



## **discovering history with tree rings**

BRYANT BANNISTER LABORATORY OF TREE RING RESEARCH  
UNIVERSITY OF ARIZONA





For more than 100 years University of Arizona scientists have collected ancient tree-ring specimens from around the world. Their collections now include more than two million specimens! These include cross sections from the world's largest and oldest trees, and roof beams from the mysterious cliff dwellings of the Southwestern United States. Now, for the first time -- and with your help -- these specimens will be on public display in a new exhibit hall for all to enjoy, to learn from, and to marvel at. The new Bryant Bannister Tree-Ring Building exhibits will be a "must see" for visitors to campus, and a showcase for the science legacies and ongoing discoveries by University of Arizona scientists.

1692 Twenty people die in Salem, Massachusetts, witch trials. Tree survives another 200 years; this cross section came from its weathered stump.

1616 Roman Catholic Church prohibits Galileo from continuing controversial scientific work.

1589 Galileo becomes professor of mathematics at University of Pisa.

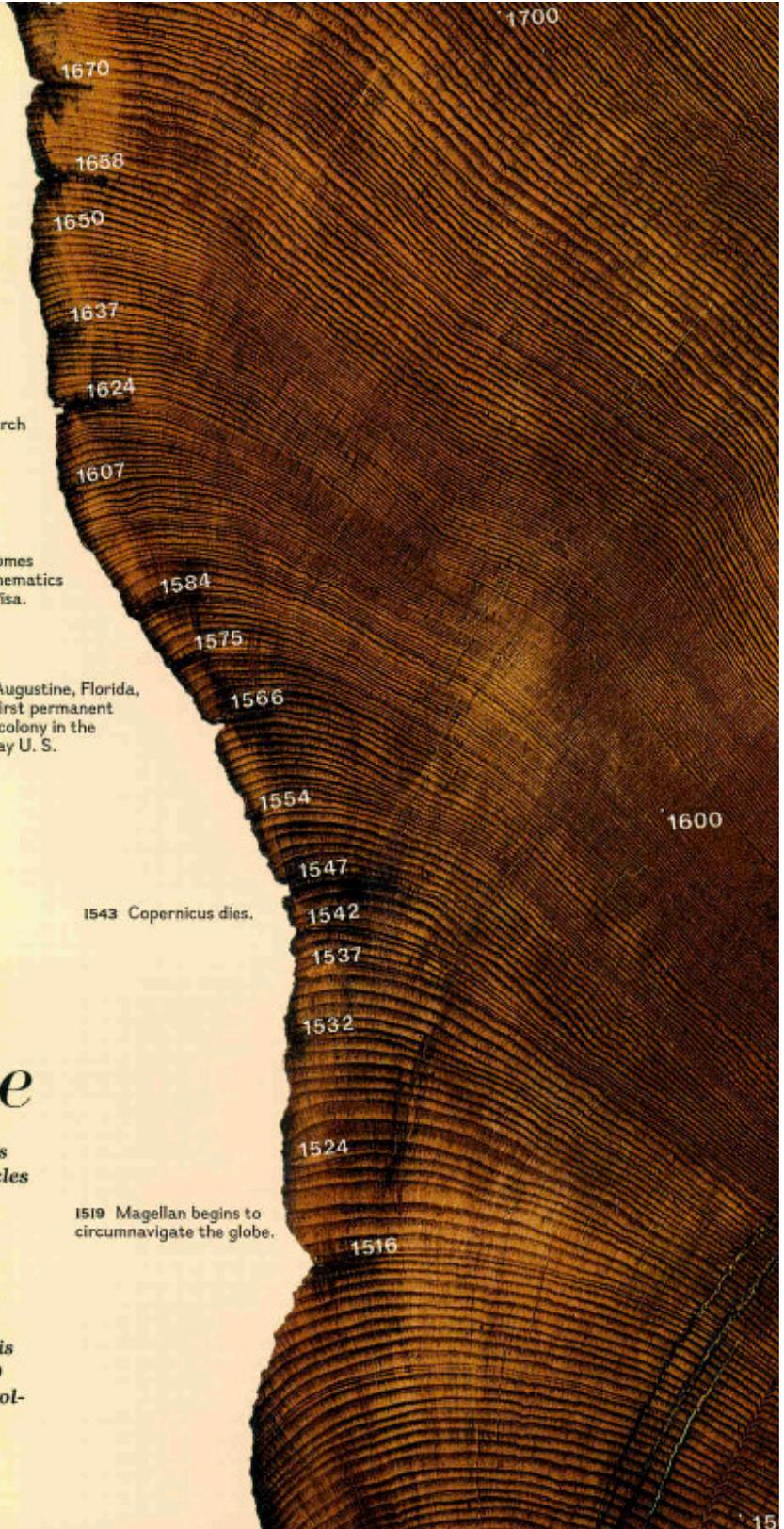
1565 St. Augustine, Florida, founded, first permanent European colony in the present-day U. S.

1543 Copernicus dies.

1519 Magellan begins to circumnavigate the globe.

## Rings of time

*A natural calendar, this ponderosa pine chronicles its 400-year existence with bands of annual growth. An accurate means of dating forest fires (here indicated by dates), droughts, and floods, tree-ring analysis now reaches back 8,600 years—an aid to climatologists, archaeologists, and others.*



# mission

The Laboratory of Tree-Ring Research (LTRR) has been housed in the West Stadium for more than 70 years, with minimal improvements to their facilities. This project will provide new laboratories and offices to house the LTRR's diverse array of research programs, as well as public outreach and support spaces. The project is the first phase of a long-term effort to relocate the entire LTRR into contemporary facilities.

These new contemporary facilities will include specifically designated exhibits space and provide many opportunities for display of LTRR related research and specimens throughout. This document is intended to serve as a conceptual and practical guide, to aid in the planning of construction and design of future exhibits in the new building.

Our goals are to:

Provide a stimulating educational experience for the public -- including the University community and all of our visitors - informing them about the highest quality and most significant science conducted at LTRR, past and present.

Efficiently and effectively communicate our research findings and teaching endeavors to the University of Arizona and LTRR visitors, while also maintaining and minimizing interference with our regular functions of laboratory research, classroom teaching, and curation of tree-ring collections.

Allow for substantial numbers of visitors to experience and learn from our exhibits, while achieving our other objectives listed above; visitors would likely range from single individuals, walking in at any time and self-guiding, to pre-arranged tours of groups of 30 to 50 or more; visitors will range in age from kindergartners to retirees.

