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**BUDGET EXPLANATION FOR SBIR/STTR APPLICATIONS**

**GRANTEE: Booth Rocketry**  
**GRANT APPLICATION NO.: WS00050300**

Please provide detailed information to support each element of the proposed budget. If an element is not applicable, please indicate. **Please ensure that the figures provided in this explanation are consistent with those reflected on your proposed budget pages.**

**A/B. SENIOR/KEY PERSON & OTHER PERSONNEL \$87,761**

1. Identify each position (“Role in Project”) to be supported under the proposed award, including the name of the Principal Investigator and other Key Personnel. Other personnel shall be identified by name to the extent possible.

Dr. Nichelle Nichols is the Chief of Research and Development at Booth Rocketry, the applicant small business, and also serves as PI, technical contributor, and supervisor for other company personnel.

Ms. Christine Chappel serves as the Coordinator of Research and Development at Booth Rocketry, the applicant small business, and also serves as the Project Coordinator for this project/application and will assist in managing and synthesizing the efforts and research of the 2 proposed post-docs included in our budget.

We are requesting two post-docs to assist Dr. Nichols with the research associated with this application.

2. Briefly justify the need for each individual proposed. **(Note: If your budget includes any proposed labor that is primarily administrative or managerial in nature, particular effort should be made to support such labor, as these positions are not customarily proposed or recorded as direct labor charges to a specific award.)**

Dr. Nichols has extensive experience with rockets and high-powered solar cells. She has worked in this field for over 20 years and is a recognized expert. She has developed the research plan necessary to carry out this work and has the scientific expertise and background to complete the project.

Ms. Chappel has worked with Book Rocketry for over 10 years and serves as the lead research coordinator on many projects. She has significant experience synthesizing research in this area and is essential for carrying out the project in an efficient manner. She has worked on many projects involving high powered solar cells and will be able to provide guidance to the post-doc researchers we have included in our budget.

The post-docs will carry out research as directed by Dr. Nichols and will serve to assist her in the research and development associated with this project.

3. State the number of hours to be expended, and the hourly labor rate, for each position proposed.  
Dr. Nichelle Nichols  
Hours expended: 704  
Hourly labor rate: \$50

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Ms. Christine Chappel, PMP  
Hours expended: 480  
Hourly labor rate: \$30

2 post-doctoral positions  
Hours expended (each): 280  
Hourly labor rate (each): \$25

4. Identify the basis for the labor rate(s) proposed and explain why it is reasonable for the market (e.g., education, skills, experience, salary survey, etc.). **Please note it is not sufficient to state only that the proposed compensation is an individual’s actual salary; however, that should be addressed.**

Dr. Nichelle Nichols

The average salary for a PhD in aerospace engineering at a Research-1 institution is well over \$225,000 per calendar year, or \$4,326 per week, approximately \$108 per hour. Given the expertise of Dr. Nichols, her academic background, and specialized skills in this area, the hourly rate of \$50 is very reasonable.

Ms. Christine Chappel, PMP

Ms. Chappel is a certified PMP and has over 10 years of experience managing and coordinating research projects. \$30 per hour is well below the current market rate for a PMP in aerospace engineering.

2 post-doctoral positions at hourly rate of \$25 each

Competitive rates for aerospace engineering post-doctoral positions are slightly higher in the area in and around New York. However, given Dr. Nichols’ reputation in the field and the nature of the project, it should not be difficult to hire 2 persons at this rate.

5. FRINGE BENEFITS - If separately proposed, indicate the basis for the rate used or the computation applied, including the types of benefits to be provided. If the rate or computation protocol used has been approved by a Federal agency, provide a copy of the agreement.

Fringe Benefits for Dr. Nichols and Ms. Chappel are at 37% and the post-doc rates are 41%. These rates cover FICA contributions, health insurance, including eye, disability, and dental, and paid time off. The rates for the post-doctoral positions are higher as they are temporary employees and the coverage costs are more expensive as a result. Our company offers extensive benefits to its employees.

