

Expression of Interest for Scientific Consultant  
for CAIPEEX Phase-II Second year

**Project details:**

Indian Summer Monsoon Rainfall (ISMR) is the main source of water for Agriculture, drinking, industry and power generation over Indian region. It shows large interannual and intraseasonal variability. During the weak monsoon years, acute water shortages prevail over the large part of the country. To alleviate the stresses generated by water shortages, cloud seeding experiments for rain enhancements have been carried out by state governments.

The efficiency with which clouds produce rain at the surface varies greatly. Observational study of clouds, aerosols and their interaction is very essential for understanding the various mechanisms which lead to precipitation and also for conducting the precipitation enhancement experiment. The potential for increases in rainfall using cloud seeding is strongly dependent on the natural microphysics and dynamics of the clouds that are being seeded. The microphysics in turn depends on background aerosol levels. It is therefore essential to understand atmospheric aerosols and pollution levels and their effects on the microphysics and dynamics of naturally forming clouds. Indian Institute of Tropical Meteorology (IITM)'s has carried out cloud seeding experiments in the past over India. There are large changes in the atmospheric constituents due to anthropogenic activities and increase in pollution (aerosols) levels after the past experiment. For addressing a series of questions in regard to interactions between aerosol-cloud-precipitation, a carefully designed experiment with all the cloud microphysical and aerosol measurements along with the large scale atmospheric conditions in which the clouds are embedded is required over the different parts of our country.

With this need in mind, IITM has been conducting a national experiment "Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEEX)" since 2009. All the Indian national Institutions and universities working in the area of aerosol and monsoon are participating in the experiment. The CAIPEEX unites the best scientists of India in the field, and that this national and international cooperation is likely to advance significantly the present knowledge of the ways mankind is affecting clouds, precipitation,

monsoonal circulation and the whole climate system. During the experiment a unique wealth of aerosol and cloud microphysical data is being generated using instrumented aircraft campaigns. Diagnostic, modeling and data analysis studies will also be carried out using this data.

CAIPEEX has two components viz. (1) Cloud-Aerosol interaction and (2) Precipitation Enhancement. Understanding of cloud-aerosol interaction is pre requisite for the second component. Phase-I of the CAIPEEX was conducted during the period from May-September 2009 using an instrumented aircraft equipped with many aerosol and cloud microphysics probes and campaign has been carried out many parts of the country. Based on the results obtained from Phase-I, Phase-II first year experiment was conducted in 2010 wherein pilot phase of cloud seeding was carried out along with the aerosol and cloud microphysics observations. Two aircraft, one seeding and one instrumented research aircraft were in operation during the period September-November 2010. Phase-II second year experiment is being planned to be conducted during the monsoon/post-monsoon periods of 2011, wherein a fully randomized cloud seeding experiment along with the aerosol and cloud microphysics observations through two aircraft are proposed.

### **Requirement of Mission Scientist**

IITM is looking for a Mission Scientist who will be able to help during the CAIPEEX Phase-II second year mission in conducting the randomized cloud seeding, guiding the aircraft research missions and related training.

The proposed Mission Scientist is required to assist in the following activities:

- Design flight patterns, fly as crew on science missions, plan mission objectives.
- Design, conduct and evaluate randomized cloud seeding experiment.
- Provide expertise in radar based cloud observations and decision making for seeding.
- Training IITM scientists in the above areas.
- Submission of a comprehensive report on all the activities.
- Aircraft data processing

Scientist should have previous experience of airborne aerosol, cloud microphysics data collection, retrieval, analysis and warm/mixed phase cloud seeding procedures. Scientist should be equipped with latest aircraft data processing tools for processing the CIP, CDP, FSSP, PCASP data sets. Scientist should have publications in reputed peer-reviewed International journals on the subjects of cloud physics and cloud seeding.

Interested persons who are capable of undertaking this type of job may provide the relevant information in regard to the project with full technical/scientific details, past experience etc. without mentioning any commercial information.

Soft copy of the proposal may be submitted along with the capability statement within 15 days (i.e. up to 18 May 2011 at 12:00 hrs.) of publishing of this advertisement. The EoI shall be as concise and focused as possible to give the evidence of the above requirements and addressed to the Director, IITM. Only those persons pass the pre-selection process will be contacted and invited to submit detailed proposals.

Director

(Kind Attention : Dr. J.R. Kulkarni, Program Manager-CAIPEEX)

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