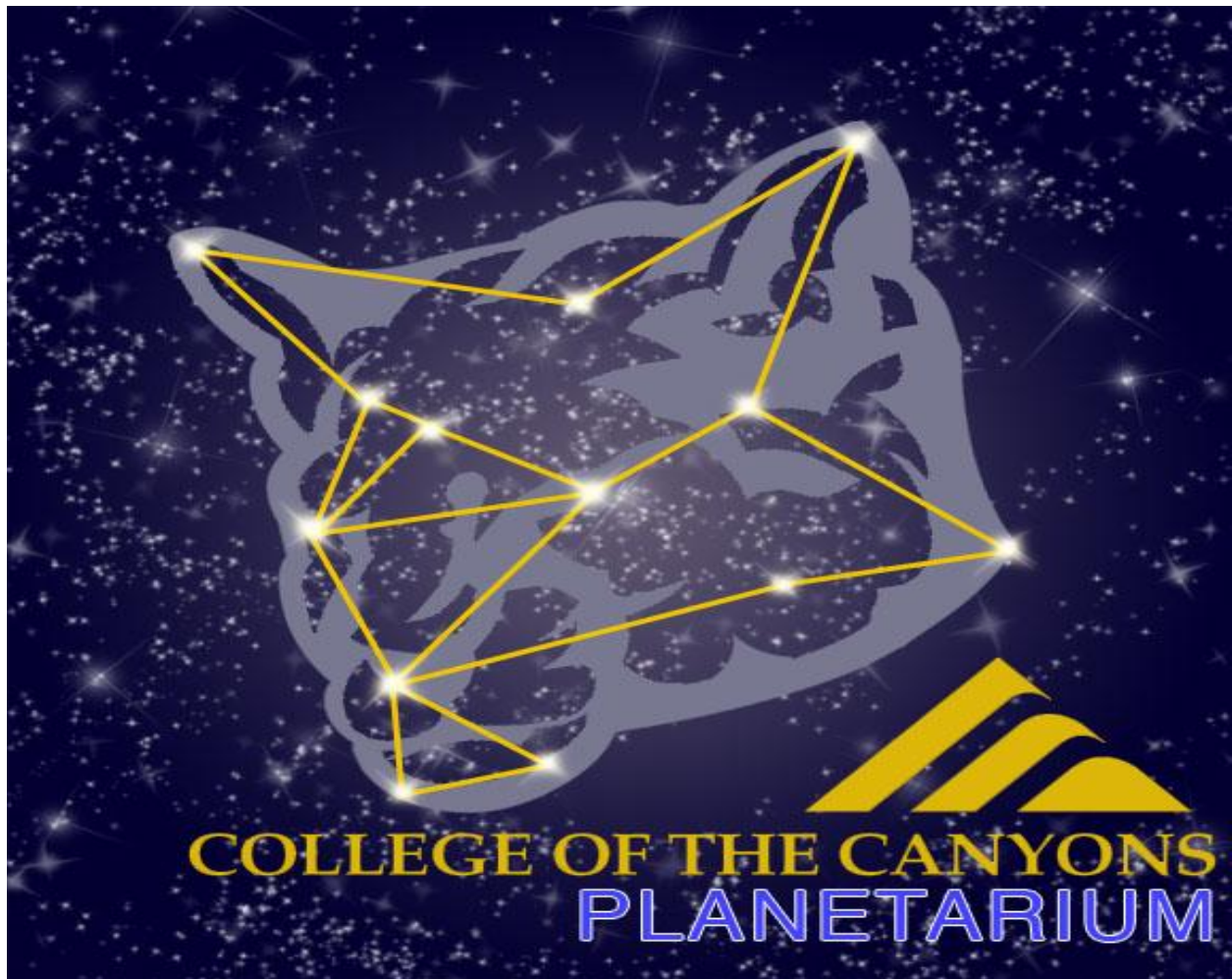


# College of the Canyons Planetarium

## Business Plan

May 11, 2012



## Executive Summary

The idea of building a planetarium on the Canyon Country Campus at College of the Canyons ("CCC") was launched in 2008. The benefits of having a planetarium at CCC are myriad:

- Provide a unique educational resource to enhance the education provided to astronomy and science students at COC
- Provide educational opportunities for local K-12 students
- Provide an educational resource to the community at large
- Provide a unique recreational resource to the community at large
- Provide a unique identifying landmark to help brand CCC.

