Title: Workshop on Scientific Directions for Cloud Chamber Research

Date: July 13-14, 2024 (Precedes International Conference on Clouds and Precipitation)

Venue: National Institute for Meteorological Sciences (NIMS), 33 Seohobukro, Seogwiposi, Jeju, South Korea

Sponsor: International Commission on Clouds and Precipitation (ICCP)

Co-Sponsor: IUGG

Organizers: Joo Wan Cha (jwcha@korea.kr), Ottmar Moehler (ottmar.moehler@kit.edu), Raymond Shaw (rashaw@mtu.edu)

Registration

Please email ccw2024@mtu.edu to let the organizers know that you plan to attend, or if you would like to be included on the email list for further announcements.

Scientific objective and scope of the meeting

The motivation for the meeting is to bring the community together to discuss recent progress and future opportunities for research involving cloud chambers. This will include discussion of recent and future chamber designs, aerosol/cloud measurement methods for cloud chamber research, and modeling studies related to cloud chamber research. After reaching a peak in the 1970s and 1980s, there was a steady decline in the number of scientifically-active cloud chamber facilities. In recent years, however, several facilities have been upgraded and built, and there are active plans for the development of additional facilities. Cloud chambers allow for the investigation of fundamental aerosol and cloud microphysical processes, specifically those related to the interactions of multiple particles (i.e., not single-particle experiments). For example, there has been significant recent interest in using cloud chambers for investigations of processes related to geoengineering involving clouds. There also has been significant progress in modeling such as large eddy simulation of cloud processes in laboratory chambers.

The first part of the workshop will allow participants to learn about the most recent scientific research from existing cloud chamber laboratories around the world. Then

there will be an opportunity to see plans for new chambers either being built or envisioned for the near future. The first day of the workshop will end with a tour of the new NIMS cloud chamber research facility, followed by a general discussion of the recent progress and developments in cloud chamber research.

The second day of the workshop will begin with presentations of recent advances in cloud chamber instrumentation. This will be followed by a discussion of technical challenges related to cloud chamber design, operation, and instrumentation. The focus will then shift to computational studies of cloud chamber processes. That will begin with a presentation of results from the mixed-phase cloud Pi Chamber case wrapped up during the International Cloud Modeling Workshop held the previous week. This will be followed by presentations of recent results and progress in cloud chamber process modeling. The day will end with a discussion of scientific opportunities and the future of cloud chamber research, as well as a summary of key workshop outcomes and plans for future interactions.

Proposed agenda

Saturday July 13

8:00 to 9:00	Arrival & Light Breakfast
9:00 to 9:30	Introduction, Scope, and Workshop Goals
9:30 to 10:30	Recent Scientific Results from Established Cloud Chamber Laboratories
10:30 to 10:45	Break
10:45 to 12:00	Recent Scientific Results from Established Cloud Chamber Laboratories
12:00 to 13:00	Catered Lunch Break
13:00 to 15:00	New Developments and Concepts for Cloud Chamber Instrumentation [likely to overlap with Cloud Probe Workshop]
15:00 to 15:30	Break
15:30 to 17:00	Tour of NIMS Cloud Chamber Facility

17:00 to 18:00	Group Discussion on Instrumentation for Cloud Chamber Research [likely to overlap with Cloud Probe Workshop]
18:00 to 19:00	Break
19:00 to 21:00	Group Dinner

Sunday July 14

8:00 to 9:00	Arrival & Light Breakfast
9:00 to 10:30	New Cloud Chamber Developments and Concepts
10:30 to 10:45	Break
10:45 to 11:30	Group Discussion on Recent Progress and Developments in Cloud Chamber Research and Technical Challenges in Cloud Chamber Design/Operation
11:30 to 12:00	Presentation of Results from International Cloud Chamber Workshop – Cloud Chamber Case
12:00 to 13:00	Catered Lunch Break
13:00 to 14:00	Progress in Cloud Chamber Modeling
14:00 to 15:00	Discussion on Scientific Opportunities – The Future of Cloud Chamber Research
15:00 to 15:30	Break
15:30 to 16:00	Summary of Workshop Outcomes, Plans for Future Interactions
16:00	Head to Jeju International Conference Center for Registration for ICCP