This medieval astrolabe is officially world’s oldest known such instrument

Enlarge / Left: A laser imaging scan of the so-called Sodre astrolabe, recovered from the wreck of a Portuguese Armada ship. Right: The astrolabe is believed to have beeb made between 1496 and 1501.
David Mearns/University of Warwick

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A mariner’s astrolabe recovered from the wreck of one of Portuguese explorer Vasco da Gama’s ships is now officially the oldest known such artifact, according to a new paper in the *International Journal of Nautical Archaeology*. It’s even going into the Guinness Book of world records, along with the ship’s bell, now that both have been independently verified as the oldest of their kind in the world.

Key distinction: this is the oldest known *mariner’s* astrolabe. Astrolabes are actually very ancient instruments—possibly dating as far back as the Second Century, B.C.—for determining the time and position of the stars in the sky by measuring a celestial body’s altitude above the horizon. They were mostly used for astronomical studies, although they also proved useful for navigation on land. Navigating at sea was a bit more problematic, unless the waters were calm.

The development of a mariner’s astrolabe—a simple ring marked

in degrees for measuring celestial altitudes—helped solve that problem. It was eventually replaced by the invention of the sextant in the18th century, which was much more precise for seafaring navigation. Mariner's astrolabes are among the most prized artifacts recovered from shipwrecks; only 108 are currently catalogued worldwide.

The so-called Sodre astrolabe was recovered from a shipwreck off the coast of Oman in 2014.

The so-called Sodre astrolabe was recovered from a shipwreck off the coast of Oman in 2014, along with around 2800 other artifacts. The *Esmerelda* was part of da Gama's armada. When the explorer returned to Portugal in early 1503, he left behind several ships, including the *Esmerelda*, which were eventually sunk by severe storms. According to expedition leader and recovery expert David Mearns of Blue Water Recoveries, Ltd., it's an unusual specimen in that it is decorated with the royal coat of arms of Portugal, as well as the personal emblem of King Don Manuel I.

However, any navigational markings on the instrument had worn away sufficiently as to be invisible to the naked eye, making it difficult to confirm that the object was indeed an astrolabe. So researchers at the University of Warwick in England, led by Mark Williams, traveled to Oman in November 2016 to study laser scans of various artifacts recovered from the shipwreck, including the astrolabe. They used those scans to build a 3D virtual model of the instrument.

Among the details gleaned from the scan were 18 scale marks, uniformly spaced along the disk, at 5 degree intervals. Mariners would have used the instrument to measure the height of the sun above the horizon at noon to pinpoint their location at sea. The astrolabe was made sometime between 1496 and 1501. According to the Warwick team, that makes this instrument a transitional design, linking an earlier type of astrolabe with one using an open-wheel design that mariners

began using before 1517.

“Without the laser scanning work performed by [the Warwick team] we would never have known that the scale marks, which were invisible to the naked eye, existed,” said Mearns. “Their analysis proved beyond doubt that the disk was a mariner’s astrolabe. This has allowed us to confidently place the Sodré astrolabe in its correct chronological position and propose it to be an important transitional instrument.”

DOI: *International Journal of Nautical Archaeology*, 2019. 10.1111/1095-9270.12353 (About DOIs).

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