Inspiration of Astronomical Phenomena VIII: City of Stars
ASP Conference Series, Vol. 501
Brian Patrick Abbott, ed.
© 2015 Astronomical Society of the Pacific

Stars on the Ceiling

E. C. Krupp

Griffith Observatory, Los Angeles, California, United States;
eckrupp@earthlink.net

Abstract. Astronomy and celestial imagery have been incorporated into architectural ceilings from antiquity to the present to reference the sky on behalf of a variety of agendas. Burial chambers in Egyptian pyramids and tombs, the Osiris chapel on the roof of Ptolemaic Egypt's Temple of Dendera, ancient Chinese tombs, painted rock shelters in California and the American Southwest, the cupola above a hot bath from medieval Jordan, elaborately illustrated ceilings in Italian cathedrals and palaces, the main concourse in New York's Grand Central Terminal, and a variety of other public buildings in America all brought the sky inside to convey relationships between the architecture, people, and the cosmos. In these interior environments, the symbolic function of the astronomical ceiling is driven by the thematic function of the building. At Griffith Observatory in Los Angeles three signature spaces are equipped with astronomically illustrated ceilings. In content and location, these prominent murals operate symbolically to convey meaning through public display and unexpectedly prompt people to think more expansively about the universe. This artwork is familiar in Los Angeles, but its use in a public observatory puts it outside the range of most commentaries on public art. Although experienced by more than seventy-six million persons over the last eighty years, Griffith Observatory's celestial murals are not well known. Their history, content, character, meaning, and purpose are detailed here.

When principles of cosmology are mimicked in architecture, ceilings usually operate as stand-ins for the sky. They display stars, constellations, and other celestial objects overhead and convey heaven down to earth. Examples from antiquity and today are abundant. They all bring the sky inside to transmit messages about relationships between the building, the people who use it, and the heavens, and so the detailed meaning of these astronomical ceilings is modulated by the thematic function of the building.

1. Ceilings Like the Sky

The first modern formal exposition of this obvious architectonic principle appears to be the work of William Lethaby, who in 1891 cited authorities, from Clement of Alexandria (third century AD) to Shakespeare, leveraged the architectural analogy, and linked ceilings with the sky. Lethaby detailed the symbolic meaning of architecture in *Architecture, Mysticism and Myth*, which includes a chapter, titled "Ceilings Like the Sky." He examined the starry ceilings at Sainte-Chapelle, the thirteenth-century Gothic chapel in Paris; Takht-e Soleyman, a Sassanid sanctuary in northwest Iran; and the starry ceiling in the burial chamber of the Fifth-Dynasty pharaoh Wenis, at Saqqara, Egypt. Elsewhere in the book, Lethaby described the vaulted roof in the temple of Seti I, an Eighteenth-Dynasty pharaoh, at Abydos and provided many other examples of cosmological architecture.

Lethaby was a practicing architect and a professor of design at London's Royal College of Art, and he is credited with inventing organized art and design education. Godfrey Rubens, who wrote the introduction to the 1974 reissue of *Architecture, Mysticism and Myth*, explained how the book "advanced the then new idea that psychological and philosophical notions found symbolic expression in architecture" (Lethaby 1891). Lethaby's ideas inspired contemporary architects to incorporate traditional cosmological symbolism into their designs, but some commentators recognized that Lethaby provided no guidance for the representations of contemporary cosmology and a modern symbolism in architecture. Lethaby was primarily interested in what he called "the esoteric principles of architecture" embedded in the monuments of "many lands and religions."

The inventory of cosmological architecture and celestial ceilings is too large to be documented here, but a sample of these monuments illustrates the principle.

2. Temples and Tombs

The pyramid of Wenis at Saqqara (2375–2345 BC) placed the deceased pharaoh in symbolic contact with the sky. As a junction of earth and sky, the burial chamber, with the help of the *Pyramid Texts* inscribed on its walls, spirited the dead king's soul to his celestial destinies, with the imperishable stars in the north and at the head of the timekeeping decans, in Orion (Faulkner 1969; Krupp 1983). The same treatment of ceilings occurs again a thousand years later in the New Kingdom tomb of Amenhotep II (1453–1419 BC), while other New Kingdom royal tombs, like that of Seti I, explicitly depict the stellar destiny of the pharaoh overhead and transform the ceiling into constellations (Neugebauer & Parker 1969; Krupp 1983, 1997).

