MITTIC

MUREP Innovation and Tech Transfer Idea Competition

CHALLENGE GUIDELINES

FEBRUARY 2021

MITTIC Description

The Minority University Research and Education Project (MUREP) Innovation and Tech Transfer Idea Competition (MITTIC) is a higher education spinoff challenge established to develop new ideas for commercialization by seeking concept papers from multi-disciplinary student teams enrolled at a Minority Serving Institution (MSI).

MITTIC & L'SPACE Curriculum

New this year! Through collaboration with NASA L'SPACE Academy, MITTIC is offering a "concept to commercialization" training opportunity. The L'SPACE Proposal Writing and Evaluation Experience Academy is a free, online, interactive 12-week training course designed to provide unique, hands-on learning and insight into the dynamic world of the Space Industry. Learn to effectively write a concept proposal that turns innovative ideas into reality. Gain experience in the process of writing, reviewing, and scoring proposals through the lens of a NASA reviewer. **MITTIC requires at least one student per team to complete the L'SPACE training course in order for the team to participate in the MITTIC competition.** NASA L'SPACE Academy is scheduled for September 3 - November 19, 2020.

MITTIC Competition

1. Upon completion of the L'SPACE Academy, teams composed of four (4) to five (5) students must choose **one** NASA Intellectual Property (IP) from the provided list on page 11, and submit a concept paper explaining the commercial viability of the proposed concept using MITTIC challenge guidelines (pages 4-8). *Priority is given to teams partnering with a Large or Small Business Company.
2. Up to eight (8) qualifying teams are selected to participate in an online collaboration tool with NASA's Johnson Space Center in Houston, Texas. The virtual immersion experience will occur in April 2021. Each team is **REQUIRED** to submit:
    - Certificate of completion from a least one team member who completed one of the L'SPACE academies
    - Concept paper/business plan
    - Explanation of team's concept and business plan during a poster session
    - An oral "lightning pitch" presentation, during Space Tank competition

    The concept paper, poster session and oral presentation will be reviewed and evaluated by a committee using the criteria listed within this document.
3. The winning team of the Space Tank competition will virtually visit, tour and present at NASA's Ames Research Center and various tech companies in Silicon Valley, California. This experience provides the team with an exclusive look at facilities, laboratories, start-up companies and the opportunity to discuss further concept development.

MITTIC Prizes and Internships

Prizes

New this year! EACH qualifying team could receive incentives of up to $5,000 to support team activities, while the winning team is eligible to receive up to an additional $10,000 in support of prototype development

Internships

A goal of MITTIC is to diversify the NASA internship pool for the NASA International Space Station Program Office (ISSPO), NASA Technology Transfer Program and the NASA Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) Programs. At the completion of the MITTIC immersion experiences, selected MITTIC participants receive a paid NASA internship funded by the Minority University Research and Education Project (MUREP) and NASA STEM on Station. All MITTIC *applicants* can apply.

*Visit intern.nasa.gov for internship eligibility requirements.

Eligibility Requirements

- All team members must be 16 or older.
- All team members are required to be U.S. Citizens.
- Each team must have four (4) to five (5) team members currently enrolled in the proposing Minority Serving Institution (MSI).
- All team members must be full-time undergraduate or graduate students enrolled in an accredited U.S. institution of higher learning (junior college, community college, college or university) at the time the concept paper is submitted.
- At least one member from each team is required to complete a L'SPACE training course at the time the concept paper is submitted. L'SPACE alumni automatically qualify.
- Each team is required to have a principal investigator (PI) who actively works for the proposing MSI.

Getting Started

~~**Teams and Principal Investigators (PIs) interested in participating in MITTIC must submit a letter of intent (LOI) to** HQ-MITTIC@mail.nasa.gov **by August 24, 2020**~~

~~The letter of intent should express intent to participate in MITTIC by briefly providing all known information:~~

- ~~Your name and email~~
- ~~Name of your college/university - must be a minority serving institution~~
- ~~Teams may combine MSI's to form teams. Your "core team institution" is the institution of which your PI is employed.~~
- ~~Type of minority serving institution (e.g. TCU, HBCU, HSI, ANAPISI, etc.) **of each team member and PI**~~
- ~~For more information, visit: https://www.nasa.gov/stem/murep/faq.html#3~~
- ~~Name and email of Principal Investigator (PI)~~
- ~~Names and email of four (4) to five (5) student team members (if available)~~

~~Note: If you have your student team and do not yet have a PI, submit the LOI with all other necessary contents.~~

Submitting a Concept Paper

Interested teams who meet all eligibility requirements may submit a concept paper, using the link on the MITTTIC website, during the submission time frame (January 4, 2021-March 1, 2021).