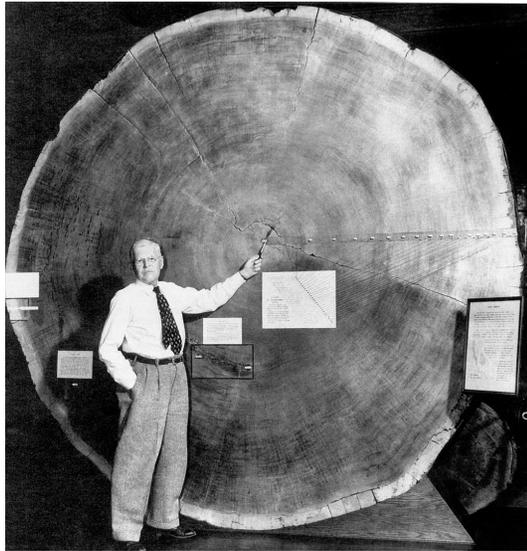
Provide opportunities to inspire and engage new donors and supporters of our mission.

The exhibits should tell a story, be it about a significant person, site, event, or field of research.

Categories of possible exhibits include:

Major/permanent exhibits; general exhibits; area-specific displays; small stand-alone displays

Included in this booklet are an initial set of exhibits that we hope to install in the new building as soon as possible, and that we hope to secure support from donors to make these a reality.



# giant sequoia

## what

Sequoia Section (currently in the Arizona State Museum storage)

## location

Near the center of the exhibit hall so it can be viewed from interior and exterior. Refinish both sides, if possible. Will require a new support structure.

This is a Tucson classic, and must be prominent, stable and accessible. Some photos could be placed around the top half on the interior face.

This classic type of tree-ring display has been shown all over the world: e.g., Columbus “discovers” the Americas, American Revolution, etc. A dynamic display is envisioned. Possibly a moveable strip of reflective material, upon which various types of events can be projected (or imagined), so that different types of timelines might be examined, and changed interactively by the user/observer: e.g., human history events, natural history events (droughts, floods, volcanic eruptions, etc.)

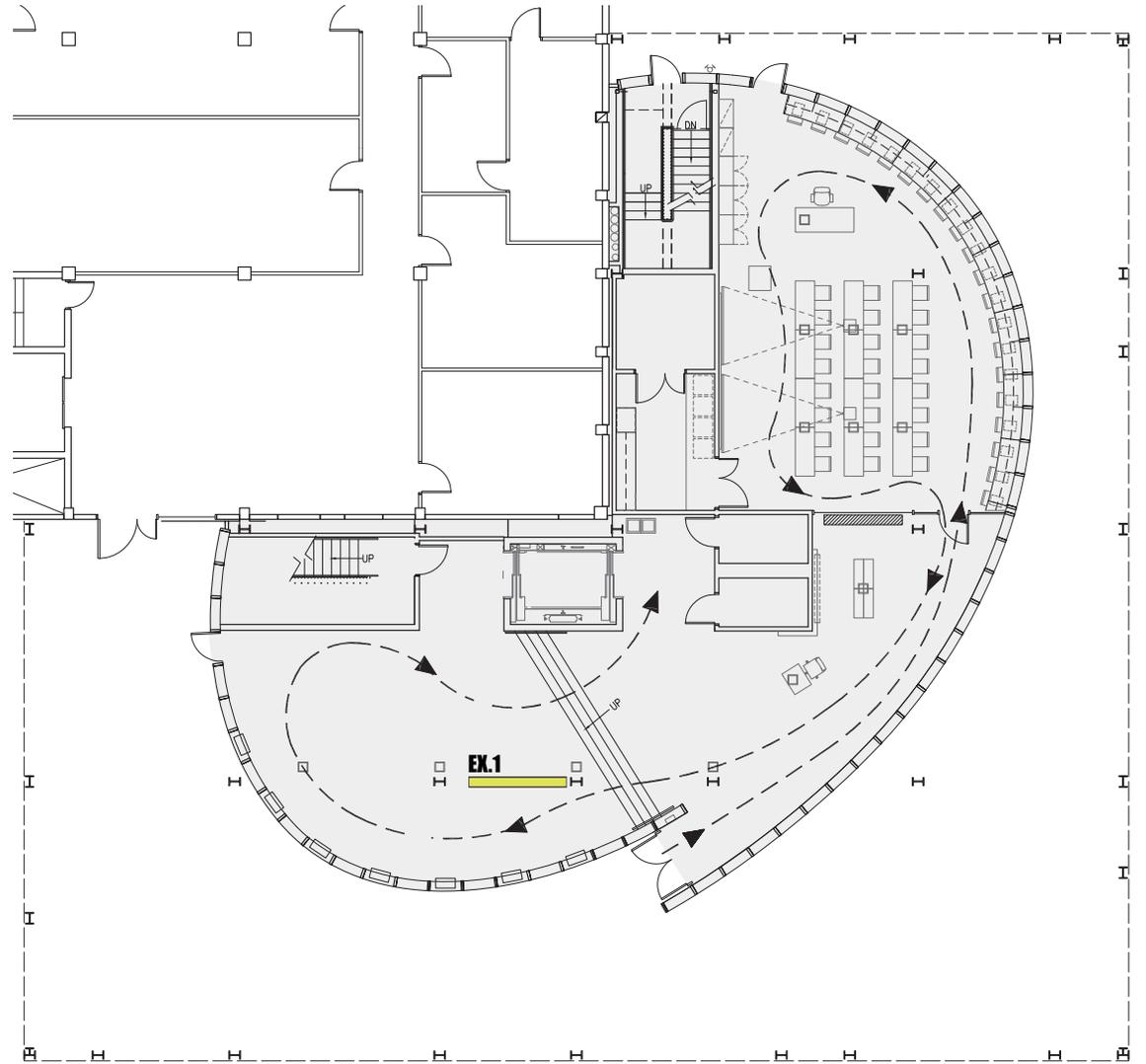
This exhibit, and its installation, is a very large opportunity for local and regional news coverage and vehicle for raising awareness about the building and LTRR. This is an iconic Tucson and University of Arizona scientific object that has impressed Tucson school children and other visitors for generations, but sadly, it has been unavailable for viewing for 10 years. We are bringing it out for future generations to learn from and enjoy!

## estimated cost

\$10,000 to \$20,000

(depending on projection, interpretive materials to be used; note this does NOT include the costs for moving and mounting the big section, which is probably in the \$15,000 range ADDITIONALLY)





**exhibit 1**





# ponderosa pine snag

## what

Ponderosa Pine Snag (approximately 30 feet tall)

## location

centerpiece for lobby

An interesting, gnarled snag (dead tree), with some artistic carvings and modifications by a local artist (Kate Hodges).

