12th Symposium of the International Commission on Atmospheric Chemistry and Global Pollution (iCACGP)

and

11th Science Conference of the International Global Atmosphere Chemistry (IGAC) Project

PROGRAMME

Abstracts available on-line at
https://www1.cmos.ca/abstracts/congress_schedule.asp

http://www.icacgp-igac-2010.ca

Editors : Lisa M. LeBlanc, James R. Drummond

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Cover Photo: This true-colour image taken October 6, 2002, by the Moderate Resolution Imaging Spectroradiometer (MODIS) onboard the Terra satellite, shows autumn's march across the forests of eastern Canada and the U.S. The inset photos illustrate some of Nova Scotia's natural beauty. (MODIS Images courtesy Jesse Allen, NASA's Earth Observatory, based upon data provided by the MODIS Land Rapid Response Team at NASA GSFC - http://visibleearth.nasa.gov/; Inset photos by L.M. LeBlanc.)

Welcome from the Prime Minister of Canada

PRIME MINISTER . PREMIER MINISTRE

I am pleased to extend my warmest greetings to everyone attending the 12th Symposium of the International Commission on Atmospheric Chemistry and Global Pollution (ICACGP) and the 11th Science Conference of the International Global Atmospheric Chemistry Project (IGAC).

As someone who suffers from asthma, I am deeply concerned about clean air. I was proud that the Government of Canada helped to establish the world's first Air Quality Health Index and to expand the Air Quality Forecast Program, to better inform Canadians about the state of air pollution. Under the theme ***Atmospheric Chemistry: Challenging the Future,*** *this conference provides an ideal forum for exploring the impact of human activities on our atmosphere, and to discuss ways in which we can take steps to mitigate these effects on our health and climate. I am certain that everyone attending this conference will be inspired by the strategies presented here.*

For over a decade, ICACGP and IGAC have worked diligently to expand our understanding of our atmosphere. You may take great satisfaction in knowing that your efforts have such a positive impact on air quality and environmental stewardship.

On behalf of the Government of Canada, please accept my best wishes for a most productive meeting.

The Rt. Hon. Stephen Harper, P.C., M.P.

OTTAWA
2010

Premier's Message

On behalf of the Province of Nova Scotia, I am pleased to welcome you to Halifax for this year's Atmospheric Chemistry Conference: Challenging the Future. Nova Scotia is an environmental and energy leader, so I am confident that Nova Scotia will be an ideal host.

I want to thank the organizers for providing an opportunity for the world's leading scientists in atmospheric chemistry to come together and discuss important issues such as air quality and the interaction between chemistry and our climate.

I am proud to say that Nova Scotians are very engaged when it comes to environmental issues. Our province was the first in Canada to place hard caps on greenhouse gas emissions in the electricity sector, and our goal to have 40 per cent of Nova Scotia's electricity come from renewable sources by the year 2020 makes us one of the most aggressive renewable energy jurisdictions in the world.

I encourage you all to take some time this week to get our and experience some of what our great province has to offer. Enjoy the conference and please come visit us again soon.

Sincerely,

Darrell Dexter

Premier

Greetings from the Mayor

On behalf of Halifax Regional Council, I would like to take this opportunity to extend warm greetings and a special welcome to all attending the international Conference '*Atmospheric Chemistry: Challenging the Future*' taking place at Dalhousie University, July 11 – 16, 2010.

The 12th Symposium of the International Commission on Atmospheric Chemistry and Global Pollution (CACGP) and the 11th Science Conference of the International Global Atmospheric Chemistry (IGAC) Project will bring together scientists from all over the world to discuss current issues in chemistry and pollution that will greatly affect our planet in the future. Atmospheric Chemistry is important to Canada because of its influence on air quality and health. Delegates will participate in a full scientific program and provided the opportunity to network and develop contacts with other scientists in this important field.

I am pleased that you have chosen Halifax Regional Municipality as the site of your Conference and invite you to enjoy all our area has to offer, our region's culture is noted for its unique blend of history and tradition, co-existing comfortably with the contemporary. Enjoy!

Respectfully, I remain

Peter Kelly
Mayor

Welcome from the iCACGP Executive

Welcome message
from
the International Commission on Atmospheric Chemistry and Global Pollution (iCACGP)
to the participants of the
12th International Symposium of iCACGP
organized jointly with the
11th Science Conference of the International Global Atmospheric Chemistry (IGAC) Project.

The International Commission on Atmospheric Chemistry and Global Pollution (ICACGP) welcomes all participants to ist 12th Symposium. This scientific forum will facilitate discussion and scientific exchange and promote research related to global pollution and climate change. These are key modern research themes of great societal significance.

ICACGP is one of the International Commissions of the IAMAS (International Association of Meteorology and Atmospheric Sciences) and a sponsor of International Global Biosphere Programme –International Global atmospheric Chemistry project, IGAC, and the IGBP Surface ocean Lower Atmosphere Study, SOLAS, scientific organisations. The Commission was founded in 1957 as the Commission on Atmospheric Chemistry and Radioactivity. In 1971 the name was changed to the Commission on Atmospheric Chemistry and Global Pollution. iCACGP co-sponsors the international research project IGAC together with the International Geosphere-Biosphere Programme (IGBP), and the international SOLAS together with IGBP, the Scientific Committee on Oceanic Research (SCOR) and the World Climate Research Programme (WCRP).

