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IGACnews

facilitating atmospheric chemistry research towards a sustainable world

issue 71
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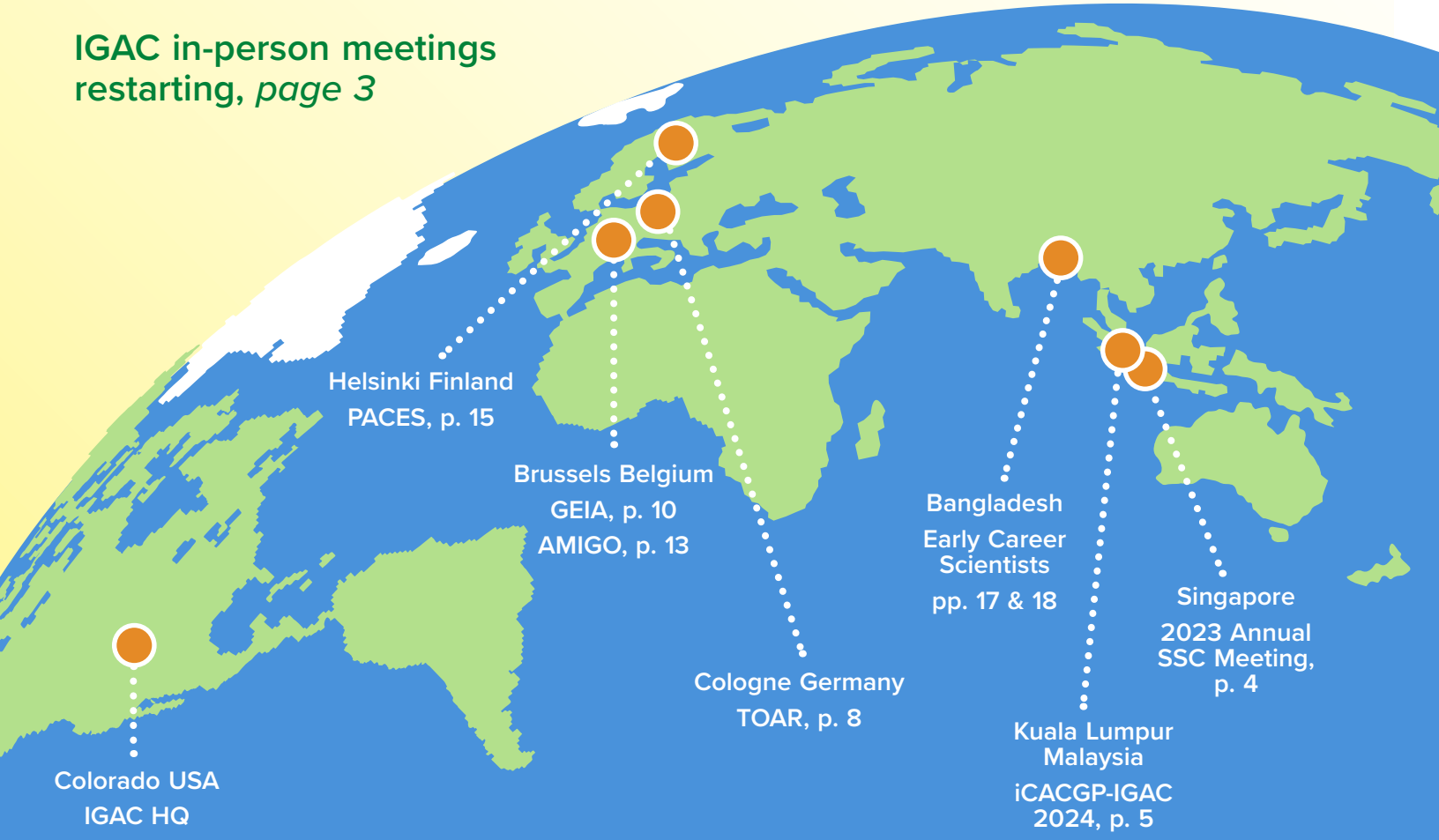
Around the World with IGAC

IGAC in-person meetings restarting, *page 3*



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futureearth
Research. Innovation. Sustainability.

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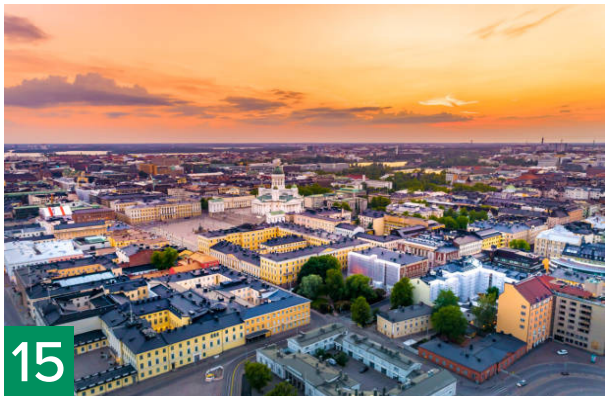


See page 6 for article submission guidelines.

On the Cover

2023 was a busy year for in-person meetings.

Editor: *Langley DeWitt*
Design: *Allison Gray*

IGAC was formed in 1990 to address growing international concern over rapid changes observed in Earth's atmosphere. IGAC operates under the umbrella of Future Earth and is jointly sponsored by the international Commission on Atmospheric Chemistry and Global Pollution (iCACGP). The IGAC International Project Office is hosted by the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado and is sponsored by the US National Science Foundation (NSF), National Oceanic and Atmospheric Association (NOAA), and National Aeronautics and Space Administration (NASA). Any opinions, findings, and conclusions or recommendations expressed in this newsletter are those of the individual author(s) and do not necessarily reflect the views of the responsible funding agencies.

Thoughts from the annual SSC Meeting

The annual in-person IGAC Scientific Steering Committee (SSC) meeting took place in Singapore in late September. While the SSC meets virtually quarterly, the in-person meetings allow uninterrupted time to focus on the mission of IGAC (to 'advance atmospheric chemistry towards a sustainable world'), evaluate the IGAC community's recent contributions and collaborations, consider the evolving picture of global atmospheric chemistry, and set priorities for the following year. This year, the SSC meeting was joined by the two co-chairs of the newly formed early career SSC, Emily Matthews and Maximilien Desservettaz, to bring the perspectives and needs of early career researchers to the SSC discussion.

IGAC prides itself on being a community-driven organization. What we strive to achieve is community and capacity building, leading to advancement in atmospheric chemistry and societal engagement. Meetings and conferences are one way IGAC achieves these goals, and how we communicate in meetings is key to ensure inclusivity. A mix of presentations, small-group discussions, plenary discussions, and **yarning circles** (suggested by IGAC-co-chair Clare Murphy, yarning circles are an indigenous way of communication focused on no interruptions and engaged listening) were used to discuss IGAC business.

I and the SSC hope to continue advancing IGAC in new ways, folding in the fresh ideas of our new early career researcher SSC, and communicating with respect and engagement with the wide IGAC atmospheric chemistry community this next year.

