

**ARCTAS Science Team Meeting**  
**Virginia Beach Holiday Inn SunSpree Resort**  
**Virginia Beach, VA**  
**27-30 January 2009**

**Revised Agenda – 15 January 2009 ([djacob@fas.harvard.edu](mailto:djacob@fas.harvard.edu))**

**Tuesday, 27 January 2009**

7:30 *Registration*

*Mission Overview*

- 8:30 Welcome and charge (Jim Crawford/Jay Al-Saadi/Hal Maring, NASA HQ)
- 8:45 ARCTAS mission overview (Daniel Jacob, Harvard)
- 9:00 Meteorological overview (Henry Fuelberg, FSU)
- 9:15 Fires in the summer phase (Mike Fromm, NRL)
- 9:30 DC-8 overview (Hanwant Singh, ARC/Jack Dibb, UNH)
- 9:45 P-3 overview (Phil Russell, ARC/Tony Clarke, U. Hawaii)
- 10:00 B-200 overview (Rich Ferrare/Chris Hostetler, LaRC)
- 10:15 Data status and intercomparisons (Jennifer Olson/Gao Chen, LaRC)

10:30 *Break*

*Partner activities*

- 10:45 NOAA ARCPAC (Chuck Brock, NOAA ESRL)
- 11:00 DOE ISDAC (Steve Ghan, DOE PNNL)
- 11:15 DLR (Hans Schlager, DLR)
- 11:30 POLARCAT-France (Jacques Pelon, CNRS)
- 11:45 ARC-IONS (Anne Thompson, Penn State)

12:00 *Lunch*

*Long-range transport*

- 13:30 Airborne DIAL ozone, aerosol, and clouds measurements: Observations of large-scale transport of pollution and fire plumes, and low ozone depletion events (John Hair, LaRC)
- 13:45 Patterns of CO<sub>2</sub> and radiocarbon across high northern latitudes during IPY 2008 (Stephanie Vay, LaRC)
- 14:00 Pyrocumulus transport of biomass burning tracers into the upper troposphere (Jason St. Clair, Caltech)
- 14:15 Biomass burning signatures in the Arctic troposphere observed by PTR-MS (Armin Wisthaler, U. Innsbruck)
- 14:30 Interannual variability of boreal biomass burning and relationship with climate cycles (Allen Chu, GSFC)
- 14:45 Factors influencing tropospheric Hg<sup>o</sup> in the North American Arctic during the spring and summer periods (Huiting Mao, UNH)

15:00 *Break*

## **Tuesday, 27 January 2009 (continued)**

### *Aerosol sources and properties*

- 15:15 Ground-based lidar and aerosol measurements (Glenn Shaw, U. Alaska)
- 15:30 HSRL measurements of smoke during ARCTAS (Rich Ferrare, LaRC)
- 15:45 Combustion aerosol in the Arctic: Models, size-resolved microphysics, chemistry, and relationships to CCN variability (Tony Clarke, U. Hawaii)
- 16:00 Arctic aerosol chemistry and spectral optical characteristics: Mixtures of major ions with black, brown and organic carbon (Steve Howell, U. Hawaii)
- 16:15 The physical and chemical evolution of biomass burning aerosols (Jose Jimenez, U. Colorado)
- 16:30 Evolution of physical and chemical properties of black carbon emitted from biomass burning and fossil fuel combustion (Yutaka Kondo, U. Tokyo)
- 16:45 Aerosol optical properties measured from aircraft, satellites and the ground during ARCTAS summer - their relationship to aerosol chemistry and smoke type (Yohei Shinozuka, ARC)
- 17:00 CCN measurements during ARCTAS (Thanos Nenes, Georgia Tech)
- 17:15 *Adjourn plenary session*
- 19:00 1<sup>st</sup> Poster Session (two hours)

## **Wednesday, 28 January 2009**

7:30 *Registration*

### *Aerosols and radiation*

- 8:30 Synchronicity of aerosol optical measurements acquired at Arctic and sub-Arctic sites during the ARCTAS spring campaign (Norm O'Neill, Université de Sherbrooke)
- 8:45 Airborne sunphotometer (AATS-14) measurements in ARCTAS – First insights into their combined use with satellite observations to study Arctic aerosol radiative effects (Jens Redemann, ARC)
- 9:00 Simultaneous retrieval of aerosol and surface properties over snow (Charles Gatebe, GSFC)
- 9:15 The implications of SSFR measurement uncertainty and surface heterogeneity for spectral surface albedo and spectral aerosol forcing measured during ARCTAS (Eike Bierwirth, LASP/CU)
- 9:30 ARCTAS Snow Albedo Experiment (Ralph Kahn, GSFC)
- 9:45 Arctic haze and fire plume impact on the actinic flux and photolysis frequencies (Sam Hall, NCAR)
- 10:00 *Break*

