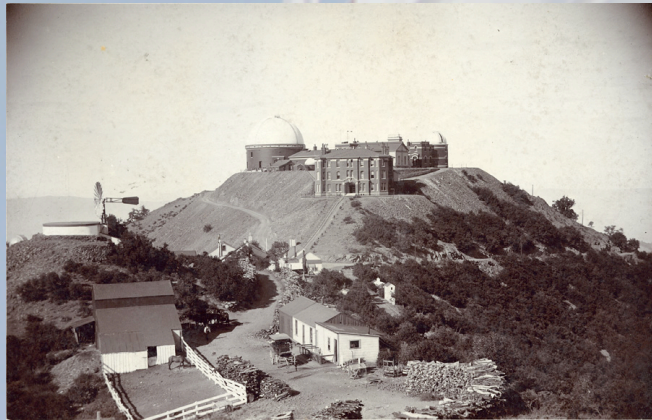


# LO Operations Budget Overview



- LO established in 1888 and administered via UCOP like a campus until 1960's when astronomers moved to UCSC
- From this point, operations budget is split between science program funding through UCOP and facilities funding through UCSC

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September 2007



- UCO science program continues to be managed via UCOP (first as an ORU and then as an MRU in 1988)
- UCO spends about 23% of its total operating budget for Lick Observatory Science Operations
- Diner/Dorm and Visitors Program expected to be primarily self-supporting

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September 2007

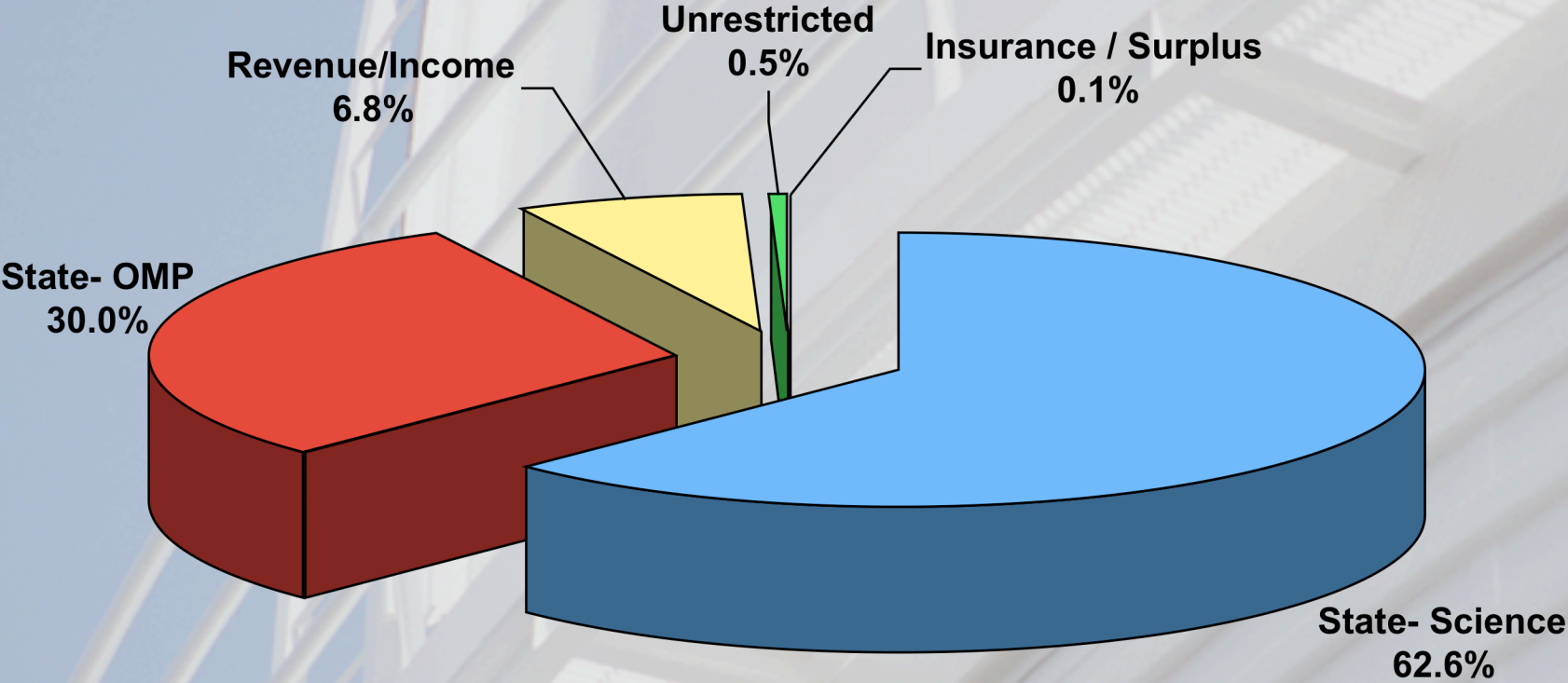


- Operations and Maintenance of Plant (OMP) budget derives from historical UCSC campus allocation and managed independently by LO
- UCSC also directly funds utilities (less residential share) and police officer



- The FY 07 operations budget comprised state funds allocated by UCOP (62%) for the science program, state funds allocated by UCSC (30%) for OMP, revenue (7%) and insurance/surplus (1%)

**Lick Observatory Operations by Fund Source  
Fiscal Years 1997 - 2007**



**LICK OBSERVATORY OPERATIONS**  
**Multi-Year Comparative (Fiscal Years 1997 - 2007)**  
**Variance in Expenditure for Comparison Years 1997 & 2007**

<b>Expense Category</b>	<b>1997</b>	<b>2007</b>	<b>Change in \$\$ Cost</b>	<b>% change from 1997</b>
Salary and Benefits Total	\$ 1,059,408	\$ 1,583,303	\$ 523,895	49%
Supplies and Materials Total	\$ 165,325	\$ 219,615	\$ 54,290	33%
Equipment Expense Total	\$ 38,754	\$ 40,849	\$ 2,095	5%
<b>Total Operating Costs</b>	<b>\$1,263,487</b>	<b>\$1,843,767</b>	<b>\$580,280</b>	<b>46%</b>

