The 71st Gaseous Electronics Conference (GEC)
November 5-9, 2018
in Portland, Oregon

Final Announcement

Early Registration Ends September 21

Register Today! See details at
http://www.apsgec.org/gec2018

GENERAL INFORMATION

- The 2018 GEC continues its tradition of offering an outstanding venue for leading research in low-temperature plasma and collision physics.
- The 2018 GEC meeting will co-locate with the 60th annual meeting of the American Physical Society's Division of Plasma Physics (DPP).
- DPP co-location adds the dimension of high-temperature plasma science and novel plasma applications.

Over 2300 attendees expected at combined events!

GEC is a special meeting of the Atomic, Molecular, and Optical Physics Division of the American Physical Society. The GEC enables invaluable exchange of scientific information, viewpoints, ideas, and methods (experimental, theoretical, and simulation) regarding particle collision dynamics and the physical and chemical processes occurring in partially ionized, collisional plasmas. The GEC is a leading venue for reporting on emerging areas of plasma processing, plasma-biotechnology, plasma medicine, plasma-metal catalysis, & atmospheric-pressure plasma systems.

TOPICS

1. Atomic and molecular processes
1.1 Electron and photon collisions with atoms and molecules: excitation
1.2 Electron and photon collisions with atoms and molecules: ionization
1.3 Heavy particle collisions
1.4 Dissociation, recombination, and attachment
1.5 Distribution functions and transport coefficients for electrons and ions
1.6 Other atomic/molecular collision phenomena

2. Plasma science
2.1 Non-equilibrium kinetics of low-temp plasmas
2.2 Basic phenomena in low-temp plasmas
2.3 Boundaries: sheaths, double layers, others
2.4 Gas phase plasma chemistry
2.5 Plasma-surface interactions
2.6 Plasma diagnostic techniques
2.7 Plasma modeling and simulation
2.8 Glows: DC, pulsed, microwave, others
2.9 Capacitively coupled plasmas
2.10 Inductively coupled plasmas
2.11 Magnetically-enhanced plasmas: ECR, helicon, magnetron, others
2.12 High pressure discharges: dielectric barrier discharges, coronas, breakdown, sparks
2.13 Microdischarges: DC, RF, microwave
2.14 Thermal plasmas: arcs, jets, switches, others
2.15 Plasmas in liquids
2.16 Negative-ion/dust particle-containing plasma
2.17 Other plasma science topics

3 Plasma applications
3.1 Plasmas for light production: laser media, glows, arcs, flat panels, and novel sources
3.2 Plasma etching
3.3 Plasma deposition
3.4 Plasma ion implantation
3.5 Green plasma technologies: environmental and energy applications
3.6 Photovoltaic-application plasma processing
3.7 Biological/biomedical applications of plasma
3.8 Plasma propulsion and aerodynamics
3.9 Plasma nanotechnology, flexible electronics and other emerging applications

PROGRAM

- Oral sessions (invited and contributed papers)
- Poster sessions
- Will Allis Prize Talk
- Plasma Data Exchange Project and LXCat
- Two "Town Hall" meetings
- A luncheon for Women in Plasma Physics
- Student Awards
- Two-Day MOOSE Workshop on Sunday & Monday
- High Performance Computing for Plasma Applications Workshop on Monday
- Plasma Diagnostics Workshop on Monday
- Special US federal agency session

See the program section of GEC website for more details!

CONTRIBUTED PAPERS

- Contributed papers will be presented as 15-min oral talks or as posters.
- Posters to be presented on poster boards 4ft high x 8ft wide

ABSTRACTS BOOK & CONFERENCE APP

Go Green: An online version of the full scientific program will be available on the conference mobile app, the APS website and on the GEC website. In accord with the DPP meeting, there will be no printed bulletin available. However, a pocket epitome will be provided.

