

**U.S. Department of Energy
Summary Budget Page**

Summary

ORGANIZATION Brookhaven National Laboratory				Budget Page No.: 1 of 6	
TITLE LAB 11-572 Early Career - Measuring Dark Energy with Gravitational Lensing in the Dark Energy Survey					
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR Dr. E. Sheldon				Requested Duration: 60 (months)	
A. SENIOR PERSONNEL: PI/PD, Co-Pis, Faculty and Other Senior Associates (List each separately with title; A.6. Show number in brackets)		DOE Funded Person-mos.		Funds Requested	Funds Granted
		CAL	ACAD	by Applicant	by DOE
1. Dr. E. Sheldon		60.0		\$888,773	
2.		0.0		\$0	
3. 0		0.0		\$0	
4. 0		0.0		\$0	
5. 0		0.0		\$0	
6. 0 Others (List individually on Budget Explanation Page)				\$0	
7. 1 Total Senior Personnel (1 - 6)		60.0	0.0	\$888,773	
B. OTHER PERSONNEL (show numbers in brackets)		M.m(months)			
1. 1 Post Doctoral Associates		60.0		\$309,856	
2. 0 Other Professional		0.0		\$0	
3. 0 Graduate Students		0.0		\$0	
4. () Undergraduate Students		0.0		\$0	
5. () Secretarial - Clerical		0.0		\$0	
6. () Others (List individually on Budget Explanation Page)		0.0		\$0	
Total Salaries and Wages (A + B)				\$1,198,629	
C. Fringe Benefits (if charged as Direct Costs) Included in salary band rate				\$0	
Total Salaries, Wages and Fringe Benefits (A + B + C)				\$1,198,629	
D.					
Total Permanent Equipment				\$0	
E. Travel					
1. Domestic (incl. Canada and U.S. Possessions)				\$58,315	
2. Foreign				\$24,802	
Total Travel				\$83,117	
F. Trainee/Participant Costs					
1. Stipends (Itemize levels, types and totals on budget justification page)				\$0	
2. Tuition & Fees				\$0	
3. Trainee Travel				\$0	
4. Other (fully explain on justification page)				\$0	
Total Participants 0 Total Cost				\$0	
G. Other Direct Costs					
1. Materials and Supplies				\$166,500	
2. Publication Costs/Documentation/Dissemination				\$0	
3. Consultant Services				\$0	
4. Computer (ADPE) Services				\$0	
5. Subcontracts SUNY student				\$212,789	
6. Other Organizational Burden & Electric Power				\$174,039	
Total Other Direct Costs				\$553,328	
H. Total Direct Costs (A through G)				\$1,835,074	
I. Indirect Costs (specify rate and base) Composite G & A Rate of 43.15%. Material Burden rate of 6.5% on purchase and travel. See Budget Explanation tab for breakdown of rates.					
Total Indirect Costs				\$749,926	
J. Total Direct and Indirect Costs (H + I)				\$2,585,000	
K. Amount of any Required cost sharing from Non-federal Sources					
L. Total Cost of Project (J + K)				\$2,585,000	

