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IGACnews

facilitating atmospheric chemistry research towards a sustainable world

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SAMLAC: Atmospheric Particles and Reactive Gases

Cape San Juan Atmospheric Observatory, Fajardo, Puerto Rico



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Participants of the 2018 School of Atmospheric Measurements in Latin America and the Caribbean (SAMLAC): Atmospheric Particles and Reactive Gases at the Cape San Juan Atmospheric Observatory, Fajardo, Puerto Rico).

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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.

Challenges Facing International Collaborations

In January I went to Manchester, UK to visit the site of the 2020 16th IGAC Science Conference, which will take place 13-18 September 2020. I was very impressed with the facilities, the banquet venue, Manchester as a city, but most importantly with the Local Organizing Committee (LOC). This is sure to be a great conference and I hope all of you have it marked on your calendar.

While in the UK, I took the train to the University of York to visit the Wolfson Atmospheric Chemistry Laboratories and give a talk. I have now been the IGAC Executive Officer for eight years and feel over this tenure I have gained some insights into the challenges facing international collaborations, which is what my talk focused on.

I spoke about what I believe are five challenges facing international scientific collaborations.

Production of Scientific Knowledge.

There is an increasing use of low cost sensors and do it yourself approaches to “monitoring” air quality. This has made me wonder not only who produces and owns scientific knowledge, but more importantly, how to determine what is credible scientific knowledge. The scientific community, I believe, has a duty to continue to produce credible scientific information and this will often require international collaborations.

Post-Truth Era. We are currently living in a time in which personal opinion is formed much more strongly by emotion and personal belief than by objective facts. This implies that when talking about our science, it might be important to connect first on emotion or personal belief before conveying the objective scientific knowledge. As **Katherine Hayhoe** from Texas Tech University says; “Bond, Connect, Explain, and Inspire.”

Nationalism. When I gave the talk, it was a day after the Brexit vote and during the U.S. government shutdown. Both of these events are having major impacts on scientific research. However, history has shown the benefits of international scientific collaborations and scientific advancements often outweigh political differences. Some successful example of this are the formation of the International Council for Science (ICSU) in 1931 and the formation of the International Institute for applied Systems Analysis (IIASA) in 1972.

Fostering Early Career Scientists.

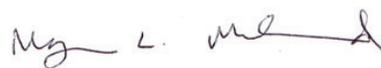
In the prior issue of IGACnews, Willis *et al.* wrote an article entitled “An Early Career Perspective on Fostering the Next Generation of Atmospheric Scientists in an International Community.” The article had three recommendations on how to foster the next generation of scientists in an international community. I think,

unfortunately, early career scientists are not receiving sufficient training and mentoring required to participate successfully in an international scientific community.

The Right to Science. In a recent article in *Science* entitled “Define the human right to science,” I learned as part of the **Universal Declaration of Human Rights**, Article 27 states everyone has the right “to share in scientific advancement and its benefits.” The article identifies three key insights the scientific community has contributed to defining this right to science. I think the implications of this right to science are significant and could help foster further international scientific collaborations.

Although the five challenges facing international collaborations listed above are my opinion, I feel strongly that organizations such as IGAC play a very important role in overcoming these challenges. I believe at the core of addressing global change and sustainability issues is international scientific collaborations.

Happy Reading!



MEGAN L. MELAMED

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Megan Melamed received her PhD in 2006 in Environmental Engineering from the University of Colorado. She then received the National Science Foundation International Research Fellowship to work at the Universidad Nacional Autónoma de México (UNAM) in Mexico City for two years. Upon completion of the NSF Fellowship, Megan became an American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellow at the U.S. Environmental Protection Agency. She has been the IGAC Executive Officer since January 2011.



IGAC is accepting nominations for the 2020 SSC

IGAC welcomes nominations to its Scientific Steering Committee (SSC) from the international community. IGAC is currently accepting nominations for the 2020 SSC. For information on serving on the IGAC SSC, please see **The Expectations and Role of IGAC SSC Members**.

