AIAA Student Branch at UCLA

aiaa.seas.ucla.edu

aiaaucla@gmail.com

The American Institute of Aeronautics and Astronautics at UCLA

2021-2022 Sponsorship Proposal

DESIGN. BUILD. FLY. AT UCLA

ROCKET PROJECT AT UCLA

UAS@UCLA Uncrewed Aerial Systems at UCLA

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Letter From Our President

Dear Prospective Sponsor,

The American Institute of Aeronautics and Astronautics Student Branch at the University of California, Los Angeles (AIAA at UCLA) is a professional organization that connects students, industry representatives, and academics dedicated to the advancement of aeronautics and astronautics. AIAA at UCLA focuses on enhancing our members' college education by providing students with knowledge and activities not incorporated into the curriculum. With career development, mentorship, and hands-on technical projects, our members are better prepared for their future in aerospace after UCLA.

During the school year, our chapter hosts and organizes events that facilitate networking and improve professional development skills of our members. By collaborating with different companies, facility tours and info-sessions are made possible to increase industry exposure for our members. The annual Mechanical and Aerospace Engineering Career Fair at UCLA is co-hosted by AIAA at UCLA, providing students the opportunity to speak with industry representatives and even securing an internship or job.

Furthermore, AIAA at UCLA is an umbrella organization for three student projects: Design Build Fly at UCLA (DBF), Rocket Project at UCLA (URP), and Unmanned Aerial Systems at UCLA (UAS). The majority of our membership actively participates in at least one of these projects, allowing them to develop their technical abilities and apply concepts taught in the classroom to real engineering problems. With experience in working with an engineering team, our members develop their problem solving, leadership, and teamwork skills.

AIAA at UCLA serves almost every technical major on campus, including aerospace, mechanical, electrical, chemical, and computer engineering, physics and astrophysics in both undergraduate and graduate programs. We also encourage non-technical majors with a passion for aerospace to join.

By contributing to the AIAA chapter at UCLA, your company helps young engineers and even others interested in aerospace acquire vast technical skills, teamwork and leadership traits, and a true enthusiasm for their work. Our students are grateful for the opportunities afforded to them by your sponsorship and enrichment of their college education.

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As an entirely student-run organization and the largest aerospace society on campus, we ask for you to join us in our endeavours to sustain and advance aerospace in our community.

Thank you for your time and consideration.

Sincerely,

Selin Berk

Selin Berk
President, AIAA at UCLA

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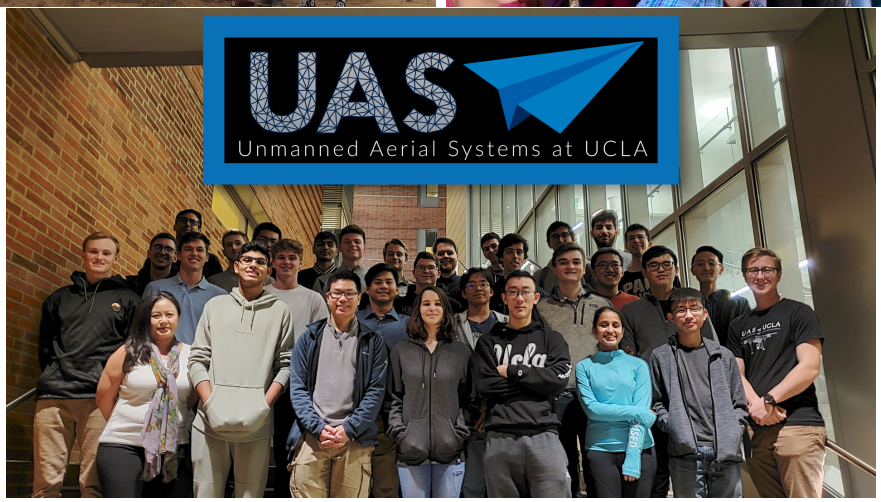
Project Overviews

As a sponsor, you will be able to play a critical role in supporting hands on engineering projects that allow students to develop technical skills as well as soft skills as they work towards a common goal on a team. Students can apply theoretical knowledge from courses in a hand-on environment to prepare them for internships and working in industry.