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Year 1

ORGANIZATION Brookhaven National Laboratory				Budget Page No.: 2 of 6	
TITLE LAB 11-572 Early Career - Measuring Dark Energy with Gravitational Lensing in the Dark Energy Survey					
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR Dr. E. Sheldon				Requested Duration: 12 (months)	
A. SENIOR PERSONNEL: PI/PD, Co-Pis, Faculty and Other Senior Associates (List each separately with title; A.6. Show number in brackets)		DOE Funded Person-mos.		Funds Requested	Funds Granted
		CAL	ACAD	SUMR	by DOE
1. Dr. E. Sheldon		12.0			\$164,749
2.					
3.					
4.					
5.					
6. Others (List individually on Budget Explanation Page)					
7. 1 Total Senior Personnel (1 - 6)		12.0	0.0	0.0	\$164,749
B. OTHER PERSONNEL (show numbers in brackets)		M.m(months)			
1. 1 Post Doctoral Associates		12.0			\$57,437
2. Other Professional					
3. Graduate Students					
4. () Undergraduate Students					
5. () Secretarial - Clerical					
6. () Others (List individually on Budget Explanation Page)					
Total Salaries and Wages (A + B)				\$222,186	
C. Fringe Benefits (if charged as Direct Costs) Included in salary band rate				\$0	
Total Salaries, Wages and Fringe Benefits (A + B + C)				\$222,186	
D.					
Total Permanent Equipment				\$0	
E. Travel					
1. Domestic (incl. Canada and U.S. Possessions)				\$15,355	
2. Foreign				\$5,802	
Total Travel				\$21,157	
F. Trainee/Participant Costs					
1. Stipends (Itemize levels, types and totals on budget justification page)					
2. Tuition & Fees					
3. Trainee Travel					
4. Other (fully explain on justification page)					
Total Participants Total Cost				\$0	
G. Other Direct Costs					
1. Materials and Supplies				\$38,500	
2. Publication Costs/Documentation/Dissemination					
3. Consultant Services					
4. Computer (ADPE) Services					
5. Subcontracts SUNY student				\$40,000	
6. Other Organizational Burden & Electric Power				\$32,261	
Total Other Direct Costs				\$110,761	
H. Total Direct Costs (A through G)				\$354,104	
I.					
Indirect Costs (specify rate and base)	Composite G & A Rate of 43.15%. Material Burden rate of 6.5% on purchase and travel. See Budget Explanation tab for breakdown of rates.				
Total Indirect Costs				\$145,896	
J. Total Direct and Indirect Costs (H + I)				\$500,000	
K. Amount of any Required cost sharing from Non-federal Sources					
L. Total Cost of Project (J + K)				\$500,000	

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Year 2

ORGANIZATION Brookhaven National Laboratory				Budget Page No.: 3 of 6	
TITLE LAB 11-572 Early Career - Measuring Dark Energy with Gravitational Lensing in the Dark Energy Survey					
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR Dr. E. Sheldon				Requested Duration: 12 (months)	
A. SENIOR PERSONNEL: PI/PI, Co-PIs, Faculty and Other Senior Associates (List each separately with title; A.6. Show number in brackets)		DOE Funded Person-mos.		Funds Requested	Funds Granted
		CAL	ACAD	by Applicant	by DOE
1.	Dr. E. Sheldon	12.0		\$171,009	
2.		0.0			
3.	0				
4.	0				
5.	0				
6.	Others (List individually on Budget Explanation Page)				
7.	1 Total Senior Personnel (1 - 6)	12.0	0.0	0.0	\$171,009
B. OTHER PERSONNEL (show numbers in brackets)		M.m(months)			
1.	1 Post Doctoral Associates	12.0		\$59,619	
2.	0 Other Professional				
3.	0 Graduate Students				
4.	() Undergraduate Students				
5.	() Secretarial - Clerical				
6.	() Others (List individually on Budget Explanation Page)				
Total Salaries and Wages (A + B)				\$230,628	
C. Fringe Benefits (if charged as Direct Costs) Included in salary band rate				\$0	
Total Salaries, Wages and Fringe Benefits (A + B + C)				\$230,628	
D.					
Total Permanent Equipment				\$0	
E. Travel					
1. Domestic (incl. Canada and U.S. Possessions)				\$13,424	
2. Foreign				\$5,000	
Total Travel				\$18,424	
F. Trainee/Participant Costs					
1. Stipends (Itemize levels, types and totals on budget justification page)					
2. Tuition & Fees					
3. Trainee Travel					
4. Other (fully explain on justification page)					
Total Participants Total Cost				\$0	
G. Other Direct Costs					
1. Materials and Supplies				\$31,000	
2. Publication Costs/Documentation/Dissemination					
3. Consultant Services					
4. Computer (ADPE) Services					
5. Subcontracts SUNY student				\$41,240	
6. Other Organizational Burden & Electric Power				\$33,487	
Total Other Direct Costs				\$105,727	
H. Total Direct Costs (A through G)				\$354,779	
I.	Indirect Costs (specify rate and base)	Composite G & A Rate of 43.15%. Material Burden rate of 6.5% on purchase and travel. See Budget Explanation tab for breakdown of rates.			
Total Indirect Costs				\$145,221	
J. Total Direct and Indirect Costs (H + I)				\$500,000	
K. Amount of any Required cost sharing from Non-federal Sources					
L. Total Cost of Project (J + K)				\$500,000	