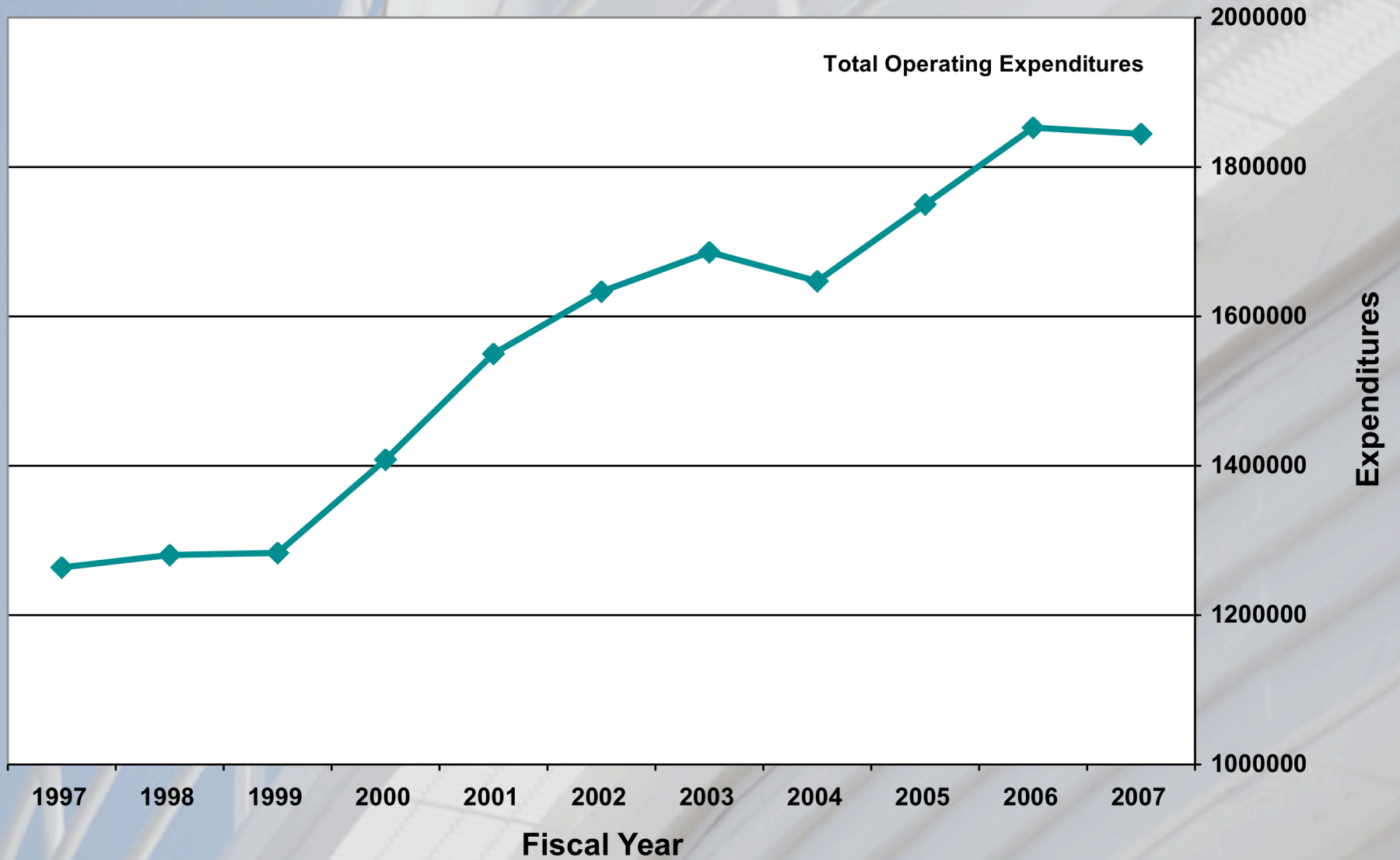
Notes:

1. Does not include Visitor Services Operation

Annual Average CPI Index for this period is 2.5%  
(US Department of Labor)

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# Lick Observatory Total Operations Trend by Annual Expenditures (1997-2007)



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# Lick Observatory Annual Operations (1997-2007) Trend by Type of Expenditures

