



# MITTIC

MUREP Innovation and Tech Transfer Idea Competition

## CHALLENGE GUIDELINES

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OCTOBER 2019 REVISED

# MITTIC ACTIVITY DESCRIPTION

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). Concept papers must be submitted online via <http://go.nasa.gov/NASAMITTIC> and include all relevant documentation described in these guidelines.



## MITTIC COMPETITION

1. Teams choose **one** NASA Intellectual Property (IP) from the provided list on page 11-12 and submit concept papers explaining the commercial viability of the proposed concept using MITTIC challenge guidelines (pages 4-8). Teams partnering with a NASA Small Business Company (SBC) will be given priority.
2. Up to 10 qualifying teams are selected to participate in an online collaboration tool and are funded to travel to NASA's Johnson Space Center in Houston for an onsite immersive experience in April 2020. During the experience, all participants are **REQUIRED** to submit:
  - concept paper/business plan
  - explain the team's concept and business plan during a poster session
  - present an oral "lightning pitch" presentation to a panel of judgesThe concept paper, poster session and oral presentation will be reviewed and evaluated by a committee using the criteria listed on page nine of this document.
3. Winning team members of the SpaceTank competition during the Johnson onsite immersive experience receive travel funding for up to eight team members and one principal investigator (PI) to visit, tour and present at NASA's Ames Research Center and various companies in Silicon Valley, California. This experience exposes team members to research facilities and laboratories, start-up companies and the opportunity to discuss further development.

4. Selected MITTIC participants receive a paid NASA Internship funded by MUREP at a NASA center. **ONLY** MITTIC participants can apply.

**NASA MUREP Internships Eligibility Requirements:**

- GPA – 3.0 or above at the time of application – There are no exceptions. Rounding of the GPA is not permissible.
- Applicants must be U.S. citizens.
- Accepted to or enrolled full-time in an accredited U.S. college or university. Must be a MSI.
- 16 years of age or older.
- Letter of recommendation to be submitted on your application to [intern.nasa.gov](https://intern.nasa.gov).

## MITTIC ELIGIBILITY REQUIREMENTS

- Four primary team members are **required** to be currently enrolled in the proposing MSI.
- Supervising principal investigator (PI) is **required** to actively work for the proposing MSI.
- Up to four primary team members and one PI are **required** to attend all onsite immersive experience events.
- Each team is **required** to provide a supporting letter of intent on school letterhead from an authorized official. (Authorized official examples: department chair, vice president or president of proposing school.)
- Teams providing a supporting letter of intent from a participating NASA SBC will be given priority.
- **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 proposal is submitted.
- **All** team members must be 16 or older before arrival to Johnson and Ames.
- **All** onsite NASA MITTIC participants are **required** to be U.S. Citizens.
- Teams may enlist the support of students of any classification, faculty members, professional consultants, etc. However, only four primary team members and one PI may participate in the onsite immersive experience at Johnson. If selected to attend Ames, eight team members and one PI may participate.



# INSPIRE - ENGAGE - EDUCATE - EMPLOY



# 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

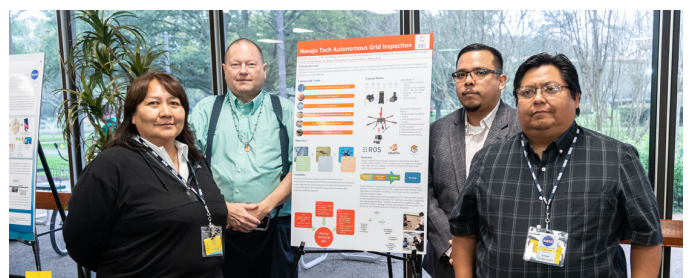
Any page(s) over the required page limit will be deleted and omitted from the review. The concept paper shall not exceed a total of 14 standard 8 1/2 x 11 inch (21.6 x 27.9 cm) pages. **The cover sheet, concept paper summary, table of contents and outreach plan are *not* included in the 14 page limit.**

### Type Size

No type size smaller than 10 point shall be used for text or tables, except legends on reduced drawings. Concept papers prepared with smaller font sizes may be rejected without consideration.