Many people outside of the SSC make IGAC the thriving community that it is. Activity and Working Groups are volunteer-run groups focused on either specific atmospheric chemistry questions that need global coordination to answer, or on regional networking and regional advancement in atmospheric chemistry. Several of these working groups and activities had meetings this year, some for the first time since the pandemic began. You can read more about these meetings here in this IGACNews.

IGAC DIRECTOR
Langley Dewitt facilitates international collaboration on atmospheric chemistry to advance the field towards a sustainable world. She also coordinates regional working groups in areas with a growing field of atmospheric chemistry to develop intraregional networks and connect scientists in these regions to the global scientific community. Langley has worked as a consultant air monitoring specialist for industry in the Houston area, helped establish a climate observatory and air quality monitoring network in Rwanda, and worked on air quality and tropospheric atmospheric chemistry issues in France and the US. Her PhD is from the University of Colorado, Boulder in Analytical and Atmospheric Chemistry, with a focus on astrobiology, and her B.S. is from Furman University in Chemistry and English.

See page 4 for more on the annual SSC meeeting in Singapore

A note from our hosts for the 2023 SSC Meeting!

NUS Environmental Research Institute (NERI) at the NUS, Singapore had the honor of hosting the International Global Atmospheric Chemistry (IGAC) Scientific Steering Committee (SSC) Meeting from 26th to 28th September 2023.

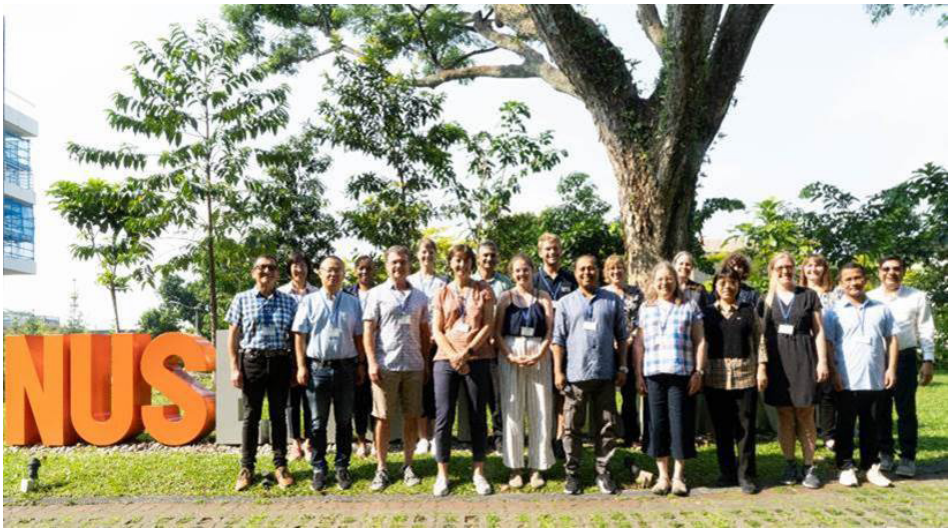
NERI Director, Associate Professor Sanjay Swarup, extended a warm welcome to IGAC Co-Chairs, Clare Murphy and Abdus Salam and IGAC Director, Langley DeWitt, along with other committee members from 12 countries, to NUS and Singapore.

The IGAC's focus on bringing together experts in atmospheric chemistry research to advance knowledge, enhance capacity building, and engage with society well resonates with NERI's commitment to urban atmospheric research. It was a privilege for NERI to host this prestigious event and engage with the IGAC SSC.

Beyond the fruitful discussions at the SSC Meeting, IGAC attendees had the chance to immerse themselves in Singapore's versatile food culture. They savored iconic local hawker delights at Lau Pat Sat and indulged in Peranakan cuisine at a restaurant in Katong offering unique heritage of Singapore.

NERI looks forward to nurturing collaborations with IGAC in the future to extend lasting and memorable positive impression of both NUS and the beautiful city of Singapore.

#Atmospheric#Chemistry#Environment#Collaboration#Sustainability



From left to right: Nestor Rojas, Liya Yu, Lin Du, Andriannah Mbandi, Owen Cooper, Katerina Sindelarova, Lisa Emberson, Sachin Ghude, Emily Matthews, Maximilien Desservettaz, Abdus Salam, Clare Murphy, Louisa Emmons, Rebecca Garland, Mei Zheng, Langley DeWitt, Kerri Pratt, Laura Dawidowski, Mingjin Tang, Sanjay Swarup.

(Back row, left to right) Lisa Emberson, Katerina Sindelarova, Owen Cooper, Abdus Salam, Mingjin Tang, Louisa Emmons, Clare Murphy, Rebecca Garland, Lin Du, Kerri Pratt, Nestor Rojas, Yu Liya
(Front row, left to right) Andriannah Mbandi, Emily Matthews, Vinayak Sinha, Langley DeWitt, Laura Dawidowski, Mei Zheng, Maximilien Desservettaz

iCACGP-IGAC 2024 Atmospheric Chemistry: From Local Knowledge to Global Sustainability

The next iCACGP-IGAC Conference, Atmospheric Chemistry: From Local Knowledge to Global Sustainability, will be held from 9-13 September 2024 in Kuala Lumpur. More information here.

Scientific Program Just Announced!

Session 1: Air Quality Impacts

Co-chairs: Nestor Rojas and Vinayak Sinha

Ambient Field Studies in Non-Urban Areas

Areas and regions of the world that have not been urbanized provide important insights into natural processes and baseline "unpolluted" conditions of the atmosphere. These could be high-altitude remote sites, the Amazon rainforest, the remote marine atmosphere, the upper troposphere, and uninhabited icy cold regions, to name a few. In this sub-session, we welcome submissions that address air quality impacts on health, vegetation, agriculture and natural ecosystems.

Ambient Studies in Urban Areas and Indoor Air Quality

Urban and industrial areas generate most of the anthropogenic pollutant emissions to the atmosphere. They also concentrate on the highest exposure to air pollutants and the health risks associated with ambient and indoor air. In this sub-session, we welcome submissions of novel air pollution studies covering pollutant emission sources, pollutant chemical and physical characteristics, and the consequential effects on human health and the environment in areas influenced by urban and industrial activities and indoor environments. We also welcome studies on the effectiveness of mitigation strategies, policy frameworks, and technological innovations designed to address these challenges.

Session 2: Atmospheric Chemistry: Climate and Weather Impacts on Air Quality

Co-Chairs: Abdus Salam and Owen Cooper

Poor air quality is primarily the result of air pollutant emissions and chemistry, but day-to-day changes in weather patterns, short-term climate variability (e.g. ENSO), and long-term climate change directly impact the intensity and longevity of air pollution episodes. This session will focus on new scientific research that identifies and quantifies the impacts of weather and climate on surface air quality. As surface air quality is also affected by long-range transport and background concentrations of air pollutants, this session will also explore the impacts of weather and climate on air pollution levels in the free troposphere or at remote surface locations.

