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

Submit Your Abstract by June 15

Abstract submission details available at http://www.apsgec.org/gec2018/abstracts.php

GENERAL INFORMATION

- The 2018 GEC will continue its tradition of offering a truly outstanding venue for leading research in low-temperature plasma science 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 the 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-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

The Program will include:

- Oral sessions (invited and contributed papers)
- Poster sessions
- Will Allis Prize Talk
- Sunday & Monday Workshops
- Plasma Data Exchange Project and LXCat
- Non-Technical meetings on selected topics
- Student Awards

CONTRIBUTED PAPERS

- Contributed papers will be presented as 15-min oral talks or as posters.
- Authors are requested to submit GEC-style abstracts to the APS website by June 15, 2018.
- Preference for oral or poster should be indicated.

The final decision will be communicated to the corresponding author

ABSTRACTS BOOK & CONFERENCE APP

Go Green: An online version of the full scientific program will be available on the conference mobile app and on the GEC website. A printed version of the bulletin will be available for an additional fee. If you select the printed bulletin option when you register, the fee will be added to your total registration amount, and a hard copy of the bulletin will be included in your registration packet.

WORKSHOPS/SPECIAL SESSIONS

- Two-Day MOOSE Workshop on Sunday & Monday
- High Performance Computing for Plasma Applications Workshop on Monday (*NEW*)
- Plasma Diagnostics Workshop on Monday (*NEW*)
- The Will Allis Prize talk on Wednesday morning
- LXCat discussion on Wednesday
- Non-Technical Programs (*NEW*)

INVITED SPEAKERS AND TENTATIVE TITLES/TOPICS

Peter Awakowicz	Volatile Organic Compound Treatment with Surface DBDs: Basics and Applications
Scott Baalrud	Influence of Positively Biased Electrodes on Plasmas: Electron Sheaths and Fireballs
Natalia Babaeva	Interaction of Atmospheric Pressure Plasmas with Solid and Liquid Surfaces
Franz X. Bronold	Electron Kinetics at Plasma-Solid Interfaces
Peter Bruggeman	Plasma-Liquid Interactions: Towards a Quantitative Description of Reactivity Transfer?
Jane P. 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	Electron-Molecule Collisions
Matthew Goeckner	The 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	Simulation, Transport
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 Scattering
Trevor Lafleur	Modeling of Kinetic Instabilities in Low Temperature Plasmas
Ningyu Liu	The Role of Streamers in the Initiation of Electrical Discharges in the Earth's Atmosphere
Josh Machacek	Positron Scattering from Large Molecules
Deborah O'Connell	Atmospheric Plasmas, Medical Applications
David Pai	Experimental Study of Nanosecond Pulsed Microplasmas Generated in Open Air at Atmospheric Pressure and How They Interact With Flow and Surfaces
Leanne Pitchford	Allis Prize Lecture
Sylwia Ptasinska	Dissociative Electron Attachment to Molecules
Yevgeny Raitses	Atmospheric Pressure Plasmas for Synthesis of Carbon and Boron Nitride Nanotubes
Seiji Samukawa	Neutral Beam Technologies for Atomic Layer Defect-Free Etching and Deposition Processes for Future sub-10-nm Devices
Thomas Schlathoelter	Ion Interactions with Biomolecules
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 Atmospheric Pressure Plasma Jets
Masahiko Takahashi	Towards Visualizing the Driving Principle of a Photochemical Reaction by Means of Time-Resolved Electron and Atomic Momentum Spectroscopies
Giichiro Uchida	Production Control of Reactive Oxygen and Nitrogen Species in Liquid Water by a Nonthermal Plasma Jet
Scott G. Walton	Electron Beam Generated Plasma as a Low Te Approach to Atomic-Precision Processing

STUDENT AWARD FOR EXCELLENCE

Application deadline is June 15, 2018.