The College of the Canyons Planetarium, known as the Cougar Dome, will provide our community with an educational experience second to none. The planetarium will provide us with the viewing of spectacular images of the sparkling night sky, amazing journeys into deep space and science exhibits that inspire both the young and not so young.

The educational benefits of a Planetarium are clear:

- A planetarium program increased student understanding of related topics by 24%.
- A planetarium visit results in an 11-20% increase in the students' interest in science as a career.

The College of the Canyons Planetarium will be a modern, state-of-the-art, center for astronomy and science education located colleges Canyon Country Campus. It is anticipated that the proposed facility will be approximately 15,000 sq ft in size, with a 150 seat planetarium. The facility will support a wide range of education and outreach objectives for the Santa Clarita Valley.

Studies show that cities with Planetariums allow local school districts to produce children who score higher on standardized tests and in the classroom. This academic achievement translates into a more educated population that is better prepared in the local workforce. This is especially important to Santa Clarita and the surrounding area, which has a major focus on high tech manufacturing and biotechnology which requires a highly educated local workforce. Local K-12 school districts as well as the growing number of private schools have emphasized science as part of the core curriculum and many schools have developed on-site science labs. An area planetarium would fit well with the curriculum offered by local schools.

The entire project is expected to cost approximately \$10 million with ground breaking anticipated to commence after the completion of the iCue Culinary Arts Center; perhaps as early as 2017.

We would anticipate that the state of California would fund half of the construction costs through their normal school construction program. A plan to raise the college's portion of the \$10 million cost, \$5 million, is being formed. This fundraising plan, which will be broken into stages, will consist of bond funds, private donations, naming rights, memberships, outside sponsorships and grants.

The Cougar Dome will be a great example of what a 21st century planetarium should be - supporting College students, local K-12 schools, and the community at large.

## Educational Benefits

The educational benefits of planetarium and science centers are well established. Planetariums allow for an engaging, immersive and fun way for college and school aged children to increase their critical thinking, reasoning, and problem-solving skills in math and science.

- A study of programs offered at the Houston Museum of Natural Science for Houston ISD documented that, in association with a hands-on science lab, a planetarium program increased student understanding of related topics by 24%, and resulted in an 11% increase in the students' interest in science as a career.<sup>1</sup>
- In a study<sup>2</sup> of 471 6th graders on planetary motion, a planetarium proved superior to classroom instruction in teaching students to recall astronomy information and apply astronomy concepts.
- In a worldwide survey of over 750 teachers who used a planetarium in their instruction, nearly 92% agreed that it helped make their students enthusiastic about science.<sup>3</sup>
- A study of ten- and eleven-year-olds in England found that visits to a space center resulted in a nearly 20% increase in students' desire to become scientists.

## The Science Center

Provides our students with a multi-media experience with slides, videos, visual effects, computer animations, narration, and music that will enlighten the wonders of the cosmos.

Regularly scheduled events include:

- Constellation Story Hour
- Light Shows
- Interactively Connecting Stars to Create Constellations
- Outer space Virtual Tours
- Lectures on Science

Workshops include:

- Location of the stars
- Star Myths of the Greeks
- Planetary Identification
- Galileo and Newton's Contributions

*1 Summers, Carolyn. Quantification of Student Learning in the Planetarium. International Planetarium Society, 12 July 2000.*

*2 Hayward, Robert R. The Developing and Field Testing of an Instrument Using the Planetarium to Evaluate the Attainment of the Concept of Annual Motion. Ms. 1976.*

*3 Kratzer, Gary D. A Survey of Educators' Perceptions Concerning the Impact of the STARLAB Planetarium on Teaching and Learning. McNeese State Univ., 1997.*

## **Facilities Location**

The Planetarium will be located on an existing graded pad on the Canyon Country Campus located on Sierra Highway in Canyon Country.

## **Facilities Description**

### Planetarium

The 150 seat Planetarium will be fitted with a Spitz's NanoSeam Dome. This is a flush style structure with no overlapping panels, no exposed rivets and provides for a smooth, even surface, completely seamless under projection.

LED lighting around dome will provides ambient lighting and help eyes adjust as shows begin, the state of the art 5.1 surround sound speaker system will create an "immersive" experience.

