

3D Simulations as Tools of Discovery: New Light on the Relationship of the Ara Pacis and Montecitorio Obelisk in Augustan Rome."

Abstract: This talk will exemplify how 3D simulations can serve not only as illustrations of expert knowledge but also as tools that experts can use to generate new insights and discoveries. The focus of the talk will be the "Digital Meridian of Augustus Project." From 13 to 9 BC, Augustus, Rome's first emperor, developed the hitherto unoccupied northern Campus Martius in Rome by constructing three monuments whose relationship has long intrigued Roman archaeologists and topographers: the Montecitorio Obelisk (one of the first two obelisks to be brought to Rome from Egypt), the nearby monumental Meridian, and the Ara Pacis (Altar of Peace). In the past, scholars have speculated that the Obelisk (which postdates the Ara Pacis by several years) was sited so as to cast its shadow onto the western facade of the Ara Pacis on Augustus' birthday (September 23). We created a 3D simulation of the northern Campus Martius using Unity enhanced with a plug-in that uses azimuthal solar data from NASA's Horizons System database to create lighting solutions minute-by-minute for the entire period from January 1, 9 BC to December 31, 40 AD. The simulation shows that on September 23, the shadow does not hit the vertical axis of the western facade of the altar, but it does do so on a series of other dates. The simulation also supports virtual fieldwork, making it easy to move around the northern Campus Martius, change the time of day, date, and year to take observations of the obelisk's shadow and the sun itself. We call this methodology "simpiricism," or empiricism supported by computer simulations. The fieldwork has allowed us to develop a new theory explaining the relationship of the Obelisk and Ara Pacis: it is not the obelisk's shadow that is important, but the sun's disk seen centered over the obelisk in the late afternoon of the annual festival to the Roman sun god, Apollo, who happens to have been Augustus' favored divinity.

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