

## **ABSTRACT**

The Sun is the center of our galaxy and its patterns have been studied by civilizations since the beginning of time. Solar energy is a complex phenomenon that is the basis for life on Earth. Understanding the position of the Sun during the day is critical for evaluating how its energy impacts our daily lives. In an urban environment, the Sun's energy can be considered as a service as well as a burden. Solar energy is beneficial when it can be harnessed using solar collectors for electric generation or when it contributes to heat energy with passive heat gains in the winter. However, solar energy can cause unwanted heat gains during warm summer months when buildings are trying to keep occupants cool. Solar radiation models used to evaluate favorable conditions and locations have traditionally only required two-dimensional data for evaluation of terrain and rooftops. However, in order to attempt a comprehensive assessment of solar radiation effects with a built environment, three-dimensional data must be used to evaluate vertical surfaces as well. The proposed research can be used to find the links between building energy usage and effects of spatial factors resulting from a building's location. The investigation is centered on an educational building, Lewis Hall, located on the University Park campus of the University of Southern California. The impacts of solar energy evident in the following research should be considered when evaluating and designing efficient building energy systems in the future.