Atmospheric Radiation Science Workshop
8-11 March, 2016, NCAR Mesa Lab, 1850 Table Mesa Dr, Boulder, CO
Please note that all times include presentation and discussion

Plenary discussions
Breakout discussions
Science talks
Breaks

Tuesday, 8 March, 2016

0745	Registration
0830	Welcome to NCAR – John Orlando
0840	Workshop goals – Sebastian Schmidt, Sam Hall

Observational system overview – Moderator: Sam Hall

0900	TOA and surface irradiances from CERES and closing the surface energy budget – Seiji Kato
0920	Role of aircraft observations in the context of ground-based and satellite measurements – Jens Redemann
0935	NCAR/RAF airborne platforms and radiation science – Jeff Stith
0950	UK radiation science– Christine Chiu
1000	German/European airborne radiation science – Manfred Wendisch
1010	Surface Networks – Chuck Long

1030	Posters / (early) lunch

1230	**Keynote 1**: Towards constraining the aerosol-cloud radiative effect – Graham Feingold

Programmatic perspectives – Moderator: Sebastian Schmidt

1330	NSF – Linnea Avallone
1445	NOAA – Allison McComiskey
1400	DOE – Beat Schmid
1415	NASA 2014 Workshop on Outstanding Questions – Sebastian Schmidt and Sam Hall

Synthesis of Observations in a Modeling Context – Moderator: Linnea Avallone

1430	The global energy budget and atmospheric radiation measurements – Dan Murphy
1455	Tropospheric UV photochemistry – Sasha Madronich
1520	Using observations to constrain simulations of cloud microphysics, radiative effects and aerosol-cloud interactions – Andrew Gettelman

1545	Plan for tomorrow – Sam Hall, Sebastian Schmidt

1600	Reception / Posters

Wednesday, 9 March, 2016

Radiometric measurements – capabilities and requirements, Moderator – Laura Riihimaki

0800   Performance parameters for airborne, satellite and ground-based measurements – Peter Pilewskie

0820   MFRSR capabilities and network – Kathy Lantz

0835   USDA UV network – John Davis

0850   Breakout coordination

0900-1045   Satellite validation, Penthouse (ML-680-Tower-B)
Moderator – Seiji Kato / Peter Pilewskie / Ralph Kahn
ReadyTalk 866.740.1260 Access code: 1571565

- Validating CERES radiative fluxes in the Arctic with airborne radiative flux measurements from the ARISE campaign – Joe Corbett
- Validating & Refining Global Aerosol Type Products – Ralph Kahn
- Areal-averaged spectral surface albedo from ground-based transmission: Coastal area – Evguenij Kassianov

0900-1045   Airborne vehicle coordination, flight planning, and air traffic regulations,
Damon Room (ML 239) then transition to Chapman Room (ML 245) at 0930
Moderator – Sebastian Schmidt
ReadyTalk 866.740.1260 Access code: 4978318 (Damon Room)
ReadyTalk 866.740.1260 Access code: 4971471 (Chapman Room)

- UAS capabilities and restrictions – Tom McKinnon
- Current efforts to obtain broadband radiative measurements using small UAS – Gijs de Boer
- Atmospheric measurements with UAS – Eric Frew

0930-1045   Radiometry 1, Damon Room (ML 239)
Moderator – Connor Flynn
ReadyTalk 866.740.1260 Access code: 4978318

- Hyperspectral Radiation Measurements, calibration and technology – Connor Flynn
- Metrology for Outdoor Radiometry: NREL's Broadband Outdoor Radiometer Calibration (BORCAL) – Ibrahim Reda
- Calibration techniques for short and longwave radiometers – Anthony Bucholtz
- Attitude corrections and stabilized platforms – Anthony Bucholtz
- NCAR/RAF radiation measurements – Julie Haggerty
- NEON airborne radiometer for atmospheric corrections – Bruce Kindel
- NCAR/ARIM radiometric calibration facility – Kirk Ullmann
- 4STAR calibration – Yohei Shinozuka
- NOAA calibration facility – Kathy Lantz

1045   Break

Wednesday… continued

Surface energy budget talks – capabilities and requirements, Moderator – Laura Riihimaki

1100	Surface radiation budget and cloud effects – Chuck Long
1115	Accuracy and stability for surface observations – Laura Riihimaki
1130	Radiative forcing of cumulus clouds from surface data: Spectral dependence – Evgueni Kassianov
1145	WRF-Solar enhancements of the aerosol-cloud-radiation system in support of solar power forecasting – Pedro Jimenez
1200	SURFRAD network – John Augustine

1215   Lunch

1300	**Keynote 2**: Understanding Arctic climate change and variability – Jen Kay
1400	Understanding the coupled Arctic system through MOSAiC – Matthew Shupe
1430	Arctic amplification: Climate relevant atmospheric and surface processes, and feedback mechanisms – Manfred Wendisch