ICACGP is supports IGAC's activities in stimulating collaborations and spreading scientific knowledge on environmental and climate change issues related to the surface - atmosphere – climate interactions and feedbacks. During the week of the Joint Symposium in Halifax, innovative research is to be presented and the important of novel and emerging research direction derived from the fruitful discussions between acknowledge outstanding scientists in the field and the young researchers. Ideas that will be the driving force to overcome the scientific challenges of the years ahead with respect to achieving i) an improved understanding of the fundamental mechanisms that control and determine atmospheric composition; ii) the necessary development and evolution of improved predictive capabilities focusing on the protection of the environment and iii) the provision of knowledge needed for solving societal issues, addressing water supply, food production and human/ecosystem health.

The ICACGP Officers:
Prof. Maria Kanakidou (President)
Prof. Kimitaka Kawamura (Vice President)
Prof. John P. Burrows (Secretary)

http://www.icacgp.org

CACGP SSC Members

Dr. Tami Bond (U.S.A.), Dr. Olivier Boucher (U.K.), Dr. Frank Dentener (Italy), Prof. James R. Drummond (Canada, and conference Chair), Prof. David Edwards (U.S.A.), Prof. Sara Feresu (Zimbabwe), Prof. Laura Gallardo Klenner (Chile), Prof. Elisabeth Holland (U.S.A.), Dr. Melita Keywood (Australia), Prof. Young J. Kim (S. Korea), Prof. Yutaka Kondo (Japan), Prof. Nilgun Kubilay (Turkey), Dr. Mark G. Lawrence (Germany), Prof. Ulrike Lohmann (Switzerland), Prof. Paul S. Monks (U.K.), Prof. Kobus J.J. Pienaar (South Africa), Prof. Mary Scholes (South Africa), Prof M.M. Sarin (India), Prof. Anne M. Thompson (U.S.A.), Dr. Kjetil Torseth (Norway), Prof. Tong Zhu (China)

Welcome from the IGAC Executive

IGAC Seattle Core Project Office
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Seattle, WA USA

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http://www.igac.noaa.gov

Welcome to the joint 11th open science conference of the IGAC project and 12th international symposium of iCACGP. We are pleased to be able to continue the tradition, started in 1994, of holding every other one of our biennial conferences with our founding organization, the International Commission on Atmospheric Chemistry and Global Pollution.

IGAC was established 1990 at the 7th CACGP international symposium in Chamrousse, France and a few years later also became a joint project of the International Geosphere Biosphere Programme (IGBP). In the intervening 20 years the field of atmospheric chemistry has grown and matured enormously. The IGAC community has always been on the leading edge of fundamental science and in taking an integrated view of atmospheric chemistry in an earth system context. Both of these strengths are reflected in the program for this year's conference. We hope that the conference theme, "Challenging the Future" will inspire everyone to continue to build in iCACGP and IGAC's tradition of forward thinking.

While we only get to gather as a community every two years IGAC activities are ongoing. Here you will see research presented from, among others, IGAC Tasks on Megacities: Asia, Air-Ice Chemical Interactions (AICI), Halogens in the Troposphere (HitT), Deposition of Biogeochemically Important Trace Species (DEBITS), the African Monsoon Multidisciplinary Analysis (AMMA), and POLARCAT. IGAC is also excited to be helping lead initiatives in the areas of Atmospheric Chemistry and Climate (AC&C) and Aerosols, Clouds, Precipitation and Climate (ACPC), as well as assessment reports on atmospheric chemistry in Mega-cities and on the role of black carbon in climate. This week we will be holding the IGAC annual Scientific Steering Committee meeting, and we encourage you to talk to any of the Steering Committee members (listed below) about the organization, opportunities for involvement and to share any ideas you have.

This conference is timely as our parent organizations IGBP and ICSU are looking forward to the future with the challenge of being relevant in a changing world. We face the scientific test of global environmental change and therefore the challenge of the future may not be far away.

We look forward to sharing an exciting week of discussions with you!

Paul Monks (U.K.), IGAC Co-chair
Tong Zhu (China), IGAC Co-chair
Sarah Doherty (U.S.A.), IGAC Executive Officer

IGAC SSC members:

Mary Barth (U.S.A.), Gufran Beig (India), James Drummond (Canada, and conference Chair), Maria Cristina Facchini (Italy), Graham Feingold (U.S.A.), Allen Goldstein (U.S.A.), David Griffith (Australia), Maria Kanakidou (Greece), Abdourahamane Konaré (Côte d'Ivoire), Yutaka Kondo (Japan), Kathy Law (France), Mark Lawrence (Germany), Karla Longo (Brazil), Shih-Chun Candice Lung (Taiwan), Celine Mari (France), Olga Mayol-Bracero (Puerto Rico), Rokjin Park (S. Korea), Kobus Pienaar (S. Africa).

Welcome from the Local Organising Committee

It is a great privilege to work in atmospheric science in this century. The importance of atmospheric science, and in particular atmospheric chemistry, to our society is undeniable. Ensuring a clean atmosphere for the present and for the future is essential for the health and well-being of humanity on this planet. The title of this conference: "Atmospheric Chemistry: Challenging the Future" reflects the necessity of working not only for the present, but also for the future of the planet.

In the planning this conference the Local Organising Committee has had a lot of support from numerous people both inside and outside of our organisations and there have been many contributions in time and effort to make this meeting a success. As the chair of the Local Organizing Committee I would like to thank everyone for their efforts. Many I will manage to thank personally, and if I miss you out - my apologies, there was no slight intended and we are very grateful for your efforts.

On behalf of the Local Organising Committee, it is now my pleasant task to welcome delegates to Halifax. This conference promises to be a productive and exciting time. If there is anything we can do to enhance your experience, please let us know and we will attempt to accommodate you. We all look forward to an exciting five days.

Let the science begin!