Session 3: Chemistry Processes and Mechanism Fundamentals

Co-Chairs: Clare Murphy and Hugh Coe

Understanding atmospheric physicochemical processes is pivotal for a quantitative description of its past, current and future composition. This is why this session is inviting curiosity oriented and fundamental contributions that will provide a better understanding of key atmospheric processes from aerosol optics, gas-phase, multiphase and heterogeneous kinetics, new

aerosol formation and transformations, and emerging contaminants and environmental problems. Contributions highlighting novel analytical theoretical and numerical approaches, process model studies and new chemical mechanism development are all welcome.

Session 4: Atmospheric Chemistry in the Changing Earth System

Co-Chairs: Yugo Kanaya, Evelyne Touré, Maheswar Rupakheti

Atmospheric chemical composition is highly impacted by environmental processes involving changes in the Earth surface system (land, oceans, cryosphere, and ecosystems) but also by human activities. In turn, atmospheric chemistry also affects the Earth system.
This session covers recent findings from observational and modeling studies on these interactions and feedbacks. Air pollutants, oxidants, aerosols, precursor gases, and greenhouse gases are all of our interests here. We welcome presentations on 1) emissions from intensified wildfires and their impact, 2) interactions with changing sea/ice/snow/land cover state (deposition, emission, heterogeneous chemistry etc.), including biological gas/aerosol emissions, 3) biogeochemical cycles and feedbacks relevant to climate and environmental change, and 4) coupled human-natural system change relevant to atmospheric chemistry. Interdisciplinary studies relevant to SOLAS (Surface Ocean - Lower Atmosphere Study) and iLEAPS (Integrated Land Ecosystem – Atmosphere Processes Study) projects are also welcomed.

Session 5: Recent Campaigns and New Developments in Observations and Modelling

Co-Chairs: David Tarasick, Nicolas Huneeus

This session aims to facilitate integration of new observations and new analyses in atmospheric chemistry research, which will promote scientific understanding, inspire further investigation and collaboration, identify critical issues and support prediction and decision making for global sustainability. We invite submissions presenting new observations, especially those that challenge current understanding and stimulate further investigation. We welcome contributions discussing the numerical analysis of data from observations and models, model evaluation against observations, data assimilation and application for prediction, and machine learning. All types of observation are in scope, from the surface to the upper atmosphere, across multiple spatial and time scales. We also welcome studies of new methodological development in measurement and theory including physical, chemical, and statistical models.

Session 6: Panel Discussion of Current Challenges and Future directions in Atmospheric Chemistry for sustainable solutions

Co-Chairs: Liya Yu and Rebecca Garland

Panel discussions will provide an opportunity to discuss current and future cross-cutting issues in atmospheric chemistry. Panelists will be invited from all five sessions (listed above), as well as IGAC working groups and activities.

An Early Career Short Course

will be held 6-8 September 2024.

More information to come soon here.

Submit articles to the next IGACnews

IGACnews is always happy to receive relevant journal article summaries, event summaries, perspectives, and other articles from the community. Please email info@igacproject.org *with ideas or for more info.*

Unveiling the Allin Wayra IGAC Activity

Allin-Wayra, which can be interpreted as "good air" or "winds of change" in Quechua (Runasimi, or "people's language") a pre-colonial South American native tongue, is the new IGAC Activity on small sensors.

Our mission is to construct a diverse, inclusive, global community of practice around small sensors. Allin Wayra aims to advance knowledge and responsible use of small sensors in air quality and atmospheric science, with a particular focus on regions lacking air quality measurements. We will also address urgent issues related to small sensors in atmospheric science, foster capacity, and champion accessibility through collaborative initiatives. Find more information **here**.

Get Involved!

In this initial phase of Allin Wayra, we will be looking for input from the community to determine what aspects related to small sensors our actions should focus on. As a first step we would ask you to join our mailing list. We promise not to spam it. In the coming months we will also organize an online consultation with the community to gather input to help shape Allin Wayra. We look forward to discussing with you all, receiving your insights, as well as sharing information on our initiatives and events! So please do join our mailing list.

For more information or to get more involved please reach out to **allin.wayra@igacproject.org.**

ALLIN-WAYRA AT THE 2023 EPA AIR SENSORS WORKSHOP

I recently attended the **2023 Air Sensors Quality Assurance Workshop** (July 25th to 27th. Durham, North Carolina). In a hybrid format, the workshop provided an excellent platform to discuss both advancements and challenges regarding the sensor data quality. In a world where sensors are expanding rapidly, the need for reliable data becomes evident. Over three days, important topics were tackled: from the reliability of sensors in quantifying air pollutants, through strategies to ensure and enhance data quality, to the inherent limitations of sensor data.

This experience was deeply enriching. I had the opportunity to present the vision behind **Allin-Wayra**, and participate in stimulating roundtable discussions. I also heard insightful presentations and showcased a case study on sensor performance across different urban environments. But if there's one thing I want to highlight, it's the value of personal interactions. The opportunity to engage in conversation, debate, and learn directly from experts was undoubtedly the highlight of this experience. I'm confident that these interactions will open the doors to future collaborations.

A key takeaway from this meeting was about the great differences in the needs of the more developed regions compared to those lacking resources. In short, while the more developed regions seem to have a clear grasp of the role of these technologies, many other regions are in the initial stages of capacity building. We aspire that this **new IGAC activity** can contribute to bridging this capability gap, striving to adapt these technologies to the specific needs of each region. Another important point raised during the presentations — which has been under discussion for a long time — was the terminology "Low-Cost Sensors". There was a general consensus that this term might lead to misperception among users. Though the purchasing price might be "low-cost", the cost associated with maintenance, data processing, plus the time dedicated to interpreting the data can easily exceed the initial expectations.

I want to conclude by expressing heartfelt gratitude to the EPA for the invitation and to IGAC for fostering these dialogues and opportunities. I remain optimistic that global collaborations will illuminate the way towards a more informed future in sensor technologies.

— Sebastián Diez. University of York and Universidad del Desarrollo (Chile)

8-10 MARCH 2023
THE METEOROLOGICAL INSTITUTE, UNIVERSITY OF COLOGNE, GERMANY

SPONSORS

JÜLICH Forschungszentrum

IntelliAQ

erc
European Research Council
Established by the European Commission

Universität zu Köln

The TOAR-II Community held its first hybrid workshop

TOAR-II Community hybrid worshop In-person participants.

Almost 50 people from 13 countries met in person in Cologne for the first time to discuss progress and plan ahead for the TOAR-II initiative. Up to 35 additional people joined the meeting online. Day 1 featured an impressive 21 presentations on draft manuscripts or paper plans from the 16 focus working groups that have been established to cover the manifold aspects related to tropospheric ozone processes, its global distribution and trends. The working groups were then given the opportunity to advance their plannings in two rounds of breakout groups. The launch of the first TOAR-II series of publications, the Community Special Issue, was announced. This is an inter-journal special issue (SI) featured by Copernicus with Atmospheric Chemistry and Physics as lead journal, but possibilities to submit manuscripts to several other Copernicus journals as well and link them to the SI. The SI accepts submissions until 30 April 2024.