INVITED SPEAKERS AND TITLES/TOPICS (For more details go to http://meetings.aps.org/Meeting/GEC18/APS_Invited)

Peter Awakowicz	Volatile organic compound-treatment in air with a surface dielectric barrier discharge array
Scott Baalrud	Electron Sheaths and Fireballs
Natalia Babaeva	Interaction of atmospheric pressure plasmas with dielectric and biological surfaces
Franz Xaver Bronold	Electron kinetics at the plasma-solid interface
Peter Bruggeman	Plasma-liquid interactions: towards a quantitative description of reactivity transfer?
Jane Chang	Plasma Processing of Functionally Enhanced Complex Material Systems at the Atomic Scale
Robin Cote	Tuning charge transfer between heavy partners at low scattering energies
Bruno deHarak	Dressing effects in laser assisted inelastic electron-atom scattering
Samantha Fonseca	Simplified approach to dissociation of polyatomic molecules by electron impact
Matthew Goeckner	The complex physics of pulsed and level-to-level discharges
Jon Tomas Gudmundsson	Electron heating in electronegative capacitively coupled discharge of complex chemistry
Gerjan Hagelaar	Fluid modeling of transport and instabilities in magnetized plasma sources
Kentaro Hara	Quasineutral plasma modeling of low-frequency oscillations in cross-field discharge plasmas: breathing mode and rotating spokes
Allison Harris	Angular Momentum in Electron-Helium Collisions
Masaru Izawa	Surface reaction control of plasma etch for atomic level accuracy in ULSI devices fabrication
Alisher Kadyrov	Quantum suppression of antihydrogen formation in positronium-antiproton collisions
Trevor Lafleur	Modelling of kinetic instabilities in low-temperature plasmas
Ningyu Liu	The Role of Streamers in the Initiation of Electrical Discharges in the Earth's Atmosphere
Joshua Machacek	Positron Scattering from Large Molecules
Deborah O'Connell	Activation of stem cell identity by low temperature plasma in primary prostate cells
David Pai	Plasma-fluid and plasma-surface interactions of nanosecond pulsed plasmas
Leanne Pitchford	Solving the Boltzmann equation for electrons in weakly ionized gases
Sylwia Ptasinska	Dissociative Electron Attachment to Gas-Phase Molecules
Yevgeny Raitses	Towards understanding of plasma-based synthesis of carbon nanomaterials
Seiji Samukawa	Atomic Layer Defect-free Etching and Deposition Processes for future sub-10-nm devices
Thomas Schlathoelter	Gas-phase interactions of fast ions and soft X-ray photons with DNA
Steven Shannon	Expanding the Functionality of Plasma Diagnostics
Daniel Slaughter	Dissociative electron attachment dynamics in polyatomic gases
Ana Sobota	Electric fields and electron properties in non-thermal atmospheric pressure plasmas in contact with different targets
Masahiko Takahashi	Towards Visualizing the Driving Principle of a Photochemical Reaction by Means of Time-Resolved Electron and Atomic Momentum Spectroscopies
Giichiro Uchida	Studies on selective production of RONS in the plasma-treated water and interaction between the plasma and amino acids
Scott Walton	Electron beam generated plasma as a low Te approach to atomic-precision processing

NON-TECHNICAL MEETINGS

Event details are available at http://apsgec.org/gec2018/non_tech_events.php

- Women in Plasma Physics Luncheon
- Town Hall: APS DPP Committee on Concerns of Junior Scientists (COJS)
- Town Hall: The National Academies' Decadal Assessment of Plasma Science

FEDERAL PERSPECTIVES ON THE FUTURE OF PLASMA SCIENCE

Representatives from NSF, DOE/FES and AFOSR will present their perspectives on the future of US plasma science research.

GEC WELCOME RECEPTION

The GEC will host a Welcome Reception on Monday, November 5 at the Doubletree Hotel in the Lloyd Center Ballroom. Early registration fee (registration by September 21) includes the welcome reception. Late registration fee (if registered after September 21) will only include the welcome reception as remaining space permits. Register early so you do not miss out on a very valuable networking opportunity!

GEC BANQUET

The GEC annual banquet will be at the Portland Art Museum on Thursday November 8. A ticket purchase is required to attend, which is not included with GEC registration but can be purchased by GEC registrants for $50. Additional Banquet tickets for companions or DPP associates can be purchased by a GEC registrant for $75 during early registration period or for $95 during late registration period as space permits. See the GEC website for more details and directions to the event. You will want to be there!

GEC STUDENT POSTER PRIZES

Application deadline is November 5, 2018.

Three student posters will be selected by the GEC 2018 Student-Poster Prize Committee and recognized at the conference dinner. The GEC gratefully acknowledges the contributions made by students.

To be eligible for the award:

- The student must present a poster as first author.
- Register for the poster judging before the application deadline.

More than one student from the same advisor may apply. At most one student per advisor will be awarded this prize.

The student application should contain:

- The title of the student's abstract.
- The name of the supervisor.

