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Title: Bradbury Science Museum NOTEs Program Docs

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Building Immunity: How fighting HIV and other viruses helps us understand our immune system.

Building Immunity is a unique opportunity to journey through the history and development of your immune system.

Our interactive touch table invites each user to choose their own, unique experience as they learn about how fighting HIV and other viruses helps researchers understand how our own immune systems work to keep us healthy.

From the Bradbury Science Museum of Los Alamos National Laboratory, the exhibit presents remarkable insight into one of the most ancient and well-traveled organisms on the planet, viruses. Viral epidemics like the H1N1 flu, which killed over 40 million people in 1918, devastate communities around the world and destabilize regions around the globe. Additionally, their ability to mutate quickly creates a "Red Queen" effect, or loop of treated and then treatment-resistant strains of deadly diseases.

Increased understanding of the relationships between viruses and our own immune system is crucial to the development of improved treatments and novel vaccines and this research is happening right now at Los Alamos National Laboratory.

Thanks to advanced supercomputing facilities hosted at LANL, Betty Korber and team were able to use sequences collected in the HIV Sequence Database to represent global diversity and publish the first concept of a mosaic vaccine.

Who are our partners for *Building Immunity*?

Los Alamos National Laboratory, Theoretical Biology and Biophysics group.

Interesting facts:

- Walter Reed discovered the first human virus, yellow fever virus, in 1901.
- Viruses are microscopic particles that contain genetic material and need living cells to replicate.
- Throughout evolution, viruses have jumped across species, constantly adapting to new hosts.
- Today, 10% of our DNA comes from ancient viruses that infected our ancestors millions of years ago, and their genetic material has become part of ours.

Requirements

-Compact exhibit needs only 12' x 10' of space
-Ships in one ATA travel case
-Sets up in 30 minutes
-Needs only one standard electrical outlet
-Includes promotional materials to help advertise it at your location
-Includes educational activity suggestions

Contact us to schedule this exhibit to your location!

Building Immunity

Set-up and Dismantle Instructions

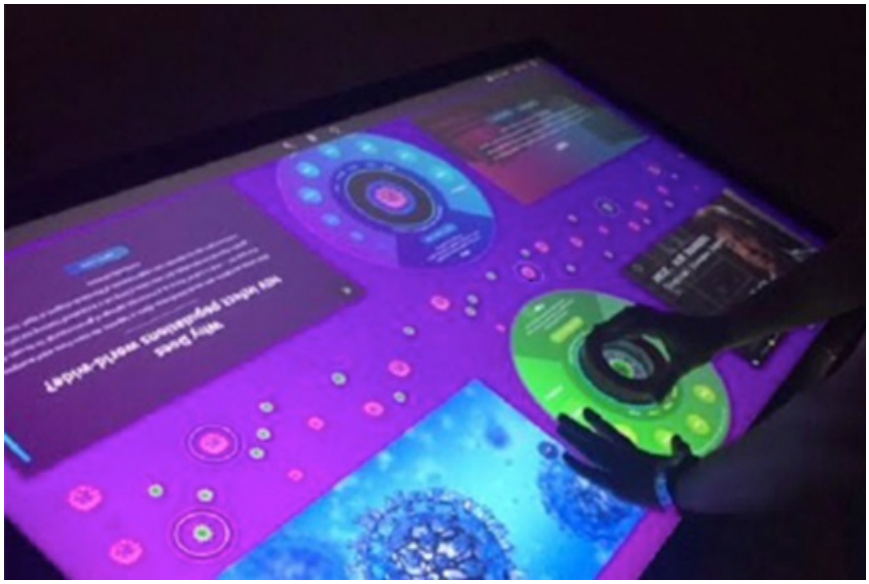


Table of Contents

Building Immunity

Exhibit Components

(1) Road case containing touch table and collateral materials

Ideum touch table (1)
Key set to access install program (1)
Exhibit banner (1)
Anti-static cloth for exhibit and screens (1)
Packing foam, velcro, and bubble wrap

Exhibit Installation (REQUIRES 4 people)

1. Identify location for installation.
2. Bring case to installation site.
3. Mark floor with tape to identify where you will place the exhibit.
4. Unlock case.
5. With two people, lift top of case straight up and then over, carefully clearing the touch table and screen. You will need to wiggle it a bit as the case is lined with foam to protect the touch table.
6. With four people, lift table and push case bottom out.
7. Plug into outlet. Please be sure to safely cover the power cord to avoid creating a tripping hazard.