The STARMASTER SB projection system shows all objects of the night sky, including the Milky Way, nebulae, Sun and Moon through its fiber-optical projectors.

Alternate presentations will use the Powerdome®4DOME Full Dome Projection system which provides up to eight million pixels for the highest resolution available on a planetarium dome.

### Science Center

The science museum will be an "Exploratorium" style facility, where kids can truly touch and interact with exhibits. The interactive areas will be contained within a more traditional museum that exhibits explanations of scientific theories and a history of scientific discoveries.

### Classrooms

The instructional area will include 2 Multi-purpose Classrooms for Astronomy/Physics/Physical Science lectures and labs, each able to accommodate 28 students plus instructor workstation with SMART room capabilities. Also included in this area will be a large stockroom/prep room for laboratory supplies and equipment as well as equipment demonstration assembly and repair and office space (e.g., laboratory technician).

### Auxiliary Space

Additional space will include a large lobby for community outreach and exhibits, a Planetarium Director's office, a Planetarium equipment room and a backstage room with back stage access (to be used for more than lecture and helpful for storing and moving demonstration equipment).

## External Community Environment

Santa Clarita Valley is anticipated to experience significant growth over the next twenty years which will increase the demand for COC classes in particular, and community resources like the proposed Planetarium – these projections were developed by the College from population data obtained from the Southern California Association of Governments (SCAG):

**TABLE 1. POPULATION PROJECTIONS, 2000 TO 2030**

Service Area	Zip Code	Population 2000	Population 2005	Population 2010	Population 2015	Population 2020	Population 2025	Population 2030
Canyon Country	91387, 91351	57322	65858	74711	80917	86412	91291	95882
Castaic	91384	20042	25903	35677	41118	46261	50311	54110
Newhall	91321	32449	40701	44377	49958	52935	55667	58181
Saugus	91350, 91390	36761	42943	50635	55197	59410	63184	66599
Stevenson Ranch	91381	3733	5014	6365	8985	11516	14265	16843
Valencia	91354, 91355	49653	54875	65534	74197	82100	90141	97696
<b>District Total</b>		<b>199960</b>	<b>235294</b>	<b>277299</b>	<b>310372</b>	<b>338634</b>	<b>364859</b>	<b>389311</b>

**TABLE 2. AGE DISTRIBUTION BY COMMUNITY**

		0-17	18-24	25-44	45-64	65+	% 18 and over	% 17 and under
<b>Canyon Country</b>	<b>91351 91387</b>	<b>29.9%</b>	<b>9.6%</b>	<b>31.4%</b>	<b>23.0%</b>	<b>6.1%</b>	<b>70.1%</b>	<b>29.9%</b>
Castaic	91384	23.5%	14.1%	38.6%	20.1%	3.6%	76.5%	23.5%
Newhall	91321 91350	26.2%	12.0%	30.2%	21.0%	10.6%	73.8%	26.2%
Saugus	91390	30.8%	9.4%	27.4%	26.6%	5.7%	69.1%	30.8%
Stevenson Ranch	91381 91354	31.4%	6.1%	36.5%	22.0%	4.0%	68.6%	31.4%
Valencia	91355	28.5%	7.7%	29.1%	26.5%	8.1%	71.4%	28.5%
<b>District Total</b>		<b>28.6%</b>	<b>9.9%</b>	<b>31.0%</b>	<b>23.8%</b>	<b>6.8%</b>	<b>71.4%</b>	<b>28.6%</b>

**Table 2** contains the age distribution of communities in the Santa Clarita Valley. For the entire valley, 71.4 percent are adults.

Data reflecting the ethnic distribution of communities in Santa Clarita are presented in **Table 3**. As is illustrated by the ethnic distribution data, 77 percent of residents in Santa Clarita are White. Furthermore, 22.5 percent are Latino. Note that this uses the Federal definitions, in which Latino ethnicity is considered independently of race. So, someone could be both White and Latino.