**C. EQUIPMENT**

**\$ 0**

1. Briefly itemize and justify the need for each item of equipment to be purchased. (*Note: Equipment is defined as any standalone item that does not require integration to work and has a per unit cost of \$5000 or more. Items that do not meet this criteria should be included in section F.1 Materials and Supplies.*)

N/A

2. Indicate the estimated unit cost for each item to be purchased.

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3. Provide the basis for the cost estimates (e.g., vendor quotes, catalog prices, invoices, past experience purchasing similar or like items, etc.). ***In addition to the basis for cost estimates, please provide documentation to support the cost for any equipment with a purchase price of \$20,000 or more per unit).***

**D. TRAVEL \$ 3000**

1. Briefly justify the need for all proposed travel.

It is anticipated that in the course of the research and development, two trips to research labs in Arizona will be required. Dr. Nichols and the two post-docs will undertake these visits to test the development of newly developed solar cells as the research lab in Arizona is the best suited facility to test their performance.

2. Indicate the estimated number of travelers, number of trips, dates, points of origin and destination.

2 roundtrips between New York, NY and Phoenix, Arizona  
 1 person on trip #1, 3 persons on trip #2  
 2 nights per trip  
 Trips to occur in May and in August

3. For each trip, itemize the transportation and/or subsistence costs for each individual traveling.

Dr. Nichols initial trip to Arizona to establish research parameters and procedures - May  
 Airfare, roundtrip New York, NY - Phoenix, AZ: \$308  
 Lodging, \$157 per night (GSA rate) @ 2 nights = \$314  
 Per diem \$64 (GSA rate), 2 days = \$128  
 Total \$750

Dr. Nichols 2<sup>nd</sup> trip to Arizona - August  
 Airfare, roundtrip New York, NY - Phoenix, AZ: \$308  
 Lodging, \$157 per night (GSA rate) @ 2 nights = \$314  
 Per diem \$64 (GSA rate), 2 days = \$128  
 Total \$750

#1 Post-doctoral trip to Arizona - August  
 Airfare, roundtrip New York, NY - Phoenix, AZ: \$308  
 Lodging, \$157 per night (GSA rate) @ 2 nights = \$314  
 Per diem \$64 (GSA rate), 2 days = \$128  
 Total \$750

#2 Post-doctoral trip to Arizona - August  
 Airfare, roundtrip New York, NY - Phoenix, AZ: \$308  
 Lodging, \$157 per night (GSA rate) @ 2 nights = \$314  
 Per diem \$64 (GSA rate), 2 days = \$128  
 Total \$750

4. Specify the basis for computation of each type of travel expense (e.g., current airline ticket quotes, past trips of a similar nature, federal government or organizational travel policy, etc.).

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Airfare - Expedia  
Lodging - GSA rates for Phoenix, Arizona  
Per diem - GSA rates for Phoenix, Arizona

**F. OTHER DIRECT COSTS**

1. Materials and Supplies \$ 30,000

Itemize materials and supplies estimates by type/nature of expense. (Note: Materials and supplies should not include machining and fabrication costs. Those costs should be included in section F.7 Alterations and renovations e.g. machining and fabrication).

Lab materials, solar cells, widgets, rocket panels

b. Provide the basis for cost estimates or computations (e.g., vendor quotes, prior purchase of similar or like items, etc.).

Vendor quotes and previous purchasing costs

2. Publication Costs \$ 0

a. Itemize publication cost estimates by type/nature of expense.

b. Provide the basis for cost estimates or computations (e.g., vendor quotes, prior purchase of similar or like items, etc.).

3. Consultant Services \$ 10,000

a. Identify the individual/firm proposed and the professional services to be provided.

New York Solar Consulting will provide guidance on type of solar conversion used and conduct assessment of best manufacturing company to use for production.

b. Provide a brief justification for the use of the party selected.

New York Solar Consulting is a recognized leader in the field and has significant contacts within the industry and will be able to provide the most cost efficient, and productive, services to this project.

c. State the number of hours to be devoted to the project, and the hourly rate to be charged to this award. (Note: Consultant documentation should include a signed letter from the consultant confirming his/her agreement to perform the labor hours proposed, at the payment rate listed, and should provide verification or a statement that this rate is consistent with, or more favorable than, recent billings for similar work, e.g., copies of paid invoices.)

New York Solar Consulting will devote approximately 133 hours to this project, at the hourly rate of \$75 per hour. This is their standard cost for scouting and establishing manufacturing contacts for customers. We have included a letter from New York Solar Consulting confirming our agreement, the payment rate, and the nature of the consulting work to be performed. We have verification from past consulting

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agreements with New York Solar that this rate is either equivalent or reduced to rates we have paid in the past.