Student applications are to be emailed to Dr. Aranka Derzsi (derzsiaranka@gmail.com), chair of GEC 2018 Student-Poster Prize Committee before Monday 12:00 noon, 5 November 2018.

Members of the GEC 2018 Student-Poster Prize Committee will review the posters and select the award recipients.

CALL FOR INVITED SPEAKER RECOMENDATIONS

The GEC Executive Committee is soliciting recommendations for invited speakers for the 2019 conference from GEC members. A member can recommend a person to present an invited talk by filling out the online form available at https://ultron.aps.org/forms/aps.cgi?id=1400.

Although more than one submission is allowed, please be judicious if you make multiple recommendations. On the online form you can supply supporting information. A compelling recommendation, with additional references, will have a greater impact on the selection of invited speakers. At the Portland conference the GEC Executive Committee will consider the recommendations for the GEC 2019 list of invited speakers. We will consider recommendations submitted to the online form by Tuesday, November 6, 23:59 Eastern Standard Time.

ENJOY PORTLAND!

Portland is an eclectic city with a walkable downtown, a vibrant "food cart" culture, and a wide selection of microbreweries, coffee shops, restaurants, and book stores. The city is surrounded by the breathtaking beauty of the Pacific Northwest, Mount Hood, and the sparkling Willamette and Columbia Rivers. The city is rich in US frontier history. Visit https://www.travelportland.com/ or go to the GEC website for restaurant suggestions, things to do and more city details.

CHANGES to GEC CONSTITUTION AND BYLAWS

The GEC Executive Committee Chair Tom Kirchner is introducing several amendments to the constitution and bylaws of the GEC. Following Article IV of the constitution the proposed amendments to the constitution were submitted in writing to the GEC Secretary Douglas Keil before the abstract submission deadline of June 15, 2018 and were endorsed by 16 members of the GEC. The proposed amendments will be presented at the Business Meeting on November 7, 2018 for consideration. As per Article X, the proposed bylaw amendment was voted on by the Executive Committee. It will also be presented to the members at the Business Meeting for approval. More information and text for the present and proposed GEC Constitution and Bylaws are available at
http://apsgec.org/gec2018/nominations.php

LXCat DISCUSSION

Emile Carbone and Jan van Dijk Presiding

LXCat (www.lxcat.net) is an open-access, web-based platform for storing, exchanging, and manipulating data needed for the electron and ion components in cold, non-equilibrium plasmas. Following an already long tradition, the GEC committee has accepted once more to host an evening workshop for the users of the LXCat databases and contributors.

Recent evolution of the LXCat databases and organization will be briefly introduced together with a brief tutorial on “how to use LXCat”. The meeting aims to be highly interactive with young researchers being strongly encouraged to make a pitch presentation of their current data needs.

PLASMA DIAGNOSTICS WORKSHOP

Organized by Peter Bruggeman

This workshop will bring together scientists interested in plasma diagnostics with an aim to exchange best practices and new developments. The morning session consists of 4 invited tutorial presentations aimed at junior researchers or researchers new to plasma diagnostics. The presentations in the afternoon session will focus on recent new developments in plasma diagnostics.

- Optical Diagnostics (R. Miles)
- Molecular Beam Mass Spectrometry (J. Benedikt)
- In Situ Surface Diagnostics (V. Donnelly)
- Electrical Probe Measurements (N. Braithwaite)
- In-situ optical diagnostics to understand plasma-surface interactions during atomic layer processing of Si-based dielectrics (S. Agarwal)
- Electrical Measurements in Pulsed Plasmas (T. Huiskamp)
- Diagnostics of Plasma-Liquid Interactions (K. Sasaki)
- In Situ Approaches for Diagnostics of Nanoparticles in Plasmas (S. Yatom)
- Coherent and Incoherent Thomson Scattering in Low-Temperature Plasmas (S. Tsikata)
- Terahertz Diagnostics for Electron Density Measurement (U. Czarnetzki)

HIGH PERFORMANCE COMPUTING FOR PLASMA APPLICATIONS WORKSHOP

Organized by Igor Kaganovich

This workshop on High Performance Computing (HPC) for Plasma Applications will bring together scientists from GEC and DPP communities with the aim to exchange best ideas and practices on how to use HPC for plasma applications. Each talk will review and summarize recent advances in HPC for a specific topic and outline most promising future directions.