**TABLE 3. ETHNIC AND RACE DISTRIBUTION BY COMMUNITY**

		White	African American	Native American	Asian / Asian-American	Other	Two or more races	Latino / Hispanic
Canyon Country	91351							
	91387	74.0%	3.9%	0.7%	5.8%	11.1%	4.3%	26.0%
	91384	72.2%	10.4%	0.5%	5.5%	8.9%	2.5%	31.9%
Newhall	91321	70.7%	2.0%	0.8%	4.4%	18.3%	3.8%	39.9%
Saugus Stevenson Ranch	91350							
	91390	84.3%	1.7%	0.5%	5.2%	4.4%	3.8%	14.5%
	91381	72.2%	3.4%	0.4%	15.2%	4.9%	0.0%	13.0%
Valencia	91354							
	91355	83.7%	1.8%	0.4%	7.9%	3.1%	3.1%	11.0%
District Total		77.4%	3.5%	0.6%	6.4%	8.5%	3.7%	22.5%

The educational attainment of adults 25 and older was also analyzed by community (see Table 4). Overall, 33.5 percent of adults over 25 have no college background.

**TABLE 4. EDUCATIONAL ATTAINMENT OF ADULTS 25 AND OLDER BY COMMUNITY**

		Elementary School	Some High School	High School Graduate	Some College	Associate Degree Only	Bachelor's Degree Only	Graduate Degree
Canyon Country	91351							
	91387	4.4%	8.8%	22.6%	30.6%	9.8%	17.3%	6.6%
	91384	7.2%	14.3%	26.0%	26.0%	8.3%	14.4%	4.0%
Newhall	91321	11.5%	11.8%	22.1%	24.6%	7.8%	15.1%	7.1%
Saugus Stevenson Ranch	91350							
	91390	2.1%	7.1%	20.1%	32.5%	10.2%	20.0%	7.7%
	91381	1.4%	3.6%	16.3%	25.0%	9.3%	30.1%	14.4%
Valencia	91354							
	91355	1.7%	4.2%	15.7%	26.4%	9.9%	28.6%	13.5%
District Total		4.6%	8.3%	20.6%	28.4%	9.4%	20.3%	8.5%

Household income also was assessed by community as is depicted in Table 5.

**TABLE 5. HOUSEHOLD INCOME BY COMMUNITY**

Household Income		Under \$15,000	\$15,000 to \$34,999	\$35,000 to \$74,999	\$75,000 to \$99,999	\$100,000 to \$149,999	\$150,000 or more
Canyon Country	91351						
	91387	5.4%	13.0%	36.2%	17.8%	18.6%	8.9%
	91350						
Saugus Newhall	91390	3.7%	8.1%	26.2%	20.0%	26.4%	15.5%
	91321	11.9%	19.4%	32.9%	14.3%	13.5%	8.0%
Castaic	91384	4.2%	10.1%	24.0%	19.0%	25.4%	17.3%
	91354						
Valencia Stevenson Ranch	91355	5.2%	9.4%	25.6%	16.1%	24.9%	18.7%
	91381	3.1%	7.6%	25.1%	13.4%	26.0%	24.8%
SCCCD	SCCCD	5.8%	11.6%	29.7%	17.2%	21.8%	13.9%

Poverty rates were also analyzed by community (see Table 6). The poverty rate district-wide is quite low at 4.7 percent. Note that Newhall has the highest poverty rates at about double the district-wide rates. This has implications for the need for services and the ability to access instructional

and non-instructional services.

**TABLE 6. POVERTY RATE BY COMMUNITY**

Poverty		At or Above	Below Poverty
Saugus	91350 91390	96.3%	3.7%
Canyon Country	91351 91387	94.8%	5.2%
Newhall	91321	90.5%	9.5%
Castaic	91384	95.6%	4.4%
Valencia	91354 91355	97.4%	2.6%
Stevenson Ranch	91381	97.5%	2.5%
SCCDD	SCCDD	95.3%	4.7%



## **Fundraising**

Funding to build the Planetarium could be drawn from a wide variety of sources:

- State of California School Construction Program (estimated to provide half the construction costs)
- Scientific Grants
- Partnership with the city of Santa Clarita
- Naming opportunities
- Foundation Fundraising efforts
- Memberships

## **Operational Costs / Income**

The planetarium will contain approximately 150 seats. Assuming we could If we offered initial programming with one evening show and four school shows per week, we would serve 700 people per week or 2,800 per month. We would eventually plan to offer two public evening shows and four K-12 school shows per week which would bring total attendance to 840 per week or 3,360 people per month. Still to be determined are charges the public will pay per person as these figures are still open to discussion. An approximate middle-of-the-road estimation based on similar programs would be \$4 per K-12 student and \$10 per adult for the evening shows. This would give us a gross income of about \$10,000 per month. When we reached the higher attendance goal listed above, then gross income might exceed \$15,000 per month. Thus, it is our anticipation that ticket sales will provide the bulk of the funding for the planetarium in terms of equipment, supplies, and publicity. It will also provide an offset for the faculty and staff salaries that will be required to operate the facility. The planetarium will be generally self-supporting.