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Year 3

ORGANIZATION Brookhaven National Laboratory				Budget Page No.: 4 of 6	
TITLE LAB 11-572 Early Career - Measuring Dark Energy with Gravitational Lensing in the Dark Energy Survey					
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR Dr. E. Sheldon				Requested Duration: 12 (months)	
A. SENIOR PERSONNEL: PI/PI, Co-PIs, Faculty and Other Senior Associates (List each separately with title; A.6. Show number in brackets)		DOE Funded Person-mos.		Funds Requested	Funds Granted
		CAL	ACAD	by Applicant	by DOE
1. Dr. E. Sheldon		12.0		\$177,508	
2.					
3. 0					
4. 0					
5. 0					
6. Others (List individually on Budget Explanation Page)					
7. 1 Total Senior Personnel (1 - 6)		12.0	0.0	0.0	\$177,508
B. OTHER PERSONNEL (show numbers in brackets)		M.m(months)			
1. 1 Post Doctoral Associates		12.0		\$61,885	
2. 0 Other Professional					
3. 0 Graduate Students					
4. () Undergraduate Students					
5. () Secretarial - Clerical					
6. () Others (List individually on Budget Explanation Page)					
Total Salaries and Wages (A + B)				\$239,393	
C. Fringe Benefits (if charged as Direct Costs) Included in salary band rate				\$0	
Total Salaries, Wages and Fringe Benefits (A + B + C)				\$239,393	
D.					
Total Permanent Equipment				\$0	
E. Travel					
1. Domestic (incl. Canada and U.S. Possessions)				\$10,277	
2. Foreign				\$5,000	
Total Travel				\$15,277	
F. Trainee/Participant Costs					
1. Stipends (Itemize levels, types and totals on budget justification page)					
2. Tuition & Fees					
3. Trainee Travel					
4. Other (fully explain on justification page)					
Total Participants Total Cost				\$0	
G. Other Direct Costs					
1. Materials and Supplies				\$31,000	
2. Publication Costs/Documentation/Dissemination					
3. Consultant Services					
4. Computer (ADPE) Services					
5. Subcontracts SUNY student				\$42,518	
6. Other Organizational Burden & Electric Power				\$34,759	
Total Other Direct Costs				\$108,277	
H. Total Direct Costs (A through G)				\$362,947	
I. Indirect Costs (specify rate and base) Composite G & A Rate of 43.15%. Material Burden rate of 6.5% on purchase and travel. See Budget Explanation tab for breakdown of rates.					
Total Indirect Costs				\$148,053	
J. Total Direct and Indirect Costs (H + I)				\$511,000	
K. Amount of any Required cost sharing from Non-federal Sources					
L. Total Cost of Project (J + K)				\$511,000	