1445   Break

1500-1800   Radiometry 2, Main Seminar Room
Moderator – Connor Flynn

1600-1800   Photochemistry, Damon (ML 239)
Moderator – Geoff Tyndall
ReadyTalk 866.740.1260 Access code: 4978318
- Spectrally resolved actinic flux measurements; photolysis , kinetics and models – Sam Hall
- Modeling of cloudy-sky actinic flux using satellite cloud retrievals and comparison to in-situ aircraft observations – Young-Hee Ryu
- The influence of aerosol on photolysis rates – Chelsea Corr
- Kinetic considerations– Geoff Tyndall

1600-1800   Arctic observations 1, Chapman Room (ML 245)
Moderator – Bill Smith
ReadyTalk 866.740.1260 Access code: 4971471
- SOCRATES – Greg McFarquar
- Overview of ARISE experiment – Bill Smith
- Changing Arctic cloud properties across the sea-ice edge observed by airborne measurements – Samuel LeBlanc

1800   Adjourn for the day

Thursday, 10 March, 2016

0800 Radiation science during recent NASA airborne missions – Brian Toon

0830 Emerging science, technology, platforms
Moderator – Jens Redemann
- Collocated microphysical and radiation measurements form helicopter and aircraft – Manfred Wendisch
- Emerging dropsonde technology – Holger Vömel

1000 Break

1015-1200 Radiation / Microphysics 1, Main Seminar Room
Moderators – Ralph Kahn / Greg McFarquar
- AirMSPI cloud and aerosol retrievals – Anthony Davis
- 4STAR retrievals of aerosol optical properties – Yohei Shinozuka
- Water vapor effects vs. Aerosol indirect and direct effect – Paquita Zuidema / Sabrina Cochrane
- High spectral resolution Lidar observations of aerosols, clouds and precipitation – Ed Eloranta

1015-1200 Coping with complexity 1, Directors Conference Room (ML 215)
Moderator – Anthony Davis
ReadyTalk 866.740.1260 Access code: 1571565
- 3D cloud properties from solar radiances and scanning cloud radar – Christine Chiu
- Overview of 3D RT Techniques and Applications – Anthony Davis
- Radiative horizontal transport and absorption in stratocumulus clouds: spectral dependence – Evgueni Kassianov
- Using spectral observations to simplify the "3D problem(s)" – Sebastian Schmidt
- Radiative transfer for radar applications – Maximilian Maahn

1045-1200 Arctic observations 2, Damon Room (ML 239)
Moderator – Bill Smith
ReadyTalk 866.740.1260 Access code: 4978318

Science talks from recent missions, Moderator – Sam Hall
1100 Relative roles of atmospheric state and boundary layer clouds on Arctic surface radiative flux: the ARISE 2014 case study – Michal Segal-Rosenheimer
1115 Retrieval of aerosol microphysical properties from AERONET photo-polarimetric measurements – Jun Wang
1130 Spectral shapes: an alternative to absolute radiance measurements for determining cloud properties– Samuel LeBlanc
1145 Quantifying the information gain in cloud optical properties from passive shortwave measurements by adding spectral-channels or increasing measurement accuracy – Odele Coddington

1200 Lunch

Thursday… continued

1300-1430   Radiation / Microphysics 2, Main Seminar Room
Moderators – Ralph Kahn / Greg McFarquar

1300-1430   Coping with complexity 2, Damon Room (ML 239)
Moderator – Anthony Davis
ReadyTalk 866.740.1260 Access code: 4978318

1430   Break

1500   Main science questions and future experiments, Moderator: Brian Toon

1800   Adjourn for the day

Friday, 11 March, 2016

0800   Reports from Breakouts

1000   Break

1015   Final discussion and reflection on workshop goals – Moderators: Sam Hall, Sebastian Schmidt

1115   Action items – Moderators: Sam Hall, Sebastian Schmidt

1200   Meeting Adjourn

Posters

Reed Espinosa – Retrievals of Aerosol Size, Shape and Refractive Index from Airborne Imaging Polar Nephelometer Scattering Measurements

Mariel Friberg – Estimating regional surface air quality using observations and chemical transport data for health studies

Aviad Levis (Anthony Davis) – Three-Dimensional Cloud Tomography via Solar Radiative Transfer

Maximilian Maahn – PAMTRA – Passive and Active Microwave TRAnsfer simulator

Brent McBride – Development to Operation of the Hyper-Angular Rainbow Polarimeter (HARP)

Daniel Murphy – A study of aerosol optical properties using a lightweight optical partial spectrometer and sun photometer from an unmanned aerial system

Alexander Radkevich – Modeling of the ice spectral albedo from ARISE campaign

Jun Wang – A new research algorithm for Retrieval of aerosol microphysical properties from AERONET photo-polarimetric measurements

Jun Wang – An algorithm for hyperspectral remote sensing of aerosols

Wei Wu – Morphology of ice crystals and cloud microphysical and radiative processes

Jianhao Zhang – Retrievals on Tropical small scale humidity variability from multi-channel microwave radiometer

Lauren Zamora – Aircraft-measured indirect cloud effects from biomass burning smoke in the Arctic and subarctic

Lei Zhu – Validation of satellite HCHO retrievals with aircraft (SEAC4RS) observations: a new indirect method