences Department, University of Michigan, Ann Arbor, MI, United States* ²*Electrical Engineering and Computer Science Department, University of Michigan, Ann Arbor, MI, United States*

16:15 6D-4 EXAMINATION OF PLASMA-TISSUE INTERACTIONS USING NUMERICAL MODELING AND LABORATORY DIAGNOSTICS

A. I. D. Macnab, T. Ziomba, J. Prager, A. Hashim, J. Carscadden

Eagle Harbor Technologies, Inc, Seattle, WA, United States

**16:30 6D-5 CONTRIBUTION OF ELECTRIC FIELDS AND ACTIVE SPECIES IN NANOSECOND PULSED DBD PLASMA TREATMENT FOR STIMULATION OF MURINE MESENCHYMAL C3H10T1/2 CELLS**

A. Lin¹, N. Chernets², D. Dobrynin¹, G. Fridman¹, T. Freeman², A. Fridman¹, V. Miller¹

¹Drexel Plasma Institute, Camden, NJ, United States ²Thomas Jefferson University, Philadelphia, PA, United States

16:45 6D-6 SYNERGISTIC ANTIBACTERIAL EFFECTS OF LOW TEMPERATURE PLASMA COMBINED WITH PULSED ELECTRIC FIELDS

Q. Zhang¹, J. Zhuang¹, T. V. Woedtke¹, J. Zhang², J. Fang², K. -D. Weltmann¹, J. F. Kolb¹

¹Leibniz-Institute for Plasma Science and Technology, Greifswald, Germany ²Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, China

17:00 6D-7 NANOSECOND PULSED ELECTRIC FIELDS (NSPEFs) AS A NOVEL TECHNOLOGY FOR IMPROVING avermectins PRODUCTION IN STREPTOMYCES AVERMILIS

J. Guo¹, R. Ma¹, S. Wu², J. Zhang^{1,2}

¹Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, China ²College of Engineering, Peking University, Beijing, China

17:15 6D-8 THE ELECTROPHYSIOLOGICAL EFFECT OF NANOSECOND PULSED ELECTRIC FIELDS ON MAGNETIC FLUID HYPERTERMIA TO TREAT HELA CELLS

S. Zuo¹, R. Zhang², R. Wang¹, J. Zhang^{1,2}, J. Fang^{1,2}

¹Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, China ²College of Engineering, Peking University, Beijing, China

Session 6E: Vacuum Microelectronics and THz Devices and Non-Fusion Microwave Sources (combined)

Wednesday, May 28 15:30-17:30 Hoover

Session Chair: *Nicholas M Jordan, University of Michigan*

15:30 6E-1 NEW SCALING OF ELECTRON THERMIONIC EMISSION FROM GRAGHENE

S. J. Liang, L. K. Ang

Engineering Product Development, Singapore University of Technology and Design, Singapore, Singapore

15:45 6E-2 OBSERVATION OF COHERENT SMITH-PURCELL EMISSION AT 32 GHZ FROM A MULTI-CHANNEL-GRATING WITH SIDEWALLS

J. Gardelle¹, P. Modin¹, J. Donohue²

¹CEA/CESTA, Le Barp, France ²CNRS/IN2P3, Gradignan, France

16:00 6E-3 EXPERIMENTAL DEMONSTRATION OF A HIGH POWER SMITH-PURCELL SOURCE USING A CYLINDRICAL GRATING

H. Bluem¹, J. Jarvis¹, A. M. M. Todd¹, R. H. Jackson¹, J. Gardelle², P. Modin², J. T. Donohue³

¹Advanced Energy Systems, Princeton, NJ, United States ²CEA/CESTA, Le Barp, France ³Centre d'Etudes Nucléaires de Bordeaux, University of Bordeaux, Gradignan, France