## Wednesday, 28 January 2009 (continued)

### *Ozone- $\text{HO}_x$ - $\text{NO}_x$ chemistry*

- 10:15 ARC-IONS meeting report (David Tarasick, Environment Canada)
- 10:30 Preliminary evaluation of  $\text{HO}_x$  during ARCTAS (Chris Cantrell, NCAR)
- 10:45  $\text{HO}_x$  chemistry and comparison with box model results during ARCTAS (Xinrong Ren, U. Miami)
- 11:00 Overview of fast photochemistry: Preliminary box modeling results (Jennifer Olson, LaRC)
- 11:15 Comparison of the  $\text{NO}_y$  budget and  $\text{NO}:\text{NO}_2$  ratio during ARCTAS and TOPSE (Ron Cohen, UC Berkeley)
- 11:30  $\text{HNO}_3$  budgets, transport, and mysteries (John Crouse, Caltech)
- 11:45 Prudhoe Bay plume emissions, transport, and chemistry (Tom Ryerson, NOAA ESRL)
- 12:00 *Lunch*

### *Halogen chemistry*

- 13:30 ARCTAS BrO workshop report (Yuhang Wang, Georgia Tech)
- 13:45 Measurement of inorganic bromine from the DC-8 during ARCTAS (Greg Huey, Georgia Tech)
- 14:00 Satellite measurements of BrO during ARCTAS (Kelly Chance, Harvard-SAO)
- 14:15 Linking satellite BrO retrievals with ARCTAS field measurements (Yuhang Wang, Georgia Tech)
- 14:30 Reconciling aircraft, ground-based, and satellite observations of BrO during ARCTAS (Ross Salawitch, U. Maryland)
- 14:45 Airborne formaldehyde measurements during select Arctic boundary runs in ARCTAS and evidence for chlorine chemistry (Alan Fried, NCAR)
- 15:00 VOCs as indicators for halogen chemistry during ARCTAS I and the observation and implications of VOC trace gases during convective events in ARCTAS II (Eric Apel, NCAR/Dan Riemer, U. Miami)
- 15:15 *Break*

### *CTM analyses*

- 15:30 Source contributions and transport pathways to the Arctic from MOZART-4 and CAM-Chem (Louisa Emmons, NCAR)
- 15:45 Modeling and interpretation of ARCTAS observations at GSFC (Jose Rodriguez, GSFC)
- 16:00 GEOS-Chem model analyses of ARCTAS observations (Daniel Jacob, Harvard)
- 16:15 Intercomparisons of CALIPSO and model aerosols during ARCTAS (Dave Winker, LaRC)
- 16:30 Meteorological data products available during ARCTAS (Walter Sessions, FSU)
- 16:45 Working Groups – Organization and charge (Daniel Jacob, Harvard)
- 17:00 *Adjourn plenary session*
- 19:00 2<sup>nd</sup> Poster Session (2 hours)

## Thursday, 29 January 2009

7:30 *Registration*

8:30 Working Groups meet – 1<sup>st</sup> Session (*includes a 15-minute break at 10:15*)

**WG 1.1: Long-range transport** (co-leads: Louisa Emmons, NCAR/Henry Fuelberg, FSU)

**WG 1.2: Arctic haze** (co-leads: Rich Ferrare, LaRC/Phil Russell, ARC)

**WG 1.3: Ozone-HO<sub>x</sub>-NO<sub>x</sub> chemistry** (co-leads: Anne Thompson, Penn State/Paul Wennberg, Caltech)

12:15 *Lunch*

13:15 Working Groups meet - 2<sup>nd</sup> Session (*includes a 15-minute break at 3:15*)

**WG 2.1: Halogens** (co-leads: Ross Salawitch, U Maryland/Yuhang Wang, Georgia Tech)

**WG 2.2: Fire plumes** (co-leads: Mike Fromm, NRL/Tony Clarke, U. Hawaii)

**WG 2.3: CARB** (co-leads: Don Blake, UCI/Ron Cohen, UC Berkeley)

17:00 *Adjourn Working Group sessions*

## Friday, 30 January 2009

7:30 *Registration*

*Wrap-up*

8:30 Working group reports – 1<sup>st</sup> Session (WG leads)

