

**ARTIFICIAL INTELLIGENCE (AI) APPLICATIONS: FROM MATERIAL ANALYSIS USING MICROPLASMAS TO AI DRIVEN MATERIALS SYNTHESIS. Terje Nissen Farup and Vassili Karanassios, University of Waterloo, Waterloo, ON, Canada.**

For use on-site for sample analysis, optical emission spectrometers must become portable and hence smaller. However, as spectrometers become smaller, their focal length must decrease. But as their focal length decreases, spectral overlaps become an issue that must be addressed. In the first part of this presentation, spectral interference correction using AI (in the form of Artificial Neural Networks or ANNs) will be described. In the second part, AI-assisted (e.g., using generative AI) development of new materials with designer, tailor-made properties will be described. As well, in this part, a brief technical introduction to AI and how we're using it aiding discovery of new materials will be described.