16:15 6E-4 THE THEORY OF ELECTRON-WAVE DEVICES FOR SHORT-WAVELENGTH PART OF THE MICROWAVE RANGE

D. I. Trubetskoy, A. V. Titov

Saratov State University, Saratov, Russian Federation

16:30 6E-5 PERFORMANCE OF ST707 GETTER MATERIAL IN A REP-RATED HIGH POWER MICROWAVE SEALED-TUBE VIRCATOR UNDER UHV CONDITIONS

P. Kelly, J. M. Parson, C. Lynn, M. Taylor, J. C. Dickens, A. Neuber, J. Mankowski

Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States



16:45 6E-6 MILLIMETER-WAVE SINTERING OF CERAMICS WITH APPLIED PRESSURE

A. W. Fliflet, B. Y. Rock, M. A. Imam

Materials Science and Technology Directorate, Naval Research Laboratory, Washington, DC, United States

17:00 6E-7 STUDY OF MULTIPACTOR LOADING IN X-BAND DIELECTRIC-LOADED ACCELERATING STRUCTURES

S. H. Gold¹, C. Jing^{2,3}, W. Gai³, A. Kanareykin², A. K. Kinkead⁴

¹*Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States*²*Euclid Techlabs LLC, Rockville, MD, United States*³*Argonne National Laboratory, Argonne, IL, United States*⁴*Icarus Research, Inc., Bethesda, MD, United States*

17:15 6E-8 A 28 GHZ 200 KW GENERATION AND LAUNCHING SYSTEM FOR ECH/EBW ON PROTO-MPEX AT ORNL

T. S. Bigelow, J. B. Caughman, C. L. Dukes, R. H. Goulding, J. Rapp, S. J. Diem, T. M. Biewer

Fusion Energy, ORNL, Oak Ridge, TN, United States



Thursday, May 29

Session PL7: Plenary 7

Thursday, May 29 08:00-09:00 Thurgood Marshall East-South

Session Chair: Chunqi Jiang, Old Dominion University

8:00 PL7-1 (invited) PLASMA SURFACE ENGINEERING OF BIOMATERIALS

P. K. Chu

Department of Physics and Materials Science, City University of Hong Kong, Kowloon, Hong Kong

Session 7A: Environmental and Industrial Applications

Thursday, May 29 9:30 - 12:00 Thurgood Marshall North

Session Chair: Paul Chu, City University of Hong Kong

9:30 7A-1 (invited) DEGRADATION OF SELECTED PHARMACEUTICALS WITH PULSED CORONA DISCHARGES GENERATED IN WATER

R. Banaschik¹, P. Lukes², K. -D. Weltmann¹, J. F. Kolb¹

¹*Leibniz Institute for Plasma Science and Technology, Greifswald, Germany* ²*Department of Pulse Plasma Systems, Institute of Plasma Physics, Prague, Czech Republic*

10:00 7A-2 REMOVAL OF DYES FROM SYNTHETIC WASTEWATER BY PLASMACHEMICAL COAGULATION

S. Nzali¹, S. Laminsi², D. Njopouwo²

¹*School of Wood, Water and Natural Resources, Faculty of Agronomy and Agricultural Sciences, University of Dschang/Ebolowa Campus, Ebolowa, Cameroon* ²*Inorganic Chemistry, University of Yaounde I, Yaounde, Cameroon*

10:15 7A-3 ORGANIC SYNTHESIS WITH CONTINUOUS FLOW WATER FILM PULSED PLASMA DISCHARGE

R. J. Wandell¹, S. Bresch², I. V. Alabugin², B. R. Locke¹

¹*Department of Chemical and Biomedical Engineering, Florida State University, Tallahassee, FL, United States*

²*Department of Chemistry and Biochemistry, Florida State University, Tallahassee, FL, United States*

10:30 7A-4 STUDY OF WATER TREATMENT BY USING UNDERWATER PULSED DISCHARGE PLASMA

T. Sakugawa, H. Akiyama

Institute of Pulsed Power Science, Kumamoto University, Kumamoto, Japan

10:45 7A-5 SHOCK WAVES GENERATED BY UNDERWATER PULSE DISCHARGE WITH CU WIRE OF DIFFERENT PARAMETER

H. B. Zhou¹, R. Y. Han¹, Q. J. Liu¹, Y. M. Zhang¹, Y. Z. Zhao², M. J. Liu²

¹*State Key Laboratory of Electrical Insulation for Power Equipment, Xi'an Jiaotong University, Xi'an, Shaanxi, China*