9:30 Working group reports – 2<sup>nd</sup> Session (WG leads)

10:30 *Break*

10:45 Cross-cutting issues, gaps, priorities, publication plans, AGU, action items (Daniel Jacob, Harvard)

11:15 Future mission plans (Hal Maring, HQ/Jay Al-Saadi, LaRC)

12:00 *Adjourn meeting*

## 1<sup>st</sup> POSTER SESSION – Tuesday, 27 January (31 posters)

**Presenters – Put up posters in meeting room in morning; remove at end of poster session.  
Push-pins will be provided. Posters are limited to 4 feet wide by 4 feet high.**

### *Long-range transport*

- NATIVE trailer (Anne Thompson, Penn State)
- Impact of Alberta oil sands emissions during ARCTAS (Isobel Simpson, UCI)
- Correlation estimates of chemical species derived from global ensemble analyses during ARCTAS field mission (Ave Arellano, NCAR)
- Comparison of model simulations with different meteorology (GFS and GEOS-5) and analysis of stratosphere-troposphere exchange (Simone Tilmes, NCAR)
- Interannual variability of transport from E. Asia to the Arctic using AIRS CO and GMI simulations of the INTEX and ARCTAS periods (Juying Warner and Bryan Duncan, GSFC)
- Methane simulation validation in the Arctic: A preliminary analysis using A/C observations from ARCTAS and Pre-HIPPO/START-08 (Christopher Pickett-Heaps, Harvard)
- Trace gas measurements during the ARCTAS field campaign (Glenn Diskin, LaRC)
- CO measurements from the P3-B during ARCTAS (Jim Podolske, ARC)
- An analysis of pollution transport events during ARCTAS using aircraft, satellite, and model results (Jenny Fisher, Harvard)
- First results from ARCTAS: A comparison of large-scale NMHC and Halocarbon distributions with TOPSE (Nicola Blake, UCI)
- Preliminary validation for AIRS CO profiles during ARCTAS (Juying Warner, UMBC)
- Investigation of tracer emission and transport in GEOS-5 during ARCTAS (Mian Chin, GSFC)
- Impact of biomass burning and midlatitude pollution during the ARCTAS/CARB field campaigns: A regional-scale modeling study (Greg Carmichael, U. Iowa)

### *Aerosol sources and properties*

- Distribution of sulfate aerosol over northern North America and the Arctic Ocean during April 2008 (Eric Scheuer, UNH)
- The preparation of a high-resolution CO and aerosol dataset using remotely sensed data and their application to ARCTAS (Michael Porter, FSU)
- Using CALIPSO observations to evaluate model predictions of aerosol transport into the Arctic (David Winker, LaRC)
- Aerosol properties observed from CALIPSO during ARCTAS (Chieko Kittaka, LaRC)
- Investigating organic compounds soluble in water in the remote Arctic and in boreal fires (Rodney Weber, GIT)
- Long-range transport of black carbon during ARCTAS (L. Sahu, U. Tokyo)
- Simulation of black carbon aerosol by GEOS-Chem and source attribution (Xiaolu Yu, Harvard)
- Airborne DIAL measurements observed during spring and summer phases of ARCTAS: Aerosols (Carolyn Butler, LaRC)

### *Aerosol sources and properties (continued)*

- Analysis of aerosol characteristics measured in the Arctic atmosphere during ARCTAS (Andreas Beyersdorf, LaRC)
- Closure and growth kinetics of ARCTAS CCN measurements (Terry Latham, Georgia Tech)
- MODIS aerosol optical depth retrieval validation and improvements over ARCTAS and CARB domains (Allen Chu, GSFC)
- Comparisons of GEOS-5 aerosol profiles to airborne HSRL measurements during ARCTAS (Mian Chin, GSFC)

### *Aerosols and radiation*

- Airborne sunphotometer (AATS-14) measurements in ARCTAS – First insights into their combined use with satellite observations to study Arctic aerosol radiative effects (Jens Redemann, ARC)
- HSRL assessment of CALIPSO measurements during ARCTAS (Ray Rogers, LaRC)
- Research Scanning Polarimeter (RSP) measurements on the B200 during the ARCTAS summer deployment (Brian Cairns, GISS)
- Daily MODIS snow albedo and reflectance anisotropy during ARCTAS (Crystal Schaaf, GSFC)
- Snow anisotropy from CAR: Analysis of LSRT, MRPV, and AART BRF models (Alexei Lyapustin, GEST UMBC/NASA GSFC)
- Remote sensing of smoke using the Research Scanning Polarimeter during ARCTAS (Brian Cairns, GISS)

