

# Planetarium Stars Again After Revamp

*Chicago's 81-Year-Old Facility Gets \$14 Million Makeover*

By JOE BARRETT

CHICAGO—Supercomputers in Illinois and California have been running 24 hours a day to finish updating the oldest planetarium in the nation.

The new show at the **Adler Planetarium** on the downtown waterfront will be one of the most data-intensive ever produced, featuring digital images captured by spacecraft and space-based telescopes.

The rebuilt theater is capable of playing back 72 separate audio sources and producing images with eight times the resolution of digital movie theaters—about as good as the human eye can see.

“The Adler is the oldest planetarium in the country and what we’ve done is make it once again the most advanced planetarium in the world,” said Paul H. Knappenberger Jr., president of the 81-year-old Adler, who spearheaded the \$14 million fund-raising drive that included \$900,000 from the federal government and \$750,000 from the state of Illinois.

The real breakthrough could be a new digital projection system that only now—a decade after planetariums started to go digital—can duplicate starry skies on a pitch-black night. Old-school projectors perfected this years ago.

Digital video systems were great at showing motion, but their overlapping projectors bled light, creating gray, dusk-like skies. So for the past few years, “the night sky disappeared” as digital technology became popular in planetarium shows, said Ryan Wyatt, director of the Morrison Planetarium in San Francisco.

But the Adler and the Hayden Planetarium at the American

Museum of Natural History in New York are the first in the U.S. to introduce a projector developed for military flight simulators that fixes the problem, Mr. Wyatt said. “The results are stunning,” said Carter Emmart, director of astrovisualization at the New York museum.

The Adler, built in 1930, was the first planetarium in North America and the second in the world. It had long been on the forefront of planetariums nationally, but a few years ago officials realized they were falling behind and kicked off a massive fund-raising drive.

In 2008, the drive became fodder for the presidential campaign, when Sen. John McCain ridiculed then-Sen. Barack Obama’s backing of a failed request for a \$3 million federal grant to replace what Mr. McCain called an “overhead projector.”

Mr. Knappenberger, an astronomer himself, held a news conference the next day, showing an old overhead projector that could be purchased for about \$30 on eBay. He contrasted it with the large, bug-like Mark VI Zeiss Projector that had been used in the planetarium since 1967.

Shortly after that, Adler astronomers and designers began mapping out plans for a new show that would take visitors on a tour of the universe and debut in a remade planetarium, with an innovative dome that starts at floor level and consists of metal pieces butting against each other in precise “nano-seams.”

The show features some of the biggest data sets and highest-resolution images ever produced for a planetarium show, said Doug Roberts, an astrono-

mer and chief technology officer for the Adler.

One two-minute section of the show that portrays the formation of the large-scale structure of the universe took over three weeks of computational time at the NASA Ames Research Center in California. The data generated totaled 400 terabytes, or 400 trillion bytes of information.

The old planetarium dome was shut down in September, so Mr. Roberts and others on the team reviewed early drafts of the show in a small minidome constructed in the Adler’s warren of subterranean computer rooms and office spaces.

In January, the team ran projections on how long it would take to run all the data for the show and realized it could take until November, unless they figured out how to cut corners. They cut down on computing time by making sure only the stars that could actually be seen by viewers would be included in the data runs.

In April, the new planetarium dome was completed and the first of the 20 new projectors arrived.

Now, the planetarium’s own large computer system as well as supercomputers at the NASA facility and at the National Center for Super Computer Applications at the University of Illinois, Champaign-Urbana are running nonstop to finish visualizations for the show.

Mr. Roberts, who sports the scruffy beard and ruffled hair of a man possessed with getting the job done, is confident the show will be ready by the July 8 opening. “I compare it to landing an airplane while building the runway,” he said.





Chicago History Museum / Getty Images

The Adler Planetarium in 1929, under construction in Chicago. Below, Paul Knappenberger, president of the planetarium and an astronomer.