The oldest known depiction of the sky in an Egyptian monument is the ceiling in the tomb of Senenmut, at Deir el-Bahri (Neugebauer & Parker 1969). The astral symbolism was normally reserved for the pharaoh, and its presence in Senenmut's tomb indicates his importance in the fifteenth century BC, when he served as Queen Hatshepsut's chief counselor and architect. Sirius as Isis, Orion as Osiris, the decans, the planets, and the northern constellations all appear in exquisitely drawn figures.

Astronomical transcendence also put the sky on the ceilings of Ptolemaic temples in Egypt's later Roman era (Neugebauer & Parker 1969; Krupp 2001). The registers of the ceiling of the hypostyle hall of the Temple of Hathor at Dendera are filled with personifications of the moon, the decans, the hours, and more, including figures of zodiacal constellations, which originated much earlier outside of Egypt. The Dendera Circular Zodiac (Figure 1), a relief that depicts constellations and planets, once filled the ceiling in one of the Osiris chapels on the roof of the Temple of Hathor. It is now in the Louvre in Paris, and it is still displayed overhead. While the celestial information in both of these settings is technical and accurate, these ceilings are not astronomical references for observation or calculation. They are instead elements of ceremonial spaces where ritual activity was performed on two different scales. Through detailed analogy, they miniaturize the sky and turn the temple and the chapel into the cosmos. These temples were designed to symbolize the landscape of Creation to create a precinct for contact with the divine (Krupp 1997).

Astronomical ceilings were also installed in Chinese tombs (Krupp 1983). Yong tai, a Tang dynasty (618–907 AD) princess, was interred under a dome of stars that



Figure 1. Constellations, timekeeping stars, and planets are carved in relief in Egyptian style on the Dendera Circular Zodiac. Now in the Louvre, in Paris, this astronomical artifact once occupied the ceiling of the central room of the East Osiris Chapel on the roof of the Ptolemaic Temple of Hathor at Dendera. The recognizable zodiac figures are not indigenously Egyptian but imported from Mesopotamia, Greece, and Rome. (E. C. Krupp)

replicated the sky with the Milky Way to ensure her soul's transcendence to the celestial paradise.

The astronomical theme and funerary mechanism of spiritual transformation was already in place during the Han dynasty, when high-status tombs often put emblems of the sky on the ceiling (Loewe 1979; Wu 2010; Tseng 2011). These tombs and their contents are vehicles for escorting the dead to the next realm, and one of the earliest astronomical ceilings, dated to 48–8 BC, is in a tomb near Luoyang, in north-central China. It is known as the Devil-expelling Frescoed Tomb of the Western Han. The images are painted on bricks that stretched across the top of the burial chamber. The sun is on brick one, on the east side of the tomb, and the moon is on brick seven, on the west side of the tomb. Several identifiable star patterns, the Big Dipper among them, are embedded in clouds.

A gorgeous Western Han tomb was discovered in April 1987, during construction for Xi'an Jiaotong University, in the eastern suburbs of Xi'an. Painted in the first century BC, its ceiling mural documents the twenty-eight *xiu*, or lunar stations. An elite male, about sixty years old, was interred there. The theme of the tomb, like other Han tombs, is the ascent of the dead soul to the celestial paradise (Xi'an Jiaotong University 1991).

Chinese tomb iconography migrated out of China. A 1,300-year-old tomb in Japan actually maps the night sky, complete with celestial circles—celestial equator and ecliptic—at Kitora in Asuka (Renshaw & Ihara 2002).

Zodiac figures were placed into the ceilings of corridors in some Shiva temples in India, like Meenakshi Temple in Madurai and Arulmigu Abimukeshvara Temple in Kumbakonam, where they helped establish the temple's cosmic connection.

