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|  | **Sounding Rocketry Team**  **Fall Application 2020-2021** | **Company Name** |

***The following form is the application for team member positions on the 2020-2021 Texas A&M University Sounding Rocketry Team. Please visit our website at tamusrt.org/apply or email our director, Nicole Dyer, at ndyer@tamu.edu for more information.***

***ELECTRONIC SUBMISSION:****Please fill out this form and save it as a* ***PDF****. Save this completed application PDF along with an updated* ***RESUME (PDF)*** *to a ZIP folder titled as follows: Last Name\_First Name\_<First preference abbreviation>\_<Second preference abbreviation> (abbreviations in “Team Specification” section). Example:* ***Smith\_Joe\_PROP\_EP.zip***

*The ZIP folder will be submitted through a Google Drive file request; use this* [*link*](https://forms.gle/2STbSa2gMHvCDS8e9) *or visit our* [*website*](https://www.tamusrt.org/apply.html)

***SUBMIT APPLICATIONS BY 11:59 PM CT AUGUST 5th, 2020. LATE APPLICATIONS WILL NOT BE REVIEWED.***

*Spring applicants will be notified of interview selections August 7th; interviews will begin August 10th.*

*The first general meeting for the Sounding Rocketry Team 2020-2021 will be the week of August 25th via Zoom*

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| Full Name: |  |  |  | Date: |  |
|  | Last | First | M.I. |  |  |

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| Phone: |  | Email: |  |

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| Major: |  | UIN.: |  | GPA: |  |

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| Expected Graduation Date: ☐ May ☐ Dec 20\_\_\_ |  |

*Rank each subteam on a scale from 0-5, where 0 is a subteam that you are not interested in, and 5 is a subteam you would most prefer to be on. Please read the Subteam Descriptions & Responsibilities (page 3-4) for detailed descriptions of each subteam before indicating your selections.* ***Please provide a variance in your rankings to aid SRT management during the interview selection process. Some subteams may have the same ranking,******however****.*

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| **SUBTEAMS** | **TEAM RANKING (0-5)** |
| Testing and Operations (TOPS) |  |
| Propulsion (PROP) |  |
| Structures (STR) |  |
| Dynamics (DYN) |  |
| Electronics & Payload (EP) |  |
| Business (BIZ) |  |

*Please list the courses that you have/will have taken during the following semesters. Please make your best guess as to which courses you will be taking in the future.*

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| **Fall 2019** | **Spring 2020** | **Fall 2020** | **Spring 2021** |
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*Please rate your familiarity with the following from 1 (unfamiliar) to 10 (expert). Note that the following programs are not requirements. If you are skilled in a program(s) not listed that you feel is valuable, please list and rank it under “Other.”*

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| --- | --- | --- | --- | --- | --- |
| CAD (SolidWorks, etc.) |  | FEA (Abaqus, etc.) |  | Welding |  |
| CFD (STAR-CCM+, etc.) |  | Soldering / Wiring |  | Composites |  |
| C / C++ / Python |  | Machining |  | Other: |  |
| MATLAB |  | Accounting |  |  |  |
| Microsoft Excel |  | Graphic Design |  |  |  |

*Please answer the following questions to the best of your ability, as concisely as possible (300 characters max, each).*

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| Why are you interested in joining the Texas A&M University Sounding Rocketry Team and what do you hope to gain personally from this experience? |
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| What would you like to contribute to the Texas A&M University Sounding Rocketry Team, if selected? |
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| SRT is a serious time commitment and members are expected to spend ~20 hours a week working on team projects. Please tell us about your other obligations during the coming Fall and Spring semester. |
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| Explain your reasoning behind selecting the above preferences for the team specification. |
|  |
| What are your aspirations after graduating from A&M? (Graduate school, academia, industry, dream job, etc.) Or, if you have any current commitments after graduating, please include those below. |
|  |
| List below any past/current membership/leadership involvement in any other organizations. |
|  |

***By signing (physically or electronically) the line below, you are certifying that the information you have entered above is both truthful, accurate, and to the best of your knowledge. Also, you are agreeing to actively participate, if selected, on the 2018-2019 Texas A&M University Sounding Rocketry Team for both semesters of the 2020-2021 academic school year.***

*AGGIE CODE OF HONOR: “An Aggie does not lie, cheat or steal, nor tolerate those who do.”*

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| Applicant Signature: |  | Date: |  |

**Subteam Descriptions & Responsibilities**

*Please feel free to contact subteam managers with questions regarding their subteam*

