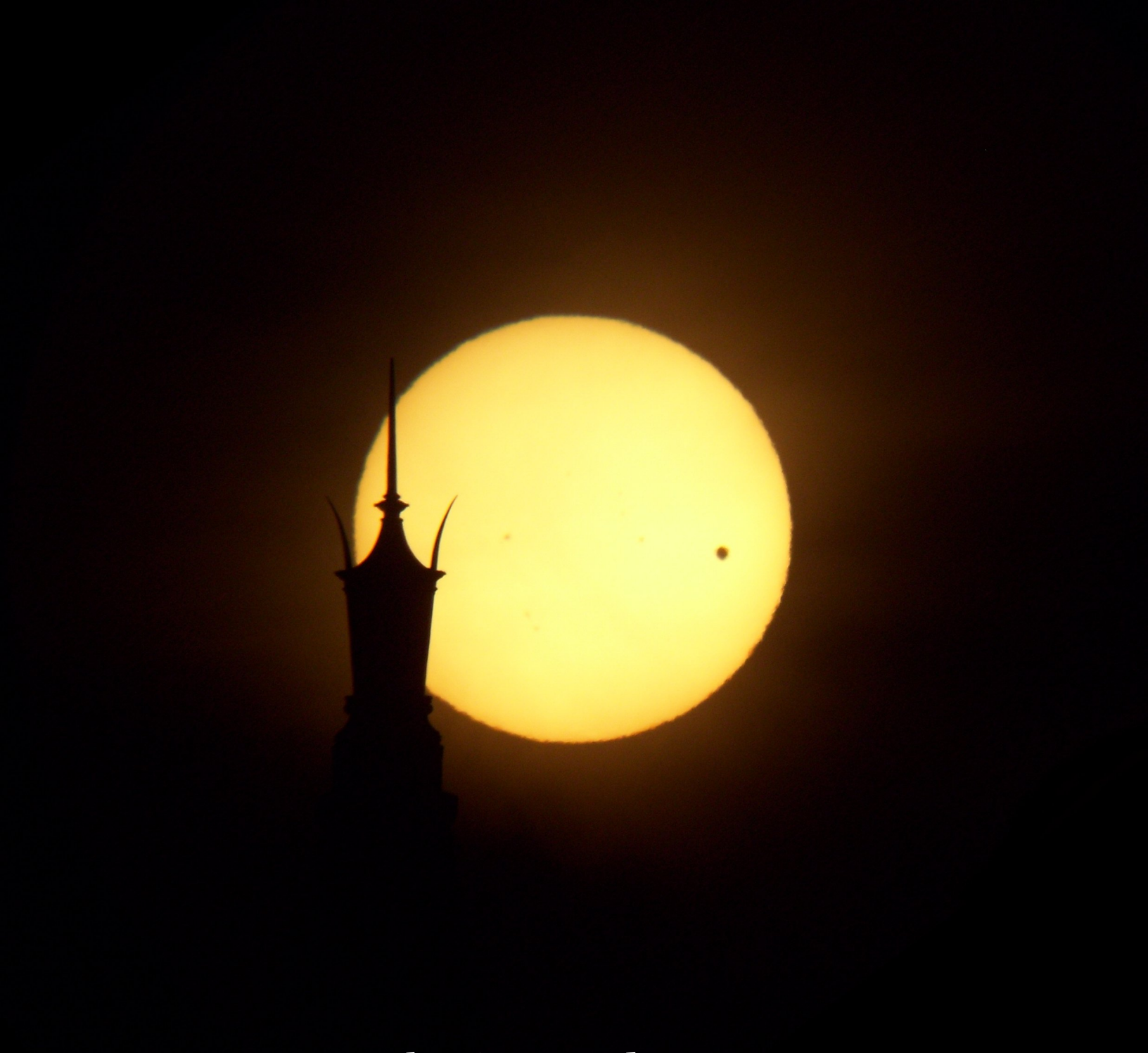


Physics Landscapes

Physics Research at Lawrence Berkeley National Laboratory and the University of California, Berkeley