Exhibit Start-up and Use

1. Using keys, open access panel and push start button.
2. On main screen, double click Bradbury folder, then double click Bradbury test.
3. When dialogue box appears, select Play. Program should begin and viruses should begin floating across the screen.
4. Touch screen to “capture” a virus and bring it to dock.
5. To return to desktop screen, swipe from left.

Version Installation

1. See Installing and Exiting the Building Immunity Application document.

Exhibit Dismantle

1. Bring travel case to exhibit.
2. Turn power off and unplug touch table, wrapping power cord in table base, below computer.
3. Lift table onto travel case bottom.
4. Repack collateral, including tangibles and keys, and lightbox, secure with velcro.
5. Lift travel case top over touch table and lower down onto case bottom. This may take some gentle wiggling as the case is lined with foam padding.
6. Once the case is on and all four corners are seated, secure the top and bottom sections by closing the fasteners.
7. Place bill of lading on crate and set in a good location for pick up by shipping vendor.

8. Pack the following in the road case:
    a) Ideum touch table (1)
    b) Key set to access install program (1)
    c) Bradbury Science Museum banner (1)
    d) Anti-static cloth for exhibit and screens (1)
    e) Packing foam, velcro, and bubble wrap

Return Shipping

Los Alamos National Lab will send shipping labels and arrange for a carrier to pick up the exhibit and ship it to its next destination. Place shipping labels on cases and secure them.

Specs

Weight: 286 LBS / 130 KG
Height: 34’
Dimensions: 61’ x 36’
Power Source: Standard 120 V outlet

Contacts

Stacy Baker: Office (505) 664-0244, Cell (505) 695-6615


BUILDING IMMUNITY
Viruses like HIV and influenza can be deadly: learn what researchers at Los Alamos National Laboratory are doing to help defeat these lifetime threats.
HIV and Other Viruses
derstand Our Immune System
2
SELECT FRO
WHEN, H
TO LE
CINES
OS RESEARCH
3
PICK A DATE TO
HIV AND INFLU
(LEFT WINDOW)
—HISTORY OF T
—SCIENTIFIC MILE
Our imm
infectiou
How do
When
What
What is a Virus?

BRADBURY SCIENCE museum

LOS ALAMOS NATIONAL LABORATORY

National Outreach Traveling Exhibits Program

(NOTEs)

Program Administrator: Stacy Baker

The Basics

- These exhibits are **free** to you, all you pay for is shipping to your venue.
- Each exhibit requires only a **10’ x 10’ footprint** and sets up in under an hour
- Each exhibit **includes educational materials** for student groups.
- Each exhibit is available for a **4-6 month loan**.
- Each exhibit ships in ATA containers, with **shipping logistics handled on our end**.

The Exhibits—Building Immunity

- An Ideum touch table that invites users on a self-guided journey to explore the world of viruses, vaccines and immunity and discover the history of understanding and creating therapies against HIV and influenza. Based on research by Bette Korber, this exhibit is also available as a plug and play flash drive for venues with their own compatible Ideum touch tables!

The Exhibits—The Ribosome

An interactive, walk-through exhibit with augmented reality that allows the guest to "enter the ribosome" and watch proteins being made! Visitors explore what a ribosome is and learn about the cutting-edge work of understanding protein synthesis—which can lead to new antibiotics, cancer therapies, and treating genetic diseases—and how supercomputing enables this work.

The Exhibits—The Seismic Seat

A ride-on shaker seat that mimics the motion of various seismic events, all while guests are safely seated in your venue. The Seismic Seat is the focal point for “Explosion Detectives,” an exhibit about the work undertaken by Lab researchers to detect nuclear explosions around the world. This offering is currently in production and will be ready to loan in early 2021.

The Exhibits—Women in Computing

A multitouch, motion-based interactive Ideum Portrait Wall depicting the historic contributions made by women in the field of computing at Los Alamos. Guests travel along a digital timeline to learn about how computing work at the Lab began with human computers and discover how this work led to the supercomputing capabilities of today.