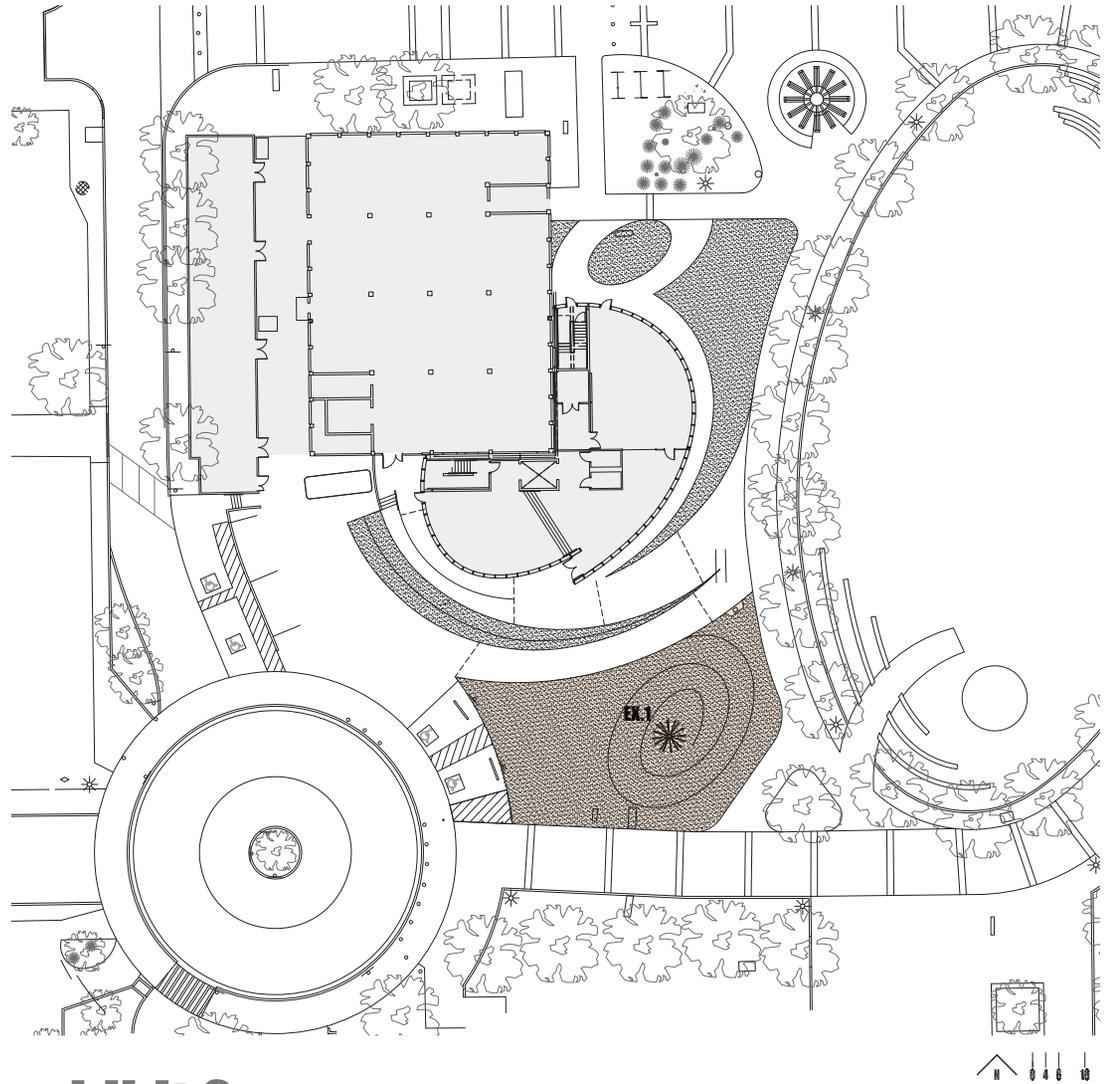
Trees tell stories not only through the structures and composition of their annual rings, but also by the shapes and “character” of their stems. Wind storms, lightning, fire, and a host of other vicissitudes are reflected in the gnarled appearance of ancient trees.

An especially interesting, but also solid and firm snag will be found in the Santa Catalina Mountains, transported to Tucson, sculpted in places by a local artist, and then securely erected at a spot near the SE corner of the new building. The sculpting may include an area near the base of the tree, enabling passerby pedestrians to see the inner ring “history” of this ancient tree.

