

SEMINAR SERIES 2020 - 2021

SOUTHERN ONTARIO CENTRE FOR ATMOSPHERIC AEROSOL RESEARCH
UNIVERSITY OF TORONTO

Optical trapping and spectroscopy of single aerosol particles



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Spherical aerosol particles can act as high-quality factor optical cavities that can support electromagnetic whispering gallery modes (WGMs). When single aerosol particles are held using optical tweezers, spontaneous Raman scattering can be enhanced at wavelengths that are commensurate with WGM resonances. This process is known as cavity-enhanced Raman scattering. As WGM resonances are very sensitive to both particle size and composition, single particles can be accurately characterized if the resonance positions are fitted with a suitable model. For instance, the radius of a 4 micrometer particle can be determined with an uncertainty of +/- 1 nm by comparing observed resonances to resonances calculated using Mie theory. This presentation will discuss methods of modelling and fitting WGMs that can exist in spherical aerosol particles of atmospheric interest. The examples that will be discussed are (i) the hygroscopic response of homogeneous particles (ii) accurate measurements of the complex refractive index and (iii) the relationship between surface tension and optical deformation.

Wednesday, March 3, 2021 3:00 - 4:00PM

Microsoft Teams Meeting - [Click here to join the meeting](#)

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