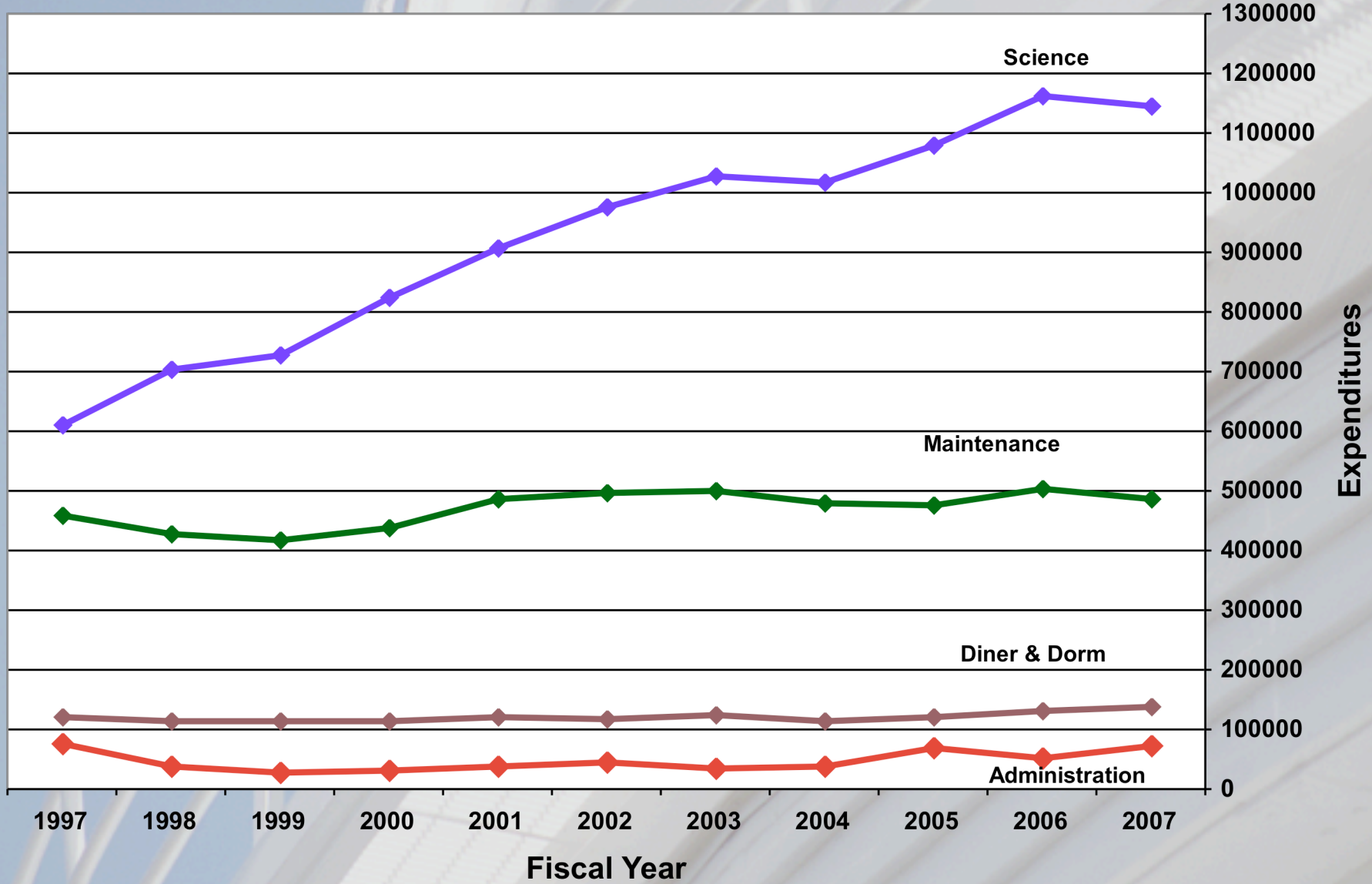


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# LO Operations

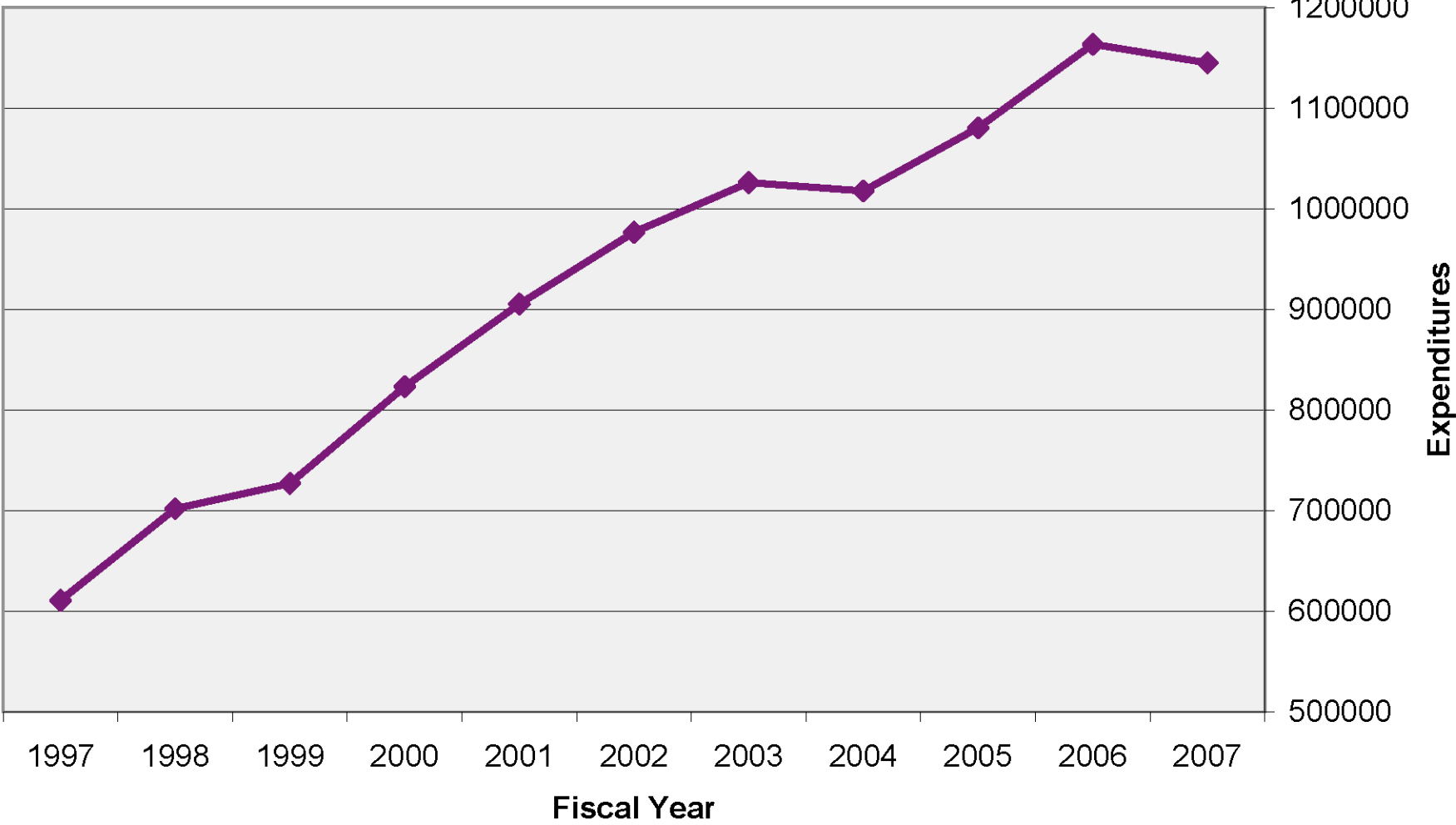
- Science Operations (includes Support Scientists and Telescope Operations)
- Maintenance (OMP)
- Visitor Services (Gift Shop, Music of the Spheres, Summer Visitor Program)
- Diner & Dorm Operations (diner will close 12/31/07)

# Lick Observatory Operations (1997 - 2007) Expenditures by Area



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Lick Observatory Operations (1997- 2007)  
Science Operations



# Observatory Personnel



Science Support	3.00 FTE
Telescope Operations	8.85 FTE
Diner Operations	2.00 FTE
Visitors Services	1.50 FTE
Maintenance	8.43 FTE
<b>TOTAL</b>	<b>23.78 FTE</b>