***Business***

Manager: Dylan Mahoney

dylan.mahoney@tamu.edu

The Business subteam consists of a manager and 3 general members, who will be tasked with securing the financial future of the team, keeping a detailed accounting record, and marketing the achievements, goals, and ideas to individuals inside and outside of the organization. SRT functions much like a start-up or research company. Selected members must demonstrate a strong entrepreneurial mindset and personal drive. This team is responsible for communication with sponsors, donors, faculty, and other university teams. The business team will also be responsible for funding and resource procurement, meaning daily responsibilities of maintaining a budget and allowing acquisition of parts for the team. Members will follow other subteams closely, documenting their technical work and relaying it to the public. Skills in photography, graphic design, accounting, and marketing are desired for this team. This subteam performs critical operations that help fund and promote the Sounding Rocketry Team.

***Testing and Operations***

Manager: Luke Adams

Luke.adams@tamu.edu

The Testing & Operations subteam consists of a manager and 4 general members whose role is to characterize the rocket’s critical sub-systems through rigorous testing and analysis; this includes the hybrid engine assembly, the oxidizer control system, and the ground communication network. Additionally, the subteam will have the responsibility of maintaining and improving testing infrastructure such as the static test cell and the vertical launch tower. Subteam members will be expected to become proficient in data acquisition, signal processing, fluid control, and systems engineering concepts. A respect for procedural testing and a considerable time commitment will expected from all subteam members.

***Propulsion***

Manager: Arsh Bala

Arsh.bala@tamu.edu

The Propulsion team consists of a manager and 5 members who are tasked with developing, manufacturing, and characterizing robust and efficient hybrid propulsion systems for use in sounding rockets. Emphasis will be placed on research into the mechanics of a hybrid engine and its subsystems to optimize engine characteristics (thrust, burn time, mass flow rates, regression, etc.) and accurately predict performance through computational models. Members must be familiar with all components of a hybrid propulsion system (oxidizer tank, plumbing assembly, injector plate, combustion chamber, nozzle) and understand how these parts interact with one another. A background in chemistry, thermodynamics, and high-speed aerodynamics is necessary, and experience with MATLAB, SolidWorks, and CFD is preferred. Additionally, prior machining experience is beneficial. Individuals will be expected to contribute a significant amount of time to research, fabrication, and testing while learning new concepts and skills quickly regardless of prior exposure.

***Structures***

Manager: Logan Collins

Logancollins22@tamu.edu

The Structures subteam consists of a manager and 4 general members whose role is to design, analyze, fabricate, and test all structural components of the team’s sounding rocket and launch infrastructure. This includes: fabrication of the rocket’s components (body tubes, nose cone, fins, and bulkheads), materials testing/analysis, and design of major improvements to the launch trailer and launch tower. Members will be responsible for making and updating relevant 3D CAD/Solidworks models. Members will work with a variety of materials such as: composites, metals, and plastics to manufacture rocket components and launch equipment. Members will also perform experimental materials testing to characterize in-house composite mixtures, optimize manufacturability and provide structural integrity of all constructed rocket components. Mechanical design, structural analysis, and hands on experience with power tools/ machining is desired but not required.

***Dynamics***

Manager : Clark Pehrson

Clark.pehrson@tamu.edu

The Dynamics subteam consists of a manager and 4 general members who will be tasked with modeling the trajectory, aerodynamics properties, and stability characteristics of sounding rockets. This will be done with the aid of aerodynamic literature, wind tunnel testing, and analysis tools such as MATLAB and STAR-CCM+. The culmination of this process will be a stable and aerodynamically sound rocket, a product of educated design choices. To accomplish this, members will be expected to consider all factors of a design problem, thoroughly document their work, and be detail-orientated while maintaining a high-level, systems engineering mindset. Members are expected to understand aerodynamic concepts and have a strong work ethic.

***Electronics and Payload***

Manager: Kevin Johnston

kevinjjohnston@tamu.edu

The Electronics and Payload subteam consists of a team manager and 3 general members who will oversee modifications and improvements to the rocket’s on-board avionics, power, and communication system via hardware and software design. The subteam's goal is to produce robust, flexible systems capable of flight data acquisition, hybrid engine control, and parachute deployment through microcontrollers, sensors, and flight computers. Additionally, the subteam will design, build, and test a functioning payload with the intentions of competing in the SDL Payload Challenge at the 2021 IREC. Restricted by rocket limitations and 8.8-pound weight limit, the team will have full liberty of overseeing the construction of a payload of scientific merit. The team’s work will require some basic programming experience (C, C++, Python, LabVIEW, etc.) and some familiarity with electronics. Basic 3D modeling (SolidWorks) is not required but highly encouraged.