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Year 4

ORGANIZATION Brookhaven National Laboratory				Budget Page No.: <u>5 of 6</u>	
TITLE LAB 11-572 Early Career - Measuring Dark Energy with Gravitational Lensing in the Dark Energy Survey					
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR Dr. E. Sheldon				Requested Duration: <u>12</u> (months)	
A. SENIOR PERSONNEL: PI/PI, Co-PIs, Faculty and Other Senior Associates (List each separately with title; A.6. Show number in brackets)		DOE Funded Person-mos.		Funds Requested	Funds Granted
		CAL	ACAD	by Applicant	by DOE
1. Dr. E. Sheldon		12.0		\$184,253	
2.					
3. 0					
4. 0					
5. 0					
6. Others (List individually on Budget Explanation Page)					
7. 1 Total Senior Personnel (1 - 6)		12.0	0.0	0.0	\$184,253
B. OTHER PERSONNEL (show numbers in brackets)		M.m(months)			
1. 1 Post Doctoral Associates		12.0		\$64,237	
2. 0 Other Professional					
3. 0 Graduate Students					
4. () Undergraduate Students					
5. () Secretarial - Clerical					
6. () Others (List individually on Budget Explanation Page)					
Total Salaries and Wages (A + B)				\$248,490	
C. Fringe Benefits (if charged as Direct Costs) Included in salary band rate				\$0	
Total Salaries, Wages and Fringe Benefits (A + B + C)				\$248,490	
D. Mass Spectrometer					
Total Permanent Equipment				\$0	
E. Travel					
1. Domestic (incl. Canada and U.S. Possessions)				\$9,547	
2. Foreign				\$5,000	
Total Travel				\$14,547	
F. Trainee/Participant Costs					
1. Stipends (Itemize levels, types and totals on budget justification page)					
2. Tuition & Fees					
3. Trainee Travel					
4. Other (fully explain on justification page)					
Total Participants Total Cost				\$0	
G. Other Direct Costs					
1. Materials and Supplies				\$35,000	
2. Publication Costs/Documentation/Dissemination				\$0	
3. Consultant Services					
4. Computer (ADPE) Services					
5. Subcontracts SUNY student				\$43,836	
6. Other Organizational Burden & Electric Power				\$36,081	
Total Other Direct Costs				\$114,917	
H. Total Direct Costs (A through G)				\$377,954	
I. Indirect Costs (specify rate and base) Composite G & A Rate of 43.15%. Material Burden rate of 6.5% on purchase and travel. See Budget Explanation tab for breakdown of rates.					
Total Indirect Costs				\$154,046	
J. Total Direct and Indirect Costs (H + I)				\$532,000	
K. Amount of any Required cost sharing from Non-federal Sources					
L. Total Cost of Project (J + K)				\$532,000	

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Year 5

ORGANIZATION Brookhaven National Laboratory				Budget Page No.: <u>6 of 6</u>	
TITLE LAB 11-572 Early Career - Measuring Dark Energy with Gravitational Lensing in the Dark Energy Survey					
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR Dr. E. Sheldon				Requested Duration: <u>12</u> (months)	
A. SENIOR PERSONNEL: PI/PI, Co-PIs, Faculty and Other Senior Associates (List each separately with title; A.6. Show number in brackets)		DOE Funded Person-mos.		Funds Requested	Funds Granted
		CAL	ACAD	by Applicant	by DOE
1. Dr. E. Sheldon		12.0		\$191,254	
2.					
3. 0					
4. 0					
5. 0					
6. Others (List individually on Budget Explanation Page)					
7. 1 Total Senior Personnel (1 - 6)		12.0	0.0	0.0	\$191,254
B. OTHER PERSONNEL (show numbers in brackets)		M.m(months)			
1. 1 Post Doctoral Associates		12.0		\$66,678	
2. 0 Other Professional					
3. 0 Graduate Students					
4. () Undergraduate Students					
5. () Secretarial - Clerical					
6. () Others (List individually on Budget Explanation Page)					
Total Salaries and Wages (A + B)				\$257,932	
C. Fringe Benefits (if charged as Direct Costs) Included in salary band rate				\$0	
Total Salaries, Wages and Fringe Benefits (A + B + C)				\$257,932	
D.					
Total Permanent Equipment				\$0	
E. Travel					
1. Domestic (incl. Canada and U.S. Possessions)				\$9,712	
2. Foreign				\$4,000	
Total Travel				\$13,712	
F. Trainee/Participant Costs					
1. Stipends (Itemize levels, types and totals on budget justification page)					
2. Tuition & Fees					
3. Trainee Travel					
4. Other (fully explain on justification page)					
Total Participants Total Cost				\$0	
G. Other Direct Costs					
1. Materials and Supplies				\$31,000	
2. Publication Costs/Documentation/Dissemination					
3. Consultant Services					
4. Computer (ADPE) Services					
5. Subcontracts SUNY student				\$45,195	
6. Other Organizational Burden & Electric Power				\$37,451	
Total Other Direct Costs				\$113,646	
H. Total Direct Costs (A through G)				\$385,290	
I. Indirect Costs (specify rate and base) Composite G & A Rate of 43.15%. Material Burden rate of 6.5% on purchase and travel. See Budget Explanation tab for breakdown of rates.					
Total Indirect Costs				\$156,710	
J. Total Direct and Indirect Costs (H + I)				\$542,000	
K. Amount of any Required cost sharing from Non-federal Sources					
L. Total Cost of Project (J + K)				\$542,000	