BRADBURY SCIENCE museum

LOS ALAMOS NATIONAL LABORATORY

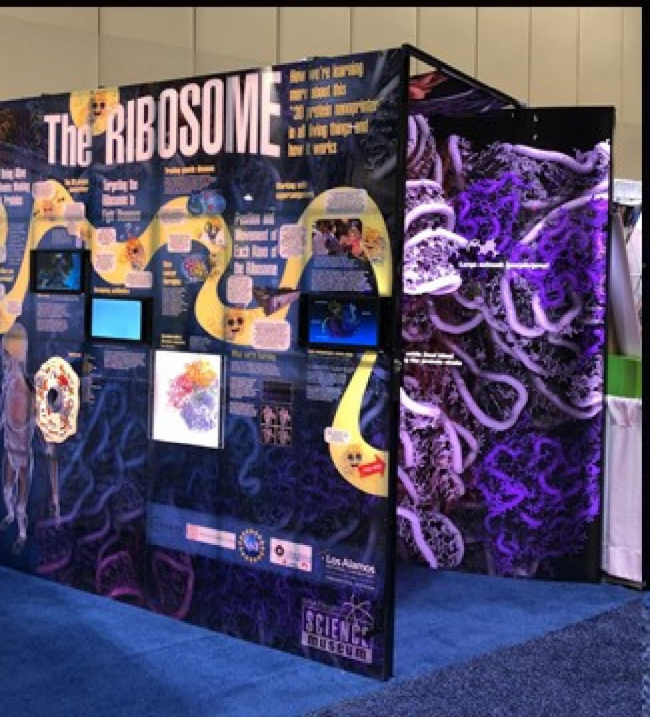
https://www.lanl.gov/museum/

National Outreach Traveling Exhibits Program (NOTEs)

Museum Director: Linda Deck (505) 665-3906 ldeck@lanl.gov

Program Administrator: Stacy Baker (505) 664-0244 slbaker@lanl.gov


The RIBOSOME
Los Alamos
SCIENCE
museum


The RIBOSOME
Los Alamos
SCIENCE
museum


Bradbury Science Museum
BRADBURY
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museum
Los Alamos


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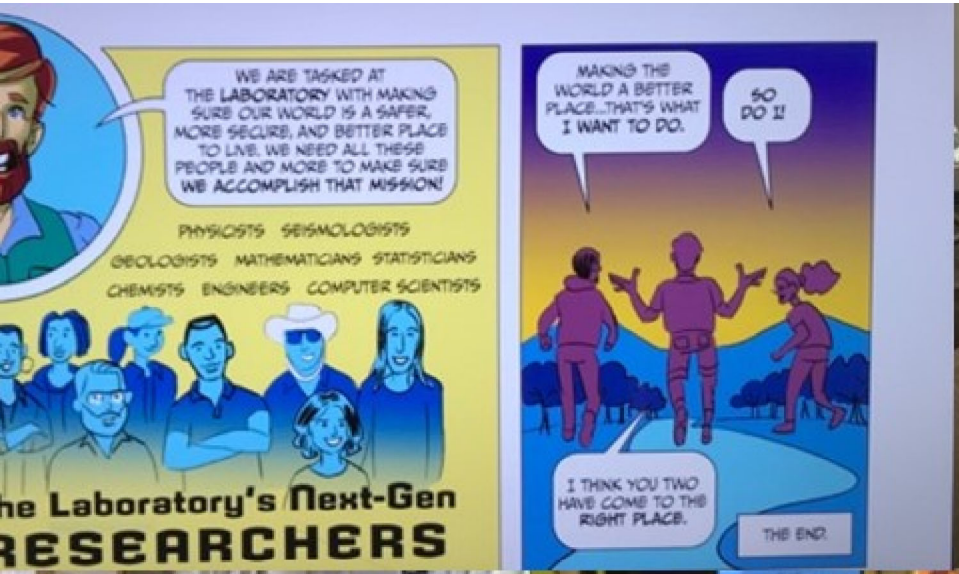
museum
Los Alamos



Ride the seismic waves!

Feel and see the difference between s
signals from explosions and earthqual

- Sit on the Seismic Seat, push the buttons, and watch the screen above.
- Can you feel* the difference between P- and S-wa

**The amplitudes of all events have been maximized for the Seismic Seat so you can better feel the differences in the wave*

Earthquake
Magnitude 6.0
2019
Miyako, Iwate, Japan

Earthquake
Magnitude 9.1
2004
Sumatra, Indonesia

Chemical explosion
Kingdome demolition
Magnitude 2.3
2000
Seattle, Washington, USA

Chemical explosion
50-metric-ton experiment
2018
Nevada National Security Site
Nevada, USA

Underground nuclear explosion
Magnitude 6.3
2017
Punggye-ri, North Korea

The Ribosome: A “3D protein nano-printer” essential to all life on earth and how it works.

The Ribosome is a unique opportunity for your guests to walk through a ribosome, the cell’s 3D protein nanoprinter, and watch proteins being made.