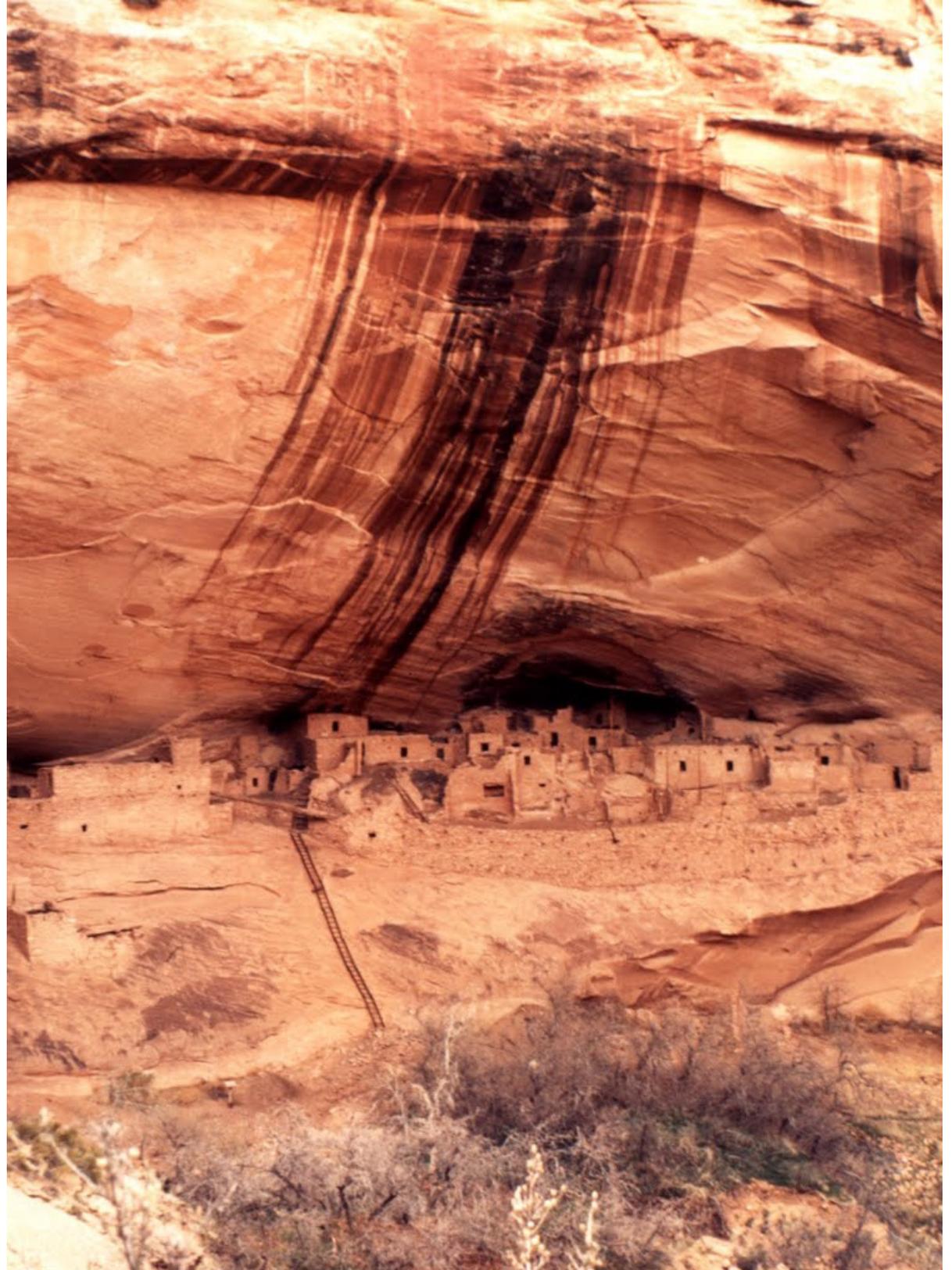
## estimated cost

\$12,000 to \$15,000





**exhibit 2**



# pueblo timeline

what

pueblo timeline

location

lobby entrance, along wall

Tree rings are famous for illustrating time and history as a long sequence of events extending long before our own lifetimes. The classic representation of history is a “time-line” with events listed in a sequence, and usually proceeding as we read, from left (the past) to the right (the present). In the 18th and 19th century, school children memorized dates of historical events, and learned the relative timings and synchrony of human events by studying elaborately illustrated timelines.

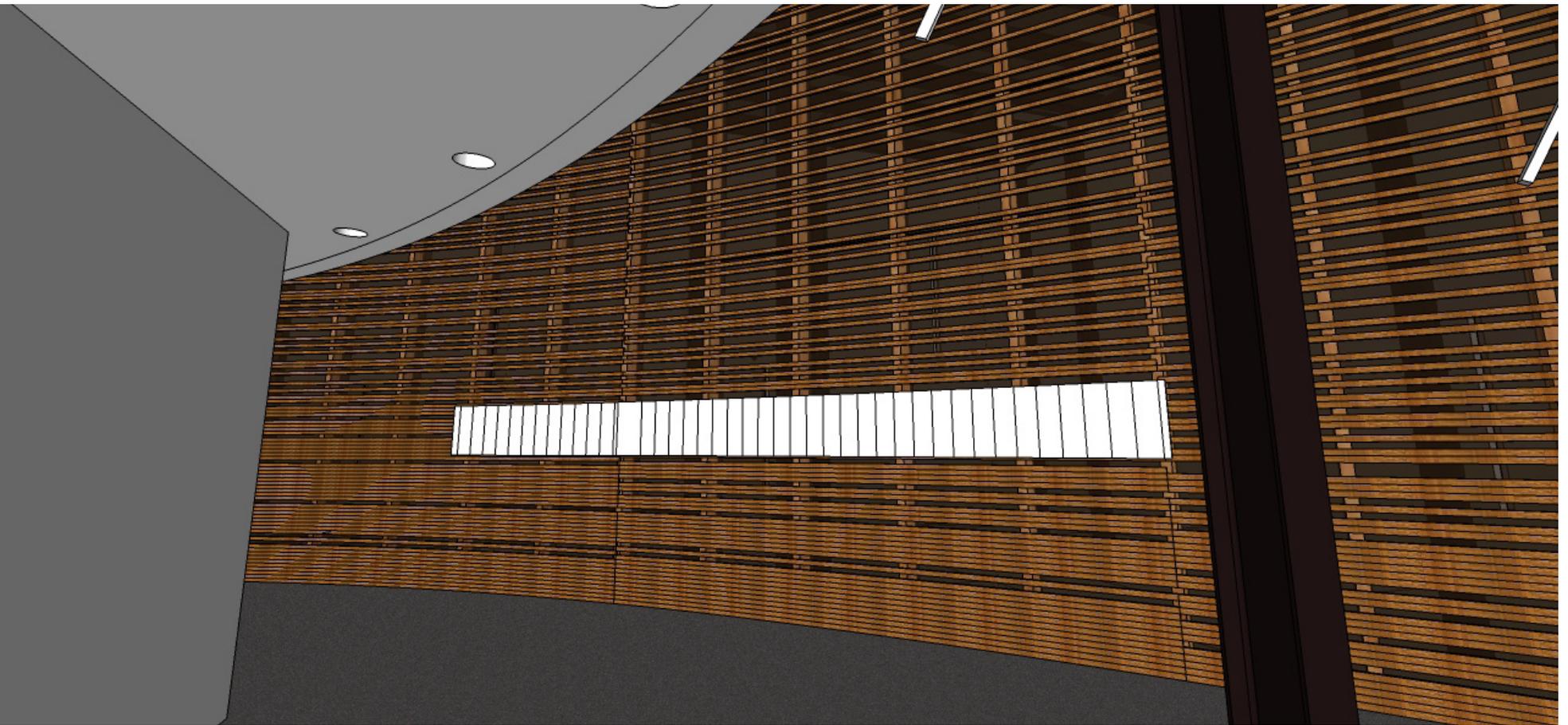
Andrew E. Douglass, the founder of the Laboratory of Tree-Ring Research, and the “father of dendrochronology”, realized that tree-ring sequences could be a powerful educational tool for showing the time depth of history. By the 1930s he had laboriously compiled measurements of tree rings from hundreds of living trees and archeological timbers into an overlapping sequence extending back in time almost 2,000 years.