James Drummond

Local Organising Committee

James R. Drummond, Chair
Tom Duck
Ian Folkins (Poster Sessions)
Lisa LeBlanc
Glen Lesins
Randall Martin
Jeffrey Pierce (Computer/IT Arrangements)
Hilda Thomas
Aldona Wiacek (Young Scientist Activities)

All at the Department of Physics and Atmospheric Science, Dalhousie University

Welcome from the Scientific Programme Committee

On behalf of the Commission on Atmospheric Chemistry and Global Pollution and the International Global Atmospheric Chemistry project, it is a pleasure to welcome you to our joint conference: "Atmospheric Chemistry: Challenging the Future". We hope to offer you exciting sessions covering nearly all fields of atmospheric chemistry: emissions, transport & transformation, observations of multiple scales, interfaces of atmospheric chemistry with other areas, and chemistry-climate coupling. Our field is changing. While we have increased our knowledge enormously during the last 3-4 decades, new challenges lie ahead: on the one hand we still have a great need to improve our knowledge on many fields of atmospheric chemistry, and remain open to discover the unknown. On the other hand, integration of our knowledge with other fields, air pollution and health, the role of pollutants as short-lived climate forcers, interactions with biosphere and cryosphere – just to name a few – are fields where such interactions are now happening. We hope that this conference will provide some new insights into these new developments.

We are therefore thankful to the 2 years of preparatory work of the scientific committee, the session chairs, and last-but-not-least the local organizers led by Jim Drummond. Without their outstanding job, we would not have been able to organize this conference on this beautiful venue.

We hope that you will find the symposium both enjoyable and relevant, and also find time to enjoy Halifax and the surrounding region with extensive coastlines, Acadian heritage, and warm Maritime hospitality.



Randall Martin and Frank Dentener

Scientific Programme Committee

Randall Martin (LOC, Canada, Co-Chair)
Frank Dentener (CACGP, Italy, Co-Chair)
John Burrows (CACGP, Germany)
Jim Drummond (LOC/CACGP/IGAC, Canada)
Graham Feingold (IGAC, USA)
Roland von Glasow (SOLAS, UK)
Maria Kanakidou (CACGP/IGAC, Greece)
Kimitaka Kawamura (CACGP, Japan)
Tong Zhu (CACGP/IGAC, China)

2010 Young Scientist Travel Grant Award Sponsors

A number of organisations have participated in sponsoring excellent young scientists to attend this conference. The community very much appreciates the support given to our up-and-coming members. We also congratulate the 47 recipients of these awards and look forward to their participation in Halifax.

Atmospheric Composition Change – the European Network of Excellence (ACCENT)

Canadian Space Agency (CSA)

International Commission on Atmospheric Chemistry and Global Pollution (iCACGP)

International Global Atmospheric Chemistry Project (IGAC)

National Oceanic and Atmospheric Administration (NOAA)

National Science Foundation (NSF)

World Meteorological Organization (WMO)

Registration Desk Information

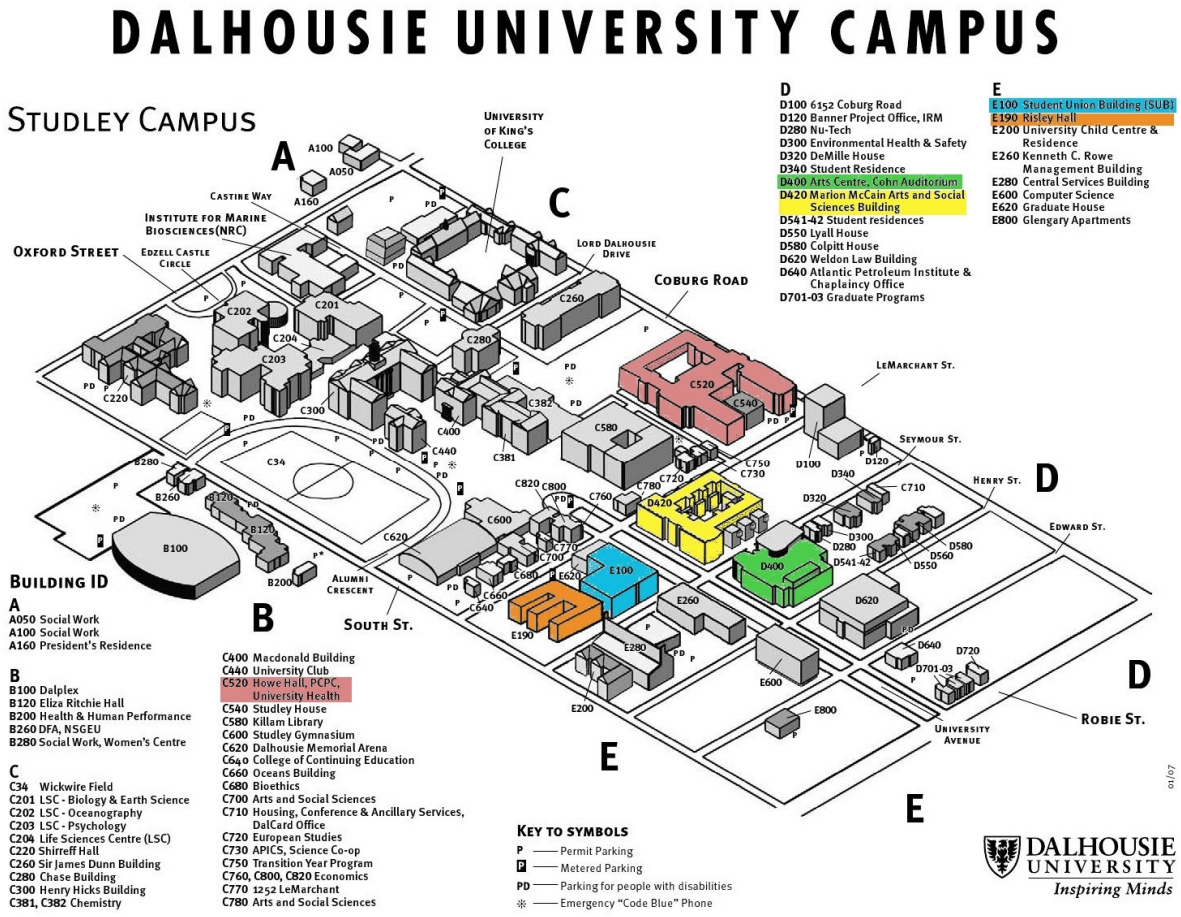
The Registration Desk will be located in the Foyer of the Rebecca Cohn Auditorium.
Hours are:

12:00-18:00 Sunday, July 11
07:30-16:00 Monday, July 12
08:00-12:00 Tuesday, July 13
08:00-08:30 and during breaks Wednesday, July 14
08:00-08:30 and during breaks Thursday, July 15

Ways the LOC is making the conference green

- Compostable badge holders from ReBinder
- Lanyards made from recycled materials from Dynamic Gift
- Travel mugs made from recycled plastic from 4imprint.com
- Natural fibre conference tote bags from Atlantic Bag Manufacturers
- Minimal paper used – conference materials presented on USB sticks from Dynamic Gift
- Plates and cutlery for lunches made from compostable materials
- Creation of taxi-sharing services as well as use of a conference-dedicated shuttle to/from the airport
- Hotels restricted to within walking distance of conference

Map of Dalhousie Studley Campus



Social Agenda

Sunday, July 11 – Icebreaker Reception
18:00-22:00 Sculpture Court of the Rebecca Cohn Auditorium
18:00-20:00 Hors d'oeuvres will be served

Monday, July 12 – Public Lecture by Ian Galbally
19:00-19:30 Rebecca Cohn Auditorium

Tuesday, July 13 – Young Scientist Mixer
19:00-22:00 Small Craft Gallery of the Maritime Museum of the Atlantic

Wednesday, July 14 – Young Scientist Luncheon
12:30-14:00 Sculpture Court of the Rebecca Cohn Auditorium

Thursday, July 15 – Banquet
18:00-22:00 Cunard Centre

Map of Conference Venues , Bus Routes, Drug Stores

Poster Session and Schedule

The posters will be located in the McInnis Room (Room 403) of the Dalhousie University Student Union Building. Each session lasts for two days with a dedicated viewing session each day. During these sessions, the presenting author is expected to be at his/her poster.

Chemistry-climate interactions: Perspectives on the future
Chemistry at the Interfaces: Discovering the unknown
Observing atmospheric composition: Implications for the future (Global)
Trace gas and aerosol source strengths: Improving their accuracy
15:35-18:00 Monday, July 12
16:30-19:00 Tuesday, July 13

Observing atmospheric composition: Implications for the future (Regional & Local)
Pollutant transformation and loss: Enhancing prognostic capability
10:30-12:30 Wednesday, July 14
10:30-12:30 Thursday, July 15

Guidelines for Presenters

Poster Presentations

- Each poster is allocated a space of approximately 4 ft (1.2m) by 4 ft (1.2m).
- The poster boards can accept both Velcro and pins (a supply of both will be available).
- Posters for Monday's poster session should be up by noon on Monday and removed by 7:00 pm on Tuesday.
- Posters for Wednesday's poster session should be up by 9:30 a.m. on Wednesday and removed by noon on Friday.
- High-resolution photographs will be taken of all posters for inclusion on the conference web-site for the convenience of conference participants and associates. Normally, display of your poster implies that you and your co-authors agree to this additional means of dissemination. If there is a problem with this, please contact the Local Organizing Committee for alternate arrangements.

Oral Presentations

- Contributed talks are to be 12 minutes in length, with 3 minutes for questions
- Have your talk ready for loading onto the computer at least half a day ahead of your presentation (i.e., morning talks before the end of the previous day, afternoon talks by the end of the morning).
- Video recording will be made of all the talks for inclusion on the conference web-site for the convenience of conference participants and associates. Normally, presentation of your talk implies that you and your co-authors agree to this additional means of dissemination. If there is a problem with this, please contact the Local Organizing Committee for alternate arrangements.

Guidelines for Chairpersons

Oral Sessions

One assistant will be present to help with any A/V or computer technical problem. Each computer will be equipped with the following software: Microsoft Office, Adobe Acrobat Reader, Quicktime Player and Windows Media Player.

Before the session starts, the chairperson(s) should touch base with the assistant, check if all talks are loaded in the computer and if all speakers are present.

Before the start of the session, the chairperson(s) should verify that the person to speak is listed in the program as the presenter or one of the authors or otherwise is sufficiently acquainted with the work in order to answer questions.

The chairperson is responsible for opening and closing the session on time. The time allocated for a presentation includes the time for questions and discussion as well as the change-over. A timer will be available. Should an unforeseen gap in the schedule appear, it should be filled with a standby paper, an extended question period on previous talks or a short description of the poster session associated with the session.

The up-dated daily session program will be posted outside the session room. The chairperson of each session will receive a copy from the assistant.