²*Xian GuanTong Energy technology co., LTD, Xi'an, Shaanxi, China*

11:00 7A-6 MODULAR MICROPLASMA OZONE GENERATORS FOR WATER TREATMENT SYSTEM

J. H. Cho^{1,2}, M. H. Kim², C. M. Herring², S. -J. Park^{1,2}, J. G. Eden^{1,2}

¹*Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL, United States* ²*EP Purification, Inc., Champaign, IL, United States*

11:15 7A-7 IN-SITU EMISSION SPECTROSCOPY AND PLASMACHEMICAL ANALYSIS OF CARBON DIOXIDE DISSOCIATION IN ATMOSPHERIC PRESSURE MICROCHANNEL PLASMA

C. Shin, Z. Dai, S. -J. Park, J. G. Eden

Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL, United States

**11:30 7A-8 RAPID ALLERGEN INACTIVATION USING ATMOSPHERIC PRESSURE COLD PLASMA**

Y. Liang¹, Y. Wu², K. Wei², W. Li¹, M. Yao², J. Zhang¹

¹College of Engineering, Peking University, Beijing, China ²College of Environmental Sciences and Engineering, Peking University, Beijing, China

11:45 7A-9 INACTIVATION OF NEWCASTLE DISEASE VIRUS BY COLD PLASMA

G. Wang¹, Q. Zhang¹, J. Zhang¹, R. Zhu², L. Yang², B. Yang², J. Fang³

¹Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, China ²Institute of Animal Sciences of CAAS, Beijing, China ³College of Engineering, Peking University, Beijing, China

Session 7B: Microwave Plasma Interaction

Thursday, May 29 9:30 - 12:00 Thurgood Marshall South

Session Chair: Sarita Prasad, University of New Mexico

9:30 7B-1 TUNABLE PLASMA-BASED MICROWAVE WAVEGUIDE TIME DELAY

N. Lei, J. Verboncoeur, J. Albrecht, L. Harle

Electrical Engineering, Michigan State University, East Lansing, United States

9:45 7B-2 REDUCTION OF HIGH POWER MICROWAVE BREAKDOWN DELAY TIMES USING MULTIPLE PASSES THROUGH A TE111 RESONATOR

S. Beeson¹, S. Lin², J. Dickens¹, A. Neuber¹

¹Texas Tech University, Lubbock, TX, United States ²Xi'an Jiaotong University, Xi'an, China

10:00 7B-3 (invited) NON-EQUILIBRIUM PLASMAS IN FUEL-AIR MIXTURES GENERATED BY HALF OF A MICROWAVE

M. Gundersen, Y. H. Lin, A. Kuthi, W. Schroeder, D. Singleton, J. Sanders

Electrical Engineering, University of Southern California, Los Angeles, United States

10:30 7B-4 SPATIALLY AND TEMPORALLY RESOLVED CHARACTERIZATION OF AN AIR BREAKDOWN PLASMA USING A 110 GHZ, 1.4 MW GYROTRON*

S. C. Schaub, J. S. Hummelt, W. C. Guss, M. A. Shapiro, R. J. Temkin

Plasma Science and Fusion Center, MIT, Cambridge, MA, United States

10:45 7B-5 INVESTIGATING THE IMPACT METAMATERIALS HAVE ON BREAKDOWN DELAY IN PLASMA FORMATION IN HIGH POWER MICROWAVE EXPERIMENTS

B. Kupczyk, X. Xiang, P. Carrigan, J. Scharer, J. Booske

Department of Electrical and Computer Engineering, University of Wisconsin-Madison, Madison, WI, United States