On the exterior of this compact exhibit, a ribosome “guide” escorts visitors along a timeline of ribosome history and research. Inside they’ll enter an atom-by-atom, augmented reality experience through the protein-building machinery of the human ribosome. Visitors can explore what a ribosome is, learn about the cutting-edge work of understanding protein synthesis—which can lead to new antibiotics, cancer therapies, and treating genetic diseases—and discover how the Lab’s supercomputing capability enables this work.

The Ribosome, curated by Karissa Sanbonmatsu of the Lab’s Theoretical Biology and Biophysics group, is a visually stunning interpretation of the ribosome, the cell organelle that makes all proteins. In addition to educational materials for student visitors and an original comic character to help our younger viewers understand the scientific concepts, the exhibit also features augmented-reality technology to transport visitors into a ribosome!

Who are our partners for *The Ribosome*?

Charité Institute of Medical Physics and Biophysics (Spahn Laboratory)
Weill Cornell Medical College (Blanchard Laboratory)
Additional sponsors include the National Science Foundation, the New Mexico Consortium, New Mexico State University, the University of New Mexico

Interesting facts:

- Ribosomes in human cells make a new protein roughly every three minutes.
- During their lifetimes, cells produce anywhere from tens of thousands to billions of proteins.
- Even a tiny bacterium contains anywhere from 10,000 to 100,000 ribosomes.

“Life is sometimes difficult to define, but usually you know it when you see it. Often characterized by growth, reproduction and replication of genetic information, one common thread ties together all forms of life: the ribosome”—Karissa Sanbonmatsu

Requirements

-Compact exhibit needs only 10’ x 10’ of space
-Ships in three ATA travel cases
-Sets up in 60 minutes
-Needs only one standard electrical outlet
-Includes promotional materials to help advertise it at your location
-Includes educational activity suggestions

Contact us to schedule this exhibit to your location!

Ribosomes Exhibit

Set-up and Dismantle Instructions

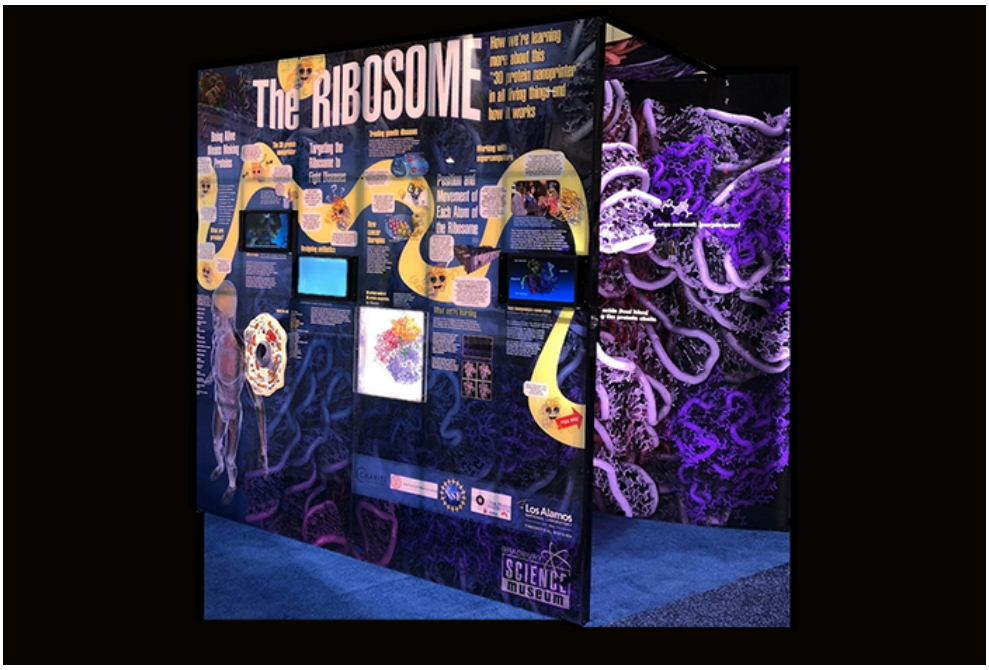


Table of Contents

The Ribosome

Exhibit Components

(2) Road Cases Containing Exhibit Sections

(#1) Front Exhibit Panels
(#2) Rear Exhibit Panels

(1) Road Case #3 Containing Installation Tools, Small Exhibit Components, Marketing Tools

iPad
Color-coded overhead crossbars (4)
Electrical connections (2)
Connecting hardware and tools and spares (Kit 1 and Kit 2)
Exhibit floor mat (1)
Exhibit overhead fabric panel (1)
Anti-static cloth for exhibit and screens
Remote controls (2) *plus 1 spare and extra batteries*
Black non-residue tape
Roll of Velcro
Packing foam and bubble wrap

