

The ODS Office organized an international lecture on November 26, 2024, featuring Prof. Eldad Avital from Queen Mary University of London. Prof. Avital delivered an insightful lecture on the topic "*Room Fluid Dynamics, Airborne Disease Transmission, Risk, and Mitigation.*"



सीएसआईआर-केंद्रीय भवन अनुसंधान संस्थान, रूड़की  
CSIR-Central Building Research Institute, Roorkee  
Ministry of Science and Technology, Govt of India



## CSIR-CBRI International Experts Lecture Series

November 26, 2024, Tuesday, 4:00 pm (IST) onwards

### ***Room Fluid Dynamics, Airborne Disease Transmission, Risk and Mitigation***

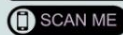
The recent COVID-19 pandemic underscored the critical importance of understanding the role of room fluid dynamics in the transmission of airborne diseases and how this knowledge can inform the development of effective air purification strategies to block transmission pathways. High-fidelity computational fluid and particle dynamics simulations, coupled with Schlieren flow visualisations, are employed to demonstrate the influence of thermal plumes emitted by occupants and their interaction with the ceiling in spreading airborne pathogens. A novel approach for estimating airborne disease infection risk is introduced, which avoids the inherent assumptions of well-mixed air and quantas in the Wells-Riley model, making it more suitable for high-fidelity simulations. Generic indoor environments, including a small office and a midsize classroom, are analysed to examine fluid dynamics, the impact of ventilation, and the effectiveness of upper-room UVC air purification. The findings reveal that the efficiency of upper-room UVC air purification can be significantly enhanced with the use of fans, although caution is necessary when combining fans with ventilation, as they may not always work in harmony. Finally, a brief analysis of thermal comfort relevant to UK summers is presented.



**Prof. Eldad Avital**  
Queen Mary University of London

*Dr Avital is a Reader specialising in fluid and particle dynamics, and fluids-structure interaction for renewables, water systems and biofluids. His group uses high fidelity simulations coupled with reduced order modelling and experimental validation. His biofluid dynamics research includes the study of airborne disease transmission, quantifying infection risk and developing air purification strategies. This research has been supported by the Royal Academy of Engineering, UK Health Safety Agency and industry. Dr Avital is an aero-mechanical engineer by profession, and is a fellow of the Royal Aeronautical Society. He is an associate editor in the journals Fluids and Frontiers in Energy Research.*

Click on the below link or QR  
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<https://forms.gle/Fjq3zeP5AQmdkYqT9>



There is no registration fee for this lecture.  
The participation link will be sent to your email.

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