11:00 7B-6 NUMERICAL SIMULATIONS OF MICROWAVE ENERGY EXTRACTION FROM A HIGH-GAIN, HIGH-POWER PULSE COMPRESSOR WITH A PLASMA SWITCH

A. S. Shlapakovski¹, L. Beilin¹, Y. P. Bliokh¹, M. Donskoy¹, Y. Hadas², E. Schamilooglu³, Y. E. Krasik¹

¹Physics Dept., Technion, Haifa, Israel ²Applied Physics Dept., Rafael, Haifa, Israel ³ECE Dept., University of New Mexico, Albuquerque NM, USA

11:15 7B-7 NANOSECOND-FRAME IMAGING OF PLASMA DISCHARGE IN A MICROWAVE PULSE COMPRESSOR INTERFERENCE SWITCH

L. Beilin¹, A. Shlapakovski¹, M. Donskoy¹, Y. E. Krasik¹, Y. Hadas²

¹Physics Department, Technion, Haifa, Israel ²Department of Applied Physics, Rafael, Haifa, Israel

11:30 7B-8 PARTICLE-IN-CELL SIMULATION ON HIGH-POWER MICROWAVE FLASHOVER AND BREAKDOWN WITH WINDOW OUTGASSING

Y. Dong, Z. Dong, Q. Zhou, W. Yang, H. Zhou

Institute of Applied Physics and Computational Mathematics, Beijing, China

**11:45 7B-9 A NOVEL AND ACCURATE TDFIT-PIC CODE FOR THE MULTIPACTOR SIMULATIONS**

J. W. You¹, J. F. Zhang¹, T. J. Cui¹, H. G. Wang²

¹School of Information and Engineering, Southeast University, Nanjing, China²Xi'an Jiaotong University, Xi'an, China

Session 7C: Codes & Modeling II

Thursday, May 29 9:30 - 12:00 Thurgood Marshall East

Session Chair: Tom Antonsen, University Of Maryland

9:30 7C-1 MAGIC3D FDTD EM-PIC CODE NON-CONFORMAL GEOMETRY (CUT CELL) IMPLEMENTATION

A. J. Woods, L. D. Ludeking

Alliant Techsystems Operations, LLC (ATK), Newington, VA, United States

9:45 7C-2 PARALLEL PARAMETRIC DESIGN OPTIMIZATION FOR RF AMPLIFIERS WITH 3D EM-PIC

G. M. Stantchev¹, S. J. Cooke¹, T. M. Antonsen, Jr.²

¹Naval Research Laboratory, Washington, DC, United States²Leidos Corp., Reston, VA, United States

10:00 7C-3 MODELING OF DRIVE INDUCED OSCILLATIONS: CAPABILITIES AND LIMITATIONS

A. N. Vlasov¹, I. A. Chernyavskiy¹, J. P. Calame¹, B. Levush¹, T. M. Antonsen, Jr.²

¹Naval Research Laboratory, Washington, DC, United States²Leidos Inc., Reston, VA, United States

10:15 7C-4 USING WHOLE STRUCTURE MODES IN THE LARGE-SIGNAL MODELING OF TWTS WITH ARBITRARY SLOW-WAVE STRUCTURES

I. A. Chernyavskiy¹, A. N. Vlasov¹, S. J. Cooke¹, B. Levush¹, T. M. Antonsen²

¹U.S. Naval Research Laboratory, Washington, DC, United States²Leidos, Reston, VA, United States

10:30 7C-5 RF AMPLIFIER DESIGN USING 3D EM-PIC

S. J. Cooke¹, G. M. Stantchev¹, T. M. Antonsen Jr.², J. J. Petillo³, S. G. Ovtchinnikov³, C. Kostas³, D. N. Panagos³

¹Naval Research Laboratory, Washington, DC, United States²Leidos, Reston, VA, United States³Leidos, Billerica, MA, United States

