Application of Modular Forms to Black Holes and String Theory. JOSE PACHECO, AJIT HIRA, REY RODRIGUEZ, EMANUEL LUCERO, JOYCE MONDRAGON, Northern New Mexico College — In Number Theory, the integer partition function $p(n)$ represents the number of distinct ways of representing $n$ as a sum of natural numbers. First, we worked on computer codes, to generate integer partitions for a given integer $n$, and calculated the values of $p(n)$ all the way up to $n = 400$. Incidentally, on a fast machine, it took 4 days, 0 h, 8 min, and 20 s, of computer time to calculate $P(210)$. In this poster, we present our results on integer partitions, and their applications to Black-Hole Physics and to Super String Theory. One important example we discuss is that of a wall-crossing as a discontinuous change across a co-dimension wall in String Theory. Another example that we present is that of topological effects hidden inside ordinary materials, which hide new particles.