



Figure S1. Aerial view of Angel Mounds site, facing east, 1950. (From Black 1967:Figure 37; photo by J. C. Householder. Photo courtesy of Indiana University Museum of Archaeology and Anthropology.)

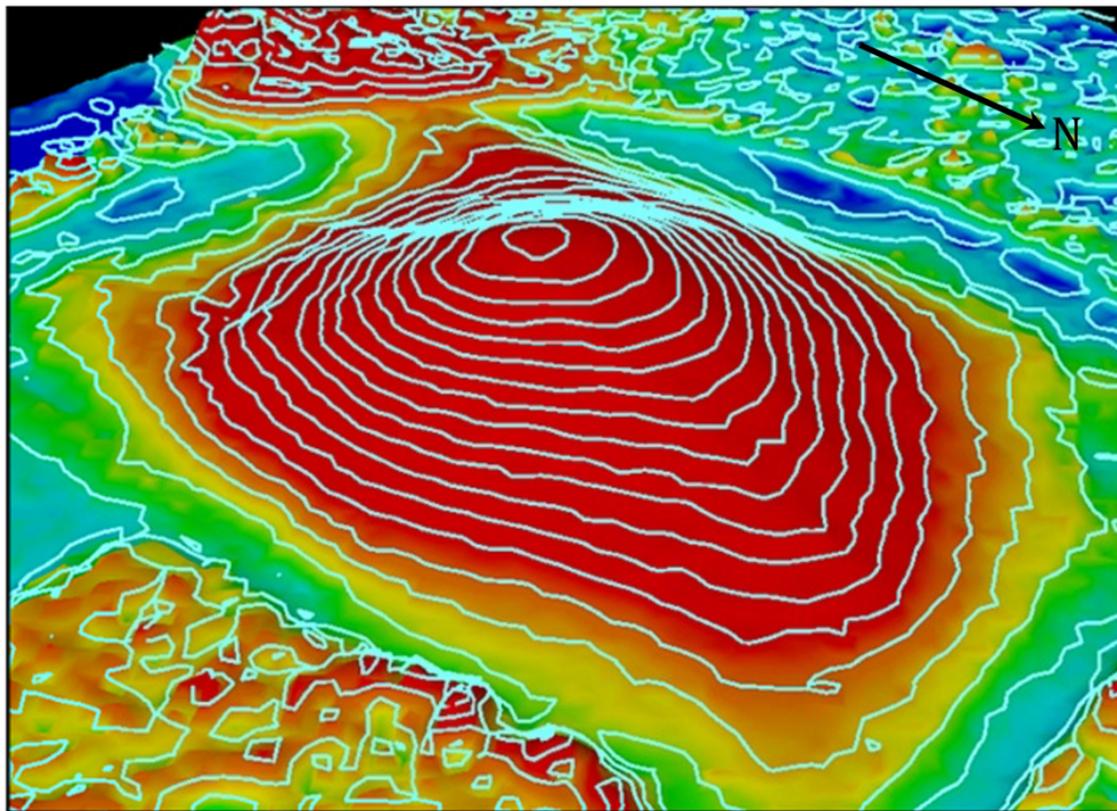


Figure S2. Lidar contour map showing Mound C, looking from the northeast. Contour interval = 0.1 m. Vertical exaggeration, Z scale = 5.4. (Lidar image from data provided courtesy of Indiana University Museum of Archaeology and Anthropology.)



Figure S3. Reconstruction of Mississippian-era structure and palisade on Mound F. (National Park Service, photograph by Francine Weiss, 1975. From https://npgallery.nps.gov/NRHP/GetAsset/NHLS/66000124_text.)