- Plus part-time pools for laser spotters, diner & visitor services

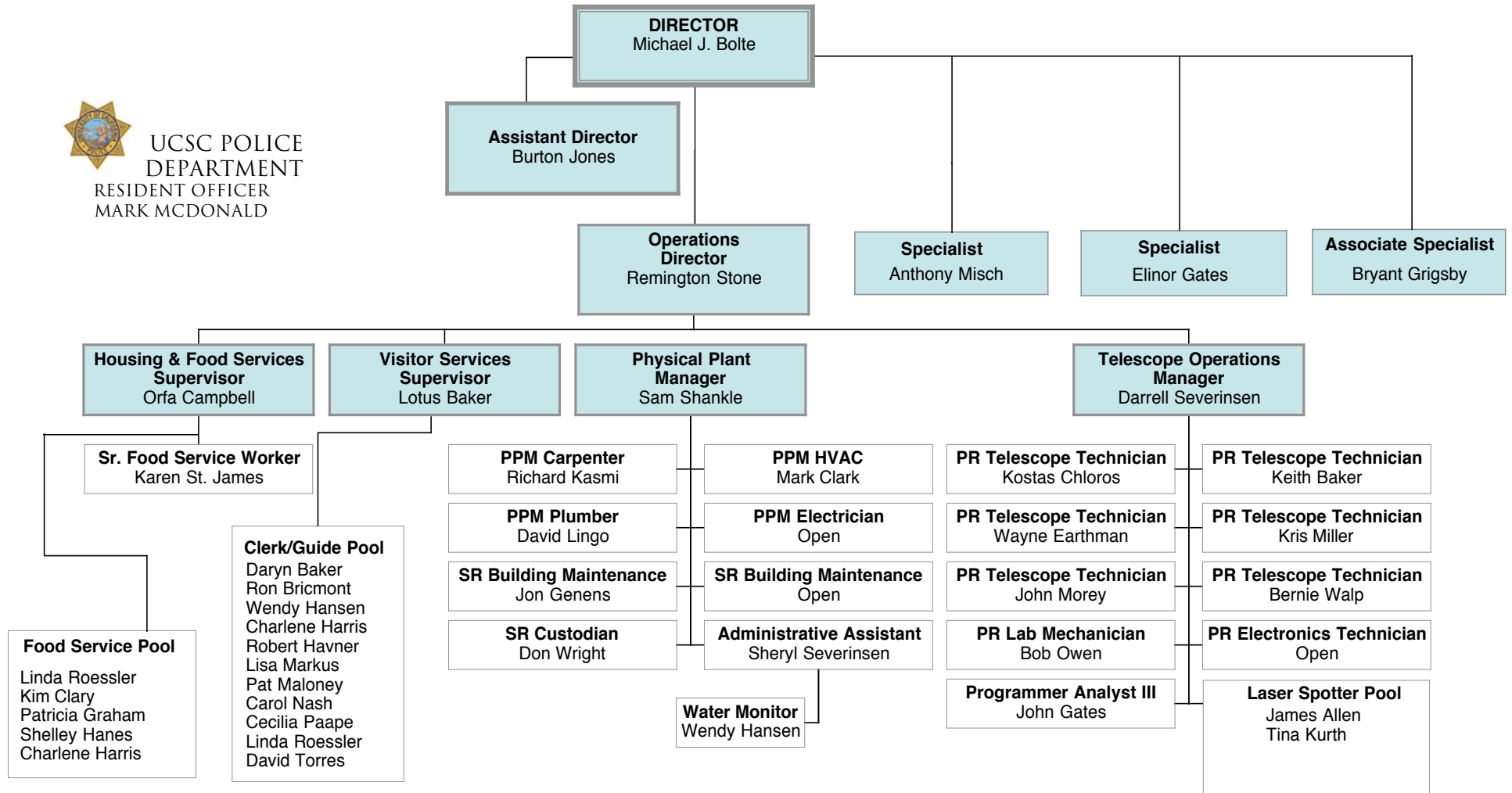


# UNIVERSITY OF CALIFORNIA OBSERVATORIES/LICK OBSERVATORY MT. HAMILTON

2007-2008



**UCSC POLICE  
DEPARTMENT**  
RESIDENT OFFICER  
MARK MCDONALD



Lick Observatory Strategic Planning Committee  
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# LO Facilities Facts & Figures



- UC property comprises 3,643 acres
- Facilities includes 57 buildings totaling 106,796 ASF
  - 17 Science buildings total 51,965 ASF
  - 40 Residential buildings total 54,831 ASF



- Facilities built between 1888 and 1996
  - 15% ASF built pre-1900
  - 42% ASF built between 1906 and 1950
  - 36% ASF built between 1951 and 1959
  - 6% ASF built between 1961 and 1964
  - 1% ASF built in 1996 (water treatment plant)
- APF will add 750 ASF when completed in 2008



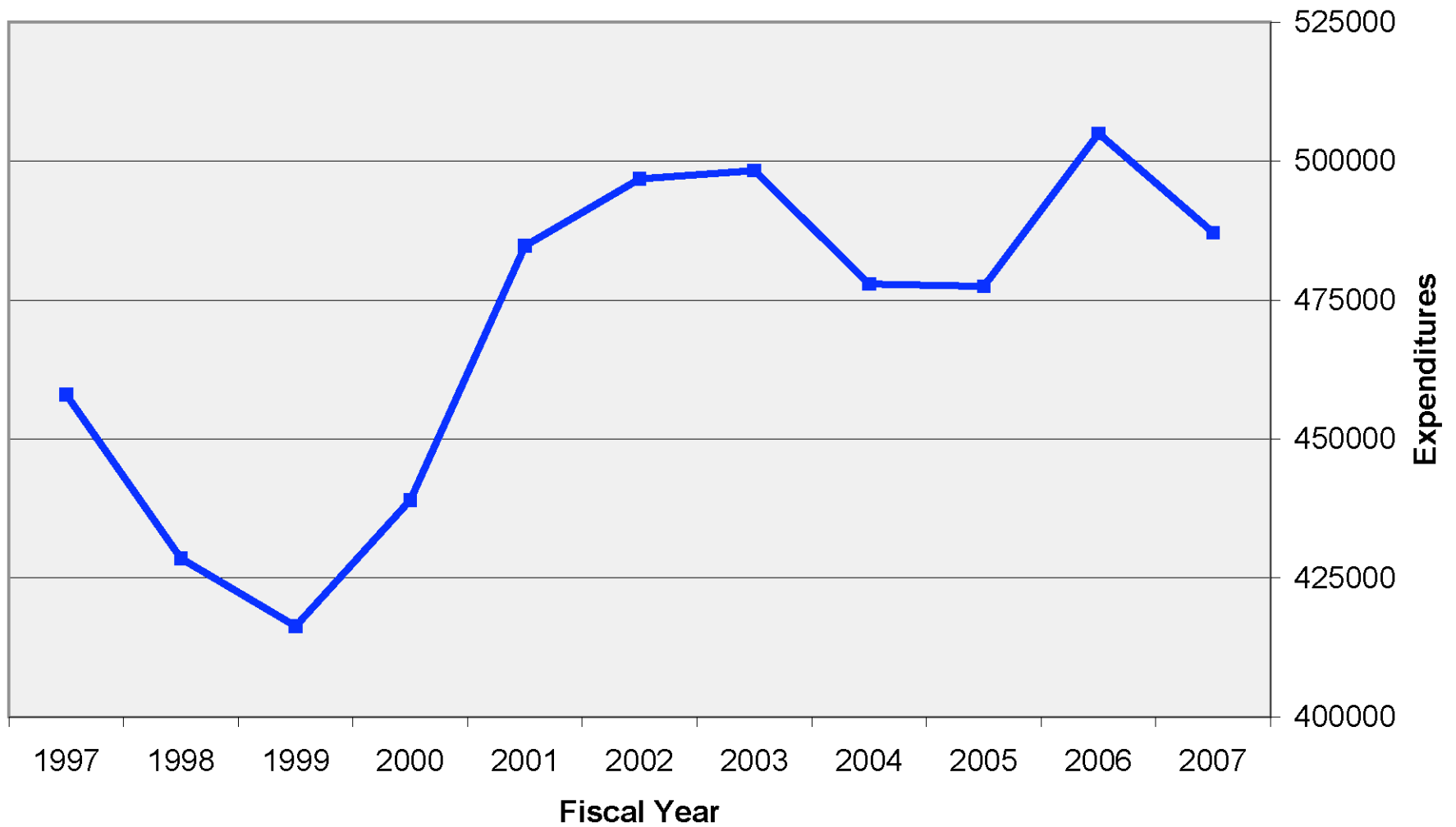
- 2004 Insurance declaration values building at \$21 M and equipment at \$37M

# Facilities Operations Overview

- OMP funds annual allocations for preventive and operations
- Deferred Maintenance funds projects >\$50K that can not be done by OMP (ex. new roof)
- Major Capital Improvement Program funds new buildings and infrastructure projects costing multi-million \$ and multi-year lead time
- All of the funding streams are allocated to campuses
- LO independently manages own OMP budget but competes with UCSC priorities for DM and MCP