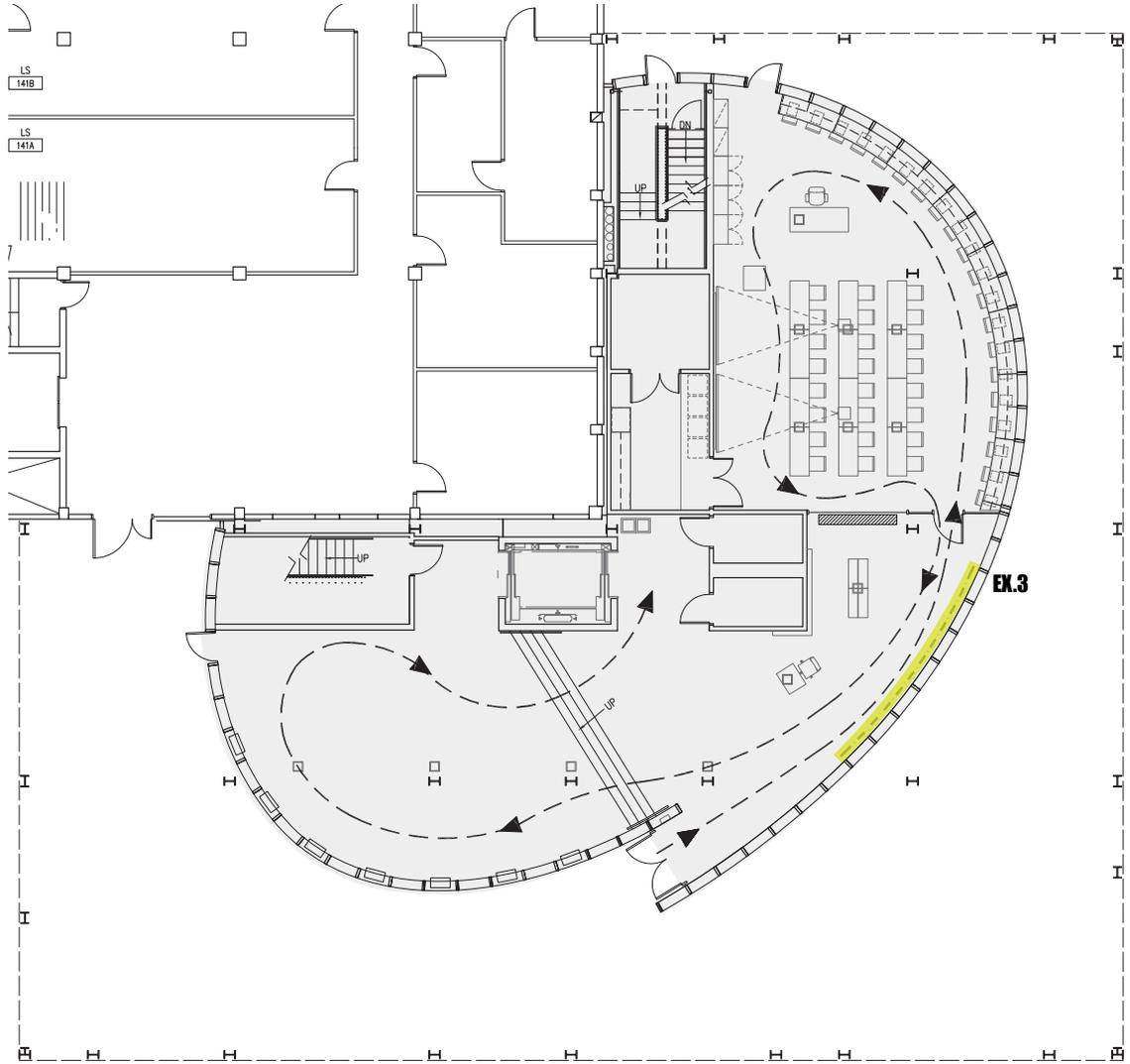
Douglass was also a skilled photographer, and he took superb, high-resolution photographs of each of the most representative tree-ring specimens available for each part of the 2 millennia of the tree-ring chronology. This scroll of photographs, assembled by Douglass himself, stretches more than 40 feet long. Each closeup photo of a ring sequence is precisely laid upon the preceding and subsequent images, forming a continuous time chronology. Dates of notable human events in world and Southwestern history are labeled on the edges, as well as the specimen numbers for each of the hundreds of tree-ring specimens from the Southwest that comprise the chronology. This chronology is known as the “Early Pueblo Dating Chronology”.

estimated cost

Mounting and Interpretative Materials for the Pueblo Time line:  
\$5,000 to \$10,000

Mounting Additional Time Lines and Interpreting (e.g., 1871 Adams Chart, and modern, Universe Time lines): \$5,000 to \$10,000





**exhibit 3**





# star trails photo + prometheus tree

## what

“Prometheus” - Oldest known living tree sample, 4,900+ years, when cut in 1964.  
Accompanying story regarding creation of Great Basin National Park, Trexler photos, etc.

## location

lobby or a long wall

This exhibit would be a combination of a beautiful time-lapse photograph of a bristlecone pine snag, or “star trails” photo, (by Robert Kawika Sheer) and a cross section specimen from the oldest tree ever found, the “Prometheus” tree.

The “prometheus” specimen is from Donald Currey, via H. ARnott. Specimen originally from Wheeler Peak, White Pine County, Nevada (formerly United States Forest Service, now National Park Service)