3. Shrines and Celestial Power

Some California Indian rock art sites put celestial objects on the ceiling of the shelter. The Luiseño shaman who painted the symbols in the upper shelter at the Motte Rimrock Reserve, near Perris, in southern California, included an emblem ethnographically known as "Heart of the Wolf," or the Pole Star (Rafter 1989; Krupp 2005). Cahuilla Indians in the high desert of Joshua Tree National Park topped the vault of Dome Rock with a rayed disk. Both were likely exercises in the shamanic acquisition of power.

Starry ceilings in Navajo territory do not map the constellations, but instead fill the overhead surface with generic fields of stars. The visual impact of Many Stars Cave, in Canyon del Muerto in Canyon de Chelly National Monument, is especially stunning, with part of the ceiling in white stars on a black field and the other zone with black stars on a white field (Chamberlain 1989; Krupp 2001). Both fields merge to enhance the sense of sweeping sky created by the eroded and exposed layers of rock which overlap overhead. Von Del Chamberlain's analysis of these ceilings suggests the stars were placed there to supply astral supernatural power that would protect the occupant from dangerous spirits (Chamberlain & Rogers 2005).

4. Constellations and Dynastic Statements

An entirely different and astronomically explicit ceiling was enigmatically mapped with stars in the eighth century AD onto the dome of a caldarium, or "hot bath," in a medieval, desert hunting lodge in Jordan, east of Amman (Beer 1967; Krupp 2001). Why this constellation-laden cupola should cap a wilderness bathhouse eludes us, but the tradition of celestial ceilings in secular settings continues into the Renaissance.

A monumental depiction of constellation figures, painted by an unknown artist in 1575, fills the ceiling of the Sala del Mappamondo of the Palazzo Farnese in Caprarola, Italy (Sesti 1991; Sgarbi 1991). The room embraces the heavens and the earth as a statement of dynastic status.

A different but related conscription of the Renaissance sky by the ruling class appears overhead in the Old Sacristy of the Basilica of San Lorenzo, in Florence, Italy. Designed in the early fifteenth century (1420–1428 AD) by Filippo Brunelleschi, the church was a Medici monument. Painted by Giuliano d'Arrigo, the dome above the altar of the cubic funeral chapel depicts the position of the sun in Cancer, the crab, and the disposition of the rest of the daytime sky on 4 July 1442, when René of Anjou, a primary driver of the Florentine Renaissance and ally of Cosimo de Medici, arrived in Florence (Forti 1993).

5. Secular Starry Ceilings

In our time, the democratization of knowledge and the consumer economy allow just about anybody to memorialize the celestial circumstances of any personally meaningful moment with glow-in-the-dark star decals that may be applied to ceilings closer to home.

Secular ceilings with stellar content continue to elevate the eye. Grand Central Terminal, on East 42nd Street in midtown Manhattan, is a world-famous New York Beaux-Arts landmark and one of the largest railroad stations in the world. A hundred years of travelers and commuters have moved through its corridors and halls. The ceiling of its Main Concourse hangs 2,500 stars and the constellations of the fall and winter sky over the crowds in transit (Figure 2), and since 1913, more people have walked beneath these stars than any other celestial ceiling on earth. Cornelius Vanderbilt, who was not only a transportation tycoon, but an amateur astronomer, commissioned the building and its astronomical ceiling, which seems intended to embody the mastery of time and space successful commerce requires (Lovi 1992; Krupp 2001).

Commerce and constellations also converge in Brooklyn's Williamsburg Savings Bank Building, with stars and constellation figures elegantly depicted over the years 1927–1929 in mosaic ceilings, the opulence of which advertises lofty intentions and mastery of wealth. The figures look inspired by Elijah H. Burritt's very popular and ubiquitous *Atlas Designed to Illustrate the Geography of the Heavens*, published in 1835.

Constellations contrived by Giovanni Smeraldi add celestial geography to the 22,000-square-foot ceiling of Mabel Shaw Bridges Music Auditorium, built in 1931 for Pomona College in Claremont, California (Krupp 2001). Although the celestial ceiling promotes no arcane symbolic agenda, it suggests music, in collusion with the Harmony of the Spheres, lifts spirits through the roof.

