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First-ever image of Sun-like star captured by Georgia State's CHARA

ATLANTA - An international team of scientists working at Georgia State University's Center for High Angular Resolution Astronomy (CHARA) telescope array in California's San Gabriel Mountains have captured a picture of Altair, one of the brightest stars visible from Earth and one of the closest at 15 light years away. The image is the first detailed picture of a hydrogen-burning star other than our own Sun.

"This really signals a new way of doing astronomy," says CHARA director Hal McAlister, a Georgia State University professor of astronomy. McAlister says hundreds of new stellar worlds are now open to astronomers.

The Altair image is the first of its kind because stars are so far from Earth that even the biggest ones appear to be tiny points of light through even the largest telescopes.

The image shows an oblong, otherworldly sun that spins so fast that its equator bulges outward. The rapid rotation makes the star's poles burn hotter, while the equator stays cooler. Altair makes nearly three rotations per day, while the Sun takes about 25 days to make one full turn. Because of its rapid spinning, Altair is about 22 percent wider than it is tall.

A paper about the achievement and the image are to be published today on Science Express, an online advance version of the journal Science.

Altair was imaged by scientists from Georgia State, the University of Michigan, the California Institute of Technology, and from the University of St. Andrews and the University of Cambridge in the United Kingdom. Working under a National Science Foundation grant, the team was using a University of Michigan-designed instrument, an infrared combiner, to collect beams from four CHARA telescopes simultaneously. The beams were collected in August and September 2006.

CHARA uses six 1-meter telescopes spread across Mount Wilson outside Los Angeles to mimic a giant telescope with a diameter of 1,000 feet. The facility has the longest spacing between optical or interferometer telescopes, which means it has the greatest ability to zoom in on a star (CHARA can zoom even more than the Hubble space telescope). The Michigan combiner was used to filter CHARA's beams into a single stream, from which an image could be processed.

"The old saying really holds true in astronomy: one picture is worth a thousand words," says McAlister. He says astronomers are now able to record visual observations about stars that have only been suggested by previous data.

In the case of Altair, astronomers already knew about its bulging equator. But comparisons of their new data with projections show surface temperatures that are different than those predicted.

"This image can only be made with a telescope the size of a football arena. I dare say that we may never create a single telescope mirror this large, but we can do this today with interferometry (a technique to resolve an image using multiple beams)," said University of Michigan astronomy professor John Monnier.

Funding to build CHARA was provided by the NSF, the W.M. Keck Foundation, the David and Lucile Packard Foundation and Georgia State University. The NSF also has awarded money for ongoing research at CHARA.

CHARA was founded by McAlister in 1984. McAlister, a Regent's professor, was recently honored with the Astronomical Society of the Pacific's 2007 Maria and Eric Muhlmann Award. The Muhlmann award is given annually to spotlight significant advances and innovations in astronomy. McAlister was presented with the award for his efforts to build CHARA. For more information, please see the following link:

<http://www.cas.gsu.edu/storydetail.aspx?id=143>

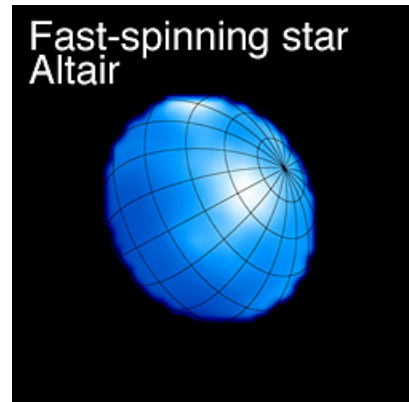
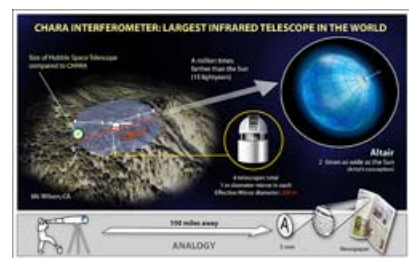


Photo Illustration: John Monnier, University of Michigan

No longer just a point of light: A summertime fixture in northern hemisphere skies, the star Altair is shown here as captured by the CHARA telescope array in what is the first detailed photograph ever taken of a hydrogen-burning star other than the Sun. Because stars are so distant from Earth, they can only be seen as small points of light by even the largest telescopes. CHARA, however, combines beams collected by multiple telescopes and can zoom in on distant objects with more resolution than even the Hubble space telescope. **Above: Altair with latitudinal and longitudinal lines showing the axis of the star.**



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