10:45 7C-6 3-D MODELING OF ELECTRON BEAM DEVICES

L. Ives, M. Read, T. Bui

Calabazas Creek Research, Inc., San Mateo, CA, United States

11:00 7C-7 HOT TEST OF GYROTRON CAVITY INTERACTION USING A 3D CFDTD PIC METHOD

M. C. Lin¹, D. N. Smithe¹, W. C. Guss², R. J. Temkin²

¹Beams Interaction Group, Tech-X Corporation, Boulder, CO, United States²Department of Physics and the Plasma Science and Fusion Center, Massachusetts Institute of Technology, Cambridge, MA, United States

11:15 7C-8 VIRTUAL PROTOTYPING OF A 5 MW CONVENTIONAL MAGNETRON

M. Lambrecht, P. Mardahl, N. Lockwood

Air Force Research Laboratory, Kirtland AFB, NM, United States

11:30 7C-9 PARTICLE WAVE INTERACTION USING CAVITY MODAL EXPANSION WITH AN APPLICATION ON SIMULATIONS OF VIRTUAL CATHODE OSCILLATOR

A. F. Abdel-Rahman, T. M. Abuelfadl

Electronics and Electrical Communications Department, Faculty of Engineering, Cairo University, Giza, Egypt

**Session 7D: Plasma Medicine & Biological Effects II**

Thursday, May 29 9:30 - 12:00 Thurgood Marshall West

Session Chair: Chunqi Jiang, Old Dominion University

9:30 7D-1 ANTIMICROBIAL COPPER COATINGS ON TEMPERATURE LABILE SURFACES DEPOSITED WITH A DC PLASMA JET OPERATED WITH AIR

J. Kredl¹, A. Quade¹, S. Mueller¹, S. Peglow¹, M. Polak¹, J. F. Kolb¹, K. -D. Weltmann¹, S. Drache², R. Hippler²
¹Leibniz Institute for Plasma Science and Technology, Greifswald, Germany²Institute of Physics, Ernst-Moritz-Arndt University, Greifswald, Germany

9:45 7D-2 DOUBLE JET ATMOSPHERIC PRESSURE PLASMA AS A DECONTAMINATING AGENT

A. -A. H. Mohamed^{1,2}, M. S. Benghanem¹, S. M. Al Shariff³, S. A. Ouf^{4,5}

¹Physics Department/Faculty of Science, Taibah University, Almadinah Almunawwarah, Saudi Arabia²Physics Department/Faculty of Science, Beni-Suef University, Beni-Suef, Egypt³Electrical Engineering Department/Faculty of Engineering of Science, Taibah University, Almadinah Almunawwarah, Saudi Arabia⁴Biology Department, Faculty of Science, Taibah University, Almadinah Almunawwarah, Saudi Arabia⁵Biology Department, Faculty of Science, Cairo University, Giza, Egypt

10:00 7D-3 A NOVEL NANOSECOND PULSED PLASMA BRUSH FOR BIOMEDICAL APPLICATIONS

J. Lane, M. Malik, C. Edelblute, L. Heller, K. Schoenbach, C. Jiang

Frank Reidy Research Center for Bioelectronics, Old Dominion University, Norfolk, VA, United States

10:15 7D-4 EFFECTIVENESS OF SURFACE DIELECTRIC BARRIER DISCHARGE (SDBD) WITH FLOW CONTROL FOR BIOLOGICAL DECONTAMINATION

K. K. Pal¹, C. T. Timmons², S. Karumuri¹, J. D. Jacob¹, G. Zhang³, L. Ma²

¹Department of Mechanical and Aerospace Engineering, Oklahoma State University, Stillwater, Oklahoma, United States²Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, Oklahoma, United States³Center for Food Safety and Applied Nutrition, Food and Drug Administration, College Park, Maryland, United States

10:30 7D-5 SURFACE FUNCTIONALIZATION OF GRAPHITE-ENCAPSULATED GOLD NANOPARTICLES FOR MULTIPLE BIOMEDICAL APPLICATIONS USING RF PLASMA

E. Yang¹, H. Chou², M. Nagatsu^{1,2}

¹Graduate School of Science and Technology, Shizuoka University, Hamamatsu, Japan²Graduate School of Engineering, Shizuoka University, Hamamatsu, Japan

