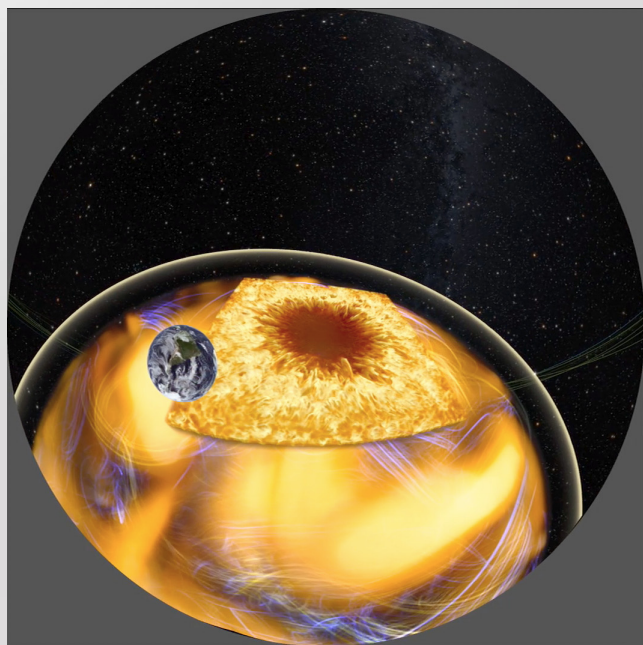


## TACC Helps “Stars” Take Center Stage in New York City

An exhilarating new film—“Journey to the Stars”—took center stage at the American Museum of Natural History’s Hayden Planetarium in New York City, thanks to resources and expertise from the Texas Advanced Computing Center (TACC).



*An image from Toomre and Brown’s visualization of the magnetic field of the solar convection zone. Here, the sunspot is magnified for better visibility, and is not to scale relative to the sun. © 2009, American Museum of Natural History*

a large portion of the inside of the Sun. Because the wreaths are within the middle 50 percent of the sun, you cannot see these phenomena directly. However, you can detect them in the eruption of magnetic fields to the surface.

“This may force us to reconsider some of our ideas about how the solar interior operates,” Toomre concluded.

Narrated by Whoopi Goldberg, the 25-minute show stirs the minds of its viewers as never before, allowing them to visit pulsing star nurseries and dying red giants, and to travel through the churning interior of the Sun.

The film projects cutting-edge images and computer visualizations onto the 87-foot, seven-million-pixel dome of the planetarium to explain how the first stars formed.

The centerpiece of the film, and the most difficult sequence to depict scientifically, is a flight into the center of the Sun. There, convective plasma roils and magnetic waves spiral from the Sun to the distant reaches of space. These sequences are based on the research of Juri Toomre, professor of astrophysics at The University of Colorado at Boulder.

“It’s not enough to know what comes out of the surface of the sun,” Toomre said. “We would like to understand how the magnetic engine of a star works, how it churns away, and how it builds orderly fields. This is one of the top ten questions in physics.”

Toomre and graduate student Ben Brown’s research on TACC’s Ranger supercomputer led to the unexpected discovery of “Christmas-like wreaths” of magnetism occupying