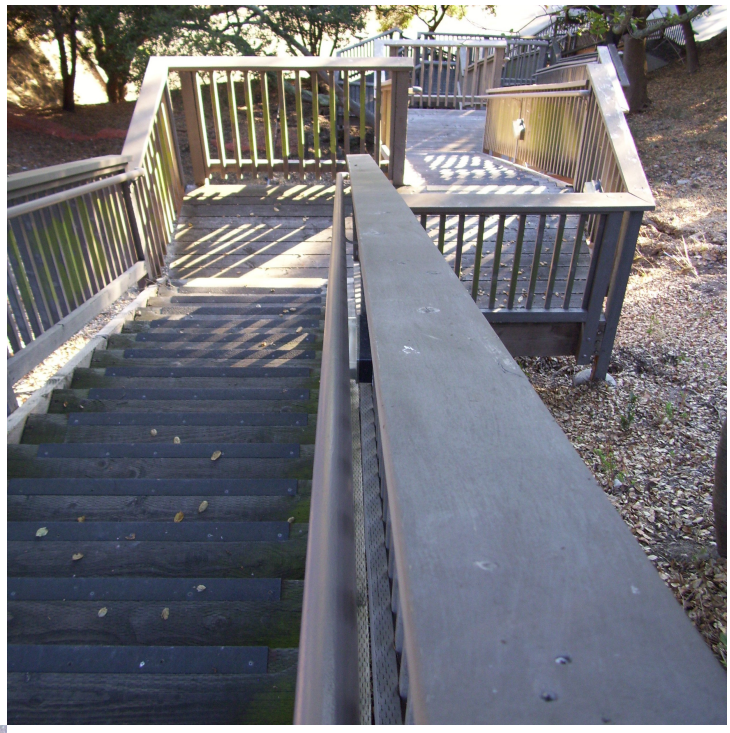
Daniel P. Hogan

"To penetrate to the central concept expressive of a place or of a project was often exceedingly difficult... Most laboratories, no matter how world-shaking their achievements, contain much the same hardware or glassware..."

--Ansel Adams & Nancy Newhall, 1967

To say with pictures something about the study of physics in Berkeley, one must address the problem identified by Adams and Newhall. In this little booklet, there are no instruments or beakers, in fact no pictures of laboratories or living scientists at all. Instead, I have tried to show a few details of the surrounding environment, human and natural, present and historical, that provides a backdrop to the physics research done in Berkeley. In the final images, a particular emphasis on the motif of light is considered.

The physics research in question is carried out under the aegis of two distinct branches of the University of California system. First is the University of California, Berkeley, with its Department of Physics and allied departments on the campus. Second is Lawrence Berkeley National Laboratory ("Berkeley Lab" for short, or in Adams' era, the "Radiation Laboratory"). In this treatment we will move between the two at will, just as many Berkeley physicists do in the course of their work.