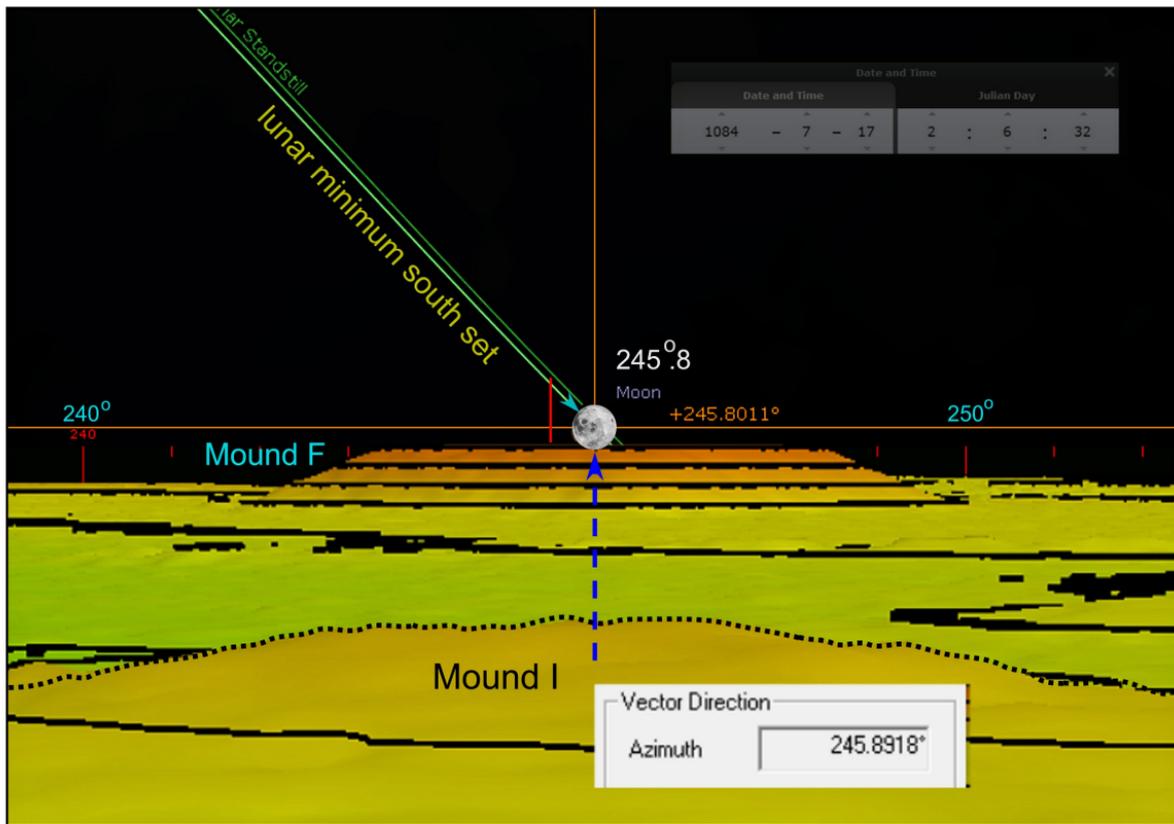


Figure S4. Schematic view showing moon minimum south set over Mound F as viewed from Mound I (7-17- AD 1084; waxing gibbous, 87.4% illuminated). Lunar trajectory plotted by Stellarium planetarium program using ArchaeoLines plug-in. Image combines lidar digital terrain model and Stellarium views. Moon illumination enhanced; atmospheric visualization enabled. Vertical exaggeration added to approximate height of structure on top of mound.