List of Session Chairs

Trace gas and aerosol source strengths: Improving their accuracy
Tami Bond, Laura Gallardo, Dylan Jones

Pollutant transformation and loss: Enhancing prognostic capability
Maria Kanakidou, Kimitaka Kawamura, Roland von Glasow

Observing atmospheric composition: Implications for the future
John Burrows, David Edwards, Young Kim, Colette Heald

Chemistry at the Interfaces: Discovering the unknown
Beth Holland, Thanos Nenes, Manmohan Sarin

Chemistry-climate interactions: Perspectives on the future
Graham Feingold, Melita Keywood, Mark Lawrence

Session Descriptions

Trace gas and aerosol source strengths: Improving their accuracy

Emissions of trace gases and aerosols from both natural and anthropogenic sources are a key driver of atmospheric chemistry. Emission inventories with improved accuracy, both in magnitude and in source identification, will support better climate assessments, air quality management, and understanding of biogeochemical cycles. This session includes innovative developments to improve the accuracy of emission inventories through both "bottom-up" approaches based on emission factors and activity rates, and "top-down" approaches based on inverse modeling of observations.

Pollutant transformation and loss: Enhancing prognostic capability

Transformation and transport of trace gases and aerosols can both enhance and reduce their atmospheric implications. Outstanding questions remain in differences between daytime and nighttime chemistry, in the role of halogens, and in the formation of organic aerosol. Long-range transport links distant atmospheric sources across intercontinental scales. Cloud processing and deposition are major processes in pollutant transformation and loss from the atmosphere. This session seeks improved understanding of these processes to enhance prognostic capability.

Observing atmospheric composition: Implications for the future

Observations from a variety of platforms including ground-based, aircraft, and satellite are fundamental to improving scientific understanding of atmospheric chemistry. Interpretation of observations with models plays a major role in quantitatively assessing process-level understanding. This session addresses the analysis of observations across a range of scales including global, regional, and urban/megacity domains to improve process-level understanding and to identify needs for future investigations.

Chemistry at the Interfaces: Discovering the unknown

Atmospheric chemistry is fundamentally intertwined with the Earth system through biogeochemical cycling of atmospheric constituents with the land surface, biosphere, oceans, and cryosphere. Polar chemistry has received recent attention in the recent international polar year. Chemistry at the interface of gaseous and condensed phases has extensive implications for processes affecting climate and air quality. This session welcomes investigations that address key interfaces in atmospheric chemistry.

Chemistry-climate interactions: Perspectives on the future

Important two-way interactions between atmospheric chemistry and global climate include drivers of climate change such as the aerosol direct and indirect effects, and the influence of a changing climate on global atmospheric chemistry and regional air quality. The atmospheric chemistry community can contribute substantially to international climate assessment programs, which play a major role in coordinating scientific investigations in this area, and in guiding exploration of options to reduce atmospheric change and its associated risks. This session includes analyses of chemistry-climate interactions, from the process level though top-down global assessments, providing insight into future scenarios.

Keynote Speaker Biographies

John H. Seinfeld is the Louis E. Nohl Professor in the Divisions of Chemistry and Chemical Engineering and Engineering and Applied Science at the California Institute of Technology. Professor Seinfeld is widely acknowledged for his research on the chemistry and physics of the atmosphere. He has made numerous contributions to our knowledge of the chemistry of the urban atmosphere, the formation, growth, and dynamics of atmospheric aerosols, and the role of aerosols in climate. He is a member of the U.S. National Academy of Engineering and a Fellow of the American Academy of Arts and Sciences. He is the recipient of the 1993 American Chemical Society Award for Creative Advances in Environmental Science and Technology and the 2001 Nevada Medal. Professor Seinfeld received the Fuchs Award in 1998, an award given every four years and considered the highest honor bestowed for work in the field of aerosol science. He was chairman of the National Research Council Committee on Tropospheric Ozone Formation and Measurement and of the NRC Panel on Aerosol Radiative Forcing and Climate. He served as Vice Chair of the NRC Committee on Atmospheric Chemistry.

Monday, 12 July 9:30 a.m., Rebecca Cohn Auditorium

Doug Dockery is the Chair of the Department of Environmental Health and Professor of Environmental Epidemiology, Harvard School of Public Health, Harvard University. Dr. Dockery and his colleagues have studied the health effects of air pollution exposures in populations who have been followed for up to twenty-five years. That research has increasingly pointed to combustion-related particles as being causally linked to increased morbidity and mortality even at the relatively low concentrations observed in developed countries today. Dr. Dockery and his colleagues have reported that episodes of particulate air pollution are consistently associated with increased daily mortality, increased hospital admissions and emergency room visits, exacerbation of asthma, increased respiratory symptoms and lower lung function. Long-term follow-up studies have shown particulate air pollution is associated with shortened life expectancy in adults and increased chronic respiratory illness and lower lung function in children. This research has led to the current debate on the role of particulate air pollution in producing adverse effect effects and to the re-evaluation of air quality standards both nationally and internationally.

Dr. Dockery's current research is attempting to more specifically identify the chemical and physical characteristics of those particles responsible for the observed adverse health effects. Current studies also are attempting to understand the pathways of acute cardiovascular events associated with air pollution exposure and to link these epidemiologic finding with toxicologic studies of particle effects. He also is assessing the health benefits of air pollution controls. In addition, the methods developed to assess air pollution health effects epidemiologically are being applied to other environmental hazards including contamination of water supplies.

Wednesday, 14 July 8:30 a.m., Rebecca Cohn Auditorium

List of Invited Speakers

Jonathan Abbatt, Dept of Chemistry, University of Toronto, Canada
"Tropospheric aerosol chemistry: Challenges, recent progress and unknowns
Tuesday, 13 July, 9:30 a.m.