10:45 7D-6 (invited) BIOLOGICAL AND CHEMICAL EFFECTS OF WATER ACTIVATED BY COLD PLASMA ABOVE AND BENEATH THE WATER SURFACE

Y. Tian¹, R. Ma¹, Q. Zhang¹, J. Zhang^{1,2}, J. Fang^{1,2}

¹Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, China²College of Engineering, Peking University, Beijing, China

11:15 7D-7 PROLONGED PRESERVATION AND INACTIVATION OF SURFACE-BORNE MICROORGANISMS OF FRESH FRUITS BY NON-THERMAL PLASMA ACTIVATED WATER

R. Ma¹, Y. Tian¹, J. Guo¹, H. Feng², J. Zhang², J. Fang²

¹Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, China²College of Engineering, Peking University, Beijing, China

11:30 7D-8 EVALUATION OF COLD PLASMA TREATMENT AND SAFETY IN DISINFECTING 21-DAY ROOT CANAL ENTEROCOCCUS FAECALIS BIOFILM IN VITRO

Y. Li¹, G. Wang¹, J. Zhang^{1,2}, J. Fang^{1,2}, J. Pan³, W. Zhu⁴

¹Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, China²College of Engineering, Peking University, Beijing, China³School and Hospital of Stomatology, Peking University, Beijing, China⁴Dept. of Applied Science and Technology, Saint Peters University, Jersey City, USA

**11:45 7D-9 THE TYPE OF DNA DAMAGE INDUCED BY DBD PLASMA VARIES DEPENDING ON THE UNIFORMITY OF DISCHARGE**

J. Azizkhan-Clifford¹, V. Limonnik¹, D. Dobrynnin²

¹Biochemistry and Molecular Biology, Drexel University College of Medicine, Philadelphia, PA, United States

²Drexel Plasma Institute, Drexel University, Philadelphia, PA, United States

Session 7E: Intense Electron and Ion Beams II

Thursday, May 29 9:30 - 12:00 Hoover

Session Chair: Aled Jones, Atomic Weapons Establishment

9:30 7E-1 (invited) SCALING OF SMP DIODE PERFORMANCE WITH GEOMETRY AND VOLTAGE

M. L. Kiefer¹, M. D. Johnston¹, T. J. Webb¹, J. J. Leckbee¹, T. J. Renk¹, B. V. Oliver¹, M. G. Mazarakis¹, D. S.

Nielsen¹, D. Ziska¹, P. W. Lake¹, N. L. Bennett², R. E. Gignac², C. C. Smith², D. W. Droemer², D. R. Welch³

¹Sandia National Laboratories, Albuquerque, NM, United States²National Security Technologies, LLC, Las Vegas, NV, United States³Voss Scientific, LLC, Albuquerque, NM, United States

10:00 7E-2 IMPEDANCE BEHAVIOR IN THE SELF-MAGNETIC PINCH (SMP) DIODE ON THE RITS-6 ACCELERATOR

T. J. Renk¹, M. D. Johnston¹, J. J. Leckbee¹, T. J. Webb¹, M. G. Mazarakis¹, M. L. Kiefer¹, N. L. Bennett²

¹Sandia National Laboratories, Albuquerque, NM, United States²National Security Technologies, LLC, Las Vegas, NV, United States

10:15 7E-3 POWER FLOW MEASUREMENTS IN A SMALL DIAMETER MAGNETICALLY-INSULATED TRANSMISSION LINE FOR FLASH RADIOGRAPHY*

J. C. Zier¹, D. D. Hinshelwood¹, C. Boyer², G. Cooperstein³, J. W. Schumer¹, S. B. Swanekamp¹

¹Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States²Engility Corporation, Chantilly, VA, United States³Independent Contractor, Engility Corporation, Chantilly, VA, United States