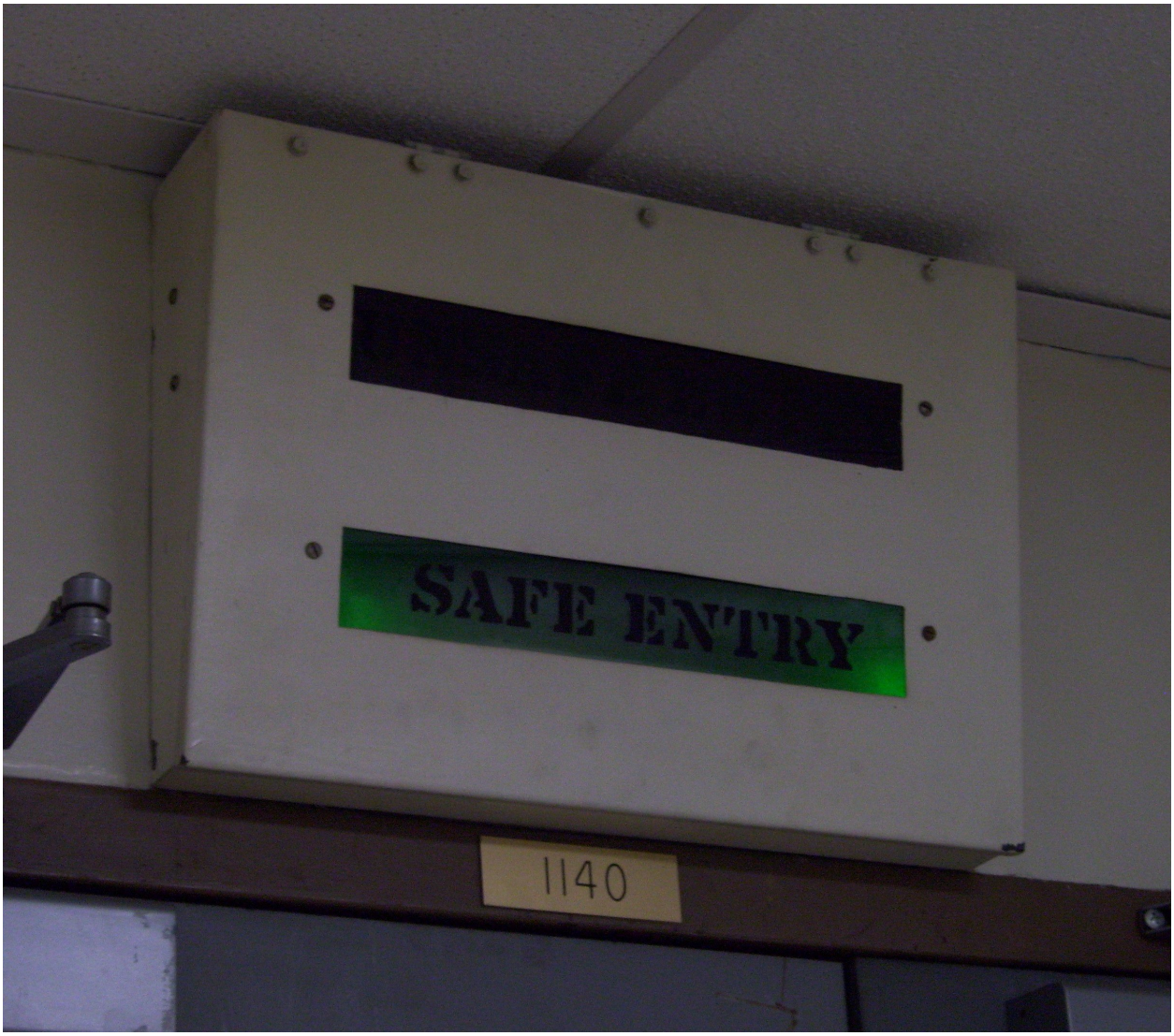


Founding father. Berkeley Lab was founded by UC Berkeley physicist E.O. Lawrence in 1931. His image appears throughout the facility, where in various contexts it becomes an icon for competent management, scientific vision, the lab itself, and even network security.