IGAC accepts both nominations and self-nominations at igacproject.org/IGAC_SSC_Nominations.

Nominations will be accepted until **15 March 2019**.

Recent IGAC Fostered Publications



Alaskan Layered Pollution And Chemical Analysis (ALPACA) White Paper (2018). Lead Authors: W. Simpson, K. Law, J. Schmale, K. Pratt, S. Arnold, and J. Mao, <https://alpaca.community.uaf.edu/files/2018/11/ALPACA-whitepaper-30Nov2018.pdf>.

The ALPACA study has been developed under the umbrella of PACES Working Group Two (WG2), which focuses on the interactions between Arctic air pollution and Arctic societies, and local sources of Arctic air pollution. The aim of ALPACA is to investigate emissions and chemical and meteorological influences on air pollution in Fairbanks, AK, USA. This study will shed light on the wintertime air pollution in many urban areas and areas affected by industrial activities in the Arctic and sub-Arctic regions.

Submit articles to the next IGACnews

IGAC is now accepting article submissions for the next IGACnews.

- Workshop Summaries, Science Features, Activity News, and Editorials are all acceptable and desired.
- Science Features should have an approximate length of 1500 words with 1-2 images.
- All other submissions should be approximately 500 words and have 1-2 images.
- Please provide high-resolution image files.

The deadline for submissions for the Jul/Aug issue of the IGACnew is 19 July 2019. Send all submissions to info@igacproject.org.

TOAR

tropospheric
ozone
assessment
report

The assessment report is being published as a series of papers in the peer-reviewed journal, *Elementa – Science of the Anthropocene*. Papers published so far are available through a **Special Feature** of *Elementa*:

Mills G, Pleijel H, Malley CS, Sinha B, Cooper OR, Schultz MG, Neufeld HS, Simpson D, Sharps K, Feng Z, Gerosa G, Harmens H, Kobayashi K, Saxena P, Paoletti E, Sinha V, Xu X, Tropospheric Ozone Assessment Report: Present-day tropospheric ozone distribution and trends relevant to vegetation. *Elem Sci Anth.* 2018; 6(1):47. DOI: <http://doi.org/10.1525/elementa.302>

Gaudel, A, et al. 2018. Tropospheric Ozone Assessment Report: Present-day distribution and trends of tropospheric ozone relevant to climate and global atmospheric chemistry model evaluation. *Elem Sci Anth.*, 6: 39. DOI: <https://www.elementascience.org/articles/10.1525/elementa.291>

Lefohn AS, Malley CS, Smith L, Wells B, Hazucha M, Simon H, Naik V, Mills G, Schultz MG, Paoletti E, De Marco A, Xu X, Zhang L, Wang T, Neufeld HS, Musselman RC, Tarasick D, Brauer M, Feng Z, Tang H, Kobayashi K, Sicard P, Solberg S, Gerosa G. Tropospheric ozone assessment report: Global ozone metrics for climate change, human health, and crop/ecosystem research. *Elem Sci Anth.*, 2018; 6(1):28. DOI: <http://doi.org/10.1525/elementa.279>

Fleming*, Zoë. L., Ruth M. Doherty*, Erika von Schneidmesser, Christopher S. Malley, Owen R. Cooper, Joseph P. Pinto, Augustin Colette, Xiaobin Xu, David Simpson, Martin G. Schultz, Allen S. Lefohn, Samera Hamad, Raeesa Moolla, Sverre Solberg, Zhaozhong Feng (2018), Tropospheric Ozone Assessment Report: Present-day ozone distribution and trends relevant to human health, *Elem Sci Anth.*, 2018; 6(1):12. DOI: <https://www.elementascience.org/article/10.1525/elementa.273/>