Budget Explanation

Title	Name	Role	Year 1	Year 2	Year 3	Year 4	Year 5
			FTE/Year				
A . Personnel							
Salary is calculated on an annual salary							
Associate Physicist Dr. E. Sheldon		Will develop software pipelines to measure gravitational shear, execute these on all DES data and analyse the results to constrain cosmology.	1.00	1.00	1.00	1.00	1.00
Total FTE's			1.00	1.00	1.00	1.00	1.00
B. Other Personnel							
Salary for Post Docs are calculated on an annual salary with a shared laboratory component of .20 fte							
			Year 1	Year 2	Year 3	Year 4	Year 5
Post Doc	TBD	Will analyze the gravitational shear and other physical probes to constrain cosmology	1.00	1.00	1.00	1.00	1.00
Total FTE's			1.00	1.00	1.00	1.00	1.00
Grand Total FTE's			2.00	2.00	2.00	2.00	2.00

C. Fringe is included in the labor band rates.

Band rates are escalated 3.8% annually

D. Low Value Equipment (under 500K)

Year 1 4K for Disk Storage and 27K for Compute Servers, 3.5 K for computer and software for post doc

Year 2 4K for Disk Storage and 27K for Compute Servers

Year 3 4K for Disk Storage and 27K for Compute Servers

Year 4 4K for Disk Storage and 27K for Compute Servers

Year 5 4K for Disk Storage and 27K for Compute Servers.

E. Travel

The DES collaboration is multi-national and Dr. Sheldon and post doc will most likely travel abroad to the collaboration meetings. Dr. Sheldon plans to spend 3 weeks each summer at a workshop in the US, such as those held at Aspen & Santa Fe. Further travel will involve attending a few conferences per year across the US for both Sheldon and post doc. Dr. Sheldon will also make regular trips to the University of Pennsylvania to collaborate with Mike Jarvis and Bhuvnesh Jain.

F. Trainee/Participant Costs

G. Other Direct Costs

Subcontracts based upon prior year estimate with a 3.1% escalation in the out years

Organization burden is assessed on salary to pay for Physics Department administrative costs at 12.6%

		Year 1	Year 2	Year 3	Year 4	Year 5	
I. Indirect Costs		%	%	%	%	%	
Composite rate	BNL Material Bu	6.50	6.50	6.50	6.50	6.50	applied to purchases and subcontracts
	PO Electric power	1.92	1.92	1.92	1.92	1.92	applied to direct salary
	BNL Common G&A	29.90	29.90	29.90	29.90	29.90	applied to direct salary , organizational burden, purchased goods, travel, subcontracts & material burden
	BNL Traditional G&A	8.25	8.25	8.25	8.25	8.25	applied to direct salary , organizational burden, purchased goods, travel, subcontracts & material burden
	BNL LDRD Burden	5.00	5.00	5.00	5.00	5.00	applied to direct salary , organizational burden, purchased goods, travel, subcontracts & material burden
43.15%							