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Role of structural morphology in urban heat islands THORSTEN EMIG, MIT — The urban heat island (UHI) is a common phenomenon in which air and surface temperatures are elevated in urban areas compared to surrounding rural areas. It has profound impact on the lives of urban residents (50% of the world's population) and energy consumption. A traditional approach in studying the UHI is to consider relative small urban regions (single street canyons) for modeling the local climate. In this talk I report our studies of the correlations between the UHI intensity and urban morphology over large urban areas (6 miles diameter) for 22 US urban regions. The observations are explained in terms of heat radiation transfer models. I shall introduce a relative simple version of such models to describe the equilibrium surface temperatures of large areas of New York City at night time where the UHI intensity is largest. The agreement with large scale spectroscopic measurements of surface temperatures on the west side of Manhattan is reassuring.

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