- For a brief period (1995-2003) LO received negotiated 7% of DM budget in lieu of competing with campus priorities
- There has been no UC funding for DM since then
- Currently only source of DM funding is getting a loan
- LO would have to borrow and repay its own DM funds
- LO also received \$5.6M in Major Capital Improvement funds in 1997 for an infrastructure upgrade (septic, heating and paving)
- Currently there are no LO projects in the UCSC MCIP pipeline

**Lick Observatory Operations (1997 - 2007)**  
**Operations & Maintenance of Plant (OMP)**



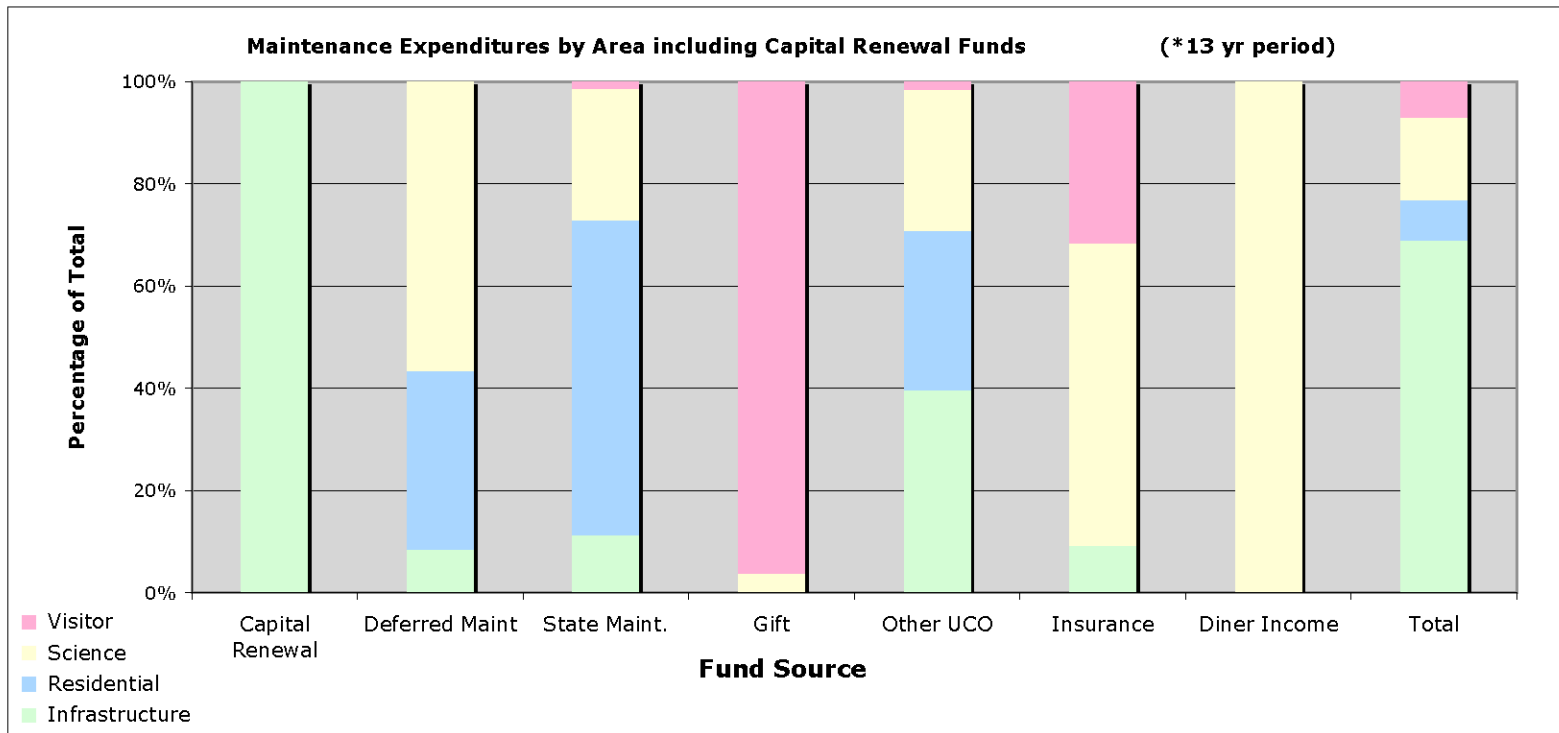
**Lick Observatory Facilities Projects by Fund Source  
Fiscal Years 1996 - 2007**

**By Amount (\$\$) Expended:**

Area:	Capital Renewal	Deferred Maint	State Maint.	Gift	Other UCO	Insurance	Diner Income	Total	% of Total
Infrastructure	\$ 5,637,514	\$ 76,231	\$ 50,204	\$ -	\$ 134,350	\$ 74,825		\$ 5,973,124	68.92%
Residential	\$ -	\$ 314,956	\$ 270,887	\$ -	\$ 105,112	\$ -		\$ 690,955	7.97%
Science	\$ -	\$ 508,819	\$ 113,068	\$ 13,933	\$ 93,259	\$ 479,434	\$ 181,416	\$ 1,389,928	16.04%
Visitor			\$ 5,931	\$ 346,728	\$ 5,330	\$ 255,314		\$ 613,302	7.08%
<b>Total</b>	\$ 5,637,514	\$ 900,007	\$ 440,089	\$ 360,661	\$ 338,050	\$ 809,573	\$ 181,416	\$ 8,667,310	100.00%

**By Percentage (%) of Total in Each Fund Category:**

Area:	Capital Renewal	Deferred Maint	State Maint.	Gift	Other UCO	Insurance	Diner Income	Total
Infrastructure	100.00%	8.47%	11.41%	0.00%	39.74%	9.24%	0.00%	68.92%
Residential	0.00%	34.99%	61.55%	0.00%	31.09%	0.00%	0.00%	7.97%
Science	0.00%	56.54%	25.69%	3.86%	27.59%	59.22%	100.00%	16.04%
Visitor	0.00%	0.00%	1.35%	96.14%	1.58%	31.54%	0.00%	7.08%
<b>Total</b>	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

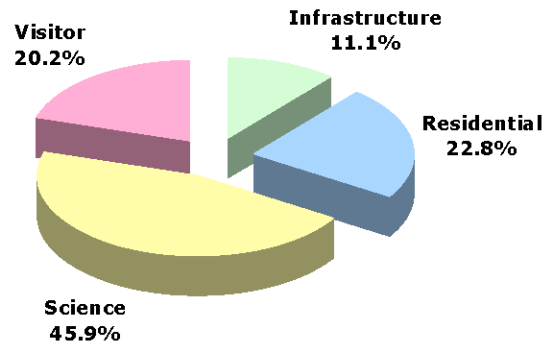


\*Includes committed funds for 2008 which have not been spent yet.

