

# solar nexus

by Sharon Tregaskis

Using digital technology, Barry Perlus offers  
new views of India's ancient observatories

Eighteenth-century astronomers at the New Delhi site used the Jai Prakash, below, to measure the altitude and movement of the sun by day and track the positions of the stars by night.





The first time Barry Perlus visited India, he had been a professor for just five years. It was 1989, and he was on his first study leave from the College of Architecture, Art, and Planning. For ten weeks the assistant professor of photography traveled throughout South Asia, carrying four wide-format cameras

loaded with black-and-white and color film. The images he captured explore the interplay of light and shadow, form and function; they also document the region's sacred and historical architecture. Twelve years later, Perlus returned to India, this time to examine more closely the astronomical observatories in New Delhi and Jaipur. He went armed with a digital Nikon CoolPix 995, loaded with the

latest in virtual reality software. "I was just completely taken by surprise and immersed in a magical world," says Perlus. "The buildings are unlike any we have in our environment."

Designed by the Maharajah Jai Singh II of Jaipur, the observatories were constructed throughout Northern India during the eighteenth century. The two largest, captured in Perlus's photos, are now tourist attractions, drawing visitors from across India. The maharajah's designs apply astronomical theories developed in ancient Greece and Persia on a grand scale, compensating for the inaccuracies of the hand-held instruments and small sundials employed by astronomers of his day. They also fulfilled an important political function, suggests architecture professor Bonnie MacDougall. They served as a thinly disguised, self-aggrandizing gesture, disclosing the ambitions of a seasoned courtier and politician. "The observatories signaled to his people that Jai Singh was someone of extreme importance," she says. "He built this city, he put these instruments which are very startling in the center of it, and we're still looking at them. Nearly three centuries later, we still know who Jai Singh is and he's written himself into the architecture text books."

For Perlus, the combination of form and multiple functions only heightens their aesthetic appeal. "They don't have rooms, they don't have seating, and they are full of measurement information, indexes, scales, and geometrical forms that correspond to their function as direct-sight observatories," he says. Furthermore, the bold design of the instruments completely engulfs the observer. "They're the size of a small auditorium," he says. "When you walk into one, the regular environment disappears. You're just in this place of spirals, or columns with radial lines."



Fresh perspective: Using virtual-reality technology, art professor Barry Perlus captured spherical images of each form. Connecting the left and right edges of each rectangular-format photo allows the viewer to see a continuous, 360-degree image. Above, an interior view of the Jai Prakash at Jaipur. At right, the exterior of the same structure at New Delhi. Below: Looking out on the Jaipur observatory from the Ram Yantra. Inset: a conventional close-up of the Misra Yantra equinoctial dial at New Delhi.







**Astrologer's approach:** Stairs lead into the Jai Prakash at New Delhi, above; the Ram Yantra is visible at the far left and right of the rendering. The Jaipur site, right, as seen from the Great Samrat Yantra, shares a wall with Jai Singh's castle, visible in the background.

Built near the grounds of the royal palace in Jaipur, Jantar Mantar was once accessible only to the teams of scientists who climbed the stairs leading in and out of each instrument. "Astrologers played a significant role as political advisors throughout the East," says Perlus. "Decisions wouldn't be made without consulting them in terms of the auspiciousness or timing of an event—did the configuration of the heavens suggest this was a good thing to do or a good time to do it? What were the messages from the heavens?"

One of the most prominent instruments at Jantar Mantar is the Jai Prakash, a device that measures the movement of the sun and stars. Together, two corresponding bowls, each more than twenty-seven feet in diameter, create a celestial map. Notches in each cavity mark the passing of the hours during the day, and at night, position an observer to see the stars







**Value added:** Perlus hopes to include a feature on his website allowing visitors to compose and capture an image from the virtual reality movies, then collaborate with him to make high-resolution prints, like the one above of Jaipur's Great Samrat Yantra. Left, the Samrat Yantra's exterior, seen from a distance.

in precise alignment. "It permits you to see time as movement," says Perlus. "You can just pause and look at the index of the sun's shadow. Every half inch represents two seconds. Looking down at the shadow, you become aware that you're standing on something in motion, witnessing the earth's movement."

As an artist, Perlus says the transition from conventional photography to digital, virtual-reality documentation required a change of perspective. Each recording knits together twenty-nine overlapping images, using stitching programs and sophisticated algorithms to blend shifts in color and exposure between shots. "The primary concept is that of being a surrogate," says the professor. "I'm providing the prospective audience an opportunity to explore, rather than handing them a fixed image to look at and reflect on. The image doesn't have fixed boundaries or frames, and I can't control the composition. The only thing I really control is where I stand when I make the recording."

Consequently, Perlus paid special attention to the vantage point from which he captured each image. "If the work were just from the mindset of a still photographer, there would be only one view, and the rest of the panorama would just be incidental. As viewers pan around in these VRs, they encounter new discoveries and new views." In some cases, he says, that meant placing the camera just inches from a small object with detailed markings and opposite a broad landscape view. "Like a filmmaker planning a dolly action, I had to compose the shots so that when viewers interacted with the panorama, they would be surprised." ●

To see the panoramas, visit  
[www.people.cornell.edu/pages/bap8/index.html](http://www.people.cornell.edu/pages/bap8/index.html)  
This summer, Cornell Adult University's Cybertower features Perlus's work in an online study room with streaming video of lectures by the professor, reading lists, and discussion boards. Go to <http://cybertower.cornell.edu>.