CIELO CENTRO

UNM | University of New Mexico
SSA | Sam Sterling Architecture
Pland Collaborative

5-14-24
CIELO CENTRO PUBLIC MEETING

Colin Nicholls
Science Dept. Chair, UNM-Taos
CIELO Centro – The Impetus

The donation by the family of Melinda King of Las Trampas of what would be the largest publicly accessible telescope in the Southwest
CIELO Centro – The Telescope

• Will be the largest publicly accessible telescope in NM

• 36” Diameter

• 144” Focal Length (F4)

• Advanced Sandwich-Mirror Design (stiff, light, fast cooling, low expansion)

• Currently re-engineering mechanics to ensure suitable for routine public use
CIELO Centro

- The Vision

"A Northern NM center to educate and inspire students, residents, and visitors"

• Observatory
  • View the sky through the largest publicly accessible ‘scope in the S/W
  • Visitors use the college’s ‘scopes or bring their own

• Education Center
  • Open for UNM-T students, K-12 outreach and visitor education

• Outdoor Amphitheater
  • Open air astronomy sky tours & other presentations

• Combined Nature/Solar System & Artwalk Trail
CIELO Centro – Approx. Facility Locations

Proposed Incorporation of Solar System Trail into UNM-T Artwalk Loop

It has long been intended to incorporate a solar system trail into the Space STEM Center. The discussion on 1/8/24 seemed to cast doubt on the feasibility of that. This proposal intends to show that the solar system can readily be incorporated into the Art walk trail.

Two options are shown here: Scale 1:8 Bn (red) and 1:5 Bn (Blue). The sizes of the Solar system objects in mm for each option are shown in the table, bottom left. The approximate location of each planet is shown by its initial on the Trail map.

Positions are not shown for Mercury & Venus, since they are too close to the observatory wall to be seen on this diagram.
CIELO Centro Observatory – Why No Dome ??

• A Dome is great for **Research**
• (Protection from Cold, Wind)

• **BUT** –

• Narrow FOV, claustrophobic, only one scope usable

*Not Good for Connecting People to the Sky!!*
CIELO Centro Observatory – What do **WE** want??

ACCESS TO THE ENTIRE SKY  MULTIPLE ‘SCOPES & PROTECTION

Alqueva Observatory in Cumeada, Portugal  Rancho Mirage Observatory, CA
CIELO Centro Observatory

• A RORO!!! *(Roll Off Roof Observatory)*
Public Outreach Observatory

Lowell Giovale Open Deck Observatory, Flagstaff, AZ
CIELO Centro Facilities – Amphitheater

Switch from Presentation in Amphitheater

To Pointing at Real Object in Sky
S-STEM Facilities – Solar System Trail

- Solar System Trail
  - Demonstrate the scale of the Solar System, by placing markers/Models along a Trail
- Will be Integrated with Klauer Trail System
  - EcoTrail
    - Teaching Biology/Ag. Science
    - Apiary, Pollination, Plantings
  - Exercise/Fitness Trail
    - Teaching Anatomy/Physiology
    - Activities & Exercise Apparatus
- Artwork Trail
  - Current Artworks will be renovated and displayed
SSTEM Programmatic Changes (Workforce Dev’t)

• Develop STEM Internship Track
  • Add Relevant Courses Linked to CIELO Centro facilities.
    • (Astronomy, Pre-Eng., Communications)
  • Fund Student Internships at STEM Employers.
  • Expose UNM-T Students to regional/national STEM Employment possibilities.

• Dark Sky Initiative
  • Educate and Empower Community Members to preserve Dark Skies.
  • Build advocacy for cultural, environmental and economic preservation.
CIELO Centro Observatory Partners

• TECHNICAL ADVISORY TEAM
  • Dr. Charlie McMillan, Gary Zientara, Geoff Goins, Phil Poirier, Dr. Tony Hull

• EL VALLE ASTRONOMERS
  • Managing & Storing Equipment Donations
  • Scope Set up
  • Technical Advice
EDUCATIONAL OUTREACH
STEM Education

is

Inspiring
Space Literacy

is

A Critical Asset
Multidisciplinary Learning is Authentic
Collaboration and Communication is A Nexus
DESIGN TIMELINE
Design Timeline

- 36” Telescope Received: Nov 2020
- Feasibility Study: Nov 2022
- Schematic Design: Nov 2023
- Design Development: May 2024
- Construction Documents: June 2024
- Permitting: Aug 2024
- Construction Begins: Sept 2024
Telescope Collection
Existing Telescope Shed
### Similar Facilities in the Region

<table>
<thead>
<tr>
<th>Facility</th>
<th>Location</th>
<th>Drive Time from Taos</th>
<th>Largest ‘Scope</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pajarito Center</td>
<td>Los Alamos</td>
<td>8 mins</td>
<td>None</td>
<td>General STEM Outreach - Weekly</td>
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<tr>
<td>UNM</td>
<td>Albuquerque</td>
<td>2.5 hrs</td>
<td>14&quot; SCT</td>
<td>Approx 30 nights/yr</td>
</tr>
<tr>
<td>Chaco Canyon</td>
<td>Rappaport</td>
<td>4 hrs</td>
<td>25&quot; Dobsonian</td>
<td>Currently dormant - Unstaffed</td>
</tr>
<tr>
<td>NMSU</td>
<td>Las Cruces</td>
<td>5.5 hrs</td>
<td>16&quot; Dobsonian</td>
<td>Approx 8 events/yr</td>
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#### New Mexico