Challenge Requirements

Format Requirements

MITTIC actively screens all concept papers and reserves the right to reject any paper that does not conform to the following formatting requirements.

Page Limitations and Margins
Any page(s) over the required page limit will be deleted and omitted from the review. The concept paper shall not exceed a total of 14 standard 8 1/2 x 11 inch (21.6 x 27.9 cm) pages. **The cover sheet, concept paper summary, table of contents and outreach plan do *not* count toward the 14-page limit.**

Type Size
Do not use type size smaller than 10 point for text or tables, except legends on reduced drawings.

Header/Footer Requirements
The header must include the project title and IP name. **Institution names should *not* be located anywhere on the document other than the cover sheet.** The footer must include the page number.

Each proposal submitted shall contain the following items in the order presented:

Cover Sheet *Does not count toward the 14-page limit.*

- **A.** Team Name
- **B.** MSI Name
- **C.** NASA IP Selected
- **D.** Team Member Information

  (List ALL team member's information below. A minimum of four primary team members is REQUIRED to meet MITTIC eligibility requirements. Please identify primary team members versus support team members.)

  1. First and Last Name
  2. Email Address
  3. Phone Number
  4. Institution
  5. Academic Year (Freshman, Sophomore, Junior, Senior, Graduate Level)
  6. Academic Major
- **E.** Principal Investigator/Co-principal Investigator (PI) Information (Lead PI is **required** to meet MITTIC eligibility requirements.)
  1. First and Last Name
  2. Email Address
  3. Phone Number
  4. Institution Employed By
- **F.** **Large or Small Business Company** Information
  (Priority given to teams that work with a Large or Small Business Company.)
  1. Large or Small Business Company
  2. First and Last Name of Contact
  3. Email Address
  4. Phone Number
- **G.** Company Logo (Optional)

Concept Paper (**Do not include proprietary information.)

Part 1: Table of Contents
The concept paper shall begin with a Table of Contents indicating the page numbers of each of the parts of the proposal.

Part 1: Table of Contents
Part 2: Identification and Significance of the Innovation
Part 3: Industry Analysis and Trends, Target Market and Competition
Part 4: Work Plan
Part 5: Institution Capabilities
Part 6: Facilities/Equipment/Budget
Part 7: Commercial Applications
Part 8: Technical References
Part 9: Outreach
Part 10: Letter of Support from Institution
Part 11: Proof of L'SPACE Completion

Part 2: Identification and Significance of the Innovation
Describe:
1. The proposed **cutting-edge** spinoff(s).
2. The **relevance and significance** of the proposed innovation to an **interest or need for commercialization.**
3. How the innovation is **new and ground-breaking.**
4. *Optional:* Include a sketch, drawing or photo of concept. CAD file(s) must be submitted as a .jpg or .pdf.

Part 3: Industry Analysis and Trends, Target Market and Competition
Define:
1. The current industry's size and capabilities.
2. Factors and trends that affect the industry including seasonality, technological and regulatory challenges, and supply and distribution characteristics.
3. Target market size, demographics, psychographics and purchasing patterns.
4. Competitive position: How will you compete with current businesses? How does your plan reduce risks and barriers to enter the market? Differentiate yourself from the current market and explain.

Part 4: Work Plan
Develop:
1. Milestone chart with tasks and objectives for development of concept. *(Task descriptions, schedules, resource allocations, estimated task hours for each key personnel and planned accomplishments including project milestones required.)*
2. Growth Plan.
3. Long Term Goals.

Part 5. Institution Capabilities
Outline:
1. MSI's capabilities to commercialize products.
2. Large or Small Business Company capabilities to commercialize products if applicable.

Part 6: Facilities/Equipment/Budget
List:
1. Facilities needed to produce your spinoff concept.
2. Equipment needed to produce your spinoff concept.
3. Proposed budget *(start-up costs, business plan assumptions, break-even analysis).*

Part 7: Commercial Applications
Forecast:
1. Potential and targeted application(s) of the proposed innovation relative to NASA's needs (including the Artemis missions), other government agencies and commercial markets.
2. Identify potential customers and why there is a need for the product.
3. Provide an initial commercialization strategy that addresses key technical, market and business factors for the successful development, demonstration and utilization of the innovation and associated products and services. Commercialization encompasses the transition of technology into products and services for NASA's mission programs, other government agencies and non-government markets. *(Marketing Plan and Sales Strategy)*

Part 8: Technical References
Cite all references.

Part 9: Outreach
The outreach section does not count towards the 14-page limit

Outreach Goal: Reach the general public and deliver information about NASA's Technology Transfer Program used in everyday life. Examples are found here: https://spinoff.nasa.gov.