4. ADP/Computer Services \$ 5000  
a. Briefly itemize and justify the need for funds to support computer services.

ADP computer services will be needed to process and analyze the data created in the R&D of this project. The project will generate a significant amount of data that will need to be analyzed to create functioning models.

- b. Provide the basis for cost estimates or computations (e.g., vendor quotes, prior purchase of similar or like services, etc.).

vendor quotes and prior purchase of similar services

5. Subawards/Consortium/Contractual Costs (Including Research Institutions and any Other Subcontractors)

\$ 0

- a. Describe the support and/or the services to be acquired.
- b. Provide a brief justification for the use of the research institution or other subcontractor selected.
- c. State the amounts of time to be devoted to the project, and the costs that will be charged to this award.
- d. For professional services contracts, state the number of hours to be devoted to the project, and the costs that will be charged to this award.
- e. A budget and budget support documentation, formatted in the same or similar manner as your own, must be obtained from the research institution or other subcontractors. **Submit the research institution or other subcontractor documentation together with your written review comments confirming your determination of the reasonableness and acceptability of each element of the proposed budget.**

**Also, if the research institution is a DOE National Laboratory, DOE Order O 481.1C "WORK FOR OTHERS (NON-DEPARTMENT OF ENERGY FUNDED WORK)" Section 4.c. requires that a determination be made by and certified in writing by the laboratory's cognizant DOE Contracting Officer indicating that the laboratory is in compliance with the cited order. Generally the DOE Contracting Officer will issue a letter containing their determination. This process can take several weeks. It is suggested that you contact the laboratory and begin the approval process as soon as possible.**

6. Equipment or Facility Rental/User Fees \$ 20,000

- a. Briefly itemize and justify the need for each item of equipment or facility to be rented or otherwise utilized.

Rental fees associated with the production of high-powered solar cells. Our firm does not have

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sufficient equipment to produce the cells, once designed, and we need to produce a sufficient number of the cells to approach manufacturers and investors for the commercialization aspects of the project.

b. Indicate the estimated unit cost (rent or user fee) for each item of equipment or facility.

\$10,000 user fee for solar cell designer

\$10,000 user fee for solar cell casing designer

c. Provide the basis for the cost estimates (e.g., vendor quotes, catalog prices, invoices, past experience with similar or like items or facilities, etc.).

vendor quotes and prior purchase of similar services

7. Alterations and renovations (e.g. machining and fabrication) \$ 0

List items by major type and provide justification for the proposed cost (e.g., vendor quotes, prior purchase of similar or like items, etc.).

8. Other/Miscellaneous

List any other proposed costs that were not captured above.

**H. INDIRECT COSTS \$ 38,941**

1. State the rate(s) and base(s) proposed in your budget. The base should be described (for example, "Total Direct Costs") and listed as a dollar amount.

We propose an indirect cost rate of 25% on the Total Direct Costs included in our budget. Please note that this amount (\$38,941) is less than 50% of the total salaries and wages of all personnel included in our budget.

2. a. Are the rate(s) and base(s) provided above approved by a Federal agency for the period of performance proposed for this award?

No.

b. If yes, identify the source of approval and provide a copy of the agreement.

N/A

c. If no, state whether the amount requested is based on a rate(s) and base(s) which have been accepted for estimating purposes by DOE or another Federal agency for the period of performance for this award. If so, identify the agency, and office, and provide any correspondence indicating acceptance and/or contact information for the agency. (Note: DOE will have to determine whether this is a sufficient basis for accepting your proposed rate(s) and base(s). More information may be required, possibly including the information requested under 3. below.)

As the amount requested is less than 50% of the total salary and wages included in the budget, DOE indicates that the rate and amount is acceptable.

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3. If the rate(s) and base(s) proposed in your budget are not approved by a Federal Agency or accepted by a Federal Agency for estimating purposes, state the basis for the amount requested. Provide documentation supporting the computation of the rate(s) proposed. **(Please see the “Guidance for Indirect Rate Submission” (Guidance Ind. Rate.doc) and model indirect rate proposal (Ind. Rate Model.xls) provided to you for guidance.)**

The basis for the rate is acceptable under the terms of the DOE SBIR/STTR Program.