#### Colorado & Arizona

<table>
<thead>
<tr>
<th>Facility</th>
<th>Location</th>
<th>Drive Time</th>
<th>Largest ‘Scope</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASU</td>
<td>Alamos CO</td>
<td>2 hrs</td>
<td>14&quot;</td>
<td></td>
</tr>
<tr>
<td>Lowell GODO</td>
<td>Flagstaff AZ</td>
<td>7 hrs</td>
<td>32&quot; Dobsonian</td>
<td>Daily</td>
</tr>
<tr>
<td>Mt. Lemmon</td>
<td>Tucson AZ</td>
<td>10 hrs</td>
<td>32&quot; Cassegrain</td>
<td>By appointment - $55 per person.</td>
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Special Design Considerations

Light Shielding

Campus Character

Site Accessibility
Proposed Site
Spaces & Programming

The following diagrams describe the layout and size of the program spaces for the observatory, classroom, support areas, exterior observation deck, and outdoor planetarium.

**INDOOR**
- Observatory: 1205 SF
- Classroom: 2063 SF

**OUTDOOR**
- Outdoor Amphitheater: 50 People
- Observatory Deck: 30 People
SCHEMATIC DESIGN
SSA – JAN 2024
### New Spaces List vs. Old Spaces List

#### Feasibility Study

<table>
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<tr>
<th>Indoor</th>
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<th>Outdoor</th>
<th></th>
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<tbody>
<tr>
<td>Observatory</td>
<td>1205 SF</td>
<td>Outdoor Ampitheater</td>
<td>50 People</td>
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<tr>
<td>Classroom</td>
<td>2063 SF</td>
<td>Observatory Deck</td>
<td>30 People</td>
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<tr>
<td></td>
<td>3268 SF</td>
<td>Entry Garden Plaza</td>
<td>50 People</td>
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#### Current

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<thead>
<tr>
<th>Indoor</th>
<th></th>
<th>Outdoor</th>
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<tbody>
<tr>
<td>Observatory</td>
<td>2022 SF</td>
<td>Outdoor Ampitheater</td>
<td>50 People</td>
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<tr>
<td>Classroom</td>
<td>1763 SF</td>
<td>Observatory Deck</td>
<td>80 People</td>
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<tr>
<td></td>
<td>3785 SF</td>
<td>Entry Garden Plaza</td>
<td>50 People</td>
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OUTDOOR FEATURES
Project Location
Observatory & Classroom
Campus Green

TERRACED USE AREAS AND ACCESSIBILITY
The existing site spans across roughly 10' of elevation change. This dynamic topography is used to create a variety of gathering spaces, while minimizing stairs and providing accessible walkways throughout.

ARROYOS AND PLANT COMMUNITIES
Building from existing campus landscapes, the hillside topography and natural areas help define the landscape areas. A reworking of bioswales and raingardens harvest rooftop and surface flow for supplemental irrigation, helping manage stormwater on site.
SSA Precedent Study

Lowell Observatory

FLAGSTAFF, AZ - 02/18/2024

BARREL VAULT ROOF
Steel frame, white metal roof panels.

FLAT ROOFED STATIONARY PORTION
Closed position.

TELESCOPE DECK
Open position.
Great viewing angles south, east & west. Very limited northern view.
Physical Models

NOVEMBER – Start of SD

MARCH – Start of SD

3D Print Refinement
Colin’s Observatory Configurations
Observatory Roof Types

1. Quonset Hut Roof - Slides Over Storage
   - Quonset hut roof - cost effective + low maintenance.
   - Tall (approx. 25') to clear storage room, blocks view north.
   - Approx 90' length
   - Similar to Colin's #3

2. Flat Roof or Low Vault - Slides South, Creates Courtyard
   - No roof overlap - simplifies roof but obstructs view south.
   - Approx. 110' length.
   - Similar to Colin's #3

3. Flat Roof - Slides North Over Storage, Creates Courtyard
   - Could be mirrored w/ storage at south, obstructs view south.
   - Approx. 90' length.

4. Low Barrel Vault Roof - Slides North, Creates Courtyard
   - Roof at north when open - maximizes views angles.
   - Storage & telescopes scopes separated.
   - Approx. 110' length.

SeaWest Telescope Angle Diagram
Recommends a wall height of 7'4" at the South, East, and West, 11' at the North.
Raised to 8' 4" (7' door + 1' roof track beam)
Observatory Floor Plan + Isometric
Classroom Floor Plan + Isometric
# UNM-Taos Material Matrix

<table>
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<tr>
<th>PATHWAYS</th>
<th>INTERIOR</th>
<th>CONTEXT</th>
<th>VEGETATION</th>
<th>SEATING/PUBLIC USE</th>
<th>NATURAL LIGHT</th>
<th>NATURAL MATERIALS</th>
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[CIelo Centro](#)