**Lick Observatory Facilities Project Comparison by Area Square Footage**  
**Fiscal Year 1996 - 2007)**  
(excluding Capital Renewal Funds)

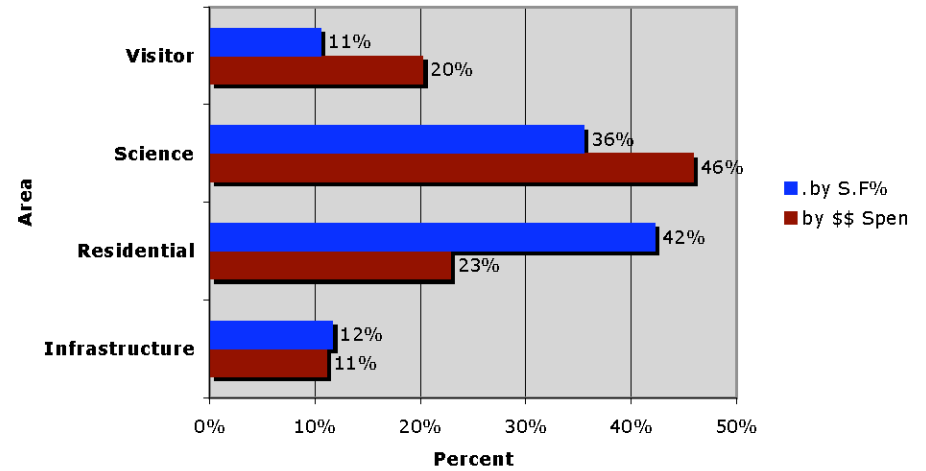
	Amount Expended	Capital Renewal Funds	Net Expenditures	% of Total	Square Footage	Expenditure/ SF	Annualized	% SF al
cture	\$ 5,973,124	\$ (5,637,514)	\$ 335,610	11.1%	12,412	\$ 27.04	\$ 2.08	
tial	\$ 690,955	\$ -	\$ 690,955	22.8%	44,925	\$ 15.38	\$ 1.18	
	\$ 1,389,928	\$ -	\$ 1,389,928	45.9%	37,761	\$ 36.81	\$ 2.83	
	\$ 613,302	\$ -	\$ 613,302	20.2%	11,211	\$ 54.71	\$ 4.21	
	\$ 8,667,310	\$ (5,637,514)	\$ 3,029,796	100%	106,309	\$ 28.50	\$ 2.19	

**MH Expenditure \$\$ Allocation by Area (excluding Capital Renewal funds)**



Area	Non-Capital Expenditures
Infrastructure	\$ 335,610
Residential	\$ 690,955
Science	\$ 1,389,928
Visitor	\$ 613,302
Total	\$ 3,029,796

**MH % of \$\$ Expended compared to % of Square Footage**



Area	% by \$\$ Spent	% by S.F.
Infrastructure	11%	12%
Residential	23%	42%
Science	46%	36%
Visitor	20%	11%
Total	100%	100%

Amounts allocations are estimated as PPC monitored the funds and there are not identifiers to calculate actual amounts spent for each phase of the infrastructure project. Maintenance Funds spent on annual repairs and not separately identified by Project are not included in this report.

LICK OBSERVATORY OPERATIONS  
Multi-Year Comparison Fiscal Years (1997 - 2007)  
VISITOR SERVICES  
Preliminary

Revenue	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Grand Total
Filming	\$ 10,630	\$ 2,750	\$ 2,957	\$ 1,600	\$ 9,800	\$ 200	\$ 5,100	\$ 1,600	\$ 3,450	\$ 2,100	\$ 1,775	\$ 41,962
Field Trips	\$ 3,500	\$ 1,500	\$ 3,350	\$ 2,800	\$ 2,200	\$ 2,450	\$ 2,450	\$ 3,850	\$ 3,500	\$ 3,150	\$ 1,750	\$ 30,500
Summer Visitor Program	\$ 730	\$ -	\$ -	\$ -	\$ 6,725	\$ 7,400	\$ 7,250	\$ 7,020	\$ 5,835	\$ 6,085	\$ 6,075	\$ 47,120
Concert	\$ 32,507	\$ 35,969	\$ 35,960	\$ 44,912	\$ 42,016	\$ 47,070	\$ 41,210	\$ 34,479	\$ 36,126	\$ 37,155	\$ 27,845	\$ 415,249
Gift Shop & Vending Operation	\$ 57,932	\$ 68,002	\$ 68,418	\$ 43,237	\$ 79,995	\$ 86,392	\$ 88,896	\$ 87,892	\$ 81,088	\$ 79,432	\$ 79,464	\$ 820,750
Visitor Center Misc		\$ 248										\$ 248
<b>Total Revenue</b>	<b>\$105,299</b>	<b>\$108,469</b>	<b>\$110,686</b>	<b>\$ 92,549</b>	<b>\$140,736</b>	<b>\$143,512</b>	<b>\$144,906</b>	<b>\$134,841</b>	<b>\$129,999</b>	<b>\$127,922</b>	<b>\$116,909</b>	<b>\$ 1,355,828</b>