You will also need:

Ladder
Gloves
Tape Measure
Anti-static Cloths

The Ribosome

Exhibit Installation (REQUIRES 2-3 people)

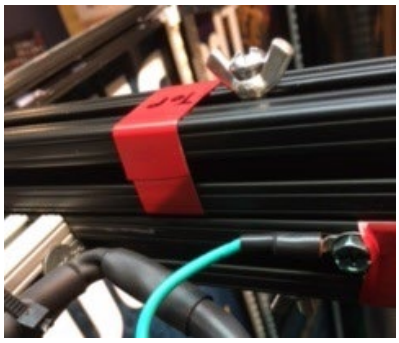
1. Identify location for installation
2. Bring cases with exhibit sections to installation site
3. Mark floor with tape to identify where you will place the rear section once you stand it upright
4. Open case end of case marked “Rear Wall.”

Rear Wall-Please avoid dragging the exhibit on the floor as the plastic may catch and warp or break.

First Section: Ease exhibit from case, keeping exhibit section level. When you expose the far end of the exhibit, set it on the floor. Raise section, set section upright, and align it with location for exhibition using tape on floor as your guide. Pull electrical cable that is nested inside back section out through hole in back of exhibit. Pull only the length you need to reach your outlet. Attach electrical cable to white receiver and plug receiver into your intended outlet. At this point, one person must steady the section while the other two now remove the second section from the case.

Second Section: Follow the same steps listed above and move it into position, aligning it with the first rear section.

Connections: Connect the rear sections using the butt fastener (hex driver) and wingnut and alignment bolt (screwdriver) as shown below:


Be careful not to drop the wingnut inside the exhibit as you’ll have to move the section to retrieve it.

Floor Mat

Place floor mat in front of rear section, fitting the curvature of the wall. The floor mat is now your guide for where the front sections need to sit in order for the connecting rods to reach.

The Ribosome

Front Wall

First Section: Ease exhibit from case, keeping exhibit section level. When you expose the far end of the exhibit, set it on the floor. Raise section and align it with location for exhibition using floor mat as your guide. Set the section upright.

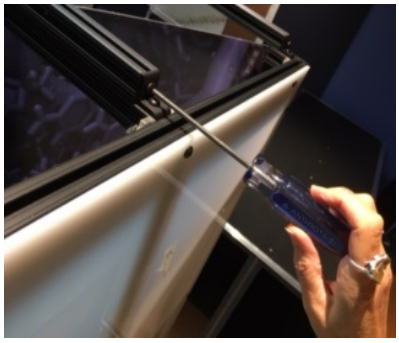
Second Section: Follow the same steps listed above and move it into position, aligning it with the first front section.

Connections: Follow the same steps as for the rear sections.

Overhead Crossbars and Power Cables

With the overhead crossbars from Road Case #3, connect the front and rear sections of the exhibit. The crossbars are color coded and are marked as to which surface should face upwards or "Top." The snaps on the crossbars are for attaching the overhead fabric panel and should face downward.

Connect crossbars: Using hex driver and screws from Kit 1, attach overhead crossbars, attaching to L bracket on top of front and rear sections as shown. Then use alignment bolts with wingnuts to secure brackets.



Connect power cables: Attach color-coded (yellow and blue) power cables from front section to their mates on the back section.

Overhead Fabric Panel

Attach overhead cover: Using snaps on bottom of overhead crossbars, attach fabric panel.

The Ribosome

Lighting

Turn on exhibit lighting: Using white remote from Kit 1, stand in front of exhibit and turn lighting on. The left back and front turn on with " ." The right back and front turn on with " ." "3" is not used for this exhibit. Place white remote in Kit 1 when not in use.

O = Shut Down

– = Start Up

Video Players-They should come on automatically with the power. If not:

Turn on video players: Using Nix remote from Kit 1, stand in front of exhibit and turn on video players.
Play videos: Press Home button → select USB → select Card → select movie → OK.
Set timing on video players: Press Home button → select Tools → select Settings → select Sleep Schedule → select Settings → select OK.

Video players are motion sensitive and will sleep during inactivity. Currently set for 5 minutes.

Augmented Reality

Turn on iPad: Turn on iPad by pressing the power or home button. The code is 900501.
Launch App by pressing the Ribosome exhibit icon in the dock.
(Be sure to test out the augmented reality app to see how it works in case visitors need assistance)
Triple click the home button to start Guided Access.

