

Dear members of the program committee,

I am writing to express my intent in applying for summer school on effective HPC for climate and weather to be held at University of Reading from 23-28 August 2020. It surely would be an exciting opportunity for me to broaden my computational skill set applied to ocean-atmosphere interactions.

High-performance computing (HPC) has been an essential tool for my research since my M.Sc. (Atmospheric Science; 2013-15); where I simulated extreme precipitation events over *Western Ghats* in India using Weather Research and Forecasting (WRF) model on a 790+ TeraFlops IBM cluster. I tuned the Betts-Miller-Janjic (BMJ) cumulus parameterization scheme to improve the hindcast of the heavy rainfall events successfully. With this background, I started my Ph.D. in Atmospheric Sciences with Prof. Stephen Nesbitt at University of Illinois Urbana-Champaign (UIUC). For my doctoral research, I have been using a multitude of HPC clusters such as Keeling (UIUC), Stampede-2 (National Science Foundation) and Mistral (DKRZ). As part of my research, I have developed a new storm-centric, tensor-based algorithm to track pockets of atmospheric cold pools using long-term satellite-based ocean vector wind datasets. I also ran a high-resolution WRF model (1 km) to resolve convective processes attributed to cold pools. In addition, I have been using high-resolution (4 km) global cloud-resolving model data hosted at Mistral to understand the relationship between convection and precipitation over tropical oceans.

During this summer school, all the academic group project topics are certainly very interesting to me. In the purview of my research, I would like to propose a topic related to 'Machine Learning'. Using multi-year geostationary* satellite data, we can train the neural network to track convective* features like hot-towers* using brightness-temperature* thresholds. Using this trained algorithm, we can identify these features in observations and model data. This could be a really interesting combination of Python and HPC architecture, which would create a nice product for weather and climate community.

This summer school would be extremely beneficial for me and my department since the knowledge gathered during this school would enable me to help my colleagues as well. Our department uses novel computational methods extensively for their research but sometimes HPC components, data storage and I/O handling isn't very well understood, leading to enhanced computational expense. These academic topics will broaden my domain and successively my colleagues as well. Moreover, the information garnered during these sessions will help me advance my future career goals as well since a good combination of computation and meteorology is necessary to analyze different geospatial datasets. Therefore, I hope that my application gets full consideration for the summer school and would allow me to be there so that we can mutually benefit from each other.

Regards,

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