

Report on DJS Arya for CanSat Competition 2019-20

DJS ARYA



DJS Arya is the official canister satellite team of Dwarkadas Jivanlal Sanghvi College of Engineering. Our team is a part of Electronics and Telecommunication department and is associated with the IETE-SF committee. We design small prototypes of satellites called a canister satellite. We participate in the international CanSat competition which is held in the United States of America every year. We represent our college and our nation at this international level competition with more than 400 teams participating in it. DJS Arya started off as a final year project of a group of engineering students and we went from there to participating and attaining success on an international level competition. After the success of this final year project, we participated in the competition for the first time in 2019 with only 10 students working on the canister satellite. Now, we are a team of over 20 members from different departments of the college coming together to learn and make something different and achieve greater heights.

Objectives

- To apply the knowledge learned in the fields of telecommunication, electronics and mechanical.
- To enhance the skills and the interest of students in the domain of space technology.
- To work together efficiently as a team, in order to get optimal results.
- To successfully design, build and launch a canister satellite and ensure that it is functioning properly.
- To represent our college and country at an international level in the CanSat competition.

Competition Details

The American Astronautical Society (AAS), National Aeronautics and Space Administration (NASA) and American Institute of Aeronautics and Astronautics (AIAA) organize an annual student design-build-launch competition for space-related topics. Similar competitions exist for other fields of engineering (robots, radio-control airplanes, racing cars, etc.) but most space-related competitions are paper design competitions which though worthwhile do not give students the satisfaction of being involved with the end-to-end life cycle of a complex engineering project, from conceptual design, through integration and test to actual operation of the system and concluding with a post-mission summary and debrief. This competition fulfills that need. This annual competition is open to teams from universities and colleges. Teams must be able to design and build a space-type system, following the approved competition guide, and then compete against each other at the end of the two semesters to determine the winners. Rockets will be provided but teams are responsible for funding the construction of their CanSat and all travel/lodging expenses.

Competition Phases: The competition is in five phases.

Phase No.	Phase Name	Approximate Months	Phase Description	Phase Outcome
1.	Application phase	November, 2019	Teams must submit an application and a \$200 competition fee that is non-refundable.	Team Registered
2.	Preliminary Design Report (PDR)	Jan – Feb, 2020	Teams are to develop designs, prototype, test concepts and generate a preliminary design review (PDR) slide package using the provided template.	After PDR, a total of 40 teams will be invited to the competition.
3.	Critical Design Report (CDR)	March – April, 2020	Teams will finalize their design and start ordering components, manufacturing parts, test subsystems and start developing the flight unit.	The marks of CDR are counted while calculating the final rankings
4.	Launch weekend	June, 2020	The CanSats must first pass the drop test, fit check, and battery verification in order to fly. Multiple attempts at the drop test are allowed. After that, the CanSats will be practically tested using NASA sponsored rockets.	This is the main phase where the actual, practical testification happens.
5.	Post Flight Review (PFR)	June, 2020	Post Flight Review is a 15 minute presentation of the flight results and 5 minutes for questions.	Awards will be presented at the end of the post Flight Reviews.

For teams to receive certificates of accomplishment and be considered for awards, they must complete all phases of the competition.

Other Participating Universities and Colleges

From India: University of Petroleum and Energy, VIT University, Netaji Subhas Institute of Technology and Chandigarh University.

Other Countries that participate in the competition: Turkey, USA, Poland, Greece, Istanbul, and many more European, American and Asian nations.

Timeline/Plan/Road Map

Sr. No.	Duration	Description
1.	Till Dec 2019	Brainstorming, Literature Survey, Marketing/Sponsorship, Components purchase.
2.	Dec 2019	Prototype Building, GUI designing, PDR development.
3.	Jan 2020	PDR development and simultaneous testing/improvement.
4.	1 st Feb 2020	PDR Final PPT submission.
5.	Feb – March 2020	Go through the submitted PDR, Complete Sponsorship deliverables and gather funds.
6.	11 th March 2020	PDR round results.
7.	March – April 2020	Improvement on the points where we have lost marks in PDR and validate the prototype design to make the CDR. Apply for US VISA.
8.	May 2020	Make arrangements for travelling to the US for final demonstration and testing.
9.	June 2020	Competition.