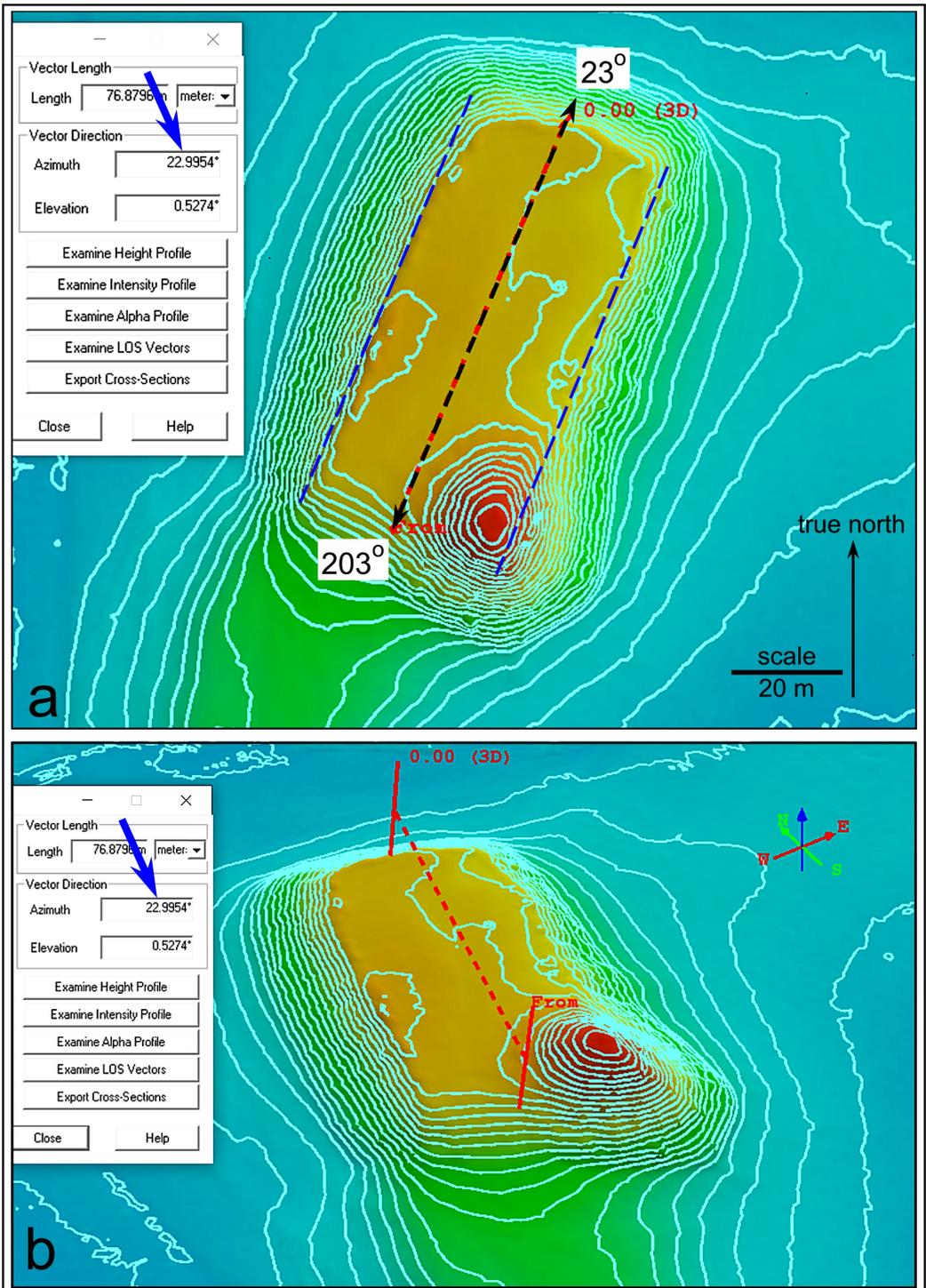


Figure S5. (a) Lidar contour map of Mound A showing azimuth of major axis of upper platform. Dashed lines added to show overall orientation. Contour interval = 0.5 m. (b) Oblique lidar image of Mound A showing azimuth of upper platform major axis. Contour interval = 0.5 m.