Team's outreach plan for disseminating the experience to the general public should include:
1. Description of the team's objectives and goals.
2. Activities planned to deliver information about NASA's Technology Transfer Program.
3. Target audiences and estimated number of participants at each event. (K-12 class or school groups, undergraduate research symposiums, university outreach to local schools, informal groups such as Boy/Girl Scouts, after school clubs, church groups, etc.)
4. Letters of agreements from institutions who have accepted your invitation to address their group.
5. Press and/or social media plan.
6. Principal investigator's intent on writing a white paper and presenting at conferences about the MITTIC authentic STEM experience.

Part 10: Letter of Support from MSI
Supporting letter of intent on official school letterhead **or** an email from an authorized official. (Authorized official includes: principal investigator, dean/department chair, vice president or president of proposing school.)

Part 11: Proof of L'SPACE Completion
Upload a copy of one team member's completion certificate.

Method of Selection and Evaluation Criteria

A. MITTIC Evaluation Process

Concept papers must provide all information needed to complete evaluation. Reviewers do not seek additional information. NASA scientists and engineers evaluate concept papers. Qualified experts outside of NASA (including industry, academia and other government agencies) may assist in evaluations as required to determine merit.

B. MITTIC Evaluation Criteria

MITTIC intends to select concept papers that offer the most advantageous commercialization potential. MITTIC gives primary consideration to the innovation, commercial viability and feasibility of the concept and its benefits to NASA interests. Each concept paper is evaluated and scored on its own merits using the factors described below:

Factor 1: Innovation (20% weighted value)

- Cutting edge or ground-breaking spinoff concept
- Demonstration of need in the commercial market

Factor 2: Commercially Viable (20% weighted value)

- Concept has the ability to compete on the current market
- Effective business plan and marketing plan

Factor 3: Feasible (15% weighted value)

- Concept has the ability to be produced
- Plan describes production of concept

Factor 4: Effectiveness of the Proposed Work Plan (15% weighted value)

- Comprehensive work plan
- Effective use of available resources
- Labor distribution
- Documents proposed schedule for meeting objectives
- Detailed plan to achieve each objective or task

Factor 5: Price Reasonableness (15% weighted value)

- Price point is able to compete in the market and make a profit
- Budget included to prove cost- efficiency

Factor 6: Outreach (15% weighted value)

- Diverse list of events and activities with implementation plan
- Include projected audience type and number of participants
- Principal investigator creates white paper to present at STEM/business conferences.

Factor 8: Eligibility

- Must meet all eligibility requirements or proposal will be rejected.

NASA'S Intellectual Property (IP) List Available For MITTIC

Choose **ONE** NASA IP below to create a spinoff concept for commercialization. Make sure the concept is:

✔ **Innovative** ✔ **Commercially Viable** ✔ **Feasible**

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1. **Shape Memory Alloy Art (SMArt)**
   https://technology.nasa.gov/patent/LEW-TOPS-137

Electrical/ Electronics

Mechanical and Fluid Systems

2. **Feedthrough for Severe Environments and Temperatures**
   https://technology.nasa.gov/patent/KSC-TOPS-48

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3. **New Capabilities for Grasp Assisting Gloves**
   https://technology.nasa.gov/patent/MSC-TOPS-80

4. **Precision Low Speed Motor Controller**
   https://technology.nasa.gov/patent/MSC-TOPS-76

5. **Laser Surface Treatment and Spectroscopic Analysis System**
   https://technology.nasa.gov/patent/LAR-TOPS-300

Robotics, Automation and Control

Sensors

6. **Hypergol Leak Detection Sensor**
   https://technology.nasa.gov/patent/KSC-TOPS-31

7. **Guided Wave-Based System for cure Monitoring of Composites Using Piezoelectric Discs and Fiber Bragg Gratings (FBGs)**
   https://technology.nasa.gov/patent/Lar-Tops-303

Websites listed for each IP have detailed information about the technologies, benefits and applications. Make sure to print off your IP's PDF fact sheet when creating your concept paper.

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Website HTTP://GO.NASA.GOV/NASAMITTIC

Email HQ-MITTIC@MAIL.NASA.GOV

The MITTIC team looks forward to receiving your ideas!

Misti Moore
MITTIC Activity Manager

Darcelle Mitchell
MITTIC Coordinator

Jonas Dino
MITTIC Coordinator

Gretchen Edwards-Bodmer
MITTIC Coordinator

Genevieve Elazier-Harris
MITTIC Coordinator

Dustin Kinnison
MITTIC Coordinator