To turn off, first turn off Guided Access, then close app and turn off iPad.

Dismantle (REQUIRES 2-3 people)

1. Arrange cases to be easily accessible to avoid undue handling of exhibit sections
2. Remove case doors

Floor Mat and Overhead Fabric Panel

Roll floor mat and secure in its case. Unsnap and roll the overhead fabric panel, pack in small road case.

Overhead Crossbars and Power Cables

Disconnect power cables: Disconnect overhead, color-coded power cables and coil neatly on at the top of the exhibit, securing them with Velcro tape, but not *on top* as this will add length to the exhibit and may prevent the exhibit from fitting in its case.

Disconnect overhead crossbars: Using screwdriver and hex driver from Kit 1, disconnect the overhead crossbars and L brackets from the front and rear sections of the exhibit. Place hardware back in Kit 1. Place overhead crossbars in small road case.

The Ribosome

Front Wall

Connections: Disconnect the front sections, placing the butt fastener and wingnut in Kit 1.

First Section: Ease section from exhibit and place in case, with open side on the bottom and curved wall towards the outside of the case, keeping exhibit section level. Gently move exhibit into case marked "Front Wall."

Second Section: Follow the same steps as for first section. Place case door on and secure it.

Rear Wall

Connections: Disconnect the rear sections, placing the butt fastener and wingnut in Kit 1.

First Section: Separate the two rear sections as needed to access the power cables. Disconnect electrical cables from white receivers and place receivers in Kit 1. Pull electrical cables back into rear section through hole in back of exhibit. Coil cable neatly and secure with Velcro tape to avoid the cable damaging the LED lighting strips. Ease section from exhibit and place in case, with open side on the bottom and curved wall towards the outside of the case, keeping exhibit section level. Gently move exhibit into case.

Second Section: Follow the same steps as for first section. Place case door on and secure.

Installation Tools, Small Exhibit Components, Marketing Tools

Pack the following in the small road case:

Overhead crossbars (4)
Electrical connections (2)
Connecting hardware and tools and spares (Kit 1 and Kit 2)
Exhibit floor mat (1)
Exhibit overhead fabric panel (1)
Anti-static cloth for exhibit and screens
Remote controls-2 plus 1 spare and extra batteries
Black non-residue tape

Return Shipping

The BSM will send shipping labels and arrange for a carrier to pick up the exhibit and ship it to its next destination. Place shipping labels on cases and secure them.