A more modest astronomical interior in the reading room of the Los Feliz Branch of the Los Angeles Public Library references the sky to reinforce the library's identity. Its skylight tops a vault of constellation wall murals, while quotations on the lower walls illustrate literary acknowledgments of the heavens (Krupp 2001). Griffith Observatory, the hood ornament of Los Angeles and a southern California icon, is the emblem of the neighborhood. The reading room's picture-perfect view of the hilltop observatory and the astronomical ceiling authenticate the library's Los Feliz pedigree and, therefore, help to reinforce community identity.

6. Unprecedented Astronomical Ceiling Murals at Griffith Observatory

Planetariums, like the Samuel Oschin Planetarium at Griffith Observatory, of course, routinely project stars on the dome with astronomical integrity in a deliberate attempt to bring the sun, moon, stars, and planets indoors in performances that clarify how the sky works. Griffith Observatory, however, also embraces the millennia-long tradition of astronomical ceilings with three overhead murals that deliberately reinforce the meaning of the signature spaces they command. Two were painted in 1934 as part of the original design and have been viewed by at least seventy-six million people since the Observatory first opened in 1935. The third was created as part of the $93-million renovation and expansion, completed in late 2006.



Figure 2. New York's Grand Central Terminal maps Orion, the zodiac, and more onto the ceiling of the Main Concourse. (Brian P. Abbott)

Because the Observatory is such a familiar element of southern California, the two original murals[1] (Koppany 1979; Mosley 1994) were routinely encountered as public art by millions of visitors, but their unexpected placement in a public observatory, their unfashionable muralist figurative style, and their focused astronomical content consign them to oblivion in the art world.

The primary mural was painted by Hugo Ballin (1879–1956) for the ceiling of the W. M. Keck Foundation Central Rotunda (Figure 3), which is such a familiar space to so many people it is often taken for granted. There is, however, nothing like it anywhere. In 1935, the Observatory's only entrance brought visitors through the theatrically emblematic and monumental bronze doors and directly under the mural, where they first

[1] http://www.griffithobservatory.org/exhibits/centralrotunda_hugoballinmurals.html



Figure 3. Celestial mythology fills the ceiling of Griffith Observatory's W. M. Keck Foundation Central Rotunda. Designed and painted by Hugo Ballin in 1934, the ceiling depicts primary elements of the sky, including the zodiac figures, personifications of planets, and other celestial figures. (Griffith Observatory, Anthony Cook)

encountered the Foucault pendulum, with its 240-pound brass ball swinging with all of the regularity of simple harmonic motion at the end of a forty-foot wire suspended from the ceiling.

Ballin was a Los Angeles artist, novelist, art director, motion picture director, and film producer, and the rotunda ceiling, he wrote, "is founded on some myths and legends of the heavens" (Ballin 1934). He specified "Atlas and the winds" (and acting as the polar axis with a talismanic Big Dipper), "the Pleiades and the Blind Giant Orion led by Kedalion," "Jupiter" (which is shown as a god armed with thunderbolts and as a planet), "Venus attired by the seasons as she comes out of the foam of the sea," "Saturn the monster. Below him are the five children he devoured" (and an image of the planet in his lap)," "Mercury sent from heaven to drive away Argus who watched



Figure 4. The Ballin mural that canopies Griffith Observatory's Keck Central Rotunda is accompanied by depictions of science and technology that illustrate "the march of science through the ages," and the Observatory's elegant Foucault pendulum, suspended from the center of the ceiling, oscillates in the illuminated pit below to demonstrate the earth's rotation in real time. (Griffith Observatory, Anthony Cook)

Io," "The first observer looking at Mars," "The angel is holding the Star of Bethlehem," "The cow in the moon being watched by the eyes of Argus," "The signs of the zodiac surround the collar of the eye of the dome." At the time plans for the mural were being consolidated, the architects, Ashley and Austin, prepared a more detailed description of all of the elements in the ceiling mural and provided a little more background on the myths (Ashley & Austin 1934).