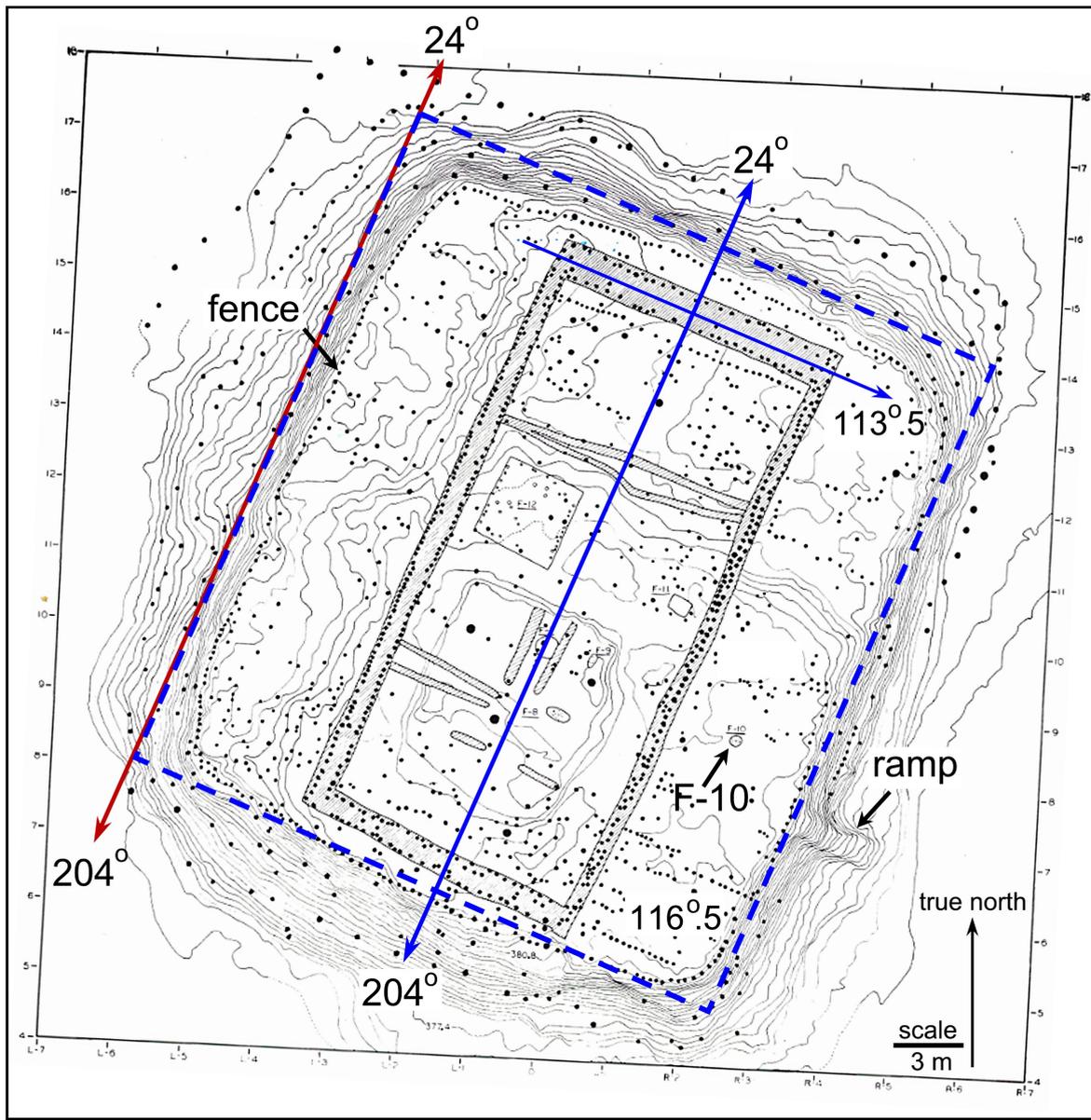


Figure S6. Contour map of Mound F by Black (1967:Figure 261; annotation added), rotated 2° clockwise so grid lines correspond to magnetic north for year 1939. Dashed blue line added to better illustrate orientation of mound. (Base map courtesy of Indiana University Museum of Archaeology and Anthropology.)