Steven Brown, Earth System Research Lab, NOAA, USA
"Heteorgeneous chemistry in the dark: New insights into atmospheric budgets for reactive nitrogen and halogens"
Thursday, 15 July, 14:00 p.m.

Cathy Clerbaux, CNRS, Université Paris 6/LATMOS, France
"Observing the troposphere with IASI: Emission, chemistry and transport"
Friday, 16 July, 11:00 a.m.

Martin Cope, Marine and Atmospheric Research, CSIRO, Australia
"Air quality and climate change – considerations for the Australian region"
Monday, 12 July, 13:30 p.m.

Mauricio Osses, International Sustainable Systems Research Center, Chile
"Connecting local and global emission inventories: New challenges to improved accuracy and consistency"
Tuesday, 13 July, 13:30 p.m.

Paul Palmer, School of GeoSciences, The University of Edinburgh, UK
"Inferring surface fluxes of trace gases from space-borne data: Current and future science"
Friday, 16 July 11:30 a.m.

Spyros Pandis, Dept of Chemical Engineering, Carnegie-Mellon University, USA
"Atmospheric organic particulate matter: Revisiting its sources, properties and impacts"
Thursday, 15 July, 8:30 a.m.

Phil Rasch, Climate and Global Dynamics Division, NCAR, USA
"In search of regional signatures of "geoengineering" aerosol injections in terms of climate forcing and response"
Monday, 12 July, 11:00 a.m.

Drew Shindell, Goddard Institute for Space Studies, NASA, USA
"Chemistry-climate interactions and the role of short-lived climate forcers"
Friday, 16 July, 9:00 a.m.

Barbara Turpin, Dept of Environmental Science, Rutgers University, USA
"Enhancing the prognostic capability of global aerosol models: Atmospheric aqueous chemistry and its role in secondary organic aerosol (SOA) formation"
Wednesday, 14 July, 14:00 p.m.

Tong Zhu, College for Environmental Sciences and Engineering, Peking University, China
"The impacts of Megacities on air quality and climate change: An IGAC perspective"
Friday, 16 July, 9:45 a.m.

All talks at the Rebecca Cohn Auditorium

Conference Schedule

Please note that this schedule is subject to change.

12th Symposium of the International Commission on Atmospheric Chemistry and Global Pollution (CACGP)
11th Science Conference of the International Global Atmosphere Chemistry (IGAC) Project

Sunday 11 July

12:00-18:00	**Registration (Sculpture Court of the Rebecca Cohn Auditorium)**
18:00-22:00	**Icebreaker (Sculpture Court of the Rebecca Cohn Auditorium)**

Monday 12 July

7:30-18:00	**Registration (Sculpture Court of the Rebecca Cohn Auditorium)**	
8:45 - 9:30	**Opening and Welcome (Rebecca Cohn Auditorium – all ORAL PRESENTATIONS are at the Rebecca Cohn Auditorium)**	
9:30 - 10:15	J. Seinfeld	Keynote address: Chemistry and Climate
10:15 - 10:30	**Chemistry-climate interactions: Perspectives on the future (Part 1)**	
10:15 - 10:30	R. Doherty	A multi-model assessment of Intercontinental Source-Receptor relationships for ozone pollution in the 21st century
10:30 - 11:00	***COFFEE BREAK*** (Sculpture Court of the Rebecca Cohn Auditorium)	
11:00 – 12:00	**Chemistry-climate interactions: Perspectives on the future (Part 2)**	
11:00 - 11:30	P. Rasch	**Invited:** In search of regional signatures of "geoengineering" aerosol injections in terms of climate forcing and response
11:30 - 11:45	L. Zhou	Assessing an NOx mitigation technique: Chemical and climatic consequences of rising methane and NOx concentration levels in the troposphere
11:45 - 12:00	A. Aghedo	Young Scientist: The vertical distribution of tropospheric ozone instantaneous radiative forcing from satellite and chemistry climate models
12:00 - 13:30	***LUNCH*** (McCain Courtyard)	
13:30 – 14:35	**Chemistry-climate interactions: Perspectives on the future (Part 3)**	
13:30 - 13:50	M. Cope	**Invited:** Air Quality and Climate Change - considerations for the Australian region
13:50 - 14:05	P. Stier	Assessment of aerosol-cloud interactions employing parametrisations of various complexities
14:05 – 14:20	R. Van Dingenen	Particulate matter in global climate and air quality policies: Co-benefits and trade-offs
14:20 - 14:35	D. Koch	Black carbon effects on clouds: Implications for mitigation
14:35 – 15:35	**Observing atmospheric composition: Implications for the future (Part 1)**	
14:35 - 14:50	P. Bhartia	Results from 6 years of operation of the Ozone Monitoring Instrument (OMI)
14:50 - 15:05	A. Voulgarakis	Young Scientist: Global correlation patterns of ozone and CO derived from TES observations and model simulations
15:05 - 15:20	R. Levy	Characterizing differences between AOD trends derived from MODIS-Terra and MODIS-Aqua
15:20 - 15:35	K. Walker	Investigating atmospheric composition using solar occultation: the Atmospheric Chemistry Experiment (ACE) and beyond
15:35 – 16:05	***REFRESHMENTS AT POSTERS*** (McInnis Room of the Student Union Building) All POSTER SESSIONS are here	
15:35 - 18:00	**POSTER SESSION: Chemistry-climate interactions / Chemistry at the interfaces** **POSTER SESSION: Observing atmospheric composition (Global) / Trace gas and aerosol source strengths**	
19:00 - 19:30	I. Galbally	Keynote: From Robert Boyle to IGAC: a history of the study of atmospheric composition and chemistry
19:30 - 19:40	B. Duce	The history of CACGP
19:40 - 21:00	CACGP open meeting	