We will also be using the Planetarium for our Astronomy and Physics classes on a regular basis and will also use it for other classes from time to time. Therefore the latest in technological and other pedagogical modalities will be available to the presentation staff thus offering the attendees the most up-to-date possible educational experience. The planetarium will be large, technically challenging, and will be open to the public much of the time. An optimal situation would be to have one full time-equivalent faculty member, one full time classified staff member along with several hourly employees (work study students or the equivalent).

## **Management**

It is anticipated that the staffing plan would look like this:

- 60% Faculty Planetarium Director (manages the facility, develops and presents shows).
- 40% Faculty Assistant Planetarium Director to develop and present shows.
- 100% Classified Staff person to handle reservations, ticket sales, help with seating and crowd control and after-show viewing.
- 2 work-study students to help the three persons above.

It is believed that most of these personnel costs will be covered by planetarium and apportionment revenues.

## **Advisory Council**

A robust advisory council is critical to the success of the Planetarium. We anticipate being able to develop an outstanding board with expertise in this area by drawing on those affiliated with the following area organizations:

- The NASA Jet Propulsion Laboratory in Pasadena
- Caltech in Pasadena
- Edwards Air Force Base in Mojave
- Lockheed Martin in Palmdale
- The Local Group Astronomy Club

# EXHIBITS

## **Exhibit A: Other Nearby Planetariums**

### **UCLA Planetarium**

Mathematical Sciences Building  
Los Angeles, CA 90095  
[www.astro.ucla.edu/planet](http://www.astro.ucla.edu/planet)

### **Glendale Community College Planetarium**

1500 N. Verdugo Rd.  
Glendale, CA 91208  
[www.glendale.edu/planetarium](http://www.glendale.edu/planetarium)

### **Mt. San Antonio College Planetarium**

1100 N. Grand Ave  
Walnut, CA 91789  
<http://www.mtsac.edu/instruction/sciences/planetarium/>

### **John Dresher Planetarium @ Santa Monica Community College**

1900 Pico Blvd  
Santa Monica, CA 90405  
[www.smc.edu](http://www.smc.edu)

### **Griffith Observatory**

2800 E. Observatory Road  
Los Angeles, CA 90027  
[www.griffithobservatory.org](http://www.griffithobservatory.org)

### **William M Thomas Planetarium @ Bakersfield College**

1801 Panorama Drive  
Bakersfield, CA 93305  
<http://www.bakersfieldcollege.edu/planetarium/>

### **Tessemann Planetarium @ Santa Ana College**

1530 West 17<sup>th</sup> Street  
Santa Ana, CA 92706  
<http://www.sac.edu/AcademicProgs/ScienceMathHealth/Planetarium>