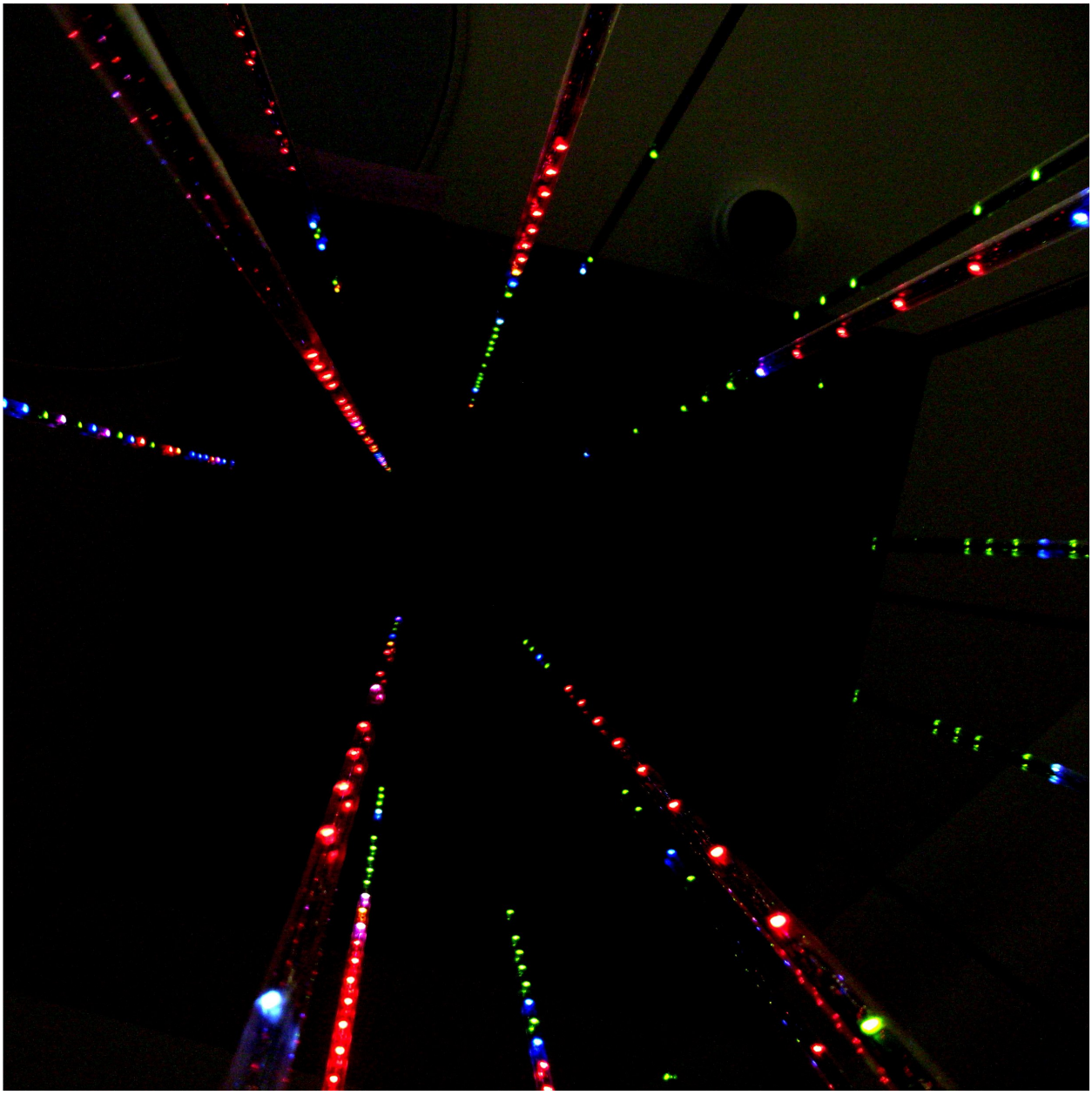
When space available on the Berkeley campus proved insufficient for Lawrence's experiments, he relocated to the only open space left: the steep face of the Berkeley Hills rising over the school. In this unusual environment -- a world-class research complex clinging in uneven terraces to the hillside -- lab scientists use long, wooden, outdoor staircases to move up and down the slopes.

Wildlife. Berkeley Lab's location at the border of of the urban Bay Area and the wildlands beyond makes for some welcome visitors. Others are not so benign -- on Oct. 11, 2012, part of the complex was issued a shelter-in-place alert as a mountain lion prowled the area.

