



Title: The Brief Golden Age of Celestial Navigation in Space

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The exploration of space required new navigation solutions. Techniques using radio signals originated at the very beginning of the space age. At the same time, other techniques were developed based on timekeeping and celestial principles long used by mariners. The navigation system used by astronauts on Apollo spacecraft to reach the Moon included celestial and inertial elements. During the 1968 flight of Apollo 8, the first mission of human exploration to approach the Moon, astronauts took more than 100 sextant sightings. This proved to be a unique turning point, as it was the last time people extensively tested celestial navigation in space flight. During this one mission, space travelers navigated using traditional celestial techniques. Radio-based positioning would take precedence in future flights, although star sightings continued to be used to control orientation of spacecraft.

Dr. Andrew Johnston is the Vice President for Museum Experience and Collections at the Adler Planetarium. Johnston leads the Adler's efforts in museum experiences, exhibitions, theater productions, telescope observing, history of astronomy research, and collections care. Before his current position, Johnston worked in science museums conducting research, developing public programs, and authoring publications, including the exhibition and book *Time and Navigation* with Smithsonian colleagues. He earned his Ph.D. in Geographical Sciences from the University of Maryland, College Park.