To encourage and recognize the important contributions students make to the Gaseous Electronics Conference, specifically, and to the plasma/atomic-molecular optical science fields, in general, the GEC Executive Committee will recognize one (1) student presenter with the **GEC Student Award for Excellence**. Finalists will be announced on the meeting website before the meeting and will present their work between Tuesday, November 6th 2018, and Thursday, November 8th 2018. The student award winner will be announced at the conference dinner Thursday evening. The award consists of cash (US$1,000) and a certificate.

To be eligible for the award, the student must present a contributed talk (not a poster), provide a recommendation letter from the student's research supervisor, a supporting letter from the student, the abstract and submit the application materials **as a single PDF-file** before the abstract-submission deadline. No more than one student may be nominated per supervisor.

The one-page **recommendation letter from the supervisor** should describe the student's creative contribution to the project, the duration of the student's participation in the project, and unique project-related qualifications of the student.

The student application should also contain:

- a copy of the student's **abstract** (plain text or .pdf when submitting via email, please do NOT send raw LaTeX files)
- a one-page **supporting letter from the student** including, among other aspects, a description of the motivation for doing the research, the relevance of the work to plasma/atomic-molecular optical science, a list of all collaborators on the project, and the scope of the student's contribution to the project
- a two-page-maximum **curriculum vitae** of the student, (including educational background, research experience, professional affiliations, publications, patents, presentations, and awards)
- a **one-page recommendation letter from the supervisor**.

Student applications and supervisor recommendation letters are to be emailed as a single PDF-file to Prof. Dr. Julian Schulze (schulze@aept.ruhr-uni-bochum.de), Chair of GEC 2018 Student Awards Committee before 11:59pm (Pacific Daylight Time) 15 June 2018.

The GEC Student Awards Committee will review the nominations and select the finalists for the Student Award for Excellence. Members of the GEC Student Awards Committee will also serve as judges. Judges will attend the finalists' oral presentations and select the award recipient.

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 important contributions students make to the Gaseous Electronics Conference.

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.

STUDENT TRAVEL ASSISTANCE

Application deadline is June 18, 2018.

Student participation has long been a valued element of the GEC, and the Student Travel Grant program was established to enable a greater number of students to attend by defraying associated expenses. Travel Grant nominations are encouraged for students attending the 2018 GEC to make an oral or poster presentation of their research. Awards will include the full cost of conference registration and partial coverage for lodging at the conference hotel. Recipients will be selected from the pool of nominated students by the GEC Student Award committee, and because funds are limited, we request that no more than one nomination be submitted per research group.

Complete nominations will include:

- A letter of support from the student's advisor. The nomination letter should address the following factors to be considered by the selection committee:

  1. The advisor's assessment of the student, including research progress and the benefits to be gained by GEC attendance,

2. Statement of financial need (i.e., would this grant enable attendance for additional students beyond student travel included in research grant budgets)
3. Statement of how the student's participation will contribute to diversity at the GEC.

- A copy of the student's GEC 2018 submitted abstract (plain text or .pdf when submitting via email (please do NOT send raw LaTeX files)

Submit nominations to Prof. Dr. Katharina Stapelmann (kstapel@ncsu.edu) before 11:59pm (Pacific Daylight Time) June 18, 2018.

Please Note:

1. A nomination for a travel grant is separate from all other award nominations.
2. To attain the full benefit of the GEC conference experience, recipients of the travel grant are expected to attend the entire conference.

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

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.
https://www.travelportland.com/

TRANSPORTATION

Ground transportation and car rentals are available at the Portland airport (PDX). However, the Metropolitan Area Express (MAX) light rail is highly recommended. The MAX Redline departs from PDX with stops in front of the GEC conference hotel and at the Portland Convention Center (the GEC conference venue). An additional 15 min ride on the MAX Redline brings you to the heart of the Portland city center. PDX airport has frequently been ranked as one of America's best domestic airports with its friendly customer service, free WIFI, and convenient layout.
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, please visit the GEC website for more details

CONFERENCE MANAGEMENT

Lynda Lauria
GEC2018@yahoo.com

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

June 15, 2018: Abstract submission deadline
October 15, 2018: Hotel reservation cut-off date

See the GEC website for the registration start date, the student-poster/oral award nomination process, and the student-travel-grant program. 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)