Abstract: Both air convection and thermal radiation have relevant impact on climate and comfort in indoor environments. In addition to the simulation and the evaluation of air flow and turbulences a detailed examination of the radiative heat exchange and its mutual interdependencies is necessary. In the research project COMFSIM (van Treeck et al., 2007) different simulation and comfort assessment methods will be implemented within an interactive, real time 3D simulation environment (Computational Steering Environment, CSE) (Wensich, 2008). This contribution will provide an overview over the current work, i.e. the implementation of numerical methods for the simulation of the thermal radiation into the CSE by presenting first results of such simulations.