

## **BNL BUDGET JUSTIFICATION**

### **LAB 12-751 Early Career Awards: Measuring Dark Energy with Gravitational Lensing in the Dark Energy Survey**

#### **A. Senior Personnel:**

Erin Sheldon, Physicist, Brookhaven National Laboratory

Will develop software pipelines to measure gravitational shear, execute these on simulations and DES data, and analyse the results to constrain cosmology.

All salaries include an escalation rate of 3.6% in years 2-5.

#### **B. Other Personnel:**

(1) Research Associate during each of the five years.

The RA will process data, develop measurement algorithms, and publish constraints on Dark Energy.

All salaries include an escalation rate of 3.6% in years 2-5.

#### **C. Equipment:**

13 computers approximately \$10,600 each, plus overhead.

This price per computer is higher than standard due to the inclusion of three high performance GPUs in each machine.

1 personal computer for use by a research associate hired in the third year, fully dedicated for work on this Early Career award.

#### **D. Travel:**

Foreign: None

Domestic: One trip per year for Sheldon and research associate inside the US for a Dark Energy Survey collaboration meeting. Three weeks per year spent at a summer institute such as the Aspen Institute for Physics, one person. Travel to visit collaborators at the University of Pennsylvania and at SLAC, Sheldon and research associate

Two to three trips to cosmology conferences per year for Sheldon and research associate..

#### **E. Other Direct Costs:**

None

#### **F. Indirect Costs:**

Materials Burden – This burden is calculated at the rate of 7.5% on the total cost for materials, supplies, travel and subcontracts. This includes \$4,000 for postdoc relocation in year 3.

Organizational Burden: This burden is calculated at the rate of 12.6% of Total Salary plus Fringe Benefits. This expense covers the costs for Departmental Management, financial and business management support services and environmental safety and health facility support services.

Space Charge: This charge is a direct charge for office space determined by average square footage of an office. This expense covers the cost for the maintenance of building space and equipment.

Electric Power: The cost for electric power is calculated at the rate of 1.92% of Total Salary plus Fringe Benefits. Note: Electric Power is exempt from BNL G&A.

General and Administrative (G&A) Overhead is assessed on all BNL research activities as a percentage rate against total modified costs less electric power. G&A consists of the following segments: Traditional G&A (8.25%), Common Support G&A (29.9%), and LDRD burden (5%).