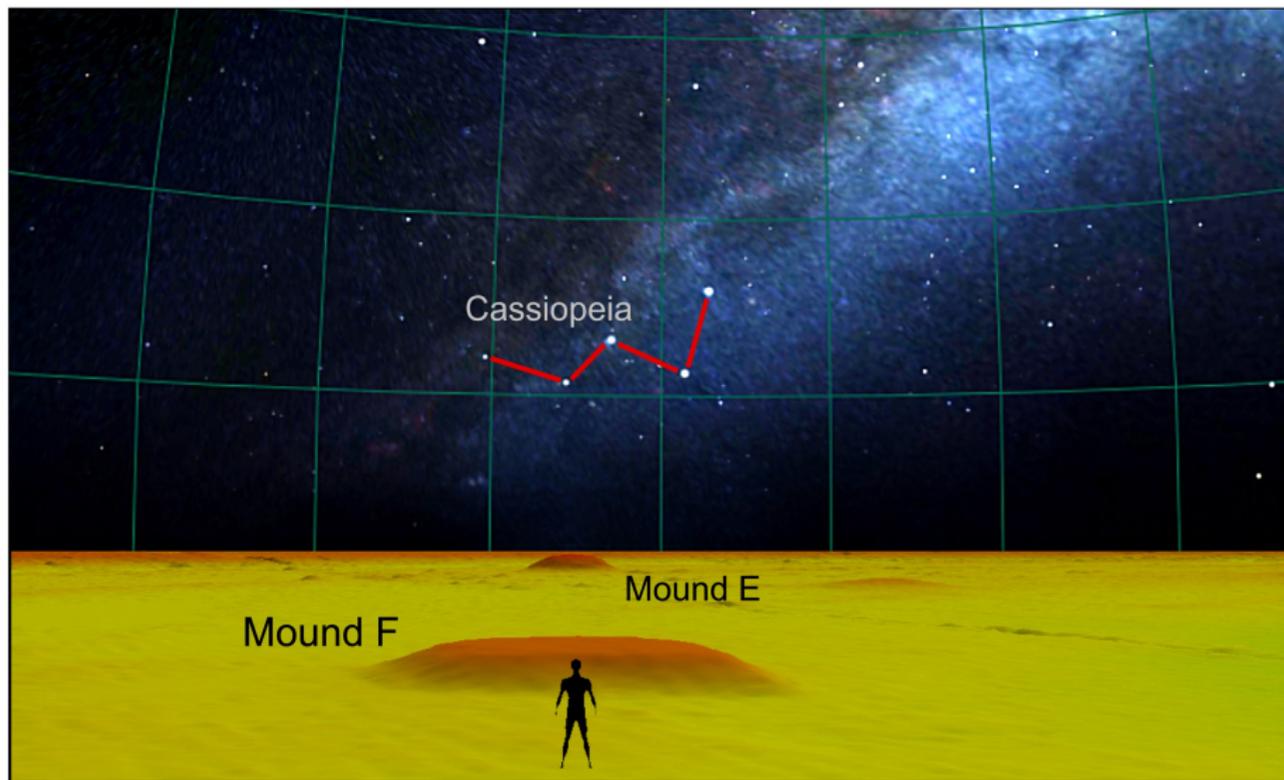


Figure S7. Schematic view looking northeast showing the Milky Way at nightfall on the summer solstice AD 1100 rising in alignment with the Angel Mound axis and Mounds F and E. Note the alignment to the constellation Cassiopeia. Image combines lidar digital terrain model and Stellarium view. Atmospheric visualization enabled with standard conditions for extinction and refraction applied.