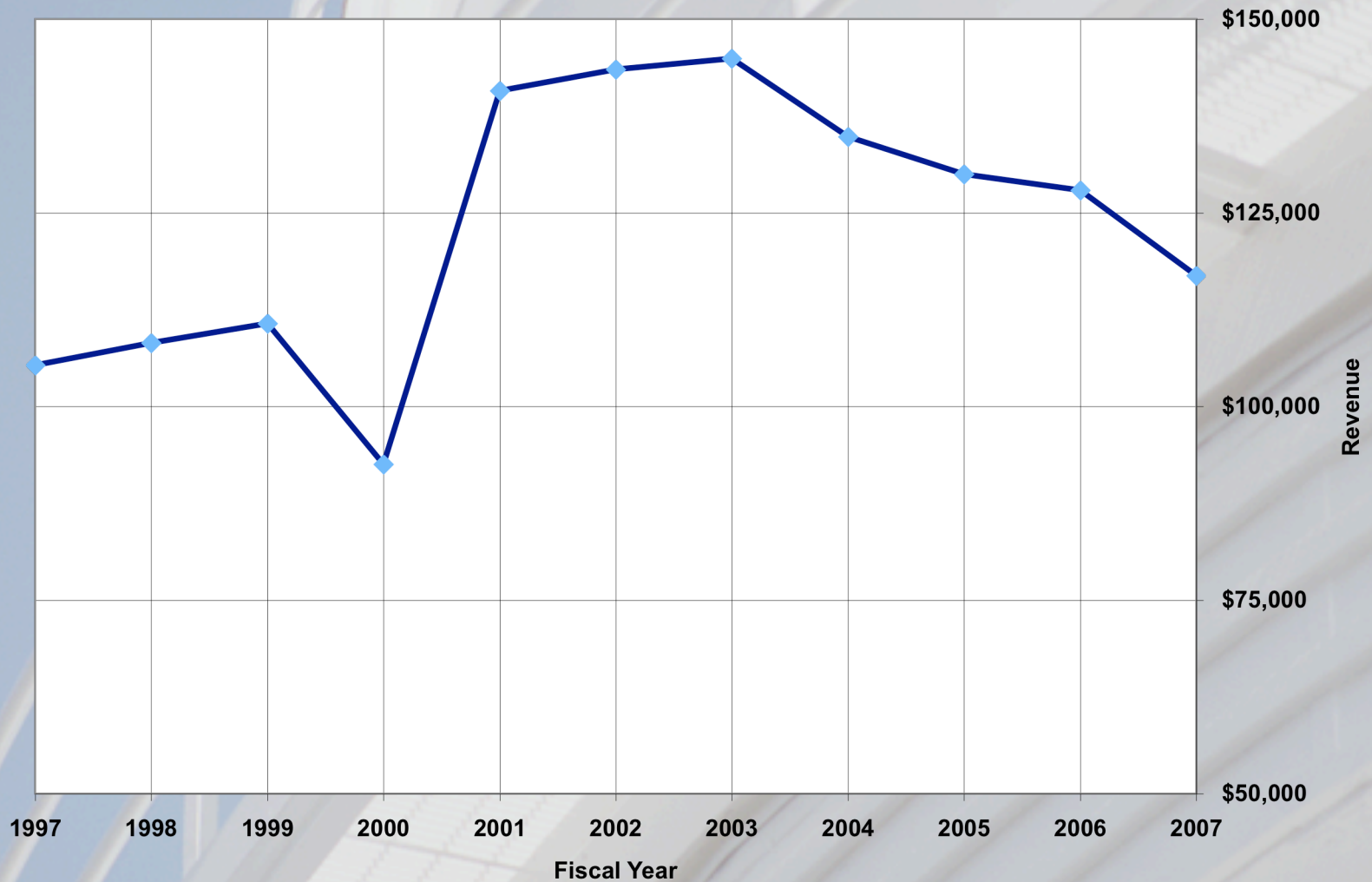
  

Expense Category	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Grand Total
Salary and Benefits Subtotal	\$ 44,775	\$ 45,970	\$ 43,386	\$ 46,016	\$ 50,802	\$ 45,680	\$ 49,613	\$ 47,872	\$ 48,474	\$ 62,783	\$ 65,409	\$ 550,780
Supplies and Materials Subtotal	\$ 61,663	\$ 79,908	\$ 53,624	\$ 66,844	\$ 85,802	\$ 80,707	\$ 77,492	\$ 81,814	\$ 74,801	\$ 85,343	\$ 57,944	\$ 805,943
Equipment Expense Subtotal	\$ 3,371	\$ 845	\$ (885)	\$ 4,221	\$ 1,304	\$ 1,432	\$ 7,913	\$ 13,728	\$ 2,838	\$ 5,973	\$ 713	\$ 41,453
<b>Total Expenditures</b>	<b>\$109,809</b>	<b>\$126,723</b>	<b>\$ 96,126</b>	<b>\$117,081</b>	<b>\$137,908</b>	<b>\$127,819</b>	<b>\$135,017</b>	<b>\$143,414</b>	<b>\$126,113</b>	<b>\$154,100</b>	<b>\$124,066</b>	<b>\$ 1,398,177</b>
<b>Net Income (Loss)</b>	<b>\$ (4,510)</b>	<b>\$ (18,254)</b>	<b>\$ 14,560</b>	<b>\$ (24,531)</b>	<b>\$ 2,828</b>	<b>\$ 15,693</b>	<b>\$ 9,889</b>	<b>\$ (8,574)</b>	<b>\$ 3,886</b>	<b>\$ (26,178)</b>	<b>\$ (7,157)</b>	<b>\$ (42,348)</b>

Notes:

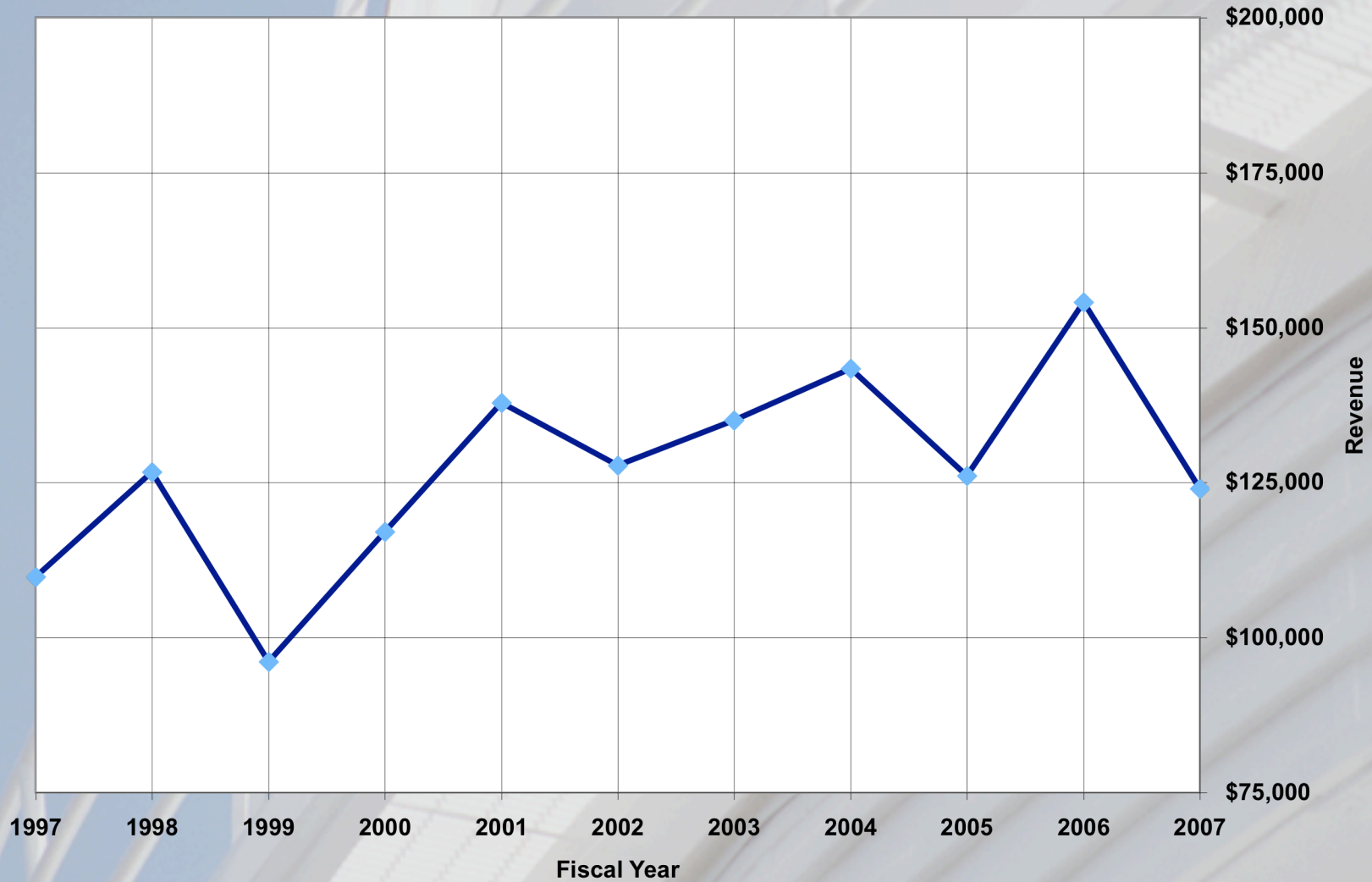
1. 2007 Concert and Visitor Programs data is incomplete as the series is still ongoing.
2. On a cash basis as UCSC general ledger does not allow for Cost of Goods Sold calculation. This differs from previously provided reports.