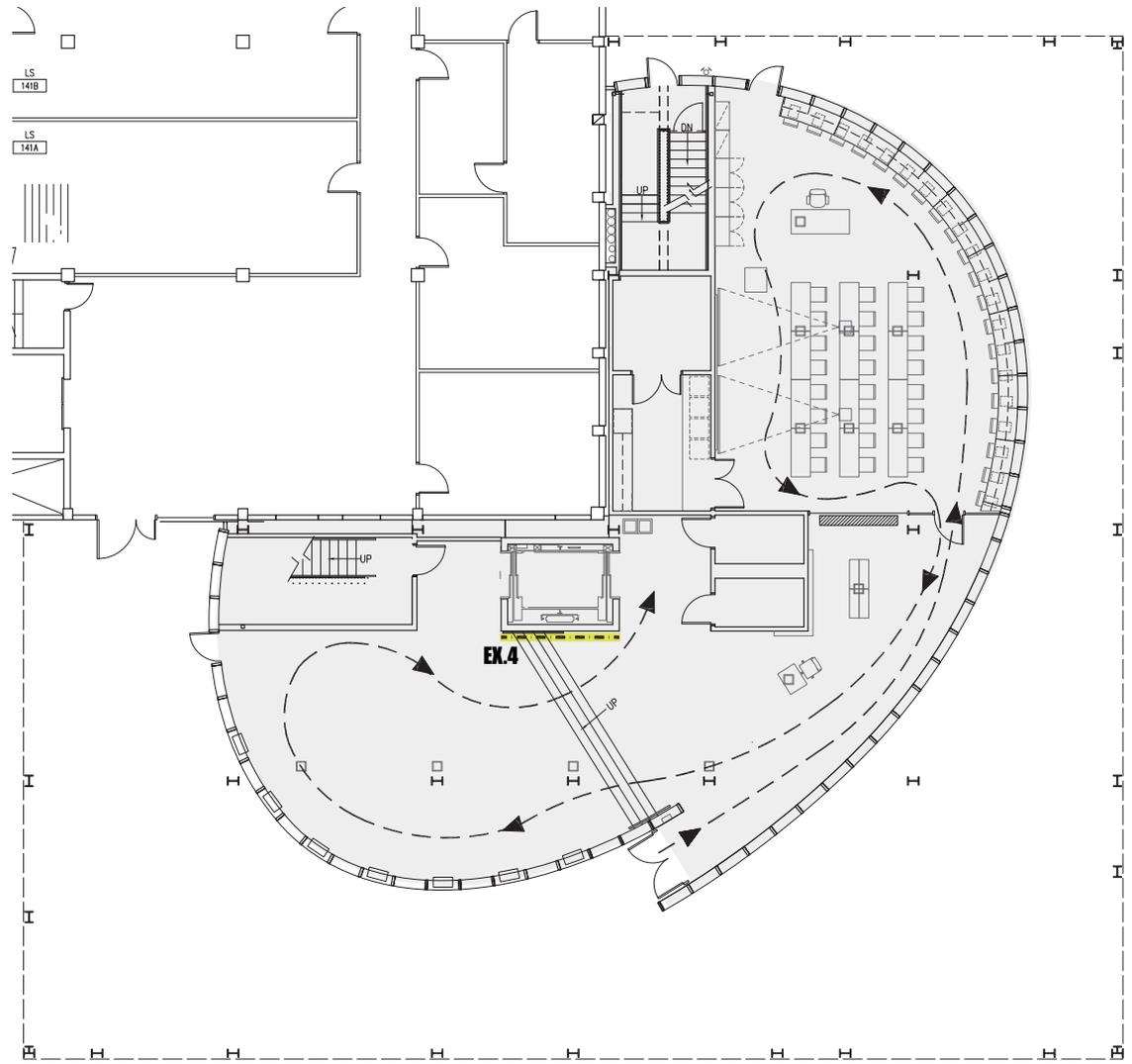
This specimen has many ironies and stories to tell, both of scientific interest and about environmental ethics and science ethics (ethics is currently a major national initiative in the sciences and there may be some role for the University of Arizona Office for the Responsible Conduct of Research here).

## estimated cost

Star Trails photo: \$5,000

Prometheus Tree Cross Section Interpretive Display: \$5,000





**exhibit 4**





# chaco canyon beam

## what

Chaco Canyon beam

## location

lobby suspended from ceiling

The Laboratories of Tree-ring Research collections include tens of thousands of cross sections and core samples from ancient beams that were used in the construction of the great houses at Chaco Canyon, and the cliff dwellings of Mesa Verde, and many other locations.

We envision developing a state-of-art archaeological interpretive exhibit that tells the wonderful story of how Andrew Ellicott Douglass, Emil Haury and dozens of other archaeologists have used tree-rings for discovering the history of Southwestern cultures. The original 1929 breakthrough by Douglass and his colleagues, in dating archeological timbers deserves to be told with the best available, most impressive set of specimens, photographs, movie footage (which we have from the 1930s), and interpretive text, sounds, etc.

A full exhibit of this nature will take time and resources to assemble. We can also imagine it linking to ongoing archaeological studies around the world that we are now engaged in, such as in the Mediterranean region.

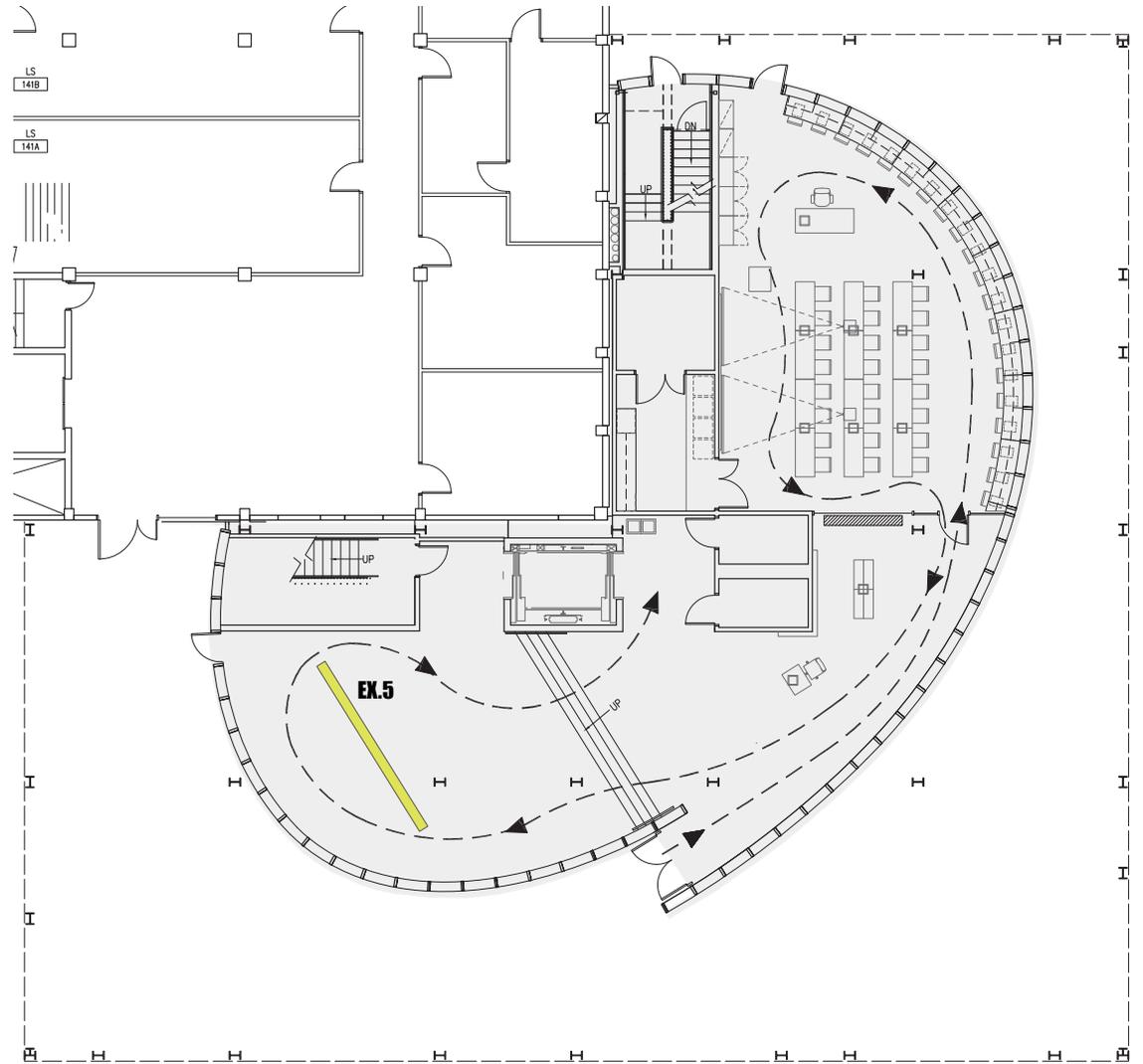
To begin, we plan to suspend a particularly interesting and impressive beam (or beams) from Pueblo Bonito or Chetro Ketl (Chaco Canyon) from the very tall ceiling of the exhibit space -- perhaps just above head (or touching) level. These beams (trees) were cut and hauled long distance about 1,000 years ago. We understand that an approximate 20 foot long beam exists at Chaco Canyon National Park Service facility, and we might obtain it on loan. Alternatively, or in addition, we have several beams of 3 to 6 foot length in our archive. For the initial exhibit, we would also assemble several examples of other archaeological beam ends and specimens, for a wall display, or a standing exhibit case.