On the second day, the focus was placed on cross-cutting science topics and identification of science aspects that may be missing from the planned second tropospheric ozone assessment. In particular, there was larger interest expressed in analyzing the impacts of the recent Covid lockdowns on global ozone air quality, the impact and variability of forest and savanna fire emissions, and

TOAR tropospheric ozone assessment report Phase II

the identification of various chemical regimes. Furthermore, it was noted that several ozone precursors on top of those identified for the TOAR-II data collection could be relevant in the future analyses and it was suggested to compile a summary of field campaign data to fill some of the remaining spatial gaps.

The third day provided a first glimpse of the structure and procedures that the steering committee envisions for the actual assessment report to be written in 2024. This is still in the planning stage, but a few cornerstones have been laid out already. The assessment shall be published in a journal that allows the editors to invite contributed papers. It will consist of updates of the three core papers on health, vegetation, and climate impacts and a few additional papers that need to be identified in a discussion between prospective authors and the steering committee. Among others, it is also envisioned to produce specific regional assessment papers for those regions that have less measurement sites compared to the three core regions of Europe, East Asia, and North America.

If you have recently published an IGAC-relevant article and wish for it to be highlighted in IGACnews, please submit the citation to **info@igacproject.org**

IGAC ON SOCIAL MEDIA

IGAC is on LinkedIn, Twitter and Facebook in an effort to further advance international scientific cooperation and serve as a resource to the public, especially you. Please join us to stay apprised of the most current news on conferences, workshops and publications. Let us hear from you on how to improve the international conversation, **@IGACProject**.

events

21-23 JUNE 2023
ROYAL MUSEUMS OF FINE ARTS OF BELGIUM, BRUSSELS

AUTHORS

Cathy Liousse, Laboratoire d'Aérologie, Université de Toulouse, CNRS, UPS, Toulouse, France

Brian McDonald, National Oceanic and Atmospheric Administration (NOAA), USA

Paulette Middleton, Panorama Pathways, USA

Claire Granier, (1) Laboratoire d'Aérologie, Université de Toulouse, CNRS, UPS, Toulouse, France; (2) NOAA Chemical Sciences Laboratory, Boulder, Colorado, USA and (3) CIRES, University of Colorado Boulder, Boulder, Colorado, USA

Trissevgeni Stavrakou, Belgian Institute for Space Aeronomy, Belgium

HOST INSTITUTIONS

Royal Museums of Fine Arts of Belgium

FUNDING

PARTICIPANTS

Argentina, Austria, Bangladesh, Belgium, Brazil, Canada, Chile, China, Colombia, Czech Republic, Denmark, Egypt, France, Germany, Greece, India, Italy, Ivory Coast, Japan, Kenya, Mexico, Netherlands, Norway, Portugal, South Korea, Spain, Sweden, Switzerland, Thailand, United Kingdom, United States.

BACKGROUND

IGAC financially sponsored this conference as part of its ongoing support of the Global Emissions Initiative (GEIA), an IGAC activity. GEIA was established in 1990 to provide emissions data and information to the scientific and stakeholder communities.

20th GEIA Conference - Towards mitigating air pollutant and greenhouse gas emissions

20th GEIA Conference Participants

The 20th international conference of the GEIA program (Global Emissions InItiAtive) was held in Brussels, Belgium, bringing together 153 researchers, including 62 young researchers, from 31 countries.

The international GEIA program includes researchers working on the science of emissions — a gateway to studies of air quality, health and climate change. The main goals of GEIA are (1) Promoting broad and consistent access to emissions information, (2) Building the scientific basis for emissions data by enhancing analysis of emissions processes and (3) Strengthening the community of emissions stakeholder groups.

The 20th GEIA conference,"Towards the reduction of emissions of air pollutants and greenhouse gases", included four themes: (1) Anthropogenic and natural emissions from local to global, (2) Top-down Emissions & Satellite Analyses, (3) Integrated studies of air pollutant and greenhouse gas emissions, and (4) Mitigation efforts including real world examples.

A special session was dedicated to discussion on GEIA Working Groups with updates, opportunities and next steps. A Town Hall breakout session invited participants to contribute to a lively interactive discussion of how GEIA can

Brussels, Belgium

best support decision making processes and how we can best organise ourselves to support mitigation of air pollution and greenhouse gases. Finally, a demonstration of ECCAD website (the GEIA portal providing data access and tools for data analysis) was provided showing the emerging capabilities for displaying and analyzing emissions data.

With 32 oral presentations and 112 posters, the conference was rich in information, innovative scientific results, debates and perspectives. Two poster prizes were awarded to Megan He (Yale University) and Glenn-Michael Oomen (BIRA-IASB), who are both early career scientists. The conference highlighted the intense GEIA activities on developments of bottom-up global/national/regional anthropogenic emission inventories, a growing interest in both biogenic and anthropogenic urban emission inventories and a few innovative emission studies on less-known pollutants and sources. The conference also brought into focus these needs: to constrain emissions through modeling, better characterize source emissions from measurements, and continue to reduce emissions uncertainties.

The conference showed an increasing number of "top-down" emissions studies since the last GEIA conference, in part thanks to the coordination of the conference with the AMIGO IGAC activity workshop. These presentations and posters demonstrated the promise of satellite-inferred emissions as a check on bottom-up emission inventories. The conference underlined the importance of recognizing challenges related to satellite observation and model errors when inferring emissions. A future goal is to move towards multi-species / sectoral emissions inversions especially with next-generation geostationary observations.

The conference also pointed out the interest of GEIA to develop integrated studies of air pollutants and greenhouse gas emissions. With a good spread in research across continents, the presenting studies showed

Poster prize winners: Megan He (Yale University, top) and Glenn-Michael Oomen (BIRA-IASB, bottom).

how the multispecies analysis can be beneficial for quantifying AQ / GHG co-benefits, the inference of fossil CO_2, and source attribution. The integrated emission inventories provide potential for mitigation, and baselines for predictions and projections.

An important question raised deals with the responsibility of scientists to engage with stakeholders. The last theme of the conference presented GEIA community mitigation efforts: the need of better targeting and documenting the different sectors of activities and their relative emissions as a first step for possible mitigations; the development of mitigation tools to support efficient mitigation strategy design; and estimates of mitigation actions' impacts on air quality, health and climate.

In the years ahead, GEIA will continue its mission to improve emissions understanding in dealing with issues around megacity air pollution, regional and international air quality, and long-term climate change. The GEIA working groups, central to addressing these challenges, will be expanding to better incorporate regional (Asia, Africa, Latin America/Caribbean) and urban analyses.