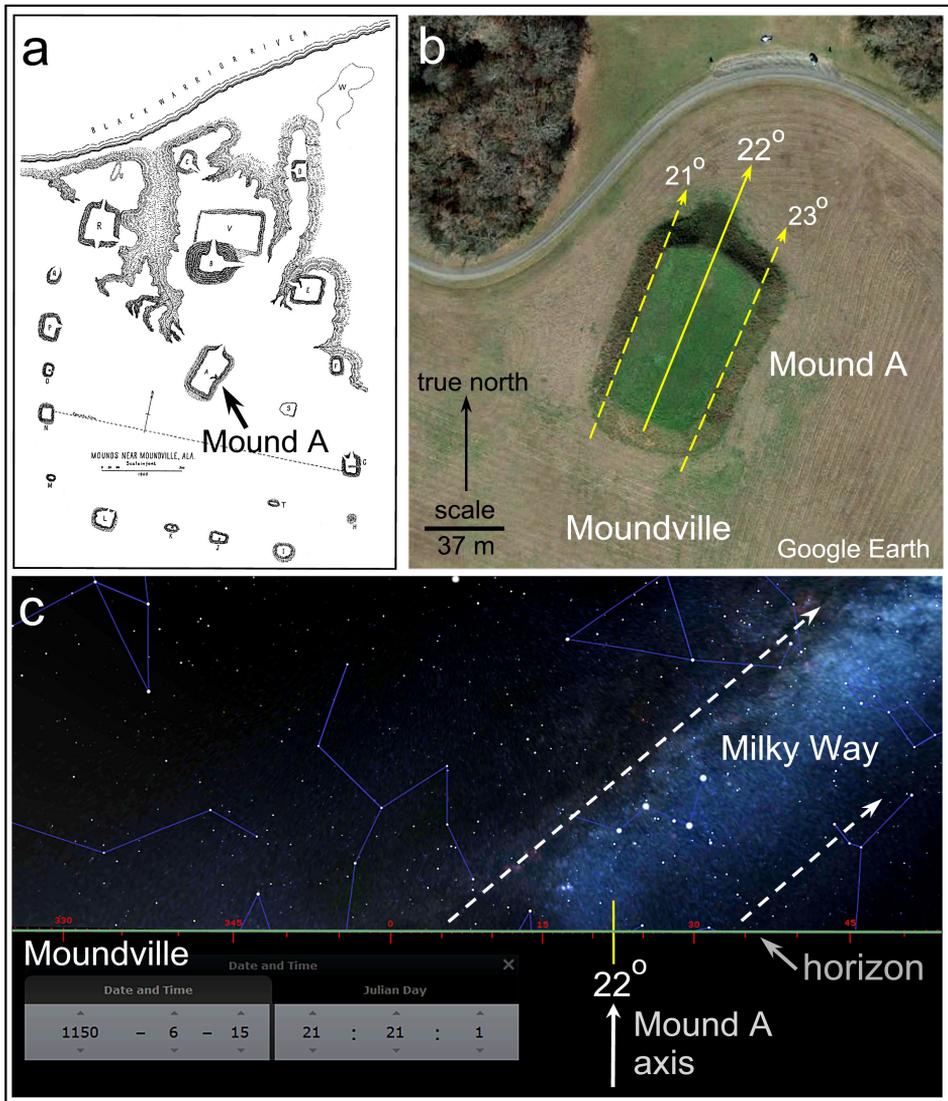


Figure S8. (a) Map of Moundville by Clarence Moore (1905; annotation added). (b) Google Earth view of Moundville Mound A. Image date 12-29-2017, eye altitude 680 m. This mound was lightly restored, with fill added to the platform surface to level it. (c) Stellarium computer simulation showing view to the northeast at Moundville at nightfall on summer solstice AD 1150. Annotation added; atmospheric visualization turned off.

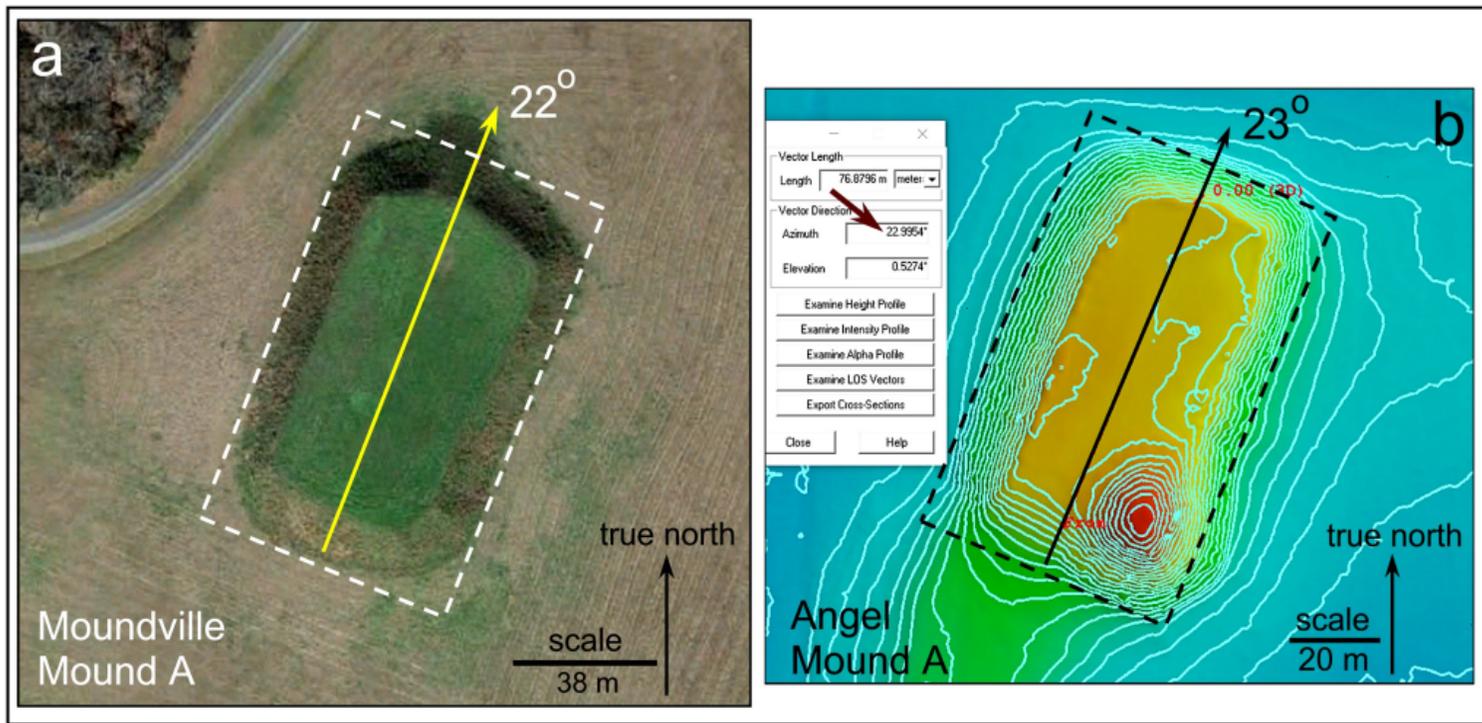


Figure S9. (a) Google Earth view of Moundville Mound A. Note ramp on the north side. (b) Lidar image of Angel Mound A. The lower platform provided gradual ascent to the top. Both the Moundville and Angel mounds point to the Milky Way at summer solstice nightfall.

