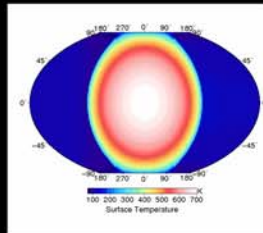
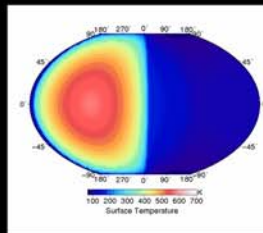


# Surface Temperature

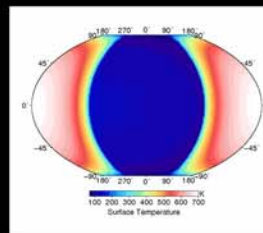
## Two Mercury Years



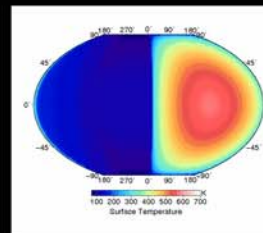
Perihelion  
Noon at 0° Longitude



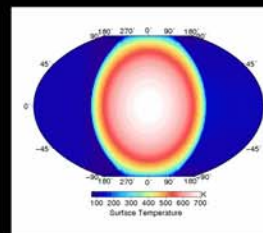
Aphelion  
Noon at 90° Longitude



Perihelion  
Noon at 180° Longitude



Aphelion  
Noon at 270° Longitude



Perihelion  
Noon at 0° Longitude

Mercury experiences extreme temperature variations on its surface because, like our Moon, Mercury lacks a substantial atmosphere to buffer surface temperatures. Without the moderating effects of an atmosphere or oceans like the Earth, the intense solar radiation (the sun appears about 2½ times larger in Mercury's sky) results in surface temperatures reaching an extreme 700 K (801 °F or 427 °C) at the subsolar point (local noon time). The nights on Mercury are long due to its slow rotation. Since there is no atmosphere to trap heat, it radiates from the surface directly into space at night and the surface gets very cold, about 90 K (-297 °F or -183 °C). Such temperature extremes do not occur on planets with atmospheres due to the insulating effects of the atmospheres that moderate temperature extremes and maintain a warmer temperature at night (the greenhouse effect).

Special thanks to David Paige at UCLA Earth and Spaces Sciences for Mercury surface temperatures (<http://diviner.ucla.edu>)

See References for details:

(1) Paige D. A., S. E. Wood and A. R. Vasavada, "The thermal stability of water ice at the poles of Mercury", *Science* 258, 643-646, 1992.

(2) Vasavada, A. R., D. A. Paige and S. E. Wood, "Near-surface temperatures on Mercury and the Moon and the stability of polar ice deposits", *Icarus* 141, 179-193, 1999.