Faculty guides

1. Dr. Amit A. Deshmukh (HOD, EXTC department)
2. Prof. Tushar Sawant (Professor, EXTC department)
3. Prof. V. Venkatraman (Professor, EXTC department)
4. Prof. Aarti Ambedkar (Professor, EXTC department)

Core Team Members

Sr. No.	Team Designation	Core Member Name	Past designations
1.	Team Captain	Vedant Awasthi	Vice Captain of DJS Skylark, the official Aero team of the college
2.	Team Manager	Niti Doshi	Vice Captain of DJS Kronos, the official All-Terrain-Vehicle team of the college
3.	Technical Head	Dishant Shah	College Tech Sec for 2019, Co-Chairperson for DJSCE IETE-SF committee, Team leader of one of the winning teams in SIH 2019.

Team History/Past Achievements

Results of CanSat competition 2018-19

This team, though relatively new has already started creating ripples across the state. What began as a mere final year project of a few BE students is now a worldwide phenomenon within its second year itself of reinstatement as an official college team.

The team's growth has been exceptional and it achieved 24th rank in PDR and 34th rank overall (Worldwide) in 2018-19, which marked its first year as an official college team.

It was also one of the six teams that represented India on an International platform in this competition, and one of the only few teams whose payload was deployed as expected and autogyro functioned as per mission requirements.

3D printing workshop with sponsor, Time to 3D

Along with these achievements, we were also successful in giving back to the college which supported and helped achieve our goals. We organised a 3D printing workshop which was conducted last year. We gathered a crowd of more than 60 students aspiring to learn about new technologies. It was organized with the help of our sponsors. The workshop demonstrated how 3D printing works and how useful it can be in today's world.



Fig: The Time to 3D workshop conducted last year, with 60+ participants.

Present Achievements

Detailed Seminar with speakers from the SRH University Heidelberg, Germany

We organised a detailed session regarding pursuing higher studies abroad was conducted by Ms. Kamilla Prutek, Director of Admission Office and Recruitment, from the SRH University Heidelberg in Germany. This university is one of the largest private universities in Germany, with around 3,500 students enrolled in 6 faculties. In the session, students were informed about the various courses offered by the university. Living arrangements, atmosphere at the university, the environment there, extracurricular activities, different methods of teaching, cost of living, arrangements for transport etc were some of the topics discussed during the interactive session. Students were shown videos and photographs of the university, including their spacious study halls equipped with high technology appliances, which would aid their students further. Ms. Prutek gave examples of the different approach towards learning at SRH.



Fig: The SRH University workshop with Ms. Kamilla Prutek speaking. The seminar was attended by 80+ students.

Documentary shot with Auxilo Finserve

We were very proud to be part of a documentary filmed by Auxilo Finserve. It was an experience like never before. The team from Auxilo Finserve interviewed the members of DJS Arya and the faculty guides who have helped us throughout the process of preparing and getting selected for the final round of the competition. We were asked about the ups and downs throughout our journey, the difficulties we faced and how we overcame them, how the team was formed, what inspired us and what drove us to work hard. It was an amazing experience and helped our story be known to many more dreamers like ourselves.

Video Links:

Part 1: <https://www.youtube.com/watch?v=4t7TsMYnec4>

Part 2: <https://www.youtube.com/watch?v=J2QoQt2itAM>



Fig. The team from Auxilo Finserve interviewing our Faculty guides.

CanSat 2020 PDR round results

DJS Arya has participated in the 2019-20 CanSat competition which will be held in the Virginia University, United States of America. On 1st February 2020, we completed the first important step towards moving ahead in the competition which was the submission of the PDR document. After waiting patiently, we reaped the rewards of our hard work as we got selected for the next round held in the United States of America. **DJS Arya stood 13th all over the world in the PDR round of the Cansat competition 2020, out of more than 400+ teams participating, leaving behind our last year's score and improving our rank considerably.**

CanSat 2020 CDR round results

The next stage of the competition is the CDR. Due to the ongoing COVID-19 pandemic and the state of lockdown, our resources were limited. But we continued to work from home and put in our best efforts into making our CDR. **It paid off when we secured the 2nd rank all over the world, and the 1st rank in India, in the CDR round.**

CanSat 2020 Overall results

The COVID-19 pandemic resulted in the cancellation of the final launch phase. Hence, the results were evaluated on the basis of the previous rounds. Although our work conditions were restricted, we managed to worked together and got into the top 10 teams worldwide. We bagged the 9th position overall which was a huge jump from our previous year's ranking.

Future Prospects

We at DJS Arya have always valued our sponsors, keeping their benefits before our own. We wish to keep this bond with your company strong and permanent for many more years to come. As the team matures, our outreach and global rankings are bound to improve. Our relation with you will only grow deeper and stronger, and we strive to spread your vision across the world.