Young*, P. J., V. Naik*, A. M. Fiore, A. Gaudel, J. Guo, M. Y. Lin, J. L. Neu, D. D. Parrish, H. E. Rieder, J. L. Schnell, S. Tilmes, O. Wild, L. Zhang, J. R. Ziemke, J. Brandt, A. Delcloo, R. M. Doherty, C. Geels, M. I. Hegglin, L. Hu, U. Im, R. Kumar, A. Luhar, L. Murray, D. Plummer, J. Rodriguez, A. Saiz-Lopez, M. G. Schultz, M. T. Woodhouse and G. Zeng (2018), Tropospheric Ozone Assessment Report: Assessment of global-scale model performance for global and regional ozone distributions, variability, and trends, *Elem Sci Anth.*, 2018; 6(1):10. DOI: <http://doi.org/10.1525/elementa.265>

Schultz, M. G. and 96 co-authors (2017), Tropospheric Ozone Assessment Report: Database and metrics data of global surface ozone observations, *Elem Sci Anth.*, 5, DOI: <http://doi.org/10.1525/elementa.244>

Chang, K-L, I. Petropavlovskikh, O. R. Cooper, M. G. Schultz and T. Wang (2017), Regional trend analysis of surface ozone observations from monitoring networks in eastern North America, Europe and East Asia, *Elem Sci Anth.*, 5:50, DOI: <http://doi.org/10.1525/elementa.243>

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.

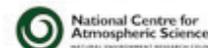


Save the Date!

13th - 18th September 2020
University of Manchester, UK
www.igac2020.com



Manchester 2020
16th IGAC Science Conference
Save the Date!



27 - 28 NOVEMBER 2018
ROME, ITALY

IGAC Sponsored

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Christian George, CNRS, France
Alfonso Saiz-López, CSIC, Spain
Hiroshi Tanimoto, NIES, Japan

HOST INSTITUTION



FUNDING



PARTICIPANTS

Australia, Canada, China, France, Germany, Greece, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Spain, Sweden, Thailand, United Kingdom, United States

BACKGROUND

IGAC has a long history of collaborating with its sister organization the Surface Ocean – Lower Atmosphere Study (SOLAS) on issues related to ocean-atmosphere interactions. IGAC sponsored this workshop in order to continue to foster collaborations with SOLAS and explore potential topics that could form new SOLAS-IGAC jointly sponsored research activities.

SOLAS-IGAC Workshop: Influence of coastal pollution on marine atmospheric chemistry: effects on climate and human health



SOLAS-IGAC workshop participants, Rome, Italy. © Jessica Gier

From November 27 to 28, 2018, a workshop on “Influence of coastal pollution on marine atmospheric chemistry: effects on climate and human health”, took place at the Italian National Research Council (CNR) headquarters in Rome, Italy, organised by the Surface Ocean - Lower Atmosphere Study (SOLAS), in collaborations with the International Global Atmospheric Chemistry (IGAC) project, and CNR.

The meeting featured presentations from experts and intense discussion sessions, exploring the multiple topics and feedbacks evident in air-sea interactions. The invited scientists were selected according to their expertise in the workshops topics and to provide a wide spectrum of knowledge. In fact, they included both experimentalists and modellers, representing the oceanographic and atmospheric science communities. Scientists from 17 different countries joined the workshop representing a wide range of career stages.

The workshop focused on the importance of the coastal environment from the air-sea interaction point of view and on the different aspects of coastal pollution (air and water), with two main objectives:

1. discussing how coastal pollution affects gas and particles emitted over the coasts, and



Colosseum and Forum Romanum, Rome, Italy. © Jessica Gier

2. understanding the effects of coastal pollution on the air quality-climate system and human health.

Presentations addressed various topics but with a clear focus on the peculiarities of atmospheric chemistry and air quality in coastal regions, with an emphasis on radical/halogen chemistry and on the oxidative properties of the coastal atmosphere. The role of sea-spray as a vehicle for transferring a variety of seawater components (biogenic organic matter, pollutants, bacteria, viruses and toxins) from the sea surface to the atmosphere has been intensively treated, evidencing a fundamental lack of knowledge on such processes and associated impacts. Emerging themes of crucial importance for the coastal environment were also identified and discussed, such as the environmental and human health impacts of micro-plastics pollution and the increased occurrence of toxic (red) tides.

