View results

Respondent

18 Peter Giannetos

01:54
Time to complete

Instructions:

Please adhere to the session word counts. Project leads must attend one SSC working group meeting post step 1 application submission. If you have any questions about the application process, please contact the SSC at Sustainability-Committee@illinois.edu.

1. Have you attended an SSC working group meeting? If not, please attend an SSC Working Group and present your project. Once working group attendance is complete, please return to complete your application.

   https://studentengagement.illinois.edu/student-sustainability/ssc/calendar/ *

   - (●) Yes
   - ( ) No

2. Please enter the date of the working group meeting you attended. As a reminder, the working group meetings are structured as follows

   - Energy + Transportation and Infrastructure working group.
   - Food & Waste + Land, Air, and Water working group.
   - Education and Justice working group.

   *

   9/27/2023

3. Date of Application *

   10/18/2023

4. Project Name: *

   SPARK

5. Total Funding Requested From the SSC. *

1980

Please enter a number less than or equal to 10000

6. Project Lead Full Name: *

Peter Giannetos

7. Project Lead University Email Address *

pg19@illinois.edu

8. Project Abstract: (In less than 100 words, briefly describe the project.) *

The Safe Pyrotechnic Analyzer Reusable Kit (SPARK) aims to be a reusable pyrotechnic circuitry tester to significantly reduce the amount of disposable single use electrical matches (e-matches) frequently used in amateur rocketry, and other pyrotechnic adjacent activities. SPARK can act as a stand-in to e-matches for repeatedly ground testing pyrotechnic electronics leading to an increase in system safety and reliability, and a decrease in e-match waste. Furthermore, SPARK will be developed as an open source right to repair friendly hardware platform. At minimum, 25 students will work with or on the development of SPARK.

9. Project Category *

- ○ Education & Justice
- ○ Energy
- ◉ Food & Waste
- ○ Land, Air & Water
- ○ Transportation & Infrastructure

All rolling application require a faculty/staff advisor.

Faculty and Staff Advisor

10. Full Name: *

Robyn Woollands

11. RSO/Department *

Illinois Space Society

12. University Email Address: *

rmw@illinois.edu

13. Do you have additional members? *

- (●) Yes
- ( ) No

Project Team Member

Additional Member

14. Full Name: *

Navya Meka

15. RSO/Department *

Illinois Space Society

16. University Email Address: *

navyasm2@illinois.edu

17. Do you have additional members? *

- (●) Yes
- ( ) No

Project Team Member

Additional Member

18. Full Name: *

Freya Bansal

19. RSO/Department *

Illinois Space Society

20. University Email Address: *

fbansal2@illinois.edu

UIUC Financial Contact

Financial Contact (Must be full-time UIUC employee)

21. Full Name: *

Laura Gerhold

22. RSO/Department *

Aerospace Engineering Department

23. University Email Address: *

gerhold@illinois.edu

Project Questionnaire:

24. Is this project student led? *

- (●) Yes
- ( ) No

25. If applicable, have you received approval from Facilities & Services and/or site manager? *

- ( ) Yes
- ( ) No
- (●) N/A

26. If additional funding is required, do you have a plan for ongoing funding beyond SSC? (SSC cannot guarantee ongoing financial support) *

- (●) Yes
- ( ) No

27. Beyond SSC, do you have sources contributing funding or support (ex. staff time, external grants, etc.) to this project? *

- ( ) Yes
- (•) No

28. Have you applied for SSC funding previously? *

- ( ) Yes
- (•) No

29. Project Timeline:
(SSC funding agreements remain active for two years. List your project's timeline and major milestones.) *

- Initial prototype done by end of Fall 2023 semester
- Second prototype done by middle of Spring 2024 semester
- Final prototype done by end of Spring 2024 semester
- A more detailed timeline can be found in our budget outline.

30. Project Description:
(In 250 words or less, describe your project. What does your project hope to accomplish? What are your project's deliverables?) *

This project aims to create a small USB device the size of a soda can that can be attached to preexisting electronic devices, such as rocketry altimeters, to help test and validate their pyrotechnic circuitry by acting as a reusable electrical match (e-match). From the device's point of view SPARK will appear as a regular wire that it can send current through to "ignite" an e-match. SPARK will then measure the electrical characteristics such as current and then break the circuit as a regular e-match would. SPARK will then automatically reset itself for another test and provide the user with telemetry data over USB or WiFi so they can validate that their system would work nominally with a real e-match. In the end we plan to deliver at minimum one initial prototype device, a second prototype depending on the initial design's success, and one final revision. Additionally, we plan to create any supporting software or user manuals needed to operate the device.

31. Environmental Impact:
(In 200 words or less, how does your project increase environmental stewardship at UIUC? If applicable, what is the carbon, water, waste, and/or energy savings?) *

Our team launches about 5 times per academic year and before every launch our team goes through approximately 20 electrical matches for ground testing. By employing SPARK for the majority of our on campus electronics testing we would be able to reduce our consumption of e-matches by approximately 50%. This would save charred copper and plastic waste from entering landfills along with reducing CO2 emissions associated with the combustion of e-matches which are often made from black powder.

32. iCAP Objective Correspondence:
(In 200 words or less, does your project aim to advance one or more of the Illinois Climate Action Plan's (iCAP) objectives? If so, how?)

A full list can be found here: https://icap.sustainability.illinois.edu/objectives

- Key Objective: 5.2 Reduce Landfill Waste: By creating a reusable e-match alternative we are preventing additional e-matches from ending up in landfills.
- Key Objective: 5.3 Establish a Culture of Reuse: By creating an open source right to repair friendly design we are encouraging users to repair or modify their equipment rather than outright replace it.
- Key Objective: 6.1 Broaden Sustainability Education: This project provides students with the opportunity to learn about waste management and how engineering can be used to tackle sustainability challenges.

33. Student Impact:
(In 200 words or less, how will this project benefit students? How will students be involved with this project? What educational components are in your project?)
*

Spaceshot, a technical project within the Illinois Space Society, is a team of about 100 students racing to be the first student collegiate team to build and launch a two-stage rocket to the edge of space. Our Spaceshot Avionics team of roughly 60 students will have the opportunity to receive hands-on learning by partaking in the system planning, electrical design, manufacturing, software development, and testing of SPARK. Indirectly, many more students on our team will work with the systems that SPARK helped test and validate. Since SPARK is planned to be an open source project we plan to spread its design throughout the amateur rocketry community and to student rocketry teams at other universities nationally and internationally.

34. Please see attached file, please be very descriptive and fill out the budget and timeline Excel sheet, and submit it below.

https://studentengagement.illinois.edu/student-sustainability/ssc/docs/SSC-Supplemental-Budget-Timeline.xlsx

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SPARK-Budget_Peter Giannetos.xlsx