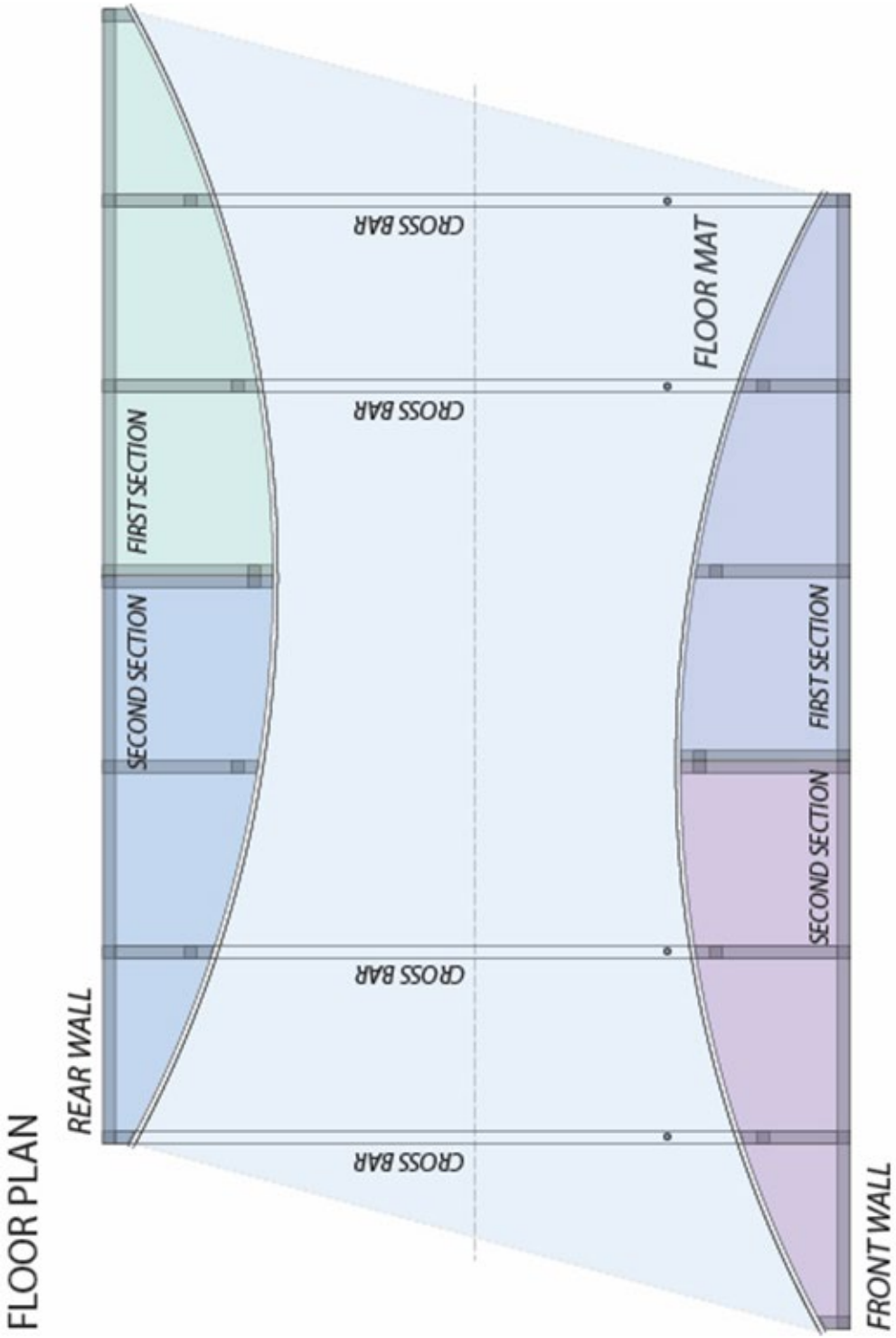
Specs

Height: 90'
Length: 92'
Depth: 4' 5"
Power Source:
Batteries Needed:
Video Remote-2025 3v
LED Remote-A23G 12v

The Ribosome

Contacts

Stacy Baker: Office 505-664-0244 Cell: 505-695-6615



BRADBURY SCIENCE museum

The Seismic Seat

The Seismic Seat is a unique opportunity for your guests to experience the motion of several actual seismic events, all while safely seated in your venue.

Under construction now, the Seismic Seat is a riveting focal point for the upcoming "Explosion Detectives" exhibit about ground-based nuclear explosion monitoring. You might imagine something like a mechanical bucking bull ride. While it's true the Seismic Seat reproduces signals from real-live quakes, you won't have to hang on for dear life (or duck under a table).

Ride the seismic waves!

Drawing from real events in Japan, Indonesia, North Korea, Washington State and Nevada, the Seismic Seat pumps out signals from both explosions and earthquakes. Each seismic wave ride lasts less than 30 seconds, with guests watching the seismogram in real time as they ride the waves.

Given six red buttons to choose from, guests might first ride the 2017 North Korea underground nuclear explosion (magnitude 6.3), then try the 2018 Japan earthquake (magnitude 6.0) — both of which are moderate events on the Richter scale. The last button is a "mystery" event, where you must guess earthquake or explosion. Guests also watch the

For younger kids, the Seismic Seat will simply be a way to feel a simulation of an event. Adults, on the other hand, will be more able to feel subtle differences.

Who are our partners for *The Seismic Seat*?

The Global Security Nuclear Nonproliferation and Security program office at Los Alamos National Laboratory

Interesting facts:

- Seismic waves move quickly at 20 times the speed of sound
- P waves are the fastest-moving type of seismic waves.
- Today, more than 150 seismic stations are operating as part of the International Monitoring System to detect nuclear tests in breach of the Comprehensive Test-Ban Treaty (CTBT), which opened for signatures in 1996.

"Although I was never in a strong catastrophic earthquake, I do remember earthquakes occasionally waking us up at night. The Seismic Seat reminds me strongly of the real thing"— Mel Strong

Requirements

-Compact exhibit needs only 10' x 10' of space
-Ships in two ATA travel cases
-Sets up in under 60 minutes
-Needs only two standard electrical outlets
-Includes promotional materials to help advertise it at your location
-Includes educational activity suggestions

Contact us to schedule this exhibit to your location!

BRADBURY SCIENCE museum

Women in Computing

Women in Computing brings women to the forefront in this self-paced journey through the evolution of computing at Los Alamos.

