



وكالة الإمارات للفضاء  
UAE SPACE AGENCY



كليات التقنية العليا  
HIGHER COLLEGES OF TECHNOLOGY

## ENERGY IN SPACE EXPERIMENT PROPOSAL FORM

### IMPORTANT NOTICE

Your proposal should be understandable to a panel of judges who are from various fields and who have scientific knowledge of the relevant competition fields.

Before you submit your proposal please ensure that you have read all available information on the challenge homepage and completed all sections of this form with full information and details.

To submit your proposal, you need to register at the ishuttle <https://ishuttle.space.gov.ae/>, and submit your proposal in the step 4 of "Submit ideas" section on the challenge homepage.

<b>Specify the selected major area of the recommended tentative research areas</b>	<input type="checkbox"/>	Space-Based Smart Grids
	<input type="checkbox"/>	Solar Power-Based Space Energy
	<input type="checkbox"/>	Solar Satellite
<b>Acronym of the full experiment title</b>		
<b>Title of experiment</b>		

## Organizational Management & Scientific Approach

<b>Student Team Information</b>	
<b>Team Leader</b> <i>Include name, nationality, school, level of study, field of specialized study, academic year, date of birth and any additional team roles of the leader if applicable.</i>	
<b>Contact Information of Team Leader</b> <i>Include at least the phone number, email address and postal address.</i>	
<b>Team Members</b> <i>Include name, nationality, school, level of study, field of specialized study, academic year, date of birth, and expected team role(s).</i>	

<b>Scientific approach to the design and execution of the experiment</b>	
<b>Background Research</b> You should provide a brief overview on relevant past studies relevant to your proposed experience. It should inform your proposed work either by identifying areas for future research or by identifying limiting factors in your own research.	
<b>Why you selected this experiment?</b> <i>Write a basic overview what you will essentially do in your experiment. You should also research past experiments that support or attempt to disprove your working theory.</i>	
<b>How you intend to accomplish the goal you set</b> <i>Provide a brief summary of the methods and techniques that you are going to employ during the experimental procedures. Outline what you expect the results will be, based off what you have learned through your background research.</i>	
<b>Explain why this research should be done.</b> <i>Here, you should clearly show why the project is relevant. What is important about it? What does it add to the field? Why should we care? Make sure that you can communicate the scientific value of your experiment.</i>	

<p>What is the scientific and/or technical objective of your experiment?</p> <p><i>This description should outline the scientific/technical question addressed, the assumptions made and the research methods chosen to solve the question.</i></p>	
<p>Why do you need the environment aboard the ISS?</p> <p><i>Clarify, why your experiment needs the microgravity environment provided by the ISS</i></p>	
<p>What environmental characteristics your experiment require?</p> <p><i>E.g. level of micro-gravity, temperature, humidity, light, vacuum, pressure, sterile etc.</i></p>	
<p>Where did you get the idea from?</p> <p><i>E.g. science fair, clubs at your school, already performed similar experiment, scientific publications, books.</i></p>	

<p><b>Description of the experiment design and execution</b></p>	<p><i>This part should link the scientific objective(s) to the experiment itself. Explain how you are going to fulfil the scientific goal</i></p>
<p>What parameters do you want to measure?</p> <p><i>In this section you'll provide a precise, in depth description of how you plan to test your hypothesis and what tools or materials you'll need to do so. Summarize your experimental design, specifically referring to how you will control and replicate the experiment. Also list the equipment and materials that you will need for undertaking your experiment.</i></p>	
<p>How do you want to take measurements?</p> <p><i>List the equipment, apparatus and materials that you will need for undertaking your experiment. Indicate also if any human or robot involvement is needed.</i></p>	
<p>Describe the process flow of your experiment.</p> <p><i>Summarize your experimental design, specifically referring to how you will control and replicate the experiment.</i></p>	
<p>How do you evaluate the data collected after the experiment?</p> <p><i>Summarize the method of storage, transmission, analysis and evaluation of the collected data as applicable</i></p>	

<b>Expected support from internal/external resources</b>	
How will you organize/distribute work within your team? Please note that you are responsible for all aspects of your experiment (science, safety, mechanical & electrical engineering, software, etc.)	
Are you scientifically and technically supported by your school and/or subject teachers? <i>Please indicate the name of the school(s) and teacher(s). It is mandatory for every experiment to have someone at your school supporting you.</i>	
Do you have access to a workshop or a laboratory that meets the fabrication and testing needs of your experiment?	
Do you have all the material and equipment that is needed for your experiment? If not, how do you plan to obtain it? How do you plan to finance your expenses?	
Who else will support you (sponsors, others)?	