More details of the Conference findings can be found in the presentations and other materials from the meeting, available at **geiacenter.org.**

19-20 JUNE 2023
ROYAL METEOROLOGICAL INSTITUTE & ROYAL BELGIAN INSTITUTE FOR SPACE AERONOMY, BRUSSELS, BELGIUM

IGAC Sponsored

AMIGO Training workshop: Atmospheric Chemistry Modeling, Data Assimilation, Inverse Modeling and Model Evaluation

AUTHORS

Jenny Stavrakou, Royal Belgian Institute for Space Aeronomy

Claire Granier, Laboratoire d'Aerologie, CNRS, UPS, Toulouse, France and NOAA Chemical Sciences Laboratory/ CIRES, University of Colorado Boulder, Boulder, Colorado, USA

Avelino Arellano, University of Arizona, Tucson, Arizona, USA

Dylan Jones, University of Toronto, Toronto, Ontario, Canada

Kazuyuki Miyazaki, Jet Propulsion Laboratory, Pasadena, California, USA

HOST INSTITUTIONS

Belgian Climate Centre

FUNDING

PARTICIPANTS

Argentina, Bangladesh, Belgium, Brazil, Canada, Chile, Colombia, Czech Republic, France, Germany, Greece, India, Italy, Kenya, Netherlands, Portugal, Spain, Sweden, United Kingdom, United States.

BACKGROUND

The AMIGO (Analysis of eMIssions using Observations) project is sponsored by IGAC. AMIGO is a recent IGAC project which aims at gathering the international scientific community around syntheses of research using observations-based analysis techniques with the purpose of better quantifying emissions for a variety of trace gases and at different spatio-temporal scales. AMIGO also organizes training activities on topics related to modeling and the analysis of observations.

Participants of the AMIGO workshop in Brussels in June 2023

The AMIGO training workshop on atmospheric chemistry modeling, data assimilation, inverse modeling and model evaluation took place at the Royal Meteorological Institute and the Royal Belgian Institute for Space Aeronomy in Brussels, Belgium on June 19-20, 2023. This workshop took place just before the 20th GEIA international conference on emissions. The local organizers were Jenny Stavrakou, Yasmine Sfendla and the colleagues from the Tropospheric Chemistry research group at

The lectures were organized around the themes of AMIGO (Analysis of eMIssions using Observations), a rather new project of IGAC which aims at gathering the international scientific community around syntheses of research using observations-based analysis techniques to better quantify emissions for a variety of trace gases and at different spatio-temporal scales.

the Royal Belgian Institute for Space Aeronomy (**https://tropo.aeronomie.be/**)

The workshop was attended by 47 scientists (mostly early career scientists) and PhD students, and 13 lecturers and organizers. The attendees came from several world countries, i.e. Argentina, Bangladesh, Belgium, Brazil, Canada, Chile, Colombia, Czech Republic, France, Germany, Greece, India, Italy, Kenya, Netherlands, Portugal, Spain, Sweden, United Kingdom, United States.

The lectures were organized around the themes of AMIGO (Analysis of eMIssions using Observations: **https://amigo.aeronomie.be/**), a rather new project of IGAC which aims at gathering the international scientific community around syntheses of research using observations-based analysis techniques to better quantify emissions for a variety of trace gases and at different spatio-temporal scales. AMIGO is at the crossroads of several parallel IGAC activities involving emissions, atmospheric modeling and analysis on observations, and the GEIA 20th conference was a good opportunity to develop more interactions between AMIGO and GEIA participants.

An introduction on the fundamentals of model developments was given by Guy Brasseur (Max-Planck Institute for Meteorology, Germany and NCAR, USA), followed by a lecture by Dylan Jones (University of Toronto, Canada) on the fundamental principles and equations for the assimilation of observations in models. Kazuyuki Miyazaki (NASA Jet Propulsion Laboratory, USA) showed how satellite and ground-based observations can be used for historical reanalyses of the atmospheric composition. The use of atmospheric reanalyses in the development of air quality atlases was discussed by Thierno Doumbia (Laboratoire d'Aerologie, France).

Two geostationary satellites observing the composition of the atmosphere are now in orbit, and Brian McDonald (NOAA Chemical Sciences Laboratory) showed how these observations will improve the simulations of air quality and the quantification of surface emissions in near real-time.

Claire Granier (Laboratoire d'Aerologie, France and NOAA/CIRES, USA) gave an overview of the calculation of the emissions from anthropogenic activities, and Katerina Sindelarova (Charles University, Czech Republic) showed how natural emissions are estimated using detailed models. Mark Parrington (ECMWF, Germany) presented the recent progress in the quantification of spatial and temporal emissions from fires. Ave Arellano (University of Arizona, USA) gave an introduction to inverse modeling techniques, and discussed the many challenges remaining to infer surface emissions from different types of observations. Deborah Zweers (KNMI, The Netherlands) showed how to access and analyze the TROPOMI satellite observations, as well as different types of applications using the TROPOMI observations. Henk Eskes (KNMI, The Netherlands) discussed several techniques to evaluate model simulations, using different types of observations.

All the lectures were followed by discussions on the techniques, observations and analyses by the early career scientists attending the workshop. The participants had also many discussions during the breaks, which continued during the 20th GEIA conference as shown in the summary of the GEIA conference. It was mentioned several times that the in-person AMIGO workshop was an excellent opportunity for early-career scientists to meet their colleagues from different institutes all over the world, and that they would all be interested in participating to more in-person workshops.

6-8 JUNE 2023
UNIVERSITY OF HELSINKI, HELSINKI, FINLAND

IGAC Sponsored

AUTHORS

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HOST INSTITUTIONS

FINNISH METEOROLOGICAL INSTITUTE

FUNDING

PARTICIPANTS

Canada, Denmark, Finland, France, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, United Kingdom, United States

INTRODUCTION

IGAC and IASC (International Arctic Science Community) co-sponsored this workshop to support the IGAC Activity air Pollution in the Arctic: Climate, Environment and Societies (PACES). This activity aims to coordinate international research on Arctic air pollution and its impacts.

5th Pollution in the Arctic: Climate, Environment and Societies (PACES) Open Science Meeting

Participants of the 5th PACES Open Science Meeting

The "air Pollution in the Arctic: Climate, Environment and Societies" (PACES, https://pacesproject.org/) initiative aims to review existing knowledge and foster new collaborative, interdisciplinary research on the sources and fate of Arctic air pollution, its impacts on climate, health, and ecosystems, on the feedbacks between pollution and natural sources, on climate responses, and on societal perspectives, including sustainability, adaptation and economic feedbacks. Arctic air pollution contributes to Arctic climate change, and is harmful to ecosystems and human health, but significant uncertainties surround quantification of these effects.

Around 40 scientists from 12 countries, with interests in Arctic air pollution, gathered in Helsinki, Finland, for the 5th PACES Open Science Meeting in

Helsinki, Finland

June 2023. Funding from both IASC and IGAC supported the attendance of six early career scientists. The three day conference included presentations organized around three main sessions: 1) long-range transport and global linkages of Arctic air pollutants (including fires), 2) local Arctic pollution and corresponding impacts to health and ecosystems, and 3) physical and chemical properties of Arctic aerosol. More than 30 presentations were given, with additional group discussion around planning for new Arctic field activities and modeling exercises, focused on addressing knowledge gaps in Arctic air pollution, sources, and impacts.