A multitouch, motion-based interactive Ideum Portrait Wall depicts the historic contributions made by women in the field of computing at Los Alamos. Guests can travel along a digital timeline to learn about how computing work at the Lab began with human computers, who could perform one operation per second. Then, they can discover how this early work by women at Los Alamos led to the supercomputing capabilities of today's Lab, who's newest supercomputer should be capable of 165 petaflops. For scale, to match what a one petaflop computer system can do in just one second, you'd have to perform one calculation every second for 31,688,765 years!

The exhibit introduces some of the women who pioneered the development and advancement of computing methods and technologies in use today. Women have played a key role in computing at Los Alamos since the Manhattan Project, building and shaping the Lab's world-renowned computing capabilities to this day. This timeline highlights the women who have been at the center of Los Alamos' long computing history, with the purpose of bringing greater recognition to all women who have contributed to the success of Los Alamos computing, and of computing everywhere.

Who are our partners for *Building Immunity*?

Los Alamos National Laboratory, High Performance Computing Systems group

Interesting facts:

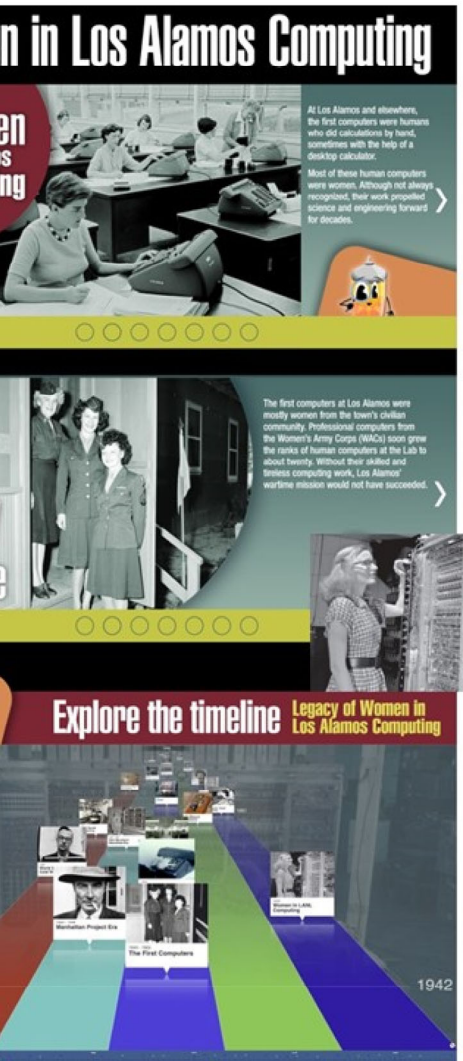
- The only patents issued for the Cray-1 computer were for its cooling system.
- The first large program for an electronic computer took up one-million punched cards!
- "Debugging" originally referred to removing insects from mechanical equipment. It was later applied to removing errors from computer software.
- In the beginning, they weren't even allowed into the ENIAC room because they didn't yet have the security clearance

Requirements

-Compact exhibit needs only 6' x 6' of space
-Ships in one ATA travel case
-Sets up in 30 minutes
-Needs only one standard electrical outlet
-Includes promotional materials to help advertise it at your location
-Includes educational activity suggestions

Contact us to schedule this exhibit to your location!


Women in Los Alamos Computing
Women in Los Alamos Computing
History of Building the Future
Explore the timeline
Legacy of Women in Los Alamos Computing
1942
1942
ideum


n in Los Alamos Computing
At Los Alamos and elsewhere, the first computers were humans who did calculations by hand, sometimes with the help of a desktop calculator.
Most of these human computers were women. Although not always recognized, their work propelled science and engineering forward for decades.
The first computers at Los Alamos were mostly women from the town's civilian community. Professional computers from the Women's Army Corps (WACs) soon grew the ranks of human computers at the Lab to about twenty. Without their skilled and tireless computing work, Los Alamos' wartime mission would not have succeeded.
Explore the timeline
Legacy of Women in Los Alamos Computing
1942


Women in Los Alamos Computing
Women in Los Alamos Computing
A History of Building the Future
Explore the timeline
Legacy of Women in Los Alamos Computing
Los Alamos National Laboratory


The legacy of women building the future through computing continues at Los Alamos today.
Control Data Corporation Era
1974
1974
Cathy Stallings
Virginia Romero
The first computers at Los Alamos
mostly women from the town's ci
community. Professional compute
the Woman's Army Corps (WACs)
grew the ranks of human comput
Lab to about twenty. Without the
and tireless computing work, Los
wartime mission would not have
succeeded.
At Los Alamos and elsewhere, the first computers were humans who did calculations by hand, sometimes with the help of a desktop calculator.