<b>Outreach Program</b>	
<i>How are you planning to present your experiment to the public? E.g. newspaper, local radio, webpage, social media, presentation at the university.</i>	

## Experimental Set-up & Technical Information

<b>Mechanics</b>	
<p>Describe your experimental set-up. <i>Describe and outline the preliminary set-up of your experiment. Include at least a sketch or block diagram of the experiment (CAD drawings are optional).</i></p>	
<p>Does your experiment fit into the 100 mm x 100 mm x 152.4 mm experiment container? <i>Take note that the inner dimensions of the container are slightly smaller. For more details please refer to the technical drawings on the website.</i></p>	
<p>Estimate the mass of your experiment (kg). <i>Do not include the experiment container in your mass budget</i></p>	

<b>Electrics/Electronics</b>	
<p>Will you use the 5 V DC supplied by the USB connector of the experiment container?</p>	
<p>Do you have power requirements beyond the USB connector (i.e. batteries)? What are they used for? Estimate the electrical consumption of your experiment (Ah or Wh).</p>	
<p>Do you use any equipment with high inrush currents? If so estimate the current (A). <i>E.g. Motors may need high inrush currents which exceed the nominal allowed current limit.</i></p>	
<p>Do you need auxiliary power before or during launch?  <i>Auxiliary power for charging or consumption before launch is not standard. Mention here whether you need auxiliary power and why.</i></p>	
<p>Use of uplink and downlink <i>Please indicate expected data rates for uplink and downlink. Please note: In addition to on-board storage, it is mandatory that you downlink housekeeping/scientific data during operations.</i></p>	

<p>Provide an event timeline, including the experiment actions during experiment operations such as timer or telecommand events.</p> <p><i>Describe your event timeline from start of on-orbit operations.</i></p>	
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<b>Environmental &amp; Health &amp; Safety Issues</b>	
<p>Does the experiment uses extreme temperatures? <i>e.g. below zero centigrade or above 100 centigrade</i></p>	
<p>Does the experiment uses biological fluids, samples, microorganism or small animals?</p>	
<p>Is the experiment can be contagious or infectious?</p>	
<p>Is the experiment sensitive to humidity?</p>	
<p>Is the experiment sensitive to light? <i>E.g. when you open the container.</i></p>	
<p>Does the experiment produce harmful, toxic substances?</p>	
<p>Does the experiment use wireless devices? <i>E.g. Wifi (WLAN), Bluetooth, infrared, data transmitters. Describe the type of devices and frequencies used.</i></p>	
<p>Does the experiment create any disturbing magnetic or electrical fields?</p>	
<p>Do you expect to use high voltages in any part of your experiment? <i>Please indicate the voltage, its use within the experiment and any expected protection devices.</i></p>	
<p>Is the experiment sensitive to vibrations? <i>E.g. vacuum pump, rotating devices, stirrers, mixers</i></p>	
<p>Does the experiment generate vibrations?</p>	
<p>Will you use any flammable, explosive, radioactive, corrosive, magnetic or organic products? <i>Specify any products you will use with any of these characteristics.</i></p>	

<p>Will you use a laser?  <i>Which class? Is the laser path securely contained?</i></p>	
<p>Does your experiment or parts of it have to be airtight?</p>	
<p>Is your experiment or parts of it pressurized?  <i>If yes, please provide the expected pressure level.</i></p>	
<p>Are there any hot parts (&gt; 50°C)?  <i>Mention any parts besides electronics that heat up</i></p>	
<p>Are there any moving parts? Are the moving parts reachable?</p>	
<p>Is there any aspect in your experiment which you believe may be viewed as a health &amp; safety risk by others (regardless of whether you will mitigate this risk in your design)?</p>	
<p><b>Additional Information</b>  <i>Is there any information that is of importance for your proposal and not addressed above?</i></p>	

*Drawings can be inserted below or on separate sheets and can be referenced in the above table.*