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Design Build Fly

Overview

Design Build Fly (DBF) at UCLA, an engineering club dedicated to researching, designing, manufacturing, and flying model airplanes, is composed of a team of hardworking, dedicated students. Each year, club members bring together their collective knowledge and abilities to construct a plane designed to fit specifications outlined by the American Institute of Aeronautics and Astronautics (AIAA) for the Design Build Fly competition, which takes place each spring. This past year, despite the limitations of remote instruction, DBF built Patchwork, a model airplane made primarily of carbon fiber, spruce, and balsa with a high wing that could deploy and retract a 3D-printed sensor during flight. Although the COVID-19 pandemic limited in-person discussions and lab access, the DBF team powered through the challenge and remotely designed and manufactured Patchwork. In the competition, our design report placed 14th out of 92 and our overall score was 28th out of 92. In previous years, DBF has proven its mettle, placing 20th out of 108 in the 2019 AIAA Design Build Fly competition.

AIAA DBF Competition 2019 - Tucson, Arizona

Current and Future Development

This summer, DBF plans to direct its efforts towards research and organization. DBF is looking to more complicated and refined design and manufacturing processes; over the next few months, the club's lead members will be researching and documenting possible techniques to experiment with this coming year. In terms of administrative growth, this past year, club membership has increased dramatically, so DBF is looking to better establish the club foundation, reorganize and expand on existing resources, and document all the processes employed by the club.

This coming fall will bring back in-person instruction, along with the reopening of the lab spaces. It will also bring with it the recruitment process for new members. DBF is looking to train all the new members in CAD and FEA software as well as manufacturing techniques. To give new members a solid foundation in the necessary knowledge for designing and constructing an aircraft, the DBF leads are putting together a series of instructional presentations and demonstrations. The leads plan to walk the members of their subteams through the data-processing experience.

Prototype Fly Day

Prototype 1: Spruce Bruce

Since the usual design process is generally quite rushed and takes place at the very beginning of the year, it is often difficult for new members to really take part; with this in mind, DBF is debuting an engineering design course, offered through the school, that will entail the design and construction of a foam plane. Students who take this course will receive instruction similar to the DBF New Member Training Program and will have the chance to compete in a small peer competition designed to emulate the AIAA DBF competition. For the students who choose to join

DBF during or after the course, the mock competition will provide a chance to gain experience and thus allow these members to make active contributions during the DBF design process in future years.

In the coming year, DBF is planning to focus on competing in the AIAA Design Build Fly competition, but will also expand design options by researching new configurations and manufacturing techniques. DBF hopes to pursue constructing planes with entirely new design elements, including biplanes, swept wings, and dual-propellers.

Budget

The proposed 2021-2022 budget is estimated based on the assumption that the 2020-2021 AIAA DBF competition will be held. In the event that the competition is cancelled again, research paper based competitions and other competitions such as the SAE Aero Design competition will become the focus to allow the club to continue to develop.

Design Build Fly Proposed 2020-2021 Budget	
Laboratory	$300.00
Manufacturing	$1,000.00
Propulsion / Pilot	$1,000.00
Team Budget	$500.00
Transportation	$1000.00
Competition & Events	$5,000.00
Projected Operating Costs	**$8,800.00**

Rocket Project

Overview

Rocket Project at UCLA is a student engineering team that teaches rocket engineering through hands-on exposure to the complete design-build-test cycle of engineering, giving students an opportunity to apply classroom subjects to a project with real-world challenges and thrilling results.

Recently, collegiate rocket engineering has grown rapidly nationwide, with competitions like the Spaceport America Cup drawing over 100 teams. Rocket Project at UCLA stays at the forefront of collegiate rocket engineering with our member education, community outreach, hybrid project, and liquid project.

Over the last 4 years, we have grown our club from a couple dozen students building a single hybrid rocket to an organization serving over 100 students with multiple projects. We have greatly increased our commitment to member education and safety as well as community outreach. In the same timeframe, our liquid propulsion effort was conceived and has gone on to launch 4 liquid bi-propellant rockets, with another one coming in Spring 2022. This makes us 1 of only 7 schools in the United States to launch this type of rocket.

We emphasize inclusivity and diversity in all of our work through educational opportunities designed to make complex problems approachable and outreach events dedicated to inspiring the next generation of rocket engineers from all walks of life.

Prometheus Launch

Prometheus Team

RISE Program

Outreach Event

Current and Future Developments

During the COVID-19 pandemic we were able to maintain both our size and outreach capacity through virtual platforms like Zoom and our Slack workspace. Most of all we benefited from the dedication of our members. This fall we are planning to educate and train more than 50 new members through our RISE education program.