## estimated cost

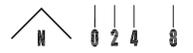
Initial Beam Exhibit and Related Interpretive Displays:  
\$10,000 to \$15,000

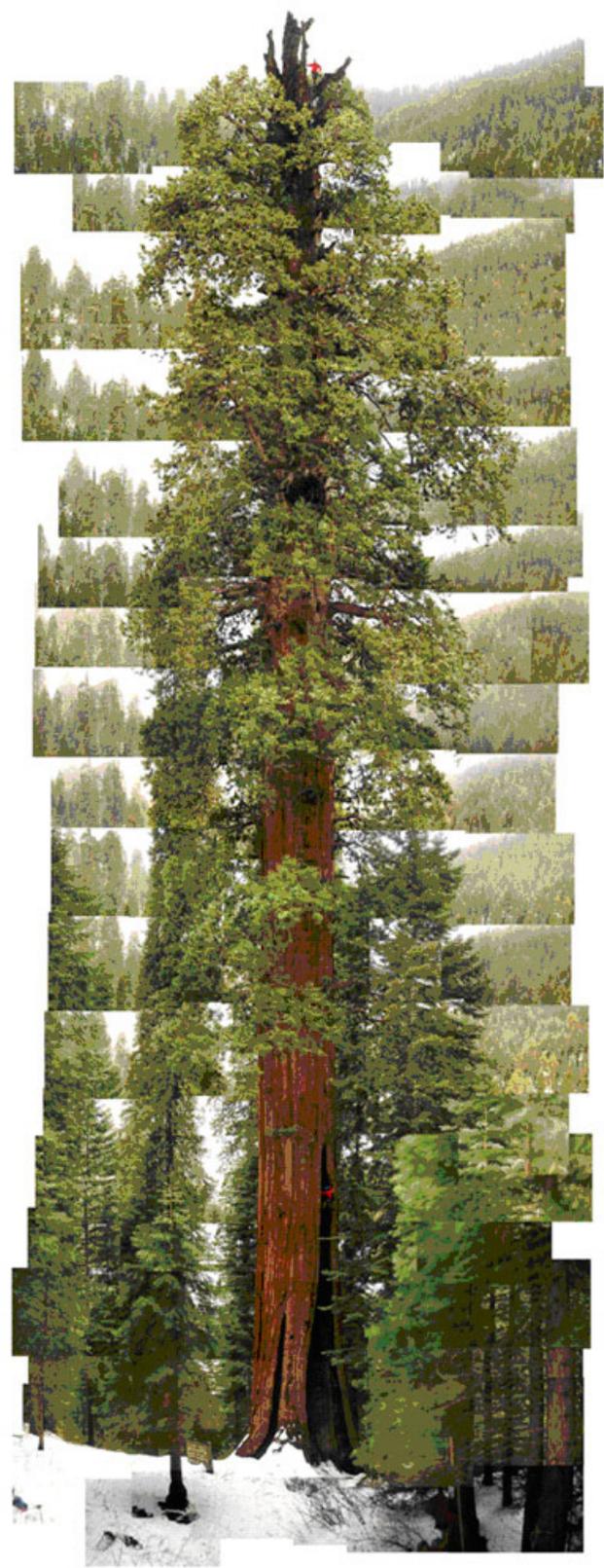
Full Archaeological Tree-Ring Exhibits:  
\$30,000 to \$50,000





**exhibit 5**





# **giant sequoia wall photo mosaic/mural**

## **what**

Giant Sequoia Wall Photo Mosaic/Mural

## **location**

lobby or a long wall

Giant sequoias are the world's largest trees. Some of them are 30 feet in diameter at the base, and more than 270 feet tall! The 10-foot sequoia cross section in our exhibit hall is only 1 third the diameter of the largest sequoias.