## Lick Observatory Visitor Services Expenditure Report Total Revenue Multi-Year Trend (1997-2007)



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## Lick Observatory Visitor Services Total Expenditure Report Multi-Year Trend (1997-2007)



Lick Observatory Strategic Planning Committee  
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# CURRENT & FUTURE ADMINISTRATIVE CHALLENGES

- Facilities preventive maintenance and renewal
- Personnel succession planning
- Emergency Services

# Facilities Preventive Maintenance & Renewal

- Current UC funding opportunities mean competing with UCSC academic priorities or borrowing \$\$
- Significant funding and expertise needed
- Aging facilities require extensive maintenance and/or replacement
- Most facilities work includes extensive planning and/or hazardous material abatement - even demolition
- Complex regulations continue to evolve regarding water plant, waste disposal, etc.

# Personnel Succession Planning

- Need to determine level and number of staff to support future operations
- Need to replace staff in “retirement window” (50% of the career staff are eligible to retire within 2 years)
- Recruiting and retaining excellent staff
- “Passing the baton”

# Emergency Services

- Services are provided for units on campus - not for LO (except police officer)
- LO location means higher risk and longer response time
- LO needs additional funding and a designated leader with expertise
- LO must create synergy with other entities (within and outside UC) to accomplish

### Mt. Hamilton Work Orders

Summary View- All Projects Year 2000-2007 and 2008 Proposed Projects

2000-2007 Mt. Hamilton Work Orders				
Full Code	Project Description	Current Status	Total \$\$ Original Budget Estimate	Total Expended or Committed thru 8/30/07
KW0002	Upgrade to MH Leach Controller	Completed	\$ -	\$ 1,687
KW0003	Upgrade to 40" CAT Encoder	Completed	\$ 6,000	\$ 27
KNCOXX	Upgrade to 120" Encoder	Completed	\$ -	\$ 78,943
KTILTM	Tiltmeter	Completed		\$ 12,791
KW0106	Upgrade to MH Spectrograph	Completed	\$ -	\$ 1,563
KW0108	Upgrade CAT drive	Completed	\$ 15,000	\$ -
KW0109	New Guide System for Coude TV	Completed	\$ 15,296	\$ 17,407
KW0110	Replace 120" Telescope Control	Completed	\$ 26,064	\$ 3,387
KW0111	Jones/Stover mini-project	Completed	\$ -	\$ 323,442
KW0214	Upgrades to MH AO System	Completed	\$ -	\$ 867
KW0317	Upgrade to PFCAM	Completed	\$ 17,200	\$ 37,380
KW0322	Upgrade to AO system encoders	Completed	\$ 40,707	\$ 210,039
KW042A	PF CAM Shroud	Completed	\$ 6,252	\$ 5,113
KW043E	Kast-Red CCD Controller (2 controllers were actually installed into the Nickel)	Completed	\$ 33,114	\$ 37,339
KW052A	POCO 120"	Completed	\$ 169,880	\$ 48,291
KW052B	120" Launch Telescope	Completed	\$ -	\$ 575
KW052C	Nickel Guider Optics Replacement	Completed	\$ 2,269	\$ 336
KW052D	Kast Red Camera drift	Completed	\$ 7,316	\$ 1,892
KW052E	PFCAM upgrade	Completed	\$ 60,025	\$ 64,159
KW052F	PFCam & ADC Servicing	Completed	\$ 15,736	\$ 5,463
KW062A	Dewar Farm		\$ 28,612	\$ 75,015
KW062B	KTL seivces over the Web	Completed	\$ 3,016	\$ 2,895
KW062C	UCAM controller for Nickel	Completed	\$ 23,130	\$ 8,454
KW072A	UCAM Power Modifications	Completed	\$ 1,500	\$ 2,834
KW072B	MH 120" Dome Wheel Axles		\$ 17,145	\$ 53,048
KW072C	MH 40" Shutter Repair		\$ 27,888	\$ 1,166
KW072D	MH 40" focus Repair		\$ 24,576	\$ 5,996
KW072E	MH 12" Telescope Refurbishment		\$ -	\$ 2,897
KW072G	KAST Motor Controller Upgrade 05/07		\$ 183,334	\$ 9,939
KW082A	KAST Optics Coating		\$ 9,098	\$ -
<b>Total without APF</b>			<b>733,157</b>	<b>1,012,943</b>
3	KFD,KFT,KFS	APF Dome, Telescope & Spectograph (total expended =total commitments of all funds)	\$8,200,000	\$ 10,150,198
<b>Grand Total Including APF</b>			<b>\$8,933,157</b>	<b>\$ 11,163,141</b>

**Notes:**

- 1 Budget showing 0 indicates either no estimate was done, or was estimated to be 0 cost.
- 2 Labor expended is from the data set 7/1/03 through 7/31/07 and is unaudited.
- 3 APF Project is shown as original submitted budget and total committed funds through 8/30/07

Proposed Mt. Hamilton Work Orders				
Full Code	Project Description		Total \$\$ Budget	Total Expended or Committed thru 8/30/07
pending (1)	Hamilton Upgrade	In Proposal	\$ 246,590	\$ -
pending (2)	KAST UCAM CCD Controller Upgrade	In Proposal	\$ 217,660	\$ -
KW082B-pending	3m Renishaw encoder measurements	Pending WO	\$ 9,745	\$ -
<b>Total</b>			<b>473,995</b>	<b>-</b>

**Notes:**

- 1 Based on Hamilton Upgrade Proposal January, 2007. ROM estimates will need to be fully costed for Proposal approval. These shown costs are without contingency.  
*Upgrade proposal includes the following:*  
-Modernization of the motor control electronics and software  
-Mechanical improvements (Guide TV rotation, Guide TV filter wheel, Stages for I2Cell and CAT mirror 5)  
-New Hamilton Dewar
- 2 Based on incomplete KAST Red CCD Proposal estimate in progress, Option 2 Parts, Option 1b Labor.

Still to be added: UPS/cabling costs, Dewar modifications & engineering study & Contingency

*Upgrade proposal includes the following:*

- Red side SNAP CCD
- Construction of new KAST Red side Dewar
- UCAM CCD Controller
- CCD Testing and Parameterization
- Integration of CCD, Dewar and UCAM controllers
- Dewar electronics box
- UCAM Controller mounting brackets
- Computer and Ancillary Systems & software (SPG)

- 3 Projects will need to be formally costed. Estimates represented above are at composite Federal rates, or P.I. estimated rates (based on June07).