The discussion sections led to the definition of two major research areas for a better understanding of coastal air-sea interactions. The first need comes with the understanding of processes of sea-air exchange in the coastal environment, which in many cases are scarcely characterised. For instance, the exchange of particles, toxins, pollutants (including newly developed materials, such as engineered nano-particles and graphene) are scarcely understood in

general and in the coastal context in particular. Moreover, the role of the sea surface microlayer in this process has been pointed out as potentially important and warrants more detailed investigations. The second research area addresses the forcing and feedbacks between the sea and the atmosphere in the coastal environment. The importance of non-linear interactions between water biology, water and air composition, meteorology, human health, ecosystems, economy, etc. was pointed out during the discussion, with a particular stress for the necessity of understanding these topics in a changing climate perspective.

Finally, the participants expressed a series of research needs for air-sea exchange investigation in the coastal environment. The necessity of linking different scientific communities (atmosphere, ocean, toxicology, and social) was considered of paramount importance in order to produce a significant advancement of science, through the development of a multidisciplinary investigation approach. The necessity of integrating laboratory and field observations, remote sensing and modelling was also highlighted, together with the importance of implementing integrated sea-atmosphere long-term observations in the coastal environment, which are almost non-existent at present. 

12 - 17 NOVEMBER 2018
SAN JUAN, PUERTO RICO

IGAC Sponsored

AUTHORS

Olga L. Mayol-Bracero, University of Puerto Rico – Rio Piedras Campus, San Juan, Puerto Rico

HOST INSTITUTION



FUNDING



PARTICIPANTS

Argentina, Chile, Bolivia, Peru, Brazil, Colombia, Venezuela, El Salvador, Mexico, Cuba, Puerto Rico, Guadeloupe, Barbados, United States, Spain, France, Germany, Norway, Switzerland, Italy, Saudi Arabia

BACKGROUND



This is the third in a series of IGAC Americas Working Group (AWG) training courses. The IGAC AWG was formed

2013 by scientists from Latin American and Caribbean (LAC) countries to improve the collaborations in the region, connect the LAC community internationally and build capacity in research fields related to atmospheric chemistry.

School of Atmospheric Measurements in Latin America and the Caribbean (SAMLAC): Atmospheric Particles and Reactive Gases



SAMLAC participants at the venue.

Sixty seven participants representing 21 countries and regions recently gathered in San Juan, Puerto Rico, for the School of Atmospheric Measurements in Latin America and the Caribbean: Atmospheric Particles and Reactive Gases (SAMLAC – 2018). SAMLAC is part of the International Global Atmospheric Chemistry Project Americas Working Group (IGAC-AWG), which aims to build a cohesive network and foster the next generation of atmospheric scientists, with the ultimate goal of contributing to development of a scientific community focused on building collective knowledge in/for the Americas, with a focus on Latin America and the Caribbean (Andrade et al. BAMS, 2016).

The first training school organized by the IGAC’s AWG took place in South America in 2015 (Bolivia, **IGACnews Training School Summary**, Andrade-Flores, M. IGACnews, 55, 2015) the second one took place in Central America in 2016 (Mexico, **IGACnews Training School Summary**, Grutter et al., Eos, 2016). SAMLAC is the third training school took place in the Caribbean (Puerto Rico).



San Juan, Puerto Rico. Photo courtesy of Puerto Rico Tourism Company

SAMLAC goals were to:

- Improve regional capacity and stimulate the development of aerosol and reactive gases monitoring programs (regional and national) that can contribute with their data to regional and international projects and networks.
- Foster the building of a community of atmospheric scientists in the Latin America and the Caribbean (LAC) region in order to provide expertise on topics related to atmospheric composition and its relation to anthropogenic emissions and natural variability to government agencies and international research.
- Educate early career scientists from the Latin America and the Caribbean region on global and regional aspects of atmospheric composition change and atmospheric composition monitoring.
- Promote best practices of open data sharing and open access publication within the Latin America and the Caribbean region.

