

**CSRE PhD Admissions 2023-24 (Spring Semester) Topics (Interview Dates: 5-6 December 2023)**

Name	Topic	Description	Do you plan to conduct written test for this topic?
Avik Bhattacharya	Crop Yield Estimation Using Remotely Sensed Data	Crop yield prediction has been a persisting challenge in the face of our expanding global population. It has necessitated the evolution of more robust predictive methodologies. While various techniques have been devised for yield forecasting, the quest for enhanced operational dependability continues. Notably, remote sensing emerges as a transformative tool, endowing agriculture with invaluable advantages such as nonintrusive data acquisition, real-time surveillance, and expansive coverage. This study will be aimed at early prediction of crop yield as it can offer impactful information for farmers and decision-making bodies.	No
Gulab Singh	Snow Deposition Study (TAP)	The snow parameters are spatially heterogeneous and the rate at which the snow deposit is also equally diversified on a spatial and temporal scale. A single point measurement is not enough to represent a large region. The underlying mechanisms responsible for the spatial diversity snow deposition are important to study, which still remains unexplored. These unexplained heterogeneous snow deposition phenomenon needs to be investigated on Pan-Himalaya level.	No
Gulab Singh	Glacier Dynamics Modeling (TAP)	To enhance our knowledge about glacier bed topography and glacier ice depth, an optimum glacier flow law can be adopted/ developed to estimate the glacier depth and bed topography. Else, the laminar flow law needs to be modified in terms of basal stress or creep parameter for understanding the anomalous change in glacier mass with more accuracy than the current glacier models.	No
Karthikeyan Lanka	Soil-Plant-Atmosphere Interactions in the Context of Extreme Dry Events	The warming climate resulted in increased frequency of extreme dry events such as droughts, heatwaves and compound extremes. Atmospheric aridity is also on the rise, which has impact on the plant functionality. In this context, we are still trying to understand the complex causal relationships between the three elements soil, vegetation and atmosphere. This PhD work shall attempt to address some of the unresolved science questions pertaining to soil-plant-atmosphere interactions during the dry extreme conditions. We shall leverage the strengths of satellite remote sensing and/or numerical weather prediction models such as Weather Research and Forecasting (WRF) model to address these questions at continental/global scales.	No