

## **FROM NANOPARTICLES TO LARGE EXPIRATORY DROPLETS IN INDOOR AIR**

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It is not a discovery that indoor aerosol, a mixture of outdoor aerosol, aerosol particles emitted by indoor sources and those formed indoors through physical and chemical reactions, presents significant scientific challenge, and in turn, challenges to control it at level acceptable in relation to health and well being of the building occupants. An additional complexity is that in order to avoid disruption to the indoor activities and inconvenience to the occupants, we are usually limited in the amount of time allowed for investigations, as well as in the type of instrumentation we can use indoors. Therefore there is still a lot to learn and discover about the dynamics of indoor aerosol and the processes driving it. For example how likely and how frequent are the events of nanoparticles formation indoors from the reactions involving for example terpenes from cleaning agents and ozone? It has been shown through controlled laboratory

experiments that such processes are likely to occur in residential or office environment. Do we detect particles from these or other nucleation processes in real indoor environments? On another end of the spectrum of particle sizes, what happens to the droplets introduced into the air by expiratory activities, including breathing, speaking, or coughing? The importance of these droplets is that they can carry infectious microorganisms, bacteria and viruses. Are they large and deposit on indoor surfaces within an arms length of emissions, as believed by respiratory physicians, or are they much smaller and can travel large distances within the building? The last few years witnessed a lot of progress in understanding of indoor aerosol and the dynamics of processes occurring in indoor air. The presentation will review the new findings and the current research directions in this field of indoor aerosol.