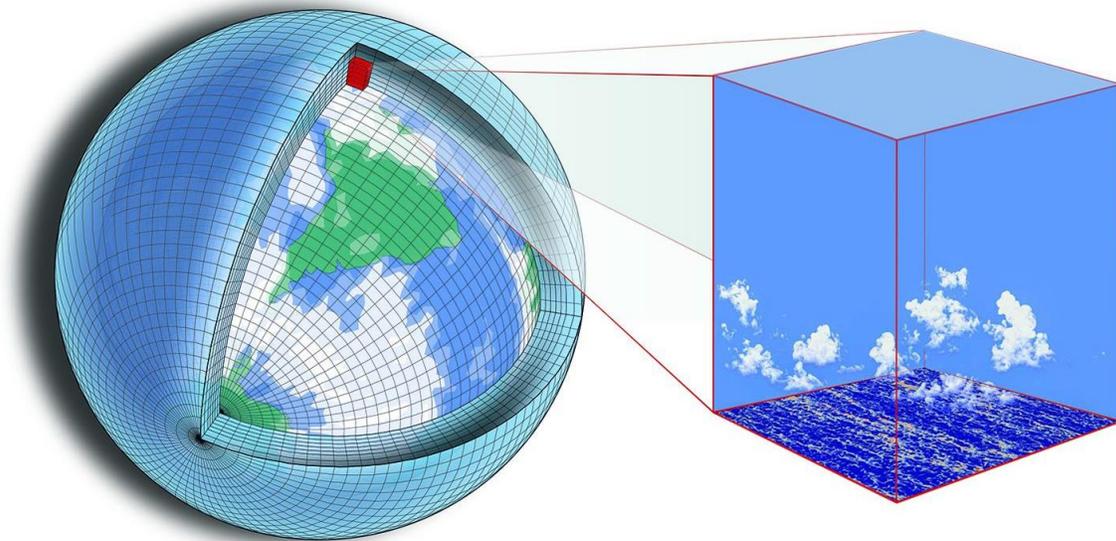


# Research Seminar

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## *Implementation of Machine Learning Methods in Atmospheric Science*

*Wednesday, April 19, 2023  
3:00 PM - 4:00 PM in 1022 HN*



Presented by  
**Dr. Ghazal Farhani**  
**National Research Council Canada**

Machine learning algorithms, and specifically neural networks (NNs) have shown promising results in different fields of science and engineering. In environmental sciences, uncertainty quantification (UQ) of the retrieved quantities is important. However, implementing UQ during the training of NNs has remained a challenging task. Moreover, as NNs are data-driven algorithms when trained on smaller data, they often fail to provide estimations that are physically meaningful.

I will present a practical approach for UQ of the output estimation of NNs and explain how we implemented the method to retrieve the tropospheric temperature profiles from a remote sensing system. Moreover, I will describe how physics-informed neural networks incorporate the physical models within their structure, thus they are suitable for cases where we have access to smaller data sets. Finally, providing several examples from atmospheric science, I will showcase the power of the NN algorithms.

