Radiant systems are often considered to provide better thermal comfort than air systems due to their active control of the mean radiant temperature. Yet beyond this theoretical explanation, what do we really know about thermal comfort for both systems? This workshop will begin with the results of a critical literature review on thermal comfort for radiant compared to all-air systems. In rooms with high heat loads (high cooling demand) it becomes challenging to achieve the targeted indoor climate without sacrificing occupants’ thermal comfort due to the increased convective flows (high volumes of air supplied). Therefore cooling systems based on convective, radiant or combined heat exchange are used. During this workshop, the differences between them will be discussed and also the performance of four systems based on radiant and convective cooling – chilled beam (CB), chilled beam with radiant panel (CBR), chilled ceiling with ceiling installed mixing ventilation (CCMV) and radiant cooling panels with ceiling installed mixing ventilation (MVRC) – compared with regard to the generated thermal environment and human responses.