## **2<sup>nd</sup> POSTER SESSION – Wednesday, 28 January (32 posters)**

**Presenters – Put up posters in meeting room in morning; remove at end of poster session. Push-pins will be provided. Posters are limited to 4 feet wide by 4 feet high.**

### *Ozone-HO<sub>x</sub>-NO<sub>x</sub> photochemistry*

- Intercomparisons between TES ozone and ARC-IONS sondes (John Worden, JPL)
- Springtime comparison between TOPSE and ARCTAS (Nicola Blake, UCI)
- Ozone sources and fires (Anne Thompson, Penn State)
- Ozone sonde results comparing the measurements from the ARCTAS campaigns with longer-term ozone observations (Sam Oltmans, NOAA ESRL)
- Using the dO<sub>3</sub>/dCO ratio to understand ozone production efficiency in various airmasses during ARCTAS and to quantify ozone budget in the Arctic troposphere (Qing Liang, GSFC)
- Airborne DIAL measurements observed during spring and summer phases of ARCTAS: Ozone (Marta Fenn, LaRC)
- Measurements of NO<sub>y</sub>, PAN, and NO<sub>x</sub> at Summit, Greenland during the ARCTAS intensive and the following months (Louisa Kramer, Michigan Tech)
- HO<sub>x</sub>-NO<sub>x</sub> chemistry in polar region from model and *in situ* measurement perspectives (Jingqiu Mao, Harvard)
- Transport and transformations of NO<sub>y</sub> and other species in pyro-convection (Andy Weinheimer, NCAR)
- OH reactivity measurements during ARCTAS (Bill Brune, Penn State)

### *Halogen chemistry*

- An update on measurements of soluble bromide and aerosol associated bromide (Jack Dibb, UNH)
- Satellite measurements of BrO during the ARCTAS campaign (Thomas Kurosu, Harvard-SAO)
- Investigation of Hg<sup>0</sup> surface depletion during springtime (Huiting Mao, UNH)
- Modeling the effect of stratospheric transport on total column BrO (Tim Canty)
- Stratospheric BrO from SCIAMACHY limb during ARCTAS spring (Justin Parrella, Harvard)
- Measurements of C<sub>2</sub>-C<sub>6</sub> hydrocarbons during ARCTAS: Indirect evidence of springtime halogen radical chemistry (Katrine Gorham, UCI)
- Characterization of Arctic haze, with a focus on aerosol halogens (Mike Cubison, CU)
- Results from the measurements at Barrow (Sam Oltmans, NOAA/ESRL)
- Arctic surface ozone depletions from ozonesondes (David Tarasick, Environment Canada)

### *Fire plumes*

- Chemical signatures of biomass burning: Source and age dependencies (Chelsea Corr, UNH)
- Boreal wildfires as a source of Hg<sup>0</sup> to the troposphere (Bob Talbot, UNH)
- NO<sub>x</sub> emission and PAN formation in boreal forest fire smoke observed during ARCTAS (Matt Alvarado, Harvard)

### *CARB*

- Investigation of the aerosols over the Los Angeles Basin during the ARCTAS-CARB 2008 pilot study (Lee Thornhill, LaRC)
- Correlations of trace gas measurements during the CARB-sponsored flights of the ARCTAS campaign (Glenn Diskin, LaRC)
- Is SOA production in LA different from eastern cities? (Rodney Weber, Georgia Tech)
- Impact of wildfires on California air quality from MOZART and WRF-Chem simulations (Gabi Pfister, NCAR)
- CARB poster (Allen Chu, GSFC)
- HO<sub>x</sub> chemistry and OH reactivity during the CARB phase (Bill Brune, Penn State)
- VOC distributions over California (Armin Wisthaler, U. Innsbruck)
- Characterization of VOC emissions during the CARB flights over the Central Valley (Melissa Yang, UCI)
- Ship emissions off the California Coast during CARB 2008 (Tony Clarke, U. Hawaii)
- AVIRIS remote sensing and ground validation of methane from natural marine seeps (Ira Leifer, UCSB)