The eight wall murals (Figure 4), or side panels, as Ballin called them, are illustrative, he explained, of the "Advancement of Science from Remote Periods to Present Times" (Ballin 1934). Each of them spotlights science and technology with a selection of images and figures from the history of each endeavor. Starting on the south, and working around the room, these emblems of discovery include astronomy, aeronautics,

navigation, civil engineering, metallurgy and electricity, time, geology and biology, and mathematics and physics. They are all heroic visual statements of origin and development, filled with historic, legendary, and thematic detail.

The documents left by Ballin and by the architects fully document their content but say little more about intent. The architects simply stated the murals "represent the march of science through the ages in various countries" and so establish a narrative of progress (Ashley & Austin 1934).

The distinction between myth on the ceiling and science on the walls is part of the fundamental character of the rotunda. Astronomy once embraced myth and now engages science for the same purpose—to get a grip on the universe and understand the big picture.

That message was well understood by the original Observatory staff and was clarified in the official *Griffith Observatory and Planetarium Los Angeles* (1935) guidebook. From the beginning, the murals were seen as a hierarchy of intellectual evolution. Their placement in the rotunda, however, was even more congruent with their message than was recognized at the time.

The pendulum illustrates the foundational principle that leverages the visitor experience of Griffith Observatory: the building as instrument. Griffith Observatory has always activated the visitor experience through instruments, and the Foucault pendulum in the Keck Rotunda is one of those fundamental instruments that transforms visitors into observers. It demonstrates, in real time, earth's rotation, which was, in turn, a profound astronomical discovery that transformed our perspective on the cosmos.

Griffith Observatory's formal Beaux-Arts, Greek Revival, Moderne design fills the Keck Rotunda with high-end and decoratively elegant materials to create a formal environment canopied with celestial mythology. This is supported on all sides by the sciences as the eye descends a cosmic axis that symbolizes earth's rotation—demonstrated in the moment with the Foucault pendulum. The entire room tells a story about our engagement with the cosmos with myth, with science, and with instruments that allow us to observe and discern the reality we inhabit.

The South Gallery (Figure 5), adjacent to the Keck Rotunda, is the formal entry to the Samuel Oschin Planetarium, and since 1935, its ceiling has been illuminated with an elegant and almost geometric mural of an elaborate rayed disk on a blue field that represents the sun in the sky (Mosley 1994). It was painted by Anthony B. Heinsbergen, and although his mural seems purely ornamental, it still manages to convey an allegorical message appropriate for the character and function of a planetarium theater. The mural's invocation of the sun puts the viewer in the realm of light, from which almost all astronomical knowledge is derived, and the band behind the sun can operate as its daily path and as the ecliptic.

Griffith Observatory's $93-million renovation and expansion provided an opportunity to add a new celestial mural to what had been a large blank ceiling with light fixtures in what was the East Hall of Science (Figure 6). The content and meaning of this mural is easy to document because I conceived and developed it. The room, now named the Jack C. and Anne Marie Wilder Hall of the Eye, is dedicated to what the eye extracts from the sky and how that information is manipulated by instruments to acquire astronomical knowledge. The new ceiling mural illustrates the constellations that represent scientific instruments. Although most of the constellations recognized today originated in antiquity, some constellations were devised in the seventeenth and eighteenth centuries, and they reflect the priorities and sensibilities of the astronomers who invented



Figure 5. Anthony B. Heinsbergen's solar ceiling mural in Griffith Observatory's South Gallery heralds the entrance to the Samuel Oschin Planetarium with graphic allusions to the sun, its daily path, and the ecliptic. (Griffith Observatory, Friends Of The Observatory, Justin Donnais)

them, just as the archaic constellations incorporate symbolically the priorities and sensibilities of antiquity. The new mural includes Sextans the Sextant, Octans the Octant, Circinus the Compasses, Pyxis the Compass, Reticulum the Reticle, Horologium the Clock, Microscopium the Microscope, and Telescopium the Telescope. Designed by Griffith Observatory Art Director Don Dixon and fabricated by Griffith Observatory artist/designer Robert Kline, the mural of celestial instruments was installed by the Observatory's technical staff in 2006 and complements the theme of the room's exhibits—our observation, analysis, and interpretation of light from astronomical objects and the character and evolution of the tools we have devised to do that.