### **Long Beach City College Planetarium**

4901 East Carson Street  
Long Beach, CA 90808  
<http://www.lbcc.edu/planetarium/>

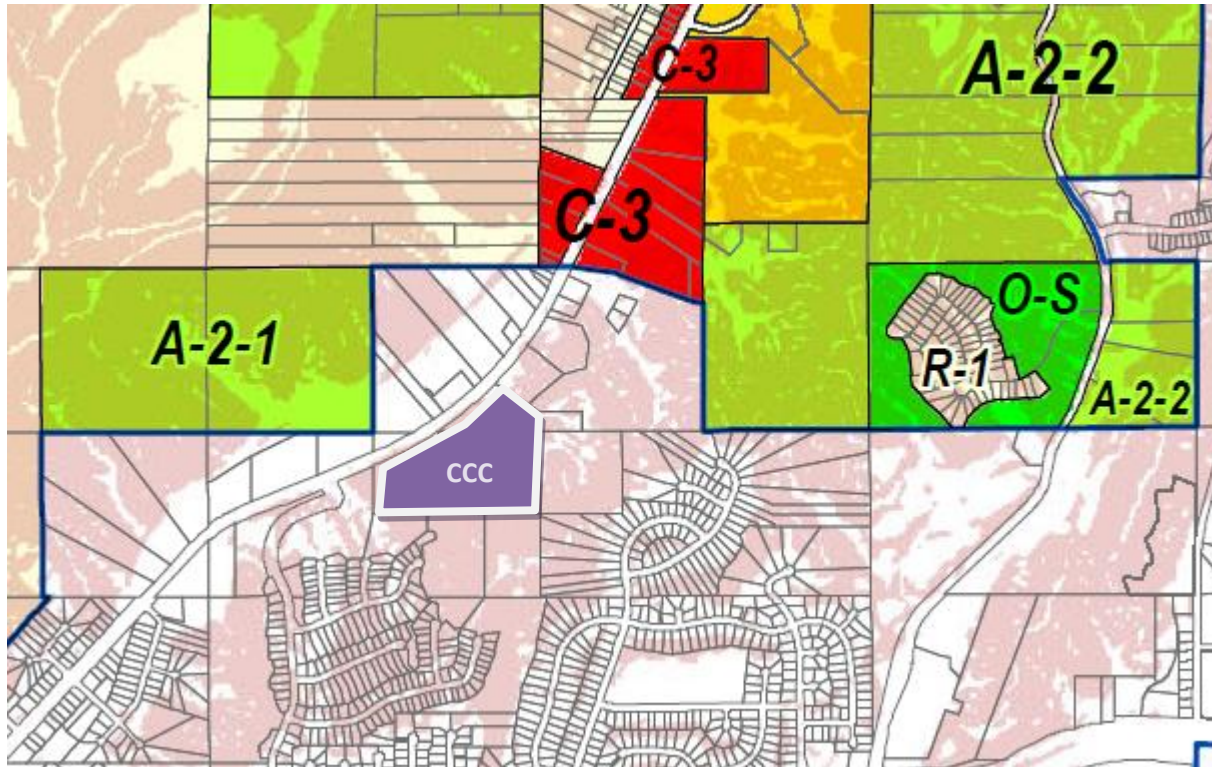
## Exhibit B: Sample Grant Opportunities

Funding Source	Funding Priorities	Range of Awards
Ahmanson Foundation	The Foundation's philanthropic interests are in four areas: Arts and Humanities, Health and Medicine, Education and Human Services. Types of funding include: Construction and renovations, Property acquisitions, Equipment and furnishings, Transportation vehicles, Technology and infrastructure, and Software, books, supplies. Requests for capital support are considered after there is clear evidence that the goal of the campaign will be achieved and that it will be accomplished within a reasonable time period. Lead gifts are rarely granted.	\$5,000 to \$1,000,000
American Honda Foundation	The American Honda Foundation engages in grant making that reflects the basic tenets, beliefs and philosophies of Honda companies, which are characterized by the following qualities: imaginative, creative, youthful, forward-thinking, scientific, humanistic and innovative. They support youth education with a specific focus on the STEM (science, technology, engineering and mathematics).	\$20,000 - \$75,000
Annenberg Foundation	The Foundation generally awards grants in several programmatic areas including Environment and Education.	\$10,000 to \$250,000
Boston Scientific Foundation	Education-related grants seek to improve educational opportunities and skill development for those at risk of not fulfilling their potential. Our primary focus is to improve science and math education for young people.	\$5,000 to \$150,000
Caterpillar Foundation	Program support in the areas of environmental sustainability, access to education and basic human needs.	
Chevron Community Foundation	Efforts to improve education are focused in the areas of science, technology, engineering and mathematics (STEM).	
General Motors Foundation	The foundation's purpose is to support a variety of organizations dedicated to improving the environmental, economic, social, educational, and cultural prosperity of their communities. GM wants to inspire young people to pursue the Science, Technology, Engineering and Math (STEM) careers that will transform transportation.	\$5,000 to \$1,000,000
JP Morgan Chase Foundation	Programs and services that increase economically disadvantaged children's access to high-quality educational opportunities. Focus is on helping students enrolled in public K-12 schools acquire the knowledge and skills they need to become productive, engaged citizens. Includes development of instructional leaders; implementation of innovative curricula; strengthening of instructional strategies; strengthening district capacity to support innovation and extending learning opportunities.	\$5,000 - \$500,000
Kenneth T. and Eileen L. Norris Foundation	Education/Science is a key priority area.	\$5,000 - \$500,000