### 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 are 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.)

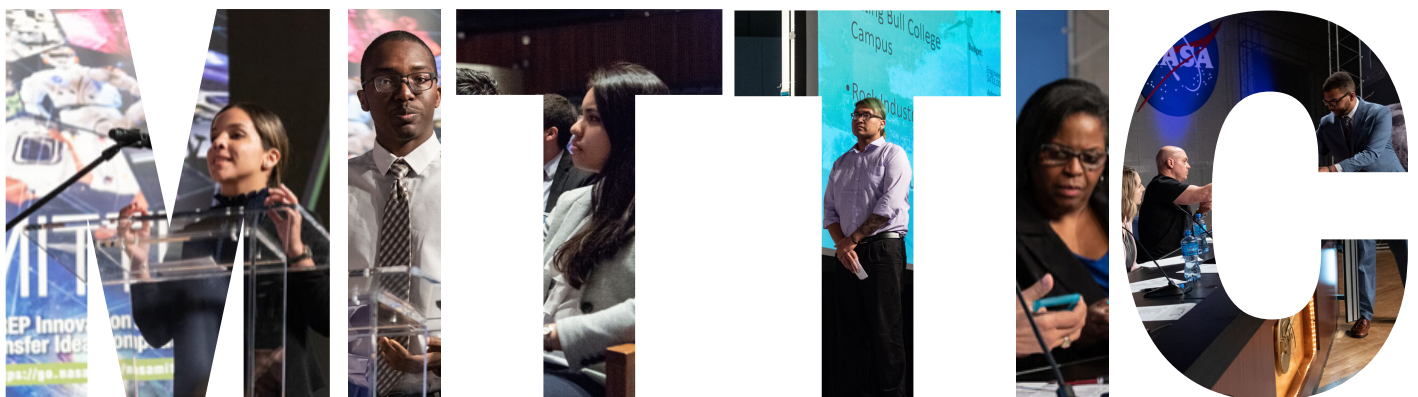
1. First and Last Name
2. Email Address
3. Phone Number
4. Institution Employed By

**F.** NASA SBC Information

**(Priority given to teams that work with a SBC.)**

1. NASA SBC Name
2. NASA SBC Registration Number (<https://www.sbir.gov/registration>)
3. First and Last Name of Contact at NASA SBC
4. Email Address
5. 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 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. 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 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 shall be included.)*
2. Growth Plan.
3. Long Term Goals.

**Part 5. Institution Capabilities**

Outline:

1. MSI's capabilities to commercialize products.
2. NASA SBC's 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**

Reference works should be cited.

**Part 9: Outreach**

*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 can be 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 school letterhead from an authorized official. (Authorized official includes: department chair, vice president or president of proposing school.)





# Method of Selection & 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 how the concept would be produced

### 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 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 LIST AVAILABLE FOR MITTIC**





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



Communications

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**1. Autonomous Positioning and Navigation Network**

<https://technology.nasa.gov/patent/MFS-TOPS-64>

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**2. Rapid and Verified Crimping for Critical Wiring Needs**

<https://technology.nasa.gov/patent/LAR-TOPS52>



Electrical/  
Electronics



Environment

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**3. Microwave-Based Water Decontamination System**

<https://technology.nasa.gov/patent/MS-C-TOPS-53>

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**4. High Quality Tissue Formation Method**

<https://technology.nasa.gov/patent/MS-C-TOPS-41>



Health, Medicine,  
and Biotechnology

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**5. Control of Nanotube (CNT) Density & Tower Height in an Array**

<https://technology.nasa.gov/patent/TOP2-139>

**6. Fabrication of Nanopipette Arrays for Biosensing**

<https://technology.nasa.gov/patent/TOP2-159>

**7. Copper Nanowire Production for Interconnect Applications**

<https://technology.nasa.gov/patent/TOP2-163>

**8. Variable-Power Handheld Laser Torch**

<https://technology.nasa.gov/patent/MFS-TOPS-5>

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**9. Multilayered Fire Protection System**

<https://technology.nasa.gov/patent/LAR-TOPS-212>



**10. Composite Joint Connector**

<https://technology.nasa.gov/patent/LAR-TOPS-198>

**11. Harsh Environment Protective Housing**

<https://technology.nasa.gov/patent/KSC-TOPS-11>

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Optics

### 12. Compact Sensor for In-Situ Gas Species Determination and Measurement

<https://technology.nasa.gov/patent/MFS-TOPS-32>

### 13. Advanced Actuators and Transducers

<https://technology.nasa.gov/patent/LAR-TOPS-21>



Power Generation  
and Storage



Robotics, Automation  
and Control

### 14. Interoperable Intelligent Controllers for Process Management & Control Networks

<https://technology.nasa.gov/patent/MSC-TOPS-69>

### 15. Inductive Non-Contact Position Sensor

<https://technology.nasa.gov/patent/KSC-TOPS-67>



Sensors

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

The MITTIC team looks forward to reading your