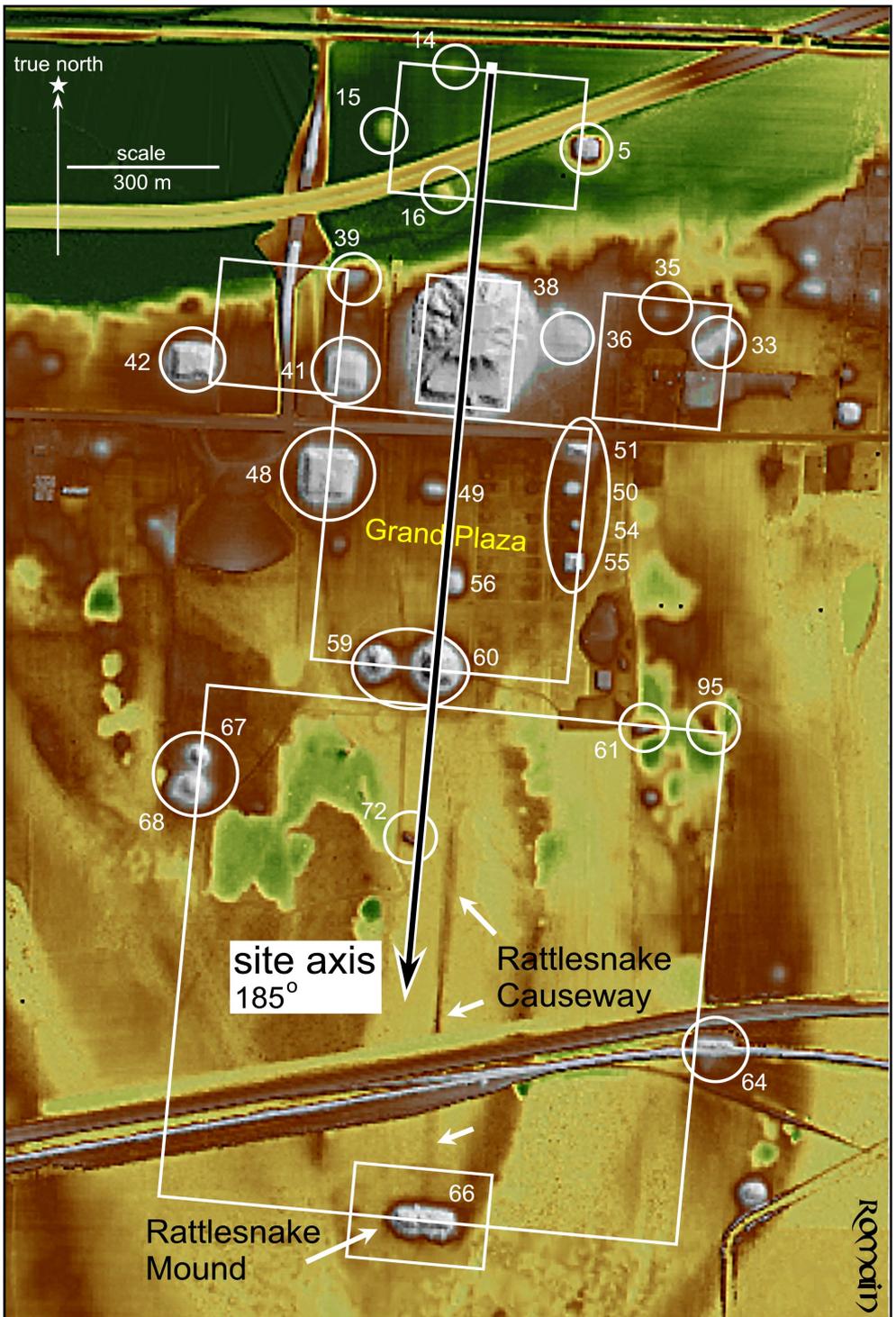


Figure S10. Lidar digital terrain model for central Cahokia showing how the site axis, mounds, and Rattlesnake Causeway are oriented to an azimuth of 185°—which is the azimuth for where the Milky Way intersected the southern horizon at nightfall on the summer solstice AD 1050. (Lidar data from State of Illinois, Geological Survey, Prairie Research Institute at <https://www.arcgis.com/apps/webappviewer/index.html?id=44eb65c92c944f3e8b231eb1e2814f4d>.)