Lockheed Martin	Lockheed Martin provides generous funding to STEM education outreach activities for students across the entire K-16 spectrum. They are committed to supporting programs, events and campaigns that focus on student achievement, teacher development, and gender and ethnic diversity.	
NASA Curriculum Improvements Partnership Award for the Integration of Research	Assists two- and four-year minority institutions with strengthening their science, technology, engineering and mathematics academic fields and technical programs. Funding is used to increase the quantity and quality of STEM curricula, the number of underrepresented and underserved students who attain degrees in STEM, and the number of underrepresented and underserved students who choose careers in NASA-related fields.	
National Science Foundation - Informal Science Education Program	NSF's Informal Science Education program supports innovation in "anywhere, anytime, lifelong learning," through investments in research, development, infrastructure, and capacity-building for science, technology, engineering, and mathematics (STEM) learning outside of formal school settings.	\$200,000 - \$700,000
Northrop Grumman Corporate Contributions Program	Focus is science, technology, engineering and mathematics (STEM) education. Northrop Grumman partners with local organizations that provide unique programming to inspire the next generation of scientists, engineers and technicians.	
PPG Industries Foundation	The PPG Industries Foundation provides funding for programs that increase awareness and offer educational opportunities for students interested in math and science discipline	\$5,000 - \$200,000
Raytheon	Raytheon's philanthropic interests are strategically focused on math and science education. We give preference to regional projects that serve the broader community in locations where we have major facilities.	
S. D. Bechtel, Jr. Foundation	Advancing STEM education in California is critical for preparing students to address the most pressing national and global challenges and to ensure that future generations have the basic STEM literacy necessary to be full participants in a productive economy and successful democracy. California relies on an innovative workforce that can only be maintained by providing opportunities for all students K-16 to succeed in STEM.	\$5,000 - \$1,000,000
Sidney Stern Memorial Trust	Funding areas include Environment, Education, Higher Education and Hispanics	\$5,000 - \$25,000
Southern California Edison	Educational partnerships nurture the imaginations and foster the academic success of the future workforce. The company's support within this arena focuses on science, technology, engineering, arts and math (STEAM), all of which help to build a foundation for student empowerment and innovation. We aim to power future generations to greatness through these five areas of academics, with the hope that we can inspire today's students to achieve a brighter future.	\$1,000 - \$5,000

United Technologies Corporation	UTC wants to inspire students to embrace science, technology, engineering and math (STEM). We support the development of the next generation of engineers, scientists and finance professionals by sponsoring primary school to university-level programs that spark students' interest and inspire innovation.	\$5,000 - \$1,000,000
Verizon Foundation	Support for schools and organizations focused on improving student achievement in Science, Technology, Engineering and Math. Focus is free online content, mobile applications and technology-focused teacher and administrator training.	\$5,000 - \$250,000

## Exhibit C: Planetarium Area Zoning Map



### LEGEND:

#### Zoning

- R-1 - Single-family residence
- R-2 - Two-family residence
- R-3-(U) - Limited multiple residence
- R-4-(U) - Unlimited residence
- R-A - Residential agriculture
- RPD - Residential planned development
- A-1 - Light agriculture
- A-2 - Heavy agriculture
- A-2-H - Heavy agriculture including hog ranches
- C-H - Commercial highway
- C-1 - Restricted business
- C-2 - Neighborhood commercial
- C-3 - Unlimited commercial
- C-M - Commercial manufacturing
- C-R - Commercial recreation
- CPD - Commercial planned development
- M-1 - Light manufacturing
- D-2 - Desert-Mountain
- IT - Institutional
- SP - Specific Plan

- M-1.5 - Restricted heavy manufacturing
  - MPD - Manufacturing industrial planned development
  - M-2 - Heavy manufacturing
  - M-3 - Unclassified
  - M-4 - Unlimited manufacturing
  - M-2.5 - Aircraft, heavy industrial
  - B-1 - Buffer strip
  - B-2 - Corner buffer
  - R-R - Resort and recreation
  - W - Watershed
  - P-R - Restricted parking
  - SR-D - Scientific research and development
  - O-S - Open space
  - A-C - Arts and crafts
  - MXD - Mixed use development
  - Significant Ecological Area
  - Hillside Management (transparent)
- #### Base Features
- Cultural Feature
  - City / Unincorporated Community Boundary
  - National Forest