The conference highlighted ongoing and planned activities within PACES. In particular, presentations and discussion of local Arctic pollution and impacts included recent findings from the Alaskan Layered Pollution And Chemical Analysis (ALPACA) field campaign that took place in Fairbanks, Alaska during January to February of 2022. Presentations on long-range transport and global linkages emphasized the intrusion of smoke to the Arctic, as well as the deposition of long-range transported anthropogenic aerosol. Arctic aerosols were discussed in the context of long-term and seasonal measurements, and focused on aerosol radiative properties, chemical composition, and contributions from natural sources such as biogenically produced aerosol in marine and continental regions.

PACES meeting attendees also participated in roundtable discussions identifying several major issues that need to be addressed in the next 10 to 15 years. Common themes emerging from these discussions were related to better understanding of changing emissions, improved consideration for changing processes and transport within and outside of the Arctic as a result of climate change, and a need for the development of improved models. Specifically, natural and anthropogenic emissions inventories will need to be updated as a result of future policy measures and those already implemented. Additionally, quantifying and modeling the production, transport, and deposition of aerosols (especially dust and black carbon) to investigate how this impacts snow and ice will be critical in assessing the future of the Arctic under rapid climate change. Finally, models that are capable of incorporating interfaces between the atmosphere, cryosphere, and other aspects of the Earth system are necessary, and utilizing machine learning to better synthesize available and future data can be a computationally efficient way to elucidate remaining uncertainties.

The meeting further included a highly beneficial early career researcher (ECR) panel discussion, where ECRs were given the opportunity to ask research scientists and faculty questions about career development. ECR funding from IGAC and also from IASC (International Arctic Science Committee) made attending PACES financially feasible, since the travel and accommodation costs would otherwise be prohibitive to ECRs. This conference thus provided an invaluable opportunity to collaborate and network with other scientists in an immersive three day experience. This is rare at large conferences like AGU, since there are many overlapping sessions at these events and one is often forced to deprioritize sessions that they would otherwise be interested in attending. Because the COVID-19 pandemic has coincided with formative years in ECR development, this opportunity provided a fast-track to meet researchers from around the world and focus on these important topics.

IGAC profile

Samiha Nahian

Where are you from?

I am from Dhaka, Bangladesh.

Where did you receive your undergraduate and graduate degrees and in what subjects?

I did my graduation in Chemistry and postgraduation in Inorganic and Analytical Chemistry from University of Dhaka, Bangladesh.

Where and what is your current position?

Currently I am engaged as a Lecturer at the Department of Chemistry, University of Dhaka.

What is your current area of research?

At present, I am conducting research on monitoring of ambient air quality and personal exposure to air pollutants of Dhaka city; more specifically- chemical characterization, source apportionment and health risk assessment of $PM_{2.5}$-bound pollutants (heavy metals, PAHs).

As an early career scientist, you have an exciting future ahead of you. What type of career and topic do you hope to be working on in 5 or 10 years from now?

I envision myself as an atmospheric researcher working for any prestigious, internationally recognized university or research organisation in future. I am highly interested in conducting research on the interactions between cryosphere and atmosphere as well as chemistry of the cold region aerosols.

If you have been to IGAC science conferences, what was the most interesting thing you learned and who was the most interesting person you met?

Being a chemistry major, I was a noob in analyzing satellite datasets owing to limited knowledge in programming. But after attending a number of IGAC trainings and conferences, I have developed an idea about how to play with Google earth engine, Giovanni, CAMS, TROPOMI datasets. It's interesting how we can retrieve any dataset irrespective of time and location and perceive the air quality simultaneously.

I have met a number of interesting personalities in IGAC conferences and to name one is quite difficult. However, I am highly inspired by Guy Brasseur, Laura Pan and James Crawford. They are not only eminent scientists and eloquent speakers, but also cordial, jolly minded and easy to interact with. I consider myself lucky to be in touch with them.

How did you become part of the IGAC community and do you think as an early career scientist IGAC workshops and conferences will aid or have aided your career as a scientist?

I got introduced to IGAC when my research supervisor, Professor Dr. Abdus Salam advised me to submit an abstract for the 14th IGAC conference in 2018. I was fortunate enough to grab a travel grant for attending that event in Takamatsu, Japan. I also became a part of the IGAC-MANGO community right after the conference. Since then, I have been receiving e- mails from IGAC about any upcoming trainings, conferences, meetings etc., and I have attended several of them. IGAC has facilitated me to present my research in many prestigious international platforms like ACAM, CCMI, GEIA. The trainings have enhanced my capability to analyze satellite datasets and peaked my interest for atmospheric modeling. My networking skills have been significantly improved as well. I believe my career in academia has been remarkably flourished since I came in touch with IGAC and I can't be grateful enough.

Is there an element or aspect of your research you believe to be particularly important?

Consistency, international collaborations and keeping up to date with the latest research topics and technology are what I believe to be of utmost importance in atmospheric research. The way the global climate is abruptly changing, it's a prerequisite that researchers all over the world diligently work together and arm themselves with proper knowledge and technology to save mother earth.

What do you think the number one benefit is of participating in an IGAC workshop as an early career scientist?

In my opinion, the number one benefit of participating in an IGAC workshop is the international exposure, which may be overwhelming to an early career scientist. One gets to know what are the possibilities and limitations of his/ her current research and how to work on them. Moreover, connecting with renowned scientists is always a cherry on top, which later paves the way for international collaborations as well as pursuing a PhD under their supervision.

Who throughout your life had the greatest impact on you deciding to pursue a career in atmospheric science?

My mentor, Professor Dr. Abdus Salam has profoundly inspired me to pursue a career in atmospheric chemistry. I am greatly indebted to him for his steady guidance, valuable suggestions and warm encouragement. His dynamic personality fueled my "Never give up" attitude, which I believe is a must in any research field.

Outside of science, what are some of your other interests/hobbies?

Apart from science, I love to travel a lot- both home and abroad. Since childhood, I have possessed a genuine interest in historical characters and events, so visiting museums amuses me the most. I am also fond of watching movies with family and friends, especially thrillers.

My experience on organizing the 5th ACAM workshop:

My excitement knew no bounds when I came to know that the 5th ACAM Workshop would be held in Dhaka, Bangladesh and I would be the Co- Chair of the local organizing committee. It was indeed a vital responsibility and I tried my level best. I learned how to chalk out an international conference, manage everything within a budget, deal varieties of people, negotiate with suppliers and vendors, work under pressure, guide the volunteers, and above all, keep calm all the time. In such global events, even a "Plan B" can go wrong, so one needs to be composed to come up with another suitable workplan immediately. I was emotionally overwhelmed when everyone tremendously appreciated me and my entire team. I am highly obliged to IGAC for offering us the opportunity of being the local host for the 5th ACAM Workshop. I would definitely love to play the role again for any local or international events in future.

IGAC profile

Shatabdi Roy

Where are you from?

Bangladesh

Where did you receive your undergraduate and graduate degrees and in what subjects?