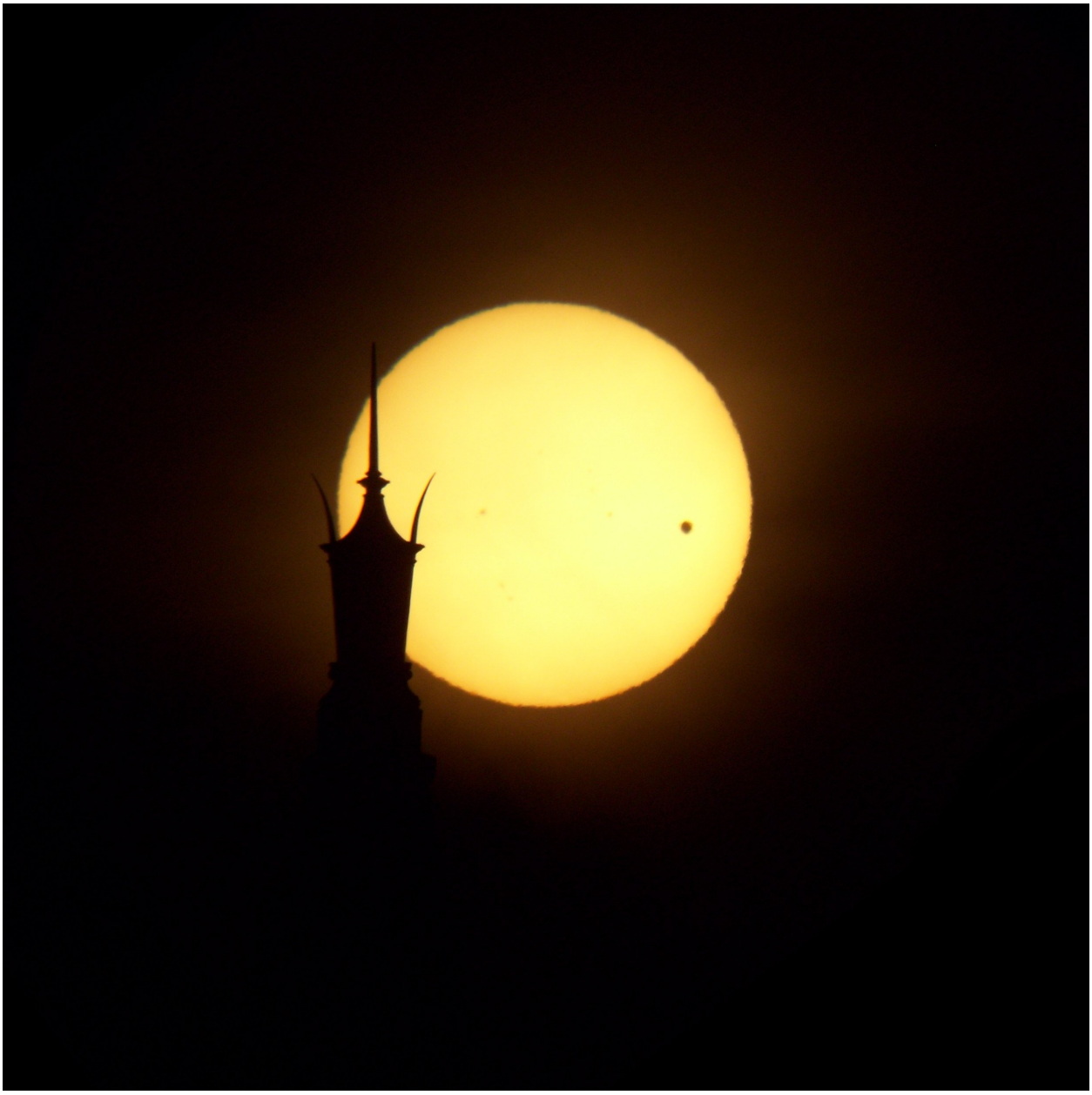
A beginning and an end. New Campbell Hall, a new building being built on the Berkeley campus to house the Astronomy Department and high-precision physics labs, may be among the last University of California buildings to be actually funded by the state. In this contrast-enhanced image, a crane rises above the construction site.



Leave the light on. This sign glows green to indicate that it's safe to enter the cavernous underground chamber built to house UC Berkeley's nuclear reactor. It will never again signal a warning, however. The reactor was decommissioned in 1987 -- the sign is all that's left.



Seeing the subatomic. One of the first photos to appear in Ansel Adams' and Nancy Newhall's 1967 work shows "a multidimensional model illustrating population dynamics." While technology has advanced, the value of a well-designed illustrative model has not diminished. This two-meter-high model uses changing patterns of light to show how IceCube, a giant instrument array embedded in the ice near the South Pole, can detect the mysterious subatomic particles known as neutrinos.



A cosmic alignment. The June 5, 2012 transit of Venus, photographed from the seventh floor of the UC Berkeley International House using a six-inch reflecting telescope with a solar filter. A transit occurs when Venus (seen as a small black dot in the picture) passes directly between the Earth and the Sun. Outlined by the sun is the distinctive profile of the lamp atop Sather Tower – in this moment the light of the University meets the light of the heavens. The next transit of Venus will occur in December of 2117, just a few months before the University of California system celebrates its 250th anniversary. ***Fiat Lux.***

Notes. All photographs were taken by Daniel Hogan with a Kodak M893IS compact digital camera. Most have been cropped, contrast-adjusted, or otherwise digitally edited. This booklet is set in Georgia font.