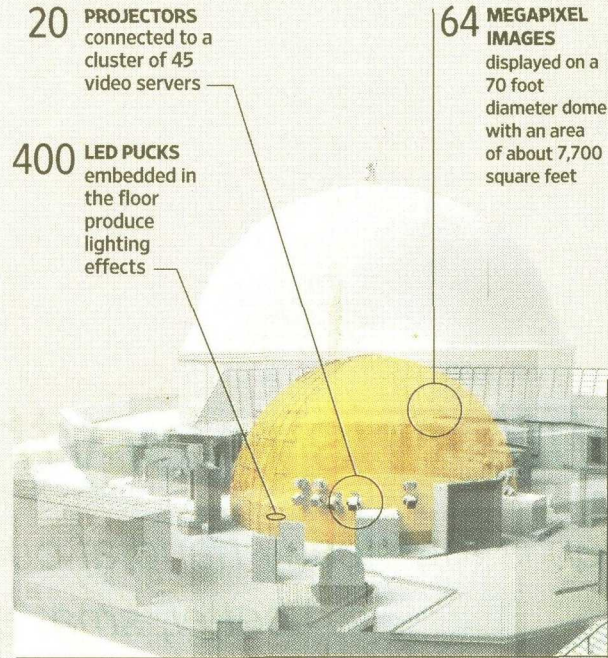


Associated Press

## Updating a Classic

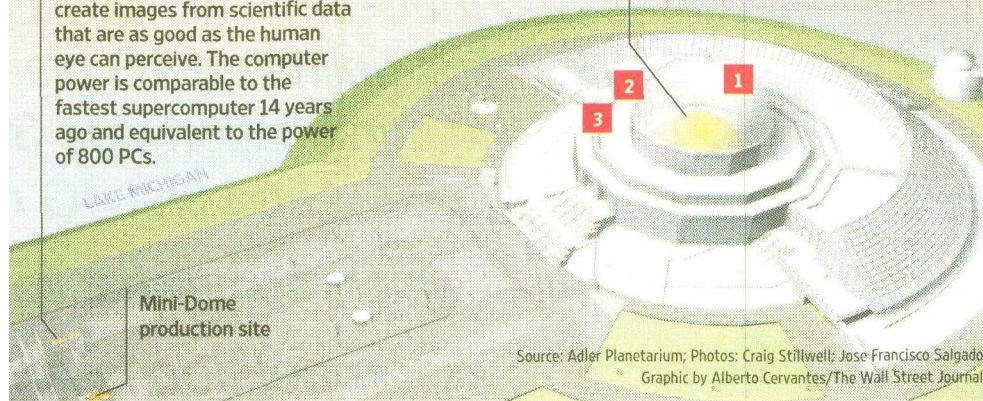
Chicago's Adler Planetarium, the first to open in North America in 1930, has just completed a \$14 million transformation, bringing it to the forefront of technology once again.

### INSIDE THE GRAINGER SKY THEATER



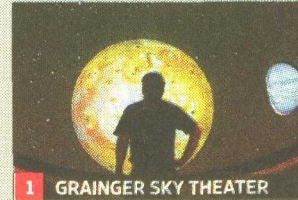
### BEHIND THE CURTAINS

**84 RENDER FARM COMPUTERS** create images from scientific data that are as good as the human eye can perceive. The computer power is comparable to the fastest supercomputer 14 years ago and equivalent to the power of 800 PCs.



## Deep Space Adventure

Some of the attractions:



**1 GRAINGER SKY THEATER**

Jupiter's moon Io, in the highest resolution and quality possible on the ultra-high-definition screen.



**2 SPACE PORTAL**

The Clark Family Welcome Gallery is a futuristic, constantly changing environment with one-of-a-kind architecture and vibrant lighting.



**3 WELCOME GALLERY**

The multimedia interactives use infrared sensors to detect body heat, allowing visitors to interact with the gallery through their movement.

Source: Adler Planetarium; Photos: Craig Stillwell; Jose Francisco Salgado  
Graphic by Alberto Cervantes/The Wall Street Journal