10:30 7E-4 PLASMA DYNAMICS IN THE SELF-MAGNETIC-PINCH DIODE

N. L. Bennett¹, M. D. Crane¹, C. C. Smith¹, D. W. Droemer¹, D. R. Welch², M. D. Johnston³, J. J. Leckbee³, M. G. Mazarakis³, M. L. Keifer³, T. J. Renk³, T. J. Webb³

¹National Security Technologies, LLC, Las Vegas, NV, United States²Voss Scientific, LLC, Albuquerque, NM, US³Sandia National Laboratories, Albuquerque, NM, US

10:45 7E-5 DIRECT MEASUREMENT OF THE BI-POLAR ION CURRENT AND ANODE-CATHODE (A-K) VOLTAGE IN A SELF-MAGNETIC PINCH (SMP) DIODE.*

M. G. Mazarakis¹, S. R. Cordova¹, M. E. Cuneo¹, M. D. Johnston¹, M. L. Kiefer¹, J. J. Leckbee¹, D. S. Nielsen¹, B. V. Oliver¹, T. J. Renk¹, M. Sceiford¹, T. J. Webb¹, D. Ziska¹, S. C. Simpson¹, N. Bennett², M. D. Crain², D. W. Droemer², R. E. Cignac², G. A. Lare², I. Molina², D. R. Welch³, T. M. Romero³, C. C. Smith², F. L. Wilkins²

¹1656, Sandia National Laboratories, Albuquerque, NM, United States²National Security Technologies, LLC, Las Vegas, NV 89193, United States³Voss Scientific, LLC, Albuquerque, NM 87108, United States

11:00 7E-6 EXPERIMENTS WITH CYLINDRICAL REFLEX TRIODES CONNECTED IN SERIES

B. V. Weber¹, E. C. Featherstone², D. G. Phipps¹, R. J. Commiss¹

¹Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States²Engility Corp, Chantilly, VA, United States

11:15 7E-7 ELECTRIC CHARACTERISTICS OF HIGH-CURRENT SELF-MAGNETIC PINCH DIODE OF PULSED ELECTRON ACCELERATOR "GAMMA-1"

K. V. Strabykin, N. V. Zavyalov, V. S. Gordeev, V. T. Punin, A. V. Grishin, S. T. Nazarenko, V. S. Pavlov, V. A. Demanov, D. A. Kalashnikov, A. V. Kozachek, S. Y. Puchagin, M. A. Moisejevskikh, D. O. Mansurov, B. P. Mironychev, R. A. Mayorov, V. L. Mayornikova

RFNC-VNIIEF, Sarov, Nizhny Novgorod region, Russian Federation

**11:30 7E-8 STUDY OF THE HOMOGENEITY OF AN ELECTRON BEAM USING CERENKOV EMISSION**

K. Pepitone, J. Gardelle, P. Modin

CEA/CESTA, Le Barp, France

11:45 7E-9 DEVELOPMENT OF AN INTENSE ION-BEAM SOURCE FOR SIMULATING COLD-X-RAY INDUCED EFFECTS IN MATERIALS

D. D. Hinshelwood¹, G. Cooperstein², D. Mosher², D. G. Phipps¹, S. J. Stephanakis², G. L. Paderewski³, M. T. Lynch³, G. C. Williams³, R. H. Burrell⁴, C. L. Seymour⁴

¹Naval Research Lab, Washington, DC, United States ²Consultant to NRL through Engility, Chantilly, VA, United States ³Exelis Inc., Colorado Springs, CO, United States ⁴Atomic Weapons Establishment, Aldermaston, United Kingdom

Session 7F: Computational Physics and Techniques II

Thursday, May 29 9:30 - 12:00 Coolidge

Session Chair: Kim Nichols, University of New Mexico

9:30 7F-1 (invited) STUDY OF NON-MAXWELLIAN ELECTRON ENERGY DISTRIBUTION FUNCTIONS FOR AN OXYGEN DISCHARGE

D. A. Tonelli¹, R. S. Pessoa², M. Roberto¹

¹Physics Department, Technological Institute of Aeronautics, Sao Jose dos Campos, SP, Brazil ²Institute of Research and Development, Paraiba Valley University, Sao Jose dos Campos, SP, Brazil