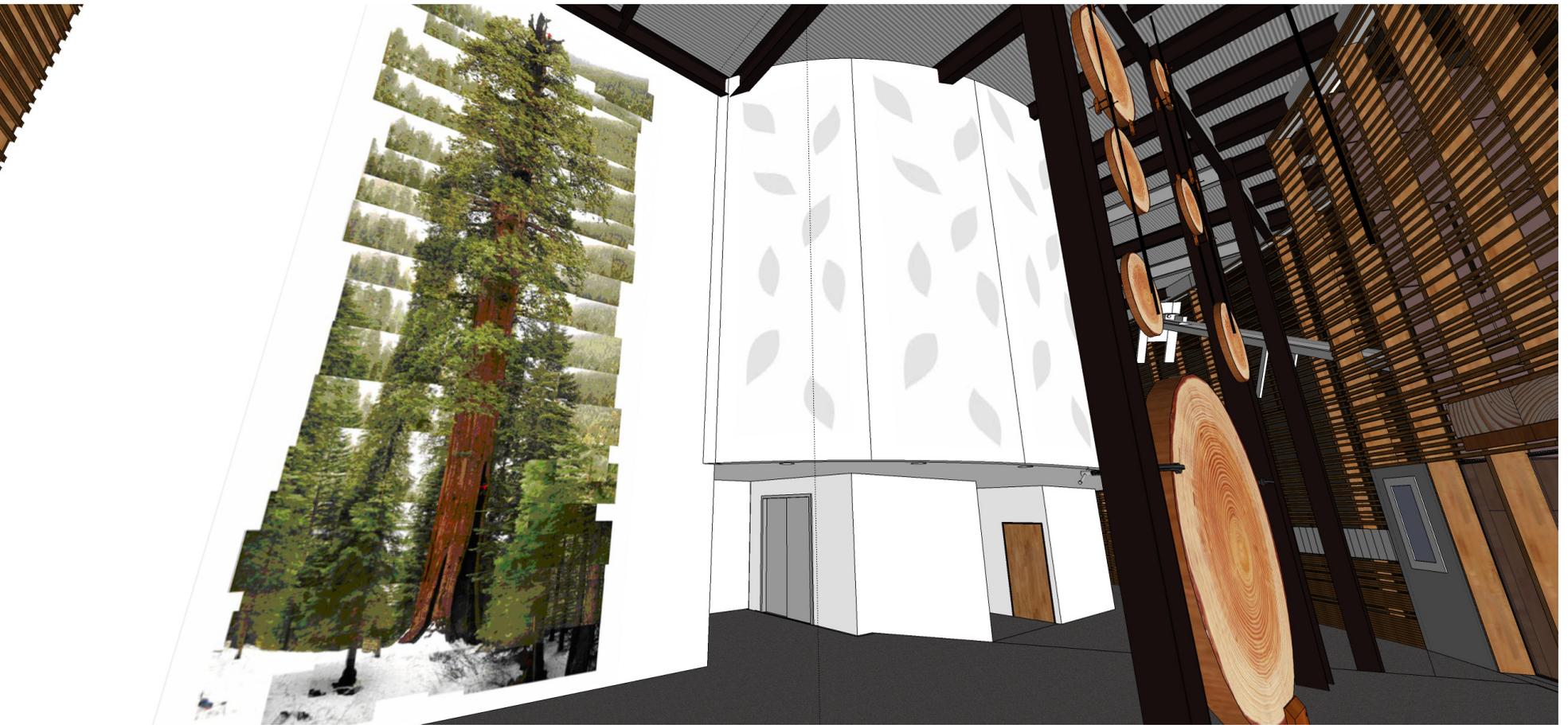
We have hundreds of sequoia specimens in our collections and we have used them to discover histories of forest fires and droughts extending back about 3,000 years.

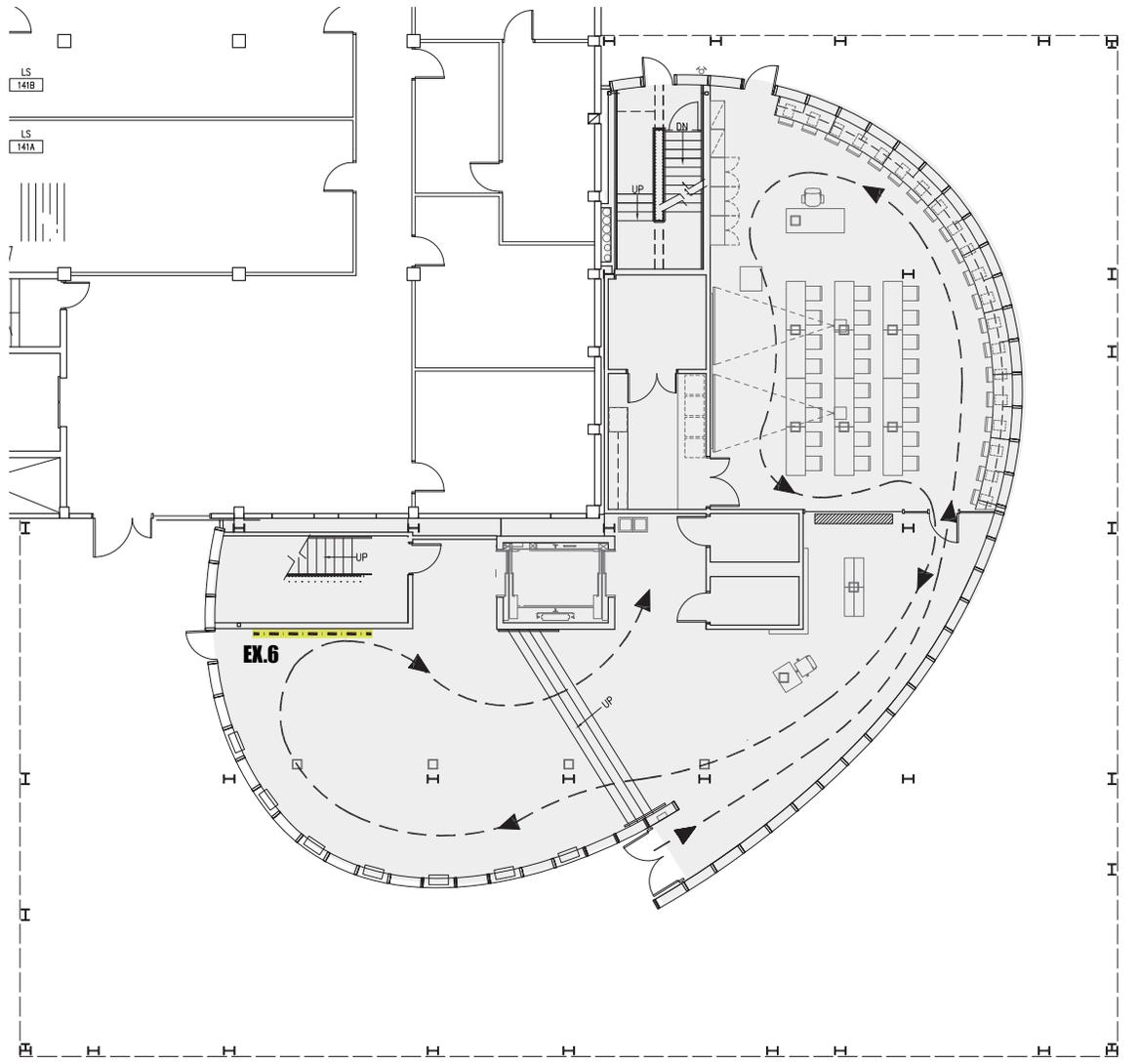
To illustrate the massive scale and grandeur of sequoias we hope to mount a museum quality photoprint on a 30 foot wall on the northeast side of our exhibit hall. the photo we may use is a a mosaic of images taken and assembled by the photographer James Balog. An approximate 30 foot tall image would be about a 1 to 10 scale of this trees. The image also includes two people (climbers) with red jackets at the top and middle, showing the scale of the immense tree.

More than a simple photograph, this image is a work of art by Mr. Balog, who is a renowned photographer and adventurer (see his book "Tree: A New Vision of the American Forest")

## **estimated cost**

Estimate cost: \$40,000





**exhibit 6**





UNIVERSITY OF ARIZONA