

## **First Circular**

# **Fourth International Workshop on Space-based Snowfall Measurement (4th IWSSM)**

**6-8 May 2013  
Mammoth Lakes, California**

### **Program Committee**

Ralf Bennartz (University of Wisconsin)  
Robin Hogan (University of Reading)  
Paul Joe (Environment Canada)  
Gail Skofronick-Jackson (Goddard Space Flight Center)  
Graeme Stephens (Jet Propulsion Laboratory)

### **Local Organizing Committee**

Deborah Vane (Jet Propulsion Laboratory)  
Tom Painter (Jet Propulsion Laboratory)  
Jeff Dozier (University of California – Santa Barbara)

**Workshop website:** <http://www.ssec.wisc.edu/meetings/iwssm/2013/>

The program committee invites you to attend the 4th International Workshop on Space-based Snowfall Measurement to be held in Mammoth Lakes, California. The workshop is sponsored by the International Precipitation Working Group (IPWG), the GEWEX Data and Assessments Panel (GDAP), the Space Science and Engineering Center at the University of Wisconsin-Madison, and the University of California Santa Barbara.

<b>1) Workshop format.....</b>	<b>2</b>
<b>2) Draft Program .....</b>	<b>2</b>
<b>3) Workshop Registration.....</b>	<b>2</b>
<b>4) Hotel information .....</b>	<b>3</b>
<b>5) How to get to Mammoth.....</b>	<b>3</b>
<b>6) Observation site .....</b>	<b>3</b>
<b>7) Airborne Experiment.....</b>	<b>3</b>

The goal of the workshop is to bring together researchers focusing on the measurement of snowfall from space using active and passive microwave sensors for the purpose of assessing the state of the science and measurement technology and to recommend future directions in research and technology development. The topics of interest include instrument development, space-borne missions and concepts, retrieval techniques, assimilation systems, modeling of microwave radiative transfer within snow particles and snowy air, modeling of microphysical processes and ground validation.

## **1) Workshop format**

The workshop will focus around the topics identified in the outline above. A limited number of invited research presentations will set the stage for subsequent working group discussions where the state of the art will be discussed and future directions of research will be identified. Attendees will be asked to contribute to a workshop report that summarizes the findings of this workshop.

## **2) Draft Program**

**Sunday, May 5 – Arrival/registration**

**Monday, May 6 – Invited Overview Talks**

**Tuesday, May 7 – WG meetings and plenaries**

**Wednesday, May 8 – WG meetings, final plenary, visit UCSB snow observation site**

**Thursday, May 9 - Depart**

## **3) Workshop Registration**

Registration for the workshop is now open:

- Registration fee will be \$400 and can be paid via our secure credit card payment form on the registration website. Go to the meeting website at <http://www.ssec.wisc.edu/meetings/iwssm/2013/> and click on the [Registration link](#) in the top bar.
- Late registration: For participants registering after 1 April 2013, registration fee will be \$500.
- Hotel reservations must be made directly with the hotel (see below).
- Icebreaker will be held on Sunday evening. Details to follow.

#### 4) Hotel information

The conference will be held at [Village Lodge](#). Information about the guest room block will be available shortly. We will have the federal rate (USD 114/night + tax) available from Sunday 5 May until Thursday 9 May 2013 (depart on Friday 10 May).

#### 5) How to get to Mammoth

- **By Air:** There are direct flights to Mammoth Lakes from Los Angeles on Horizon Airlines (Alaska Airlines website <http://www.alaskaair.com/>, use MMH for the Mammoth Lakes airport code). Current airfare is ~\$75, but it will go up as the date gets closer. Book early.
- **By car:** From Los Angeles, easy, scenic drive, about 5 hours. From Reno, easy scenic drive, about 3 hours. There may be a possibility to share a ride with a JPLer coming from Los Angeles. Contact Deborah Vane directly for information.
- Once at the meeting, a car will not be needed. The hotel provides transportation, and there is also a local shuttle bus system.

#### 6) Observation Site

Snow observation site – visit Wednesday: At 3029 m on Mammoth Mountain, UC Santa Barbara and the US Army CRREL jointly operate an instrumented site where a variety of snow properties are measured. The Mammoth Mountain Ski Area provides considerable logistical support – electric power, an Internet connection, lift access, help with repairs, and maintaining a roped off area to close the site to the skiing and snowboarding public. Measurements include the standard micrometeorological data – downwelling and reflected solar radiation, longwave radiation, snow, soil and air temperatures, humidity, snow depth, and wind speed and direction. A snow pillow keeps track of snow water equivalent, and during snowmelt eight lysimeters measure the liquid water draining from the snowpack. A webcam images each instrument hourly, and also takes a few pictures of the surrounding terrain. Current experimental instruments include a multi-angle snowflake camera (fabricated at the University of Utah) to photograph falling snowflakes, and a terrestrial scanning lidar system (from US Army CRREL) to map the site area at very high space and height resolution and also to measure lidar reflectivity from falling snow.

#### 7) Airborne Experiment

The two most critical properties for understanding snowmelt runoff and timing are the spatial and temporal distributions of snow water equivalent (SWE) and snow albedo. JPL has created the Airborne Snow Observatory (ASO), an imaging spectrometer and scanning LiDAR system, to quantify SWE and snow albedo, generate unprecedented

knowledge of snow properties, and provide complete, robust inputs to water management models and systems of the future.

ASO will be evaluated during a multi-year Demonstration Mission of weekly acquisitions in each of the Uncompahgre River Basin (Upper Colorado) and the Tuolumne River Basin (Sierra Nevada) beginning in spring 2013, anchored by snow-free acquisitions in summer 2012. Against the baseline snow-free LiDAR measurements, co-registered weekly maps of snow water equivalent and snow albedo will be made available to partner water managers and the snow hydrology community with sub-24 hour latency.