As a public observatory, planetarium, and museum, Griffith Observatory is—in the tradition of pharaonic tombs, shamanic shrines, and Grand Central Terminal—a point of celestial departure, and its murals lift everyone on-board.



Figure 6. A new Griffith Observatory mural was created in 2006 for the Jack C. and Anne Marie Wilder Hall of the Eye. The room spotlights the function and character of astronomical instruments, and "modern" constellations of instruments appear overhead. (Griffith Observatory, Anthony Cook)

References

Ashley, J. C., & Austin, F. M. 1934, Architects notes on Griffith Observatory Ballin murals. untitled and unpublished manuscript, Griffith Observatory collection

Ballin, H. 1934, Description of the Eight Murals and Ceiling for the Griffith Observatory. unpublished manuscript, Griffith Observatory collection

Beer, A. 1967, Vistas in Astronomy, 9, 177

Chamberlain, V. D. 1989, in World Archaeoastronomy, edited by A. Aveni (Cambridge: Cambridge University Press), 331

Chamberlain, V. D., & Rogers, H. 2005, in Current Studies in Archaeoastronomy: Conversations Across Time and Space, edited by J. Fountain, & R. Sinclair (Durham, NC: Carolina Academic Press), 221

Faulkner, R. O. 1969, The Ancient Egyptian Pyramid Texts (Oxford: Oxford University Press)

Forti, G. 1993, Memorie della Società Astronomia Italiana, 64, 651
Griffith Observatory 1935, Griffith Observatory and Planetarium Los Angeles (Los Angeles: Southland Publishing Company)
Koppany, B. 1979, The Murals of Griffith Observatory (Los Angeles: Bob Koppany)
Krupp, E. C. 1983, Echoes of the Ancient Skies: The Astronomy of Lost Civilizations (New York: Harper & Row)
— 1997, Skywatchers, Shamans, & Kings: Astronomy and the Archaeology of Power (New York: John Wiley & Sons)
— 2001, Sky & Telescope, 102, 86
— 2005, in Onward and Upward: Papers in Honor of Clement W. Meighan, edited by K. Johnson (Chico, CA: Stansbury Publishing), 75
Lethaby, G. 1891, Architecture, Mysticism and Myth (New York: George Braziller). 1975 American reprint
Loewe, M. 1979, Ways to Paradise: The Chinese Quest for Immortality (London: George Allen & Unwin)
Lovi, G. 1992, Sky & Telescope, 83, 57
Mosley, J. 1994, The Hugo Ballin Murals of the Griffith Observatory (Los Angeles: Griffith Observatory)
Neugebauer, O., & Parker, R. A. 1969, Egyptian Astronomical Texts: III. Decans, Planets, Constellations, and Zodiacs (Providence, RI: Brown University Press)
Rafter, J. 1989, Rock Art Papers, 6, 69
Renshaw, S., & Ihara, S. 2002, Kitora Kofun: A Detailed Astronomical Star Chart in an Ancient Japanese Tomb. URL `http://www2.gol.com/users/stever/kitora.htm`
Sesti, G. M. 1991, The Glorious Constellations: History and Mythology (New York: Harry N. Abrams, Inc.)
Sgarbi, V. 1991, in The Glorious Constellations: History and Mythology, edited by G. M. Sesti (New York: Harry N. Abrams, Inc.), 121
Tseng, L. 2011, Picturing Heaven in Early China (Cambridge, MA: Harvard University Asia Center)
Wu, H. 2010, The Art of the Yellow Springs: Understanding Chinese Tombs (Honolulu: University of Hawai'i Press)
Xi'an Jiaotong University 1991, Xi'an Jiaotong University West Han Dynasty Mural Tomb (Xi'an, China: Xi'an Jiaotong University)