10:00 7F-2 SIMULATION OF A PHASE CONTROLLED MAGNETRON USING A MODULATED, ADDRESSABLE CATHODE

J. Browning¹, S. Fernandez-Gutierrez¹, D. Smithe², M. -C. Lin², J. Watrous³

¹Electrical Engineering, Boise State University, Boise, ID, United States ²TechX, Boulder, CO, United States ³TechFlow, Albuquerque, NM, United States

10:15 7F-3 A FLAT PANEL DETECTOR

P. Zhang¹, Y. Tu¹, L. Yang¹, H. Tolner¹, W. Zhang²

¹School of Electronic Science and Engineering, Southeast University, Nanjing, China ²China Star Optoelectronics Technology Co., Ltd., Shenzhen, China

10:30 7F-4 COLD TEST OF GYROTRON CAVITY MODES USING A 3D CFDTD METHOD

M. C. Lin¹, D. N. Smithe¹, E. Choi², K. R. Chu³, W. C. Guss⁴, R. J. Temkin⁴

¹Beams Interaction Group, Tech-X Corporation, Boulder, CO, United States ²School of Electrical and Computer Engineering, Ulsan National Institute of Science and Technology, Ulsan, Korea ³Department of Physics, National Taiwan University, Taipei, Taiwan ⁴Department of Physics and the Plasma Science and Fusion Center, Massachusetts Institute of Technology, Cambridge, MA, United States

10:45 7F-5 OPTIMIZATION TO IMPROVE COUPLING TO PHOTONIC CRYSTAL DIELECTRIC ACCELERATOR STRUCTURES

G. R. Werner¹, J. R. Cary^{1,2}

¹Center for Integrated Plasma Studies, University of Colorado, Boulder, CO, United States ²Tech-X Corp., Boulder, CO, United States

11:00 7F-6 RELATIVISTIC MODELING CAPABILITIES IN PERSEUS EXTENDED MHD SIMULATION CODE FOR HED PLASMAS

N. D. Hamlin, C. E. Seyler

School of Electrical and Computer Engineering, Cornell University, Ithaca, NY, United States



11:15 7F-7 SIMULATION OF CATHODE PLASMA EXPANSION IN MAGNETICALLY-INSULATED TRANSMISSION LINES

C. H. Thoma, T. C. Genoni, D. R. Welch

Voss Scientific, LLC, Albuquerque, NM, United States

11:30 7F-8 THE CONFORMAL PARTICLE-IN-CELL SIMULATION OF THE ECCENTRIC COAXIAL MAGNETICALLY INSULATED TRANSMISSION LINE

H. Wang, Y. Li, W. Luo, C. Liu

Xi'an Jiaotong University, Xi'an, China

11:45 7F-9 USING THE HIGDON OPERATOR FOR THE DUAL PHASE VELOCITY BOUNDARY AND THE SIMULATION OF INTERMODULATION

L. D. Ludeking, A. J. Woods

Alliant Techsystem, LLC, Newington, VA, United States



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2:00 p.m. – 5:00 p.m. Truman Room

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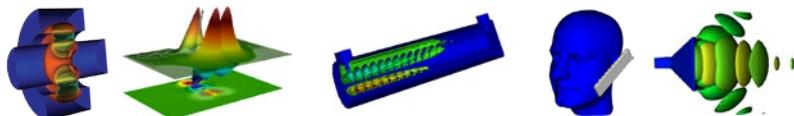
Coffee and snacks will be served.



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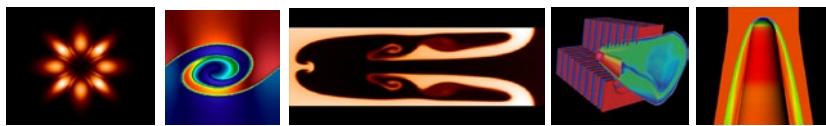
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