- Future of High Performance Particle-in-cell codes computing (J. Carlsson)
- Efficient use of GPUs in PIC and associated issues
- (P. Messmer)
- 3D Fluid simulations of discharges (G. Hagelaar)
- 3D Fluid simulations of arcs (M. Benilov)
- Atomistic simulations of plasma-surface interaction for ALD and ALE processes (S. Hamagushi)
- Dataset for cross sections (J. Tennyson)
- Mullti-scale methods for plasma chemistry (D. Curreli)
- Update on Code Validations and Verification (M. Turner)
- Laser plasma interaction (J.L. Vay)
- MFE HPC PIC (CS Chang)
- PSI modeling (Longtao Han)
- Adaptive Kinetic – Vlasov methods (V. Kolobov)

MULTI-PHYSICS OBJECT ORIENTED SIMULATION ENVIORONMENT (MOOSE) Workshop

Organized by Steven Shannon

This two day hands-on workshop is an introduction to plasma simulation in the open source Multi-Physics Object Oriented Simulation Environment (MOOSE). Attendees will be guided through the MOOSE capabilities through selected plasma simulation test cases that will illustrate capabilities with regard to chemistry formation, fluid models, plasma-surface interactions, and electromagnetics. At the completion of the workshop attendees will be able to install and run MOOSE and associated applications as well as carry out plasma simulations studies. Attendees will carry out simulations on their own laptop computers under the guidance of instructors from the MOOSE development team.

WILL ALLIS PRIZE

A must-see presentation – The Will Allis Prize talk!

Will Allis Prize Speaker: Leanne Pitchford
CNRS & Université Toulouse III - Paul Sabatier

TRANSPORTATION

Portland's international Airport (PDX) has been ranked as one of America's best domestic airports with its friendly customer service, free WIFI, and convenient layout. Ground transport and car rentals are available at the Portland airport (PDX). However, most travelers will find the Metropolitan Area Express (MAX) light rail to be the best choice. The MAX Redline departs from PDX with stops in front of the GEC conference hotel, and the heart of the Portland city center. PDX airport. See the GEC website for more travel details and a step-by-step guide for MAX travel from PDX to the GEC Hotel. (http://flypdx.com/PDX).

HOTEL ACCOMMODATIONS

DoubleTree by Hilton Portland
1000 NE Multnomah
Portland, OR 97232
Telephone 503-331-4916

- $166.00 per night, plus taxes
- $149.00 Government Rate
- Hotel reservations are open, visit the GEC website for more details

CONFERENCE MANAGEMENT

Lynda Lauria
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EXECUTIVE COMMITTEE

Chair: *T. Kirchner*, York U
Secretary: *D. Keil*, Lam Research

Secretary Elect: *D. Staack*, Texas A&M
Chair Elect: *E. Barnat*, Sandia Natl. Lab
Past Secretary: *M. Koepke*, West Virginia U
Treasurer: *M. Schulz*, Missouri S&T
DAMOP: *J. Colgan*, Los Alamos Natl. Lab

General Members:
K Stapelmann, North Carolina State U
A. Bourdon, Ecole Polytechnique
F. Tochikubo, Tokyo Metropolitan U
J. Schulze, Ruhr U. Bochum /West Virg. U

Appointed Members:
A. Wendt, U of Wisconsin
K. Bera, Applied Materials

STUDENT AWARD CHAIRS

J. Schulze, Ruhr U. – Bochum / WVU
K. Stapelmann, North Carolina State U.
A. Derzsi, W. Virginia U. / Wigner RCP

CONFERENCE VENUE

The Oregon Convention Center
Co-Located with the APS Division of Plasma Physics Meeting

Portland Waterfront Area

71st Annual GEC - Portland, Oregon

November 5 – 9, 2018

http://www.apsgec.org/gec2018/

DATES TO REMEMBER

September 21: Early registration ends.
October 15: Hotel reservation cut-off date
October 26: Last day for paper pre-registration.
November 2: Last day for online pre-registration

See the GEC website for meeting registration. the student-poster award nomination process. Information and due dates may be found at: http://www.apsgec.org/gec2018/

LOCAL ORGANIZING COMMITTEE

D. Keil (Lam Research)
L. Lauria (Conference Manager)
Y. Sakiyama (Lam Research)
M. Mamunuru (Lam Research)
D. Staak (Texas A&M University)
S. Song (Lam Research)