The 6-day training school included: (1) 17 classes on topics related to atmospheric particles, and reactive gases, (2) 11 short talks on studies and opportunities related to atmospheric particles and reactive gases in the Latin

America and the Caribbean region, (3) a poster session, (4) a session on collaborative proposals, (5) three side meetings (IGAC Americas Working Group AWG, WMO SDS WAS, and the Caribbean Aerosol Health Network - CAHN), and (6) a field trip to the Cape San Juan Atmospheric Observatory. See details at samlac.uprrp.edu.

SAMLAC brought together internationally recognized lecturers and speakers in the field of atmospheric measurements to give the lectures and/or present studies and opportunities in the LAC region. The lecturers and speakers included representatives from many diverse organizations including the World Meteorological Organizations (WMO), NASA, IGAC AWG, amongst many others (see full list at samlac.uprrp.edu). The plenary lecture “Quantifying the Health Effects of Air Pollution Globally” was given by Dr. Jason West, professor in Environmental Sciences and Engineering at the University of North Carolina - Chapel Hill, who performs interdisciplinary research that connects air pollution, climate change, energy and human health, using models of atmospheric chemistry and transport, and tools for quantitative policy analysis. The lectures covered topics such as: Measurements of Reactive Gases (O₃, CO, NO_x, VOCs), Quality Control of Trace Gases Observations, Aerosols Mechanical Properties & Filters, Aerosol Artifact-

free Sampling & Online Mass Monitors, Particle Counter & Particle Size Spectrometer, Data Analysis, Requirements for Global Networks for Short-lived Atmospheric Species, and Data Submission Procedures WMO NILU EBAS.

The poster session included 34 excellent presentations from students and participants whose research activities are related to atmospheric measurements in the LAC region. The students' posters were evaluated and the best three were awarded in the closing ceremony.

As part of the collaborative proposals session, there was a discussion on potential funding opportunities at the country and/or regional level for the LAC region. This type of funding opportunities is scarce but is very important to advance the science in the region and to foster stronger collaborations among LAC research groups. The SAMLAC students also had the opportunity to discuss their project ideas and interests in the collaborative proposals session. They formed teams and outlined the objectives, methodologies, expected results and broader impacts of collaborative projects, based on the lectures and experiences shared during the previous sessions of the SAMLAC.

The field trip took the SAMLAC participants to the Cape San Juan Atmospheric Observatory (CSJAO) in the Fajardo municipality. The participants visited the reconstructed CSJAO where the Atmospheric Chemistry and Aerosols Research group (ACAR) at the University of Puerto Rico – Rio Piedras performs their research studies. This station was devastated by Hurricane Maria on September 20, 2017, but has already been reconstructed with the help of the U.S. NSF, NASA, NOAA ESRL,

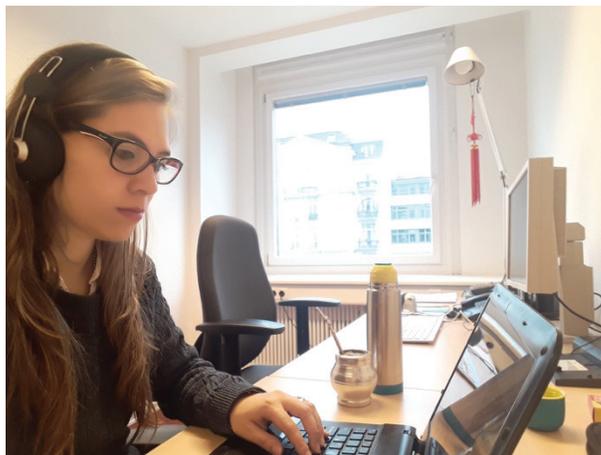
DOE ARM, UPR ACAR's group, and many others. During this visit, the participants were able to witness the installation of the NASA's PANDORA instrument in the station. They also enjoyed the view of the Cape San Juan nature reserve and received a short talk about the importance mangroves have on coastal ecosystems.