Tuesday 13 July

8:00 - 12:00	**Registration (Sculpture Court of the Rebecca Cohn Auditorium)**	
8:30 – 9:30	**Observing atmospheric composition: Implications for the future (Part 2)**	
8:30 - 8:45	J. Drummond	10 Years of Pollution Data from the MOPITT Instrument
8:45 - 9:00	K. Bowman	Next Generation Remote Sensing of Ozone: An Assessment of Tropospheric Sensitivity
9:00 - 9:15	H. Bovensmann	Atmospheric composition from geostationary orbit - Sentinel 4 UVN on Meteosat Third Generation
9:15 - 9:30	J. Mao	Young Scientist: Sensitivity of continental boundary layer chemistry to a new isoprene oxidation mechanism
9:30 – 10:35	**Chemistry at the interfaces: Discovering the unknown (Part 1)**	
9:30 - 9:50	J. Abbatt	**Invited:** Tropospheric aerosol chemistry: challenges, recent progress and unknowns
9:50 - 10:05	A. Ito	Role of dust alkalinity in atmospheric chemical processing of Asian dust for the North Pacific Ocean fertilization
10:05 - 10:20	C. Brock	Arctic Aerosols, Springtime Forest Fires, and Climate
10:20 - 10:35	A. Kumar	Young Scientist: Atmospheric chemistry in MABL of tropical Bay of Bengal: Impact of continental outflow
10:35 - 11:00	***COFFEE BREAK*** (Sculpture Court of the Rebecca Cohn Auditorium)	
11:00 – 12:00	**Chemistry at the interfaces: Discovering the unknown (Part 2)**	
11:00 - 11:15	B. Collins	How biospheric cycling affects climate metrics for air quality pollutants.
11:15 - 11:30	A. Bougiatioti	Young Scientist: Size-resolved CCN measurements in the Eastern Mediterranean: distributions, closure and activation kinetics.
11:30 - 11:45	J. Pierce	Young Scientist: Ultrafine particle growth: Better predictions of atmospheric aerosol number with revised organic condensation schemes
11:45 - 12:00	J. Hoelzemann	Young Scientist: Improving the representation of tropospheric aerosols over South America in an atmospheric chemistry model by assimilation of satellite and ground-based remote sensing data
12:00 - 13:30	***LUNCH*** (McCain Courtyard)	
13:30 – 15:00	**Trace gas and aerosol source strengths: Improving their accuracy (Part 1)**	
13:30 - 14:00	M. Osses	**Invited:** Connecting local and global emission inventories: New challenges to improved accuracy and consistency
14:00 - 14:15	M. Sanchez Gacita	Impact of an improved Cuban emissions inventory on air quality simulations
14:15 - 14:30	D. Henze	Constraining NH3 emissions using remote sensing and surface observations
14:30 - 14:45	R. Martin	Space-based constraints on global sulfur dioxide emissions
14:45 - 15:00	R. Nassar	Young Scientist: Inverse modelling of CO2 sources and sinks using Tropospheric Emission Spectrometer (TES) CO2 observations
15:00 - 15:30	***COFFEE BREAK*** (Sculpture Court of the Rebecca Cohn Auditorium)	
15:30 – 16:30	**Trace gas and aerosol source strengths: Improving their accuracy (Part 2)**	
15:30 – 15:45	K. Pickering	Lightning NOx production in midlatitude thunderstorms as observed by OMI
15:45 – 16:00	J. Turnbull	Young Scientist: Quantification of fossil fuel CO2 emissions from East Asia using atmospheric observations of Δ14CO2
16:00 - 16:15	S. Gilardoni	Better constraints on source of carbonaceous aerosol using a combined C14-macro tracer analysis in a rural European background site.
16:15 - 16:30	C. Granier	Evaluation of anthropogenic and natural surface emissions of atmospheric chemical compounds
16:30 – 17:00	***REFRESHMENTS AT POSTERS*** (McInnis Room of the Student Union Building)	
16:30 - 19:00	**POSTER SESSION: Continued from Monday**	
19:00 –22:00	**Young Scientist Mixer (Small Crafts Gallery of the Maritime Museum of the Atlantic)**	

Wednesday 14 July

8:00-8:30	**Registration (Sculpture Court of the Rebecca Cohn Auditorium)**	
8:30 - 9:15	D. Dockery	Keynote address: Particle health effects: Understanding and future challenges (Rebecca Cohn Auditorium – all ORAL PRESENTATIONS are at the Rebecca Cohn Auditorium)
9:15 – 10:30	**Observing atmospheric composition: Implications for the future (Part 3)**	
9:15 - 9:30	C. Liousse	Integrated Focus on West African cities (Cotonou, Bamako, Dakar, Ouagadougou, Abidjan, Niamey): Emissions, Air quality and Health Impact of gases and aerosols
9:30 - 9:45	N. Mihalopoulos	Particulate matter (PM10) in Istanbul: Origin, source areas and potential impact on surrounding regions
9:45 - 10:00	A. Hillbol	Young Scientist: Trends in tropospheric NO2 over megacities in the Mediterranean and Middle East from GOME and SCIAMACHY
10:00 - 10:15	S. Kim	Modeling of Texas urban, industrial, and power plant plumes observed during TexAQS 2006 field campaign and its implications for NOx and VOC emissions
10:15 - 10:30	Y. Zhang	The dependence of ozone production on its precursors in Pearl River Delta and Beijing Area, China
10:30 – 11:00	***REFRESHMENTS AT POSTERS*** (McInnis Room of the Student Union Building) All POSTER SESSIONS are here	
10:30 - 12:30	**POSTER SESSION: Observing atmospheric composition (Regional & Local) / Pollutant transformation and loss**	
12:30 - 14:00	***LUNCH*** (McCain Courtyard) Young Scientist Luncheon at Sculpture Court of Rebecca Cohn Auditorium	
14:00 – 15:30	**Pollutant transformation and loss: Enhancing prognostic capability (Part 1)**	
14:00 - 14:30	B. Turpin	**Invited:** Enhancing the prognostic capability of global aerosol models: Atmospheric aqueous chemistry and its role in secondary organic aerosol (SOA) formation
14:30 - 14:45	M. Claeys	Organosulfates of C9-C11hydroxy carboxylic acids: novel tracers for a marine secondary organic aerosol formation process
14:45 - 15:00	C. Heald	Organic Aerosol: from oxidation to optical depth
15:00 - 15:15	A. Prevot	Evolution of organics in the atmosphere: Dependence on technology of diesel vehicles and wood burning facility
15:15 - 15:30	A. Gratien	Young Scientist: Are Aromatic Hydrocarbons Generated from the Atmospheric Oxidation of Biogenic Hydrocarbons Such as α-Pinene?
15:30 - 16:00	***COFFEE BREAK*** (Sculpture Court of the Rebecca Cohn Auditorium)	