Project Ares plans to launch its 5th liquid bi-propellant rocket by Spring 2022, iterating on the design of the Endurance rocket launched in 2021. Leading up to this they will conduct multiple hot fire tests on their engine system and build a new vehicle system to carry it to its 45,000 foot goal height.

Project Prometheus is planning to perform multiple hot fire tests on their new student-researched and -designed hybrid motor system and launch multiple test rockets. Their end goal is to launch a rocket to 10,000 feet in the 2022 IREC competition at the Spaceport America Cup in Spring 2022.

The Research and Development team are planning to pursue multiple goals this year, including the launch of a small scale staged rocket and flight controls system.

Our outreach team continues to make great strides with a plan to expand on our online video curriculum which we send out to local elementary schools along with our in person events. These provide resources on rocketry, engineering, math, and science.

Ares Team

Ares Test Fire

Budget

The proposed 2021-2022 budget is estimated based on the assumption that projects will be able to continue as the situation surrounding the COVID-19 pandemic improves.

Rocket Project Proposed 2020-2021 Budget	
Ares	$13,000.00
Prometheus	$7,000.00
Outreach	$1,000.00
R&D	$3,000.00
RISE	$1,000.00
Projected Operating Costs	**$25,000.00**

Uncrewed Aerial Systems

Overview

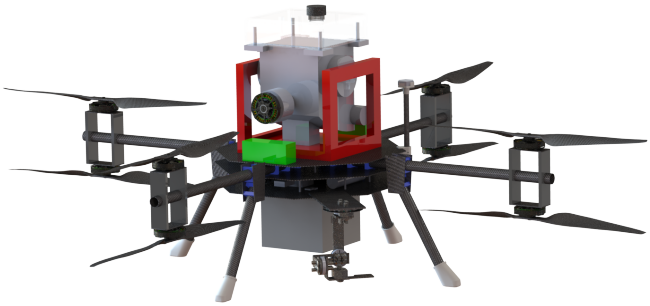
UAS at UCLA is a group of around 40 students from various engineering disciplines that gives students an opportunity to apply engineering concepts to autonomous drones, advanced control systems, and research innovation in flight technology.

In the past year, UAS was its most successful, making the finals of the First Responders Challenge: a competition where teams/companies from around the world create long flight time, easily transportable UAVs. The organization also received funding to research a hybrid airframe multidrone design that allows a single platform to remain in the air for an indefinite period.

Despite the challenges of the Covid-19 pandemic, UAS was able to continue to provide a creative outlet for our UCLA students in all parts of the world. The organization built an over 50 pound drone powered by a gas generator for the FRC competition, and successfully flew four drones all connected together, despite over half of our members being remote.

With the club's return once more to campus, we plan on further continuing our research in hybrid airframe systems, explore controls related problems through the IEEE competition, and expand the minds of as many people as possible to drones.

2019-2020 Competition Plane



Coaxial Hybrid Quadcopter

We also aim to continue to make inclusivity and diversity a priority, changing the clubs name to follow the gender neutral FAA suggestion (Uncrewed Aerial Systems), and further developing the UAS ALLFLY program, an initiative dedicated to getting everyone who wants to fly a drone, the opportunity to do so, no matter their background.

Spinny - 30 lb Quadcopter

Current and Future Developments

UAS at UCLA is currently working on three projects: the 2022 AUVSI SUAS competition, a continuation of NASA Undergraduate Student Research Challenge (USRC) and the 2022 IEEE Autonomous Unmanned Aerial Vehicles (UAV) Competition.

With the exception of its cancellation last year, UAS at UCLA always participates in the AUVSI SUAS competition. Colleges and other student groups compete from around the US to develop drones/planes that can meet a variety of waypoints, locate targets, and complete subtasks. In its last performance the club placed 4th on its technical journal, and 14th overall in the field.

In the NASA USRC research challenge, our proposal was to develop a drone platform that allowed any permutation of 8 drones to attach/detach while the platform remained in the air. With appropriate drone swapping based on battery health, such an apparatus would allow a platform to hover indefinitely. The club will work to integrate the docking mechanism with the successfully flown 4 drone frame, expanding the design to incorporate the 8 drones that were originally proposed. This will provide a compelling engineering challenge to both software and aerospace students alike.