At the closing ceremony, lecturers and participants were acknowledged and the posters prizes were awarded. The 3rd poster place corresponded to a student from Argentina (Romina M. Pascual Flores with the poster *Characterization of the spatio-temporal variation of atmospheric pollution. WRF-Chem simulations and analysis potential sources contribution to the Central Andes*), the 2nd place was awarded to a Puerto Rican student (Odalys Martínez-Sánchez with the poster *Fifteen-Year Trend in African Dust Outbreaks Across the Eastern Caribbean*), and the 1st place to a student from Chile (Luis Alberto Gómez with the poster *Synoptic forcing of Extreme Concentrations of Fine Particulate Material (PM_{2.5}) in a Patagonian city*). We all enjoyed this night, after a very intense week.

SAMLAC 2018 was a success; our students learned a lot and enjoyed their stay in Puerto Rico. The IGAC AWG will continue to offer training courses to early career scientists in the LAC regions because it is clear these types of event help the students to gain experience and motivation to continue their research in atmospheric chemistry and air quality while building a network within in the LAC region and internationally. 

Romina M. Pascual Flores

Romina M. Pascual Flores was an IGAC Travel Grant recipient to the 2018 School of Atmospheric Measurements in Latin America and the Caribbean (SAMLAC): Atmospheric Particles and Reactive Gases, 12-17 November 2018 in San Juan, Puerto Rico.



Romina M. Pascual Flores is from Mendoza, Argentina where the most important activity in the province is winemaking and the area is known as "tierra del sol y del buen vino (land of the sun and good wine)." Romina earned her undergraduate degree in chemical engineering from the National Technological University – Mendoza Regional Faculty (UTN-RFM). Currently, Romina is a graduate student in the Grupo de Estudios de la Atmósfera y el Ambiente (GEAA) at UTN-RMF, which is directed by Dr. Enrique Piliáfito. The group is strong in atmospheric research and focuses on complex numeric modeling and atmospheric monitoring. She is currently writing her Ph.D. thesis in the environmental engineering department. The aim of her research is to assess the local and regional impact of urban aerosols and biomass burning on air quality and rain/snowfall. Romina uses a coupled numeric model with chemistry (WFR-Chem), meteorological and topographic characteristic of the region, and a emission inventory developed by GEAA to conduct her research.

Was there an event, influential individual or childhood dream that lead you to become a scientist? If not, what lead you to pursue a career in science?

I've always liked reading and learning. I tend to be very curious. I think research is like an adventure, once you start, you won't be able to stop until amazing experiences come out. I remember reading Einstein's words: "Never regard study as a duty but as the enviable opportunity to learn".

What was the highlight(s) of participating in SAMLAC?

Being part of SAMLAC was priceless, personally and professionally speaking. I was able to connect with colleagues and learn from their personal, professional, academic and scientific experiences. I was able to share my knowledge with others and take advantage of group work.

How do you want your career to progress and where do you think you can ultimately have the greatest impact?

I would like to continue studying and learning new things, I want to go further. All this, with the expectation of contributing to the implementation of measures to protect health. At present, there is sufficient evidence that atmospheric pollutants have an effect on ecosystems and human health, so research on these issues is of great importance to focus on, especially mitigation and regulatory measures. The uncertainty must be reduced in order to estimate the impacts generated.

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

I teach in high school and at the University. I love being a teacher and sharing my knowledge with my students and I learn from them as well. I enjoy reading, listening to music and watching TV series. I love being with my family and friends. One of my favorite things is travelling because it helps your personal and professional growth. [IGAC](#)



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