

Mean Radiant Temperature

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Abstract

The seemingly innocuous topic of Mean Radiant Temperature (MRT) stands to radically transform architectural and energy practices in the twenty-first century. Routinely overlooked within the more dominant modes of air conditioning and thermal comfort, MRT is the sum temperature of all the surfaces in a space and thus plays an essential role in human comfort and energy practices. However, the more dominant modes of convection based forced air heating and cooling has obfuscated the important role of MRT throughout the twentieth century. An architecture derived from research on MRT yields clear environmental, energy, human comfort and architectural effects. This project aims to elaborate these effects through lab work and field tests to yield new architectural, energy, and construction practices. In short, these systems will yield more sensible systems of construction that yield a more sensible architecture.

The MRT project will proceed in three phases. First, a research on the history of conditioning (of air, spaces, people, and energy practices) will connect this research to historical and contemporary practices. Second, proposed MRT-based systems will be tested and analyzed through computer simulations. Hybrids of high mass systems (such as concrete and rammed earth) and hydronic radiant systems will be analyzed in this phase. Finally, two or more mock-ups of MRT systems will be fabricated as demonstrations and as empirical tests of the systems, their fabrication and assembly, and their potential to yield new practices in architecture.