I have completed my Bachelor of Science (B.S) degree in Chemistry from the University of Dhaka, the best school to study chemistry in our country, and have secured a CGPA of 3.70 (position 3rd) in my B.S out of 4.0 scale. During my Master's in Science (M.S.) degree, I enrolled myself in the Inorganic and Analytical Chemistry section under the Department of Chemistry, University of Dhaka, and achieved a GPA of 3.95 (position 2nd) in the class.

Where and what is your current position?

Currently, I am employed as a lecturer in the Department of Chemistry's Inorganic and Analytical Chemistry division at the University of Dhaka.

What is your current area of research?

My current area of research is Atmospheric Chemistry and Aerosols particularly analysis

of Particulate Matter and Trace Gases in air and measuring the heavy metals and microplastics in naturally occurring things.

As an early career scientist, you have an exciting future ahead of you. What type of career and topic do you hope to be working on in 5 or 10 years from now?

I want to advance my career as a teacher as well as a research scientist, which will help me to supervise my students' research projects. My research interests have always been in atmospheric chemistry, particularly evaluating the presence of heavy metals and microplastics in naturally occurring items such as air, trash burning, and mineral water, and their impact on human health. My goal over the next 5 to 10 years is to earn a Ph.D. in these connected fields from a reputable university in the United States.

If you have been to IGAC science conferences, what was the most interesting thing you learned and who was the most interesting person you met?

In 2018, I attended the IGAC science conferences in Japan. I had many questions because it was my first time attending an international conference. The large number of people from various countries conducting atmospheric science research was one of the most fascinating aspects I discovered. I went through most of the posters and oral presentations and learned a lot about aerosols, particulate matter, and toxic gases. I had the opportunity to meet with James (Jim) Crawford and Hiroshi Tanimoto in 2018 and 2023, and what pleasant and knowledgeable people they are. During our conversation, they expressed an interest in my research topic as well as my country's culture, which surprised me the most.

How did you become part of the IGAC community and do you think as an early career scientist IGAC workshops and conferences will aid or have aided you career as a scientist?

As I previously stated, I attended an IGAC workshop in Japan in 2018. Following that, in 2013, I served as a secretariat for the 3rd Asia-Pacific Network For Global Change Research (Apn-Gcr) Workshop on the Impact of the Covid-19 Pandemic on Air Quality in the Monsoon Asia Region. I met several notable research scientists at both workshops and had chats with them that sparked my interest and prompted me to begin hunting for published studies. When I read some specific articles about heavy metals and microplastics, I realized that I have the ability to conduct high-level research if given the right parameters and resources.

What do you enjoy most about your work? Is it in the lab, writing papers, doing field research or in front of a crowd giving a talk on your research?

The best part of my job is monitoring my students. Planning some fresh themes, reading several papers to gain new ideas, and distributing them to the students is a fun part. I occasionally went to the research field to see how they were sampling and whether they were doing it correctly. Writing papers based on their work once they have completed it gives me pleasure as well.

Who throughout your life had the greatest impact on you deciding to pursue a career in atmospheric science?

This is my supervisor, Professor Dr. Abdus Salam, who has always encouraged me to pursue a career in atmospheric science. I was initially perplexed by the distinction between synthesis chemistry and analytical chemistry. Then I discussed everything with Professor Abdus Salam, who provided me some research papers on atmospheric chemistry at the time. That piece had a big impression on me, so I started working on my thesis on air pollution. After finishing my thesis, I began collaborating on my work with some of my fellow seniors and juniors who had also done research on air pollution. As a colleague of Professor Abdus Salam, I now have the opportunity to continue my research with his lab, where I oversee some of his students who are conducting research on a variety of themes connected to atmospheric science. All of these factors aided me in continuing my atmospheric science research.

announcements

1st IGAC Early Career Researcher remote conference

The newly established IGAC Early Career Scientific Steering committee invites you to save **November 17th, 2023**, for the first IGAC ECR remote conference which will take place across three time zones.

In each time zone, there will be invited speakers, vPICO style and poster presentations, early career relevant workshops and networking opportunities. A conference by and for early career researchers of the IGAC community, open to all to attend.

Free registration here: **https://www.surveymonkey.com/r/MQMSBYG**

Abstract submission (early careers only, students or within 7 years of graduating with a PhD or Masters) open here: **https://app.oxfordabstracts.com/stages/6782/submitter**

Poster Prizes: travel grants and registration for the Kuala Lumpur 2024 iCACGP Conference, and ESA Swag up for grabs!

Platforms: Gather Town and Zoom.

Serie de seminarios IGAC-AWG para el año académico 2023-2024

El Grupo de Trabajo de las Américas del IGAC invita a la comunidad de Ciencias Atmosféricas de América Latina a la Serie de Seminarios para el año académico 2023-2024. En esta serie de seminarios, exploraremos temas relevantes como la química de aerosoles y su modelado y las redes de muestreo atmosférico a partir de la experiencia de nuestros distinguidos invitados. Esta serie de seminarios tiene como objetivo fomentar las colaboraciones científicas de todo el continente americano. La serie de seminarios está programada los segundos jueves de cada mes a las 11 am PST, con la excepción de diciembre 2023 que será el primer jueves de ese mes. Esperamos puedan acompañarnos.

Enlace de Zoom: **https://berkeley.zoom.us/j/92707241660?pwd=MXpiMTBmSUNCQU5UeTZDU2E3RWwvQT09**, Meeting ID: 927 0724 1660, Passcode: 932190.

Série de seminários IGAC-AWG para o ano letivo 2023-2024

O Grupo de Trabalho IGAC Américas convida a comunidade Latino-Americana de Ciências Atmosféricas para a Série de Seminários do ano acadêmico 2023-2024. Nesta série de seminários, exploraremos tópicos relevantes como química e modelagem de aerossóis e redes de amostragem atmosférica a partir da experiência de nossos ilustres convidados. Esta série de seminários visa fomentar colaborações científicas em todo o continente americano. A série de seminários está agendada para a segunda quinta-feira de cada mês, às 11h PST, com exceção de dezembro de 2023, que será a primeira quinta-feira desse mês. Esperamos que você possa se juntar a nós.

Ligação de Zoom: **https://berkeley.zoom.us/j/92707241660?pwd=MXpiMTBmSUNCQU5UeTZDU2E3RWwvQT09**, Meeting ID: 927 0724 1660, Passcode: 932190.

IGAC-AWG Seminar Series for Academic year 2023-2024

The IGAC Americas Working Group invites the Latin America Atmospheric Science community to the Seminar Series for the Academic year 2023-2024. In this seminar series we will explore relevant topics such as aerosol chemistry and modeling and atmospheric sampling networks from the experience of our distinguished guests. This seminar series is aiming to foster scientific collaborations from across the entirety of the Americas. The Seminar Series is scheduled every second Thursday of each month at 11 am PST with the exception of December 2023 which will be the first Thursday of that month. Hope you can join us.

Zoom Link: **https://berkeley.zoom.us/j/92707241660?pwd=MXpiMTBmSUNCQU5UeTZDU2E3RWwvQT09**, Meeting ID: 927 0724 1660, Passcode: 932190.