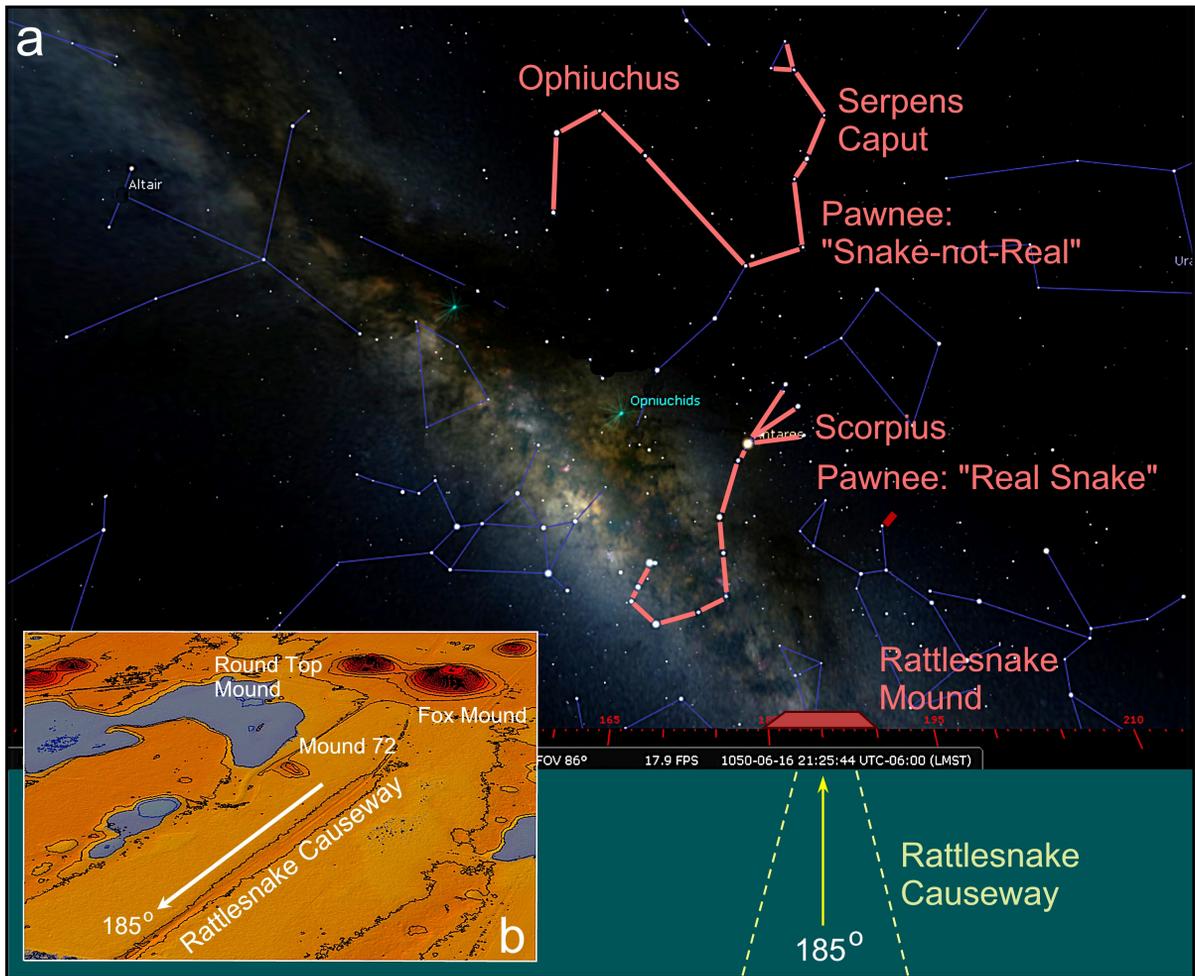


Figure S11. (a) Image showing how Rattlesnake Causeway is aligned to Rattlesnake Mound and the southern terminus of the Milky Way at nightfall on summer solstice AD 1050 and (b) lidar image showing location and azimuth of Rattlesnake Causeway.

References Cited

Black, Glenn A. (1967) *The Angel Site: An Historical, Archaeological and Ethological Study*. With James H. Kellar. 2 vols. Indiana Historical Society, Indianapolis.

Moore, Clarence B. (1905) Certain Aboriginal Remains of the Black Warrior River. *Journal of the Academy of Natural Sciences of Philadelphia* 13:125–244.