The IEEE Competition involves using drones to track and follow ground vehicles in complex environments. The first stage of the competition is done in simulation, and the second stage uses actual hardware. To accomplish this, we will need to develop advanced vision and path-planning algorithms to which the club hasn't been exposed before. This competition will further push the boundaries of student's knowledge, and give them the opportunity to explore more theoretical aspects of autonomous aerial vehicles.

Budget

The proposed 2021-2022 budget is estimated based on the assumption that projects will be able to continue as the situation surrounding the COVID-19 pandemic improves.

Uncrewed Aerial Systems Proposed 2020-2021 Budget	
AUVSI	$9,600.00
USRC	$5,000.00
AllFly	$1,000.00
IEEE UAV Competition	$6,000.00
Projected Operating Costs	**$21,600.00**

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AIAA Professional Development

Throughout the year, AIAA at UCLA hosts events to help promote professional development for students. A major event that AIAA hosts in conjunction with several other engineering organizations on campus is the MAE x MRS Career Fair. Other events held by AIAA include info-sessions with interested companies, resume and interviewing workshops, as well as free professional photo shoots. In response to the current situation with the continuing COVID-19 pandemic, AIAA will continue with mostly online or hybrid events in order to protect students while still providing opportunities for professional growth and development.

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Operating Budget

AIAA at UCLA plans to continue to host professional development events as well as host an online career fair to prioritize safety. Following all government and university guidelines, returning to work on the projects will look different and will require increased safety precautions.

AIAA General Fund Proposed 2020-2021 Budget	
Professional Development	$500.00
Project Support	$4,500.00
AIAA Branding	$500.00
Lab Maintenance	$1,500.00
PPE	$200.00
Online Career Fair Software	$1,000.00
Projected Operating Costs	**$8,200.00**

Total AIAA 2020-2021 Operating Cost	
AIAA at UCLA General Fund	$8,200.00
Design Build Fly (DBF)	$8,800.00
Rocket Project at UCLA (RP)	$25,000.00
Unmanned Aerial Systems (UAS)	$21,600.00
Projected Operating Costs	**$63,600.00**

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Sponsorship Details

	Gold ($2000+)	Silver ($0-$2000)
Company Logo	- All Presentation Slides and Design Review Slide Presentations - AIAA at UCLA web-site and project websites - Competition Rockets, Planes and Drones - Sponsorship Proposal - Project T-Shirts	- All Presentation Slides and Design Review Slide Presentations - AIAA at UCLA web-site and project websites - Competition Rockets, Planes and Drones - Sponsorship Proposal
Perks	- Meet & Greet/Lab Tours with Projects - Quarterly Update Newsletter - Free Company Infor-mation Session Hosted by AIAA at UCLA - Resume Book	- Meet & Greet/Lab Tours with Projects - Quarterly Update Newsletter

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AIAA at UCLA Sponsorship Form

Company Name: _____

Address: _____

_____

Email: _____

Phone Number: _____

☐ Yes! We would like the _____ package by generously donating

$ _____ to be distributed as follows: (Please check the box and indicate the amount next to the respective projects.)

☐ AIAA at UCLA General Fund _____ ☐ Design Build Fly _____

☐ Rocket Project at UCLA _____ ☐ Unmanned Aerial Systems _____

☐ Yes! We would like to donate the following products/supplies with a value of

$_____. Supplies/Products: _____

_____

Thank you for supporting AIAA at UCLA!

Please email this completed form to Nathan Landay of the UCLA Engineering Office of External Affairs: nlanday@support.ucla.edu and Selin Berk, AIAA at UCLA President: aiaaucla@gmail.com.

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How to Give: Online Donation

If you would like to donate by check or wire transfer, or have any additional questions about giving, please contact aiaaucla@gmail.com for more information.

AIAA at UCLA

Gift Link:

https://giving.ucla.edu/campaign/donate.aspx?Fund=12840C

sitenum=8

Design Build Fly

Gift Link:

https://giving.ucla.edu/campaign/donate.aspx?Fund=19700c

Rocket Project at UCLA

Gift Link:

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Uncrewed Aerial Systems

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Contact Us Today!

For more information about AIAA at UCLA, Design Build Fly, Rocket Project, Unmanned Aerial Systems, or planning a lab tour, please contact:

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