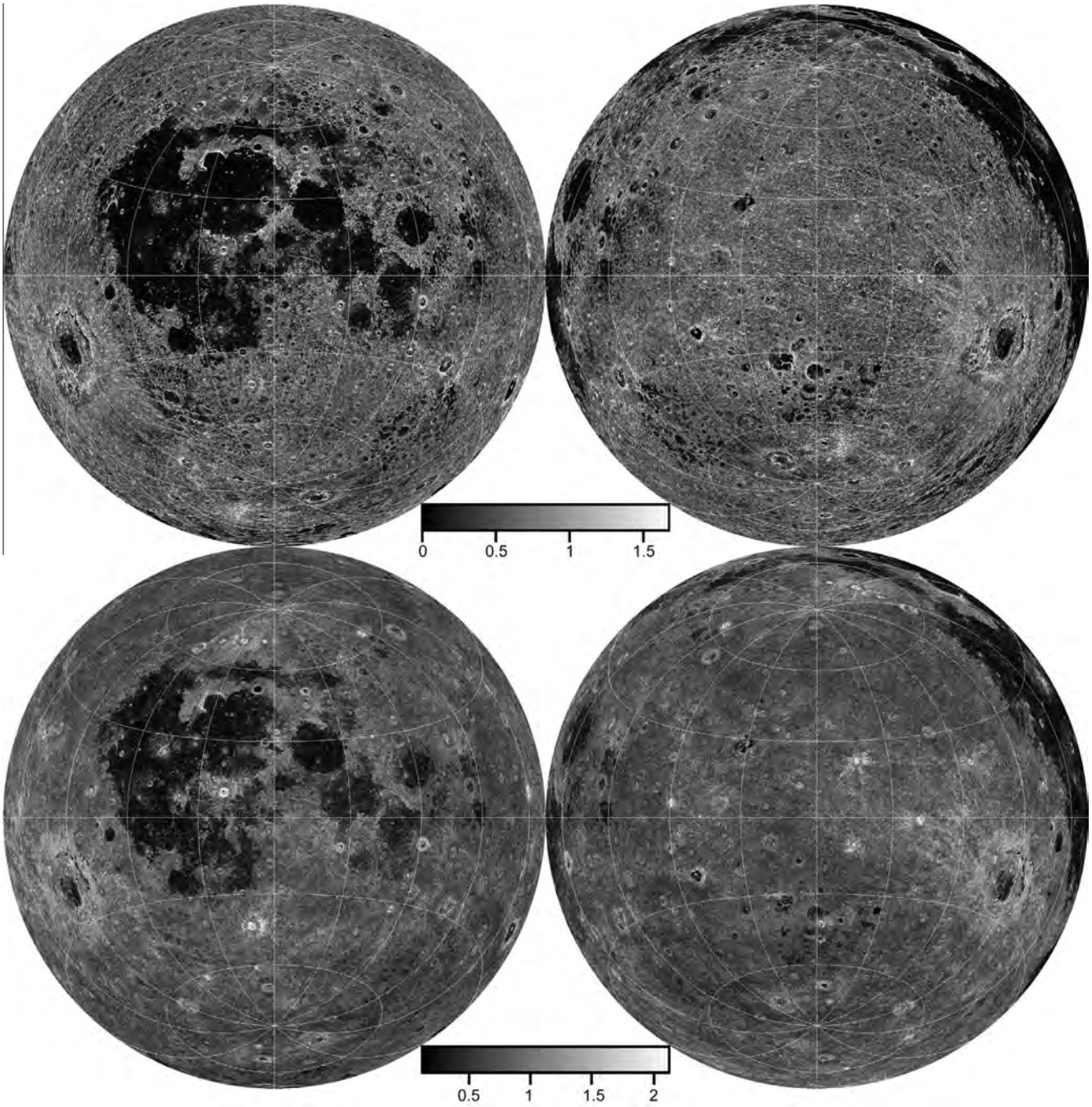

Fig. 1. Maps of kilometer-scale roughness of the Moon at two different baselines: top, 1.8 km and bottom, 0.46 km. Lambert azimuthal equal-area projections centered at the centers of the nearside (left) and farside (right). Latitude/longitude grid is 30° × 30°. Brighter shades denote rougher surfaces. Dimensionless absolute roughness values are defined according to Eq. (2).

Geosciences web site http://www.planetary.brown.edu/ at http://www.planetary.brown.edu/html_pages/data.htm.

2.2. Roughness maps

Figs. 1–3 present roughness maps at baselines of 1.8 km, 0.48 km, and 115 m in Lambert azimuthal equal-area projection in a grayscale rendition, with brighter shades denoting higher roughness. The maps have a rather high dynamical range: by changing the stretch of the maps it is possible to reveal some details not readily seen in the figures. For example, white (rough) Copernican-age craters in Figs. 2 and 3 are saturated; a proper stretch reveals details, as shown in Fig. 9. The proper stretch of the 1.8 km baseline map in Fig. 1 can reveal significant roughness variations in the maria.

Figs. 4 and 5 present RGB composites of roughness maps at 1.8 km, 0.96 km, and 0.48 km for red, green, and blue channels, respectively; stretch in each channel was chosen individually to optimize the visual perception of the maps. A greater intensity in each channel denotes higher roughness, which means that again, generally brighter shades correspond to generally rougher surfaces. Color variations characterize the scale dependence of roughness. Quantitatively the scale dependence of roughness can be characterized by so-called Hurst exponent H (see Rosenburg