Thursday 15 July

8:00-8:30	**Registration (Sculpture Court of the Rebecca Cohn Auditorium)**	
8:30-9:00	**Observing atmospheric composition: Implications for the future (Part 4)**	
8:30 - 9:00	S. Pandis	**Invited:** Atmospheric Organic Particulate Matter: Revisiting its Sources, Properties and Impacts
9:00 - 9:15	Y. Kondo	Using ambient refractory particle mass to calibrate black carbon measurements made by laser-induced incandescence, thermal-optical transmittance, and filter-based photo-absorption techniques
9:15 - 9:30	H. Schlager	Observations of large HNO3-containing particles and redistribution of reactive nitrogen in the 2010 winter Arctic stratosphere during RECONCILE
9:30 - 9:45	S. Lal	Transport effects on the vertical distribution of ozone over marine regions surrounding India
9:45 - 10:00	H. Tanimoto	Decadal trends in tropospheric ozone over East Asian Pacific rim during 1998-2007: Comparison to European and North American records, and implications for emerging Asian emissions impacts
10:00 - 10:15	Q. Chen	Aerosol characterization in the Amazon Basin during AMAZE-08: Fine particle composition and source apportionment
10:15 - 10:30	D. Ceburnis	Young Scientist: North Atlantic marine boundary layer organic aerosol: sources and fluxes
10:30 – 11:00	***REFRESHMENTS AT POSTERS*** (McInnis Room of the Student Union Building)	
10:30 - 12:30	**POSTER SESSION: Continued from Wednesday**	
12:30 - 14:00	***LUNCH*** (McCain Courtyard)	
14:00 – 15:20	**Pollutant transformation and loss: Enhancing prognostic capability (Part 2)**	
14:00 - 14:20	S. Brown	**Invited:** Heterogeneous chemistry in the dark: New insights into atmospheric budgets for reactive nitrogen and halogens
14:20 - 14:35	M. Krol	OH variability in the period 1988-2008 inferred from the global methyl chloroform budget
14:35 - 14:50	E. von Scheidemesser	Are megacity's oxidizing environments changing?
14:50 - 15:05	R. Sommariva	Young Scientist: A study of halogen chemistry in the tropical Atlantic Ocean boundary layer
15:05 - 15:20	D. Allen	An evaluation of upper tropospheric NOx/ozone chemistry during INTEX-A using CMAQ with a modified CB05 chemical mechanism and lightning NO emissions
15:20 - 15:50	***COFFEE BREAK*** (Sculpture Court of the Rebecca Cohn Auditorium)	
15:50 – 16:35	**Pollutant transformation and loss: Enhancing prognostic capability (Part 3)**	
15:50 - 16:05	K. Law	Pollutant Plume Processing during Long-range Transport to the Arctic
16:05 - 16:20	J. Dawson	Assessment report from the Task Force on Hemispheric Transport of Air Pollution
16:20 - 16:35	C.H. Song	Investigation of ship-plume chemistry using a newly-developed photochemical/dynamic ship-plume model
18:30 – 22:00	**Banquet at Cunard Centre; next to Pier 21**	

Friday, 16 July: Wake up selection – Future Challenges for IGAC

8:00-14:00	**Departure Assistance (Sculpture Court of the Rebecca Cohn Auditorium)**	
9:00 - 9:30	D. Shindell	**Invited:** Chemistry-Climate Interactions and the Role of Short-lived Climate Forcers
9:30 - 9:45	T. Bond	Bounding the Role of Black Carbon in Climate
9:45 - 10:15	T. Zhu	**Invited:** The Impacts of Megacities on Air Quality and Climate Change: An IGAC Perspective
10:15 - 10:30	R. von Glasow	Atmospheric chemistry in volcanic plumes
10:30 - 11:00	***COFFEE BREAK*** (Sculpture Court of the Rebecca Cohn Auditorium)	
11:00 - 11:30	C. Clerbaux	**Invited:** Observing the troposphere with IASI: emission, chemistry and transport
11:30 - 11:50	P. Palmer	**Invited:** Inferring surface fluxes of trace gases from space-borne data: current and future science
11:50 - 12:20	poster session winners	5 minute talks, presenting their work
12:20 - 12:30	Concluding remarks	
12:30 - 14:00	***LUNCH*** (McCain Courtyard)	

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