Seminar Schedule

Fechate	Invitado Confirmado/ Convidado confirmado/ Confirmed Speaker	Tema/Titulo/Topic
14 de septiembre, 2023. September 14th, 2023. 11:00 am PST	 **Ronald Cohen** https://cohen.cchem.berkeley.edu/	Mapeo de las emisiones urbanas de GEI con resolución vecinal./ Mapeamento de emissões urbanas de GEE com resolução de bairro./ Mapping urban GHG emissions with neighborhood resolution. **Resumen/Abstract**
12 de octubre, 2023. October 12th, 2023. 11:00 am PST	 **Loretta Mickley** https://scholar.harvard.edu/mickley/	Quema reciente de biomasa en la cuenca del Amazonas: consecuencias para el albedo de la nieve en los Andes y para la calidad del aire regional y la salud humana./ Queima recente de biomassa na Bacia Amazônica: Consequências para o albedo da neve nos Andes e para a qualidade do ar regional e a saúde humana./ Recent biomass burning in the Amazon Basin: Consequences for snow albedo in the Andes and for regional air quality and human health. **Resumen/Abstract**
9 de noviembre, 2023. November 9th, 2023. 11:00 am PST	 **Delphine Farmer** https://sites.google.com/site/delphinefarmer/	De la sartén al fuego: comprensión de las fuentes de aerosoles orgánicos, los sumideros y las conexiones entre los ambientes interior y exterior./ Da frigideira para o fogo: compreendendo as fontes de aerossóis orgânicos, os sumidouros e as conexões entre os ambientes internos e externos./ Out of the frying pan and into the fire: Understanding organic aerosol sources, sinks, and connections between the indoor and outdoor environments. **Resumen/Abstract**

Fechate	Invitado Confirmado/ Convidado confirmado/ Confirmed Speaker	Tema/Titulo/Topic
7 de diciembre, 2023. **December 7th, 2023.** **11:00 am PST**	 **Marcos Andrade** **http://www.chacaltaya.edu.bo/lfa-bolivia.html**	Más de una década de monitoreo de la composición atmosférica en los Andes tropicales en la estación GAW más alta del mundo./ Mais de uma década de monitoramento da composição atmosférica nos Andes tropicais na estação GAW mais alta do mundo./ More than a decade of monitoring atmospheric composition at the tropical Andes in the world's highest GAW station **Resumen/Abstract**
11 de enero, 2024. **January 11th, 2024.** **11:00 am PST**	No hay seminario por vacaciones de verano en el Hemisferio Sur/ Não há seminário pelas férias de verão no Hemisfério Sul/ No seminar-Southern Hemisphere summer Break	
8 de febrero, 2024. **February 8th, 2024.** **11:00 am PST**	No hay seminario por vacaciones de verano en el Hemisferio Sur/ Não há seminário pelas férias de verão no Hemisfério Sul/ No seminar-Southern Hemisphere summer break	
14 de marzo, 2024. **March 14th, 2024.** **11:00 am PST**	 **Paulo Artaxo** **http://www.researcherid.com/rid/E-8874-2010**	La Dinámica Compleja de Aerosoles y gases traza en la Amazonia, medida en la torre ATTO y en campañas aéreas./ A Dinâmica Complexa de Aerossóis e Gases Traços na Amazônia, medida na torre ATTO e em campanhas aéreas./ The Complex Dynamics of Aerosols and trace gases in Amazonia, measured at the ATTO tower and aircraft campaigns. **Resumen/Abstract**

Fechate	Invitado Confirmado/ Convidado confirmado/ Confirmed Speaker	Tema/Titulo/Topic
11 de abril, 2024. April 11th, 2024. 11:00 am PST	 **Olga Mayol-Bracero** https://www.bnl.gov/staff/omayolbra	Investigación del polvo africano en el Caribe: integración de mediciones terrestres de aerosoles, observaciones satelitales y modelos de pronóstico durante el evento de polvo “Godzilla”/. Pesquisa de poeira africana no Caribe: Integração de medições terrestres de aerossóis, observações de satélite e modelos de previsão durante o evento de poeira “Godzilla”./ African dust research in the Caribbean: Integration of aerosol ground-based measurements, satellite observations, and forecast models during the “Godzilla” dust event. Resumen/Abstract
9 de mayo, 2024. May 9th, 2024. 11:00 am PST	 **Jose Luis Jiménez** https://www.colorado.edu/chemistry/jose-luis-jimenez	Transmisión de enfermedades por el aire y los beneficios y daños de los purificadores de aire./ Transmissão de doenças pelo ar e os benefícios e malefícios dos filtros de ar./ Airborne disease transmission and the benefits and harms of air cleaners. Resumen/Abstract
13 de junio, 2024. June 13th, 2024. 11:00 am PST	  **Nestor Rojas y Nicolas Huneaus** https://orcid.org/0000-0001-7804-0449 https://sandi.cl/cv-nicolas-huneeus-lagos/	Desde las emisiones hasta la calidad del aire: retos actuales en América Latina y el Caribe./ Das emissões à qualidade do ar: desafios atuais na América Latina e no Caribe./ From emissions to air quality: Current challenges in Latin America and the Caribbean. Resumen/Abstract

For more information on upcoming seminars see **here**.

BBURNED Fire Emissions Workshop

Biomass Burning Uncertainty: ReactioNs, Emissions and Dynamics, BBURNED, sponsoring a Virtual Fire Emissions Workshop, co-hosted with HTAP.

7-19, 14 November 2023

More information **here**.

Sign up for the BBURNED mailing list **here**.

Unveiling the Allin Wayra IGAC Activity

The new Allin Wayra IGAC Activity

Allin Wayra aims to advance knowledge and responsible use of small sensors in air quality and atmospheric science, with a particular focus on regions lacking air quality measurements. We will also address urgent issues related to small sensors in atmospheric science, foster capacity, and champion accessibility through collaborative initiatives.

Find more information **here**.

Future Earth New Member Portal is Now Available!

We are excited to announce that the redesigned member portal has been launched! The member portal has been revitalized in consultation with our community to better engage and empower the dynamic international networks of Future Earth.

In the portal, you can share news about your activities, join groups of your interest, connect with sustainability professionals worldwide through the member directory, and access various resources such as the job/funding opportunities board, the events calendar, and the media center. **Explore the member portal** to better connect with our vibrant community!

OpenAQ, a nonprofit fighting air inequality through its open and universally accessible real-time air quality data platform, recently released the Spanish and Portuguese translations of the **Open Air Quality Data: The Global Landscape** report. Rigorous and thoughtful translations of the content were written by the Latin America Early-Career Earth System Scientists Network (LAECESS). Download the Spanish translation **here** and the Portuguese translation **here**.

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Events
monthly in IGAC eBulletins and on
igacproject.org

Join the IGAC Community

Don't forget to join the IGAC community to stay appraised of the most current news on conferences, workshops, and publications, as well as receive IGACnews by email.

IGAC mailing list sign up form

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