



14th Annual Student UAS Competition Awards Banquet

18 June 2016

SUAS Competition
Goods and Other
Ranking
Prizes

(Corrected)



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14th Annual AUVSI Student UAS Competition Thanks to our Sponsors



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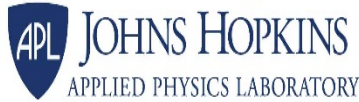
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2016 SUAS Event Photo



SUAS Competition Overview

- Used for basis of College course work
- Registration Opened when Rules Released in 20 Oct
- Registration Closed in mid-Nov
- Deliverables
 - Fact-Sheet & Flight Plan
 - Base Access Information
 - Technical Journal Paper
 - Proof-of-Flight Video
 - Telemetry Data
 - Safety Pilot Experience and Flight Logs
- Flight Readiness Review (FRR) Presentations
- Flight-Mission Demonstration

GENERAL TEAM STATS

2016 Teams

Registered = 43



U.S. National Schools	International Schools	High Schools
<ol style="list-style-type: none"> 1. Brigham Young University 2. Cal Poly - Pomona 3. Christopher Newport University 4. Cornell University 5. Embry Riddle Aeronautical University - ANDRONE 6. Illinois Institute of Technology 7. Kansas State University – Manhattan 8. Michigan State University 9. Mississippi State University 10. Monroe Community College 11. Norfolk State University 12. North Carolina State University 13. Purdue University 14. Rutgers University 15. Saint Louis University 16. San Diego State University 17. South Dakota School of Mines & Technology 18. Stevens Institute of Technology 19. University of Arizona 20. University of California, Los Angeles 21. University of California, Riverside 22. University of California, San Diego 23. University of Hawaii 24. University of Maryland 25. University of Texas, Austin 	<ol style="list-style-type: none"> 1. Concordia University 2. Delhi Technological University 3. École de Technologié Supérieure (Montréal) 4. Indian Institute of Technology, Bombay 5. Indraprastha Institute of Information Technology, Delhi 6. Istanbul Technical University, ITUNOM 7. M.S. Ramaiah Institute of Technology 8. McGill University 9. Mukesh Patel School of TM&E, NMIMS University 10. Munich University of Applied Sciences 11. Northern India Engineering College 12. R. V. College of Engineering 13. Technion, Israel Institute of Technology 14. Université de Sherbrooke 15. University of Alberta 16. University of Toronto 	<ol style="list-style-type: none"> 1. Flint Hill School 2. The Gilman School

2016 Teams

Journals Papers = 30

U.S. National Schools	International Schools	High Schools
<ol style="list-style-type: none"> 1. Cal Poly - Pomona 2. Christopher Newport University 3. Cornell University 4. Embry Riddle Aeronautical University - ANDRONE 5. Michigan State University 6. Mississippi State University 7. Monroe Community College 8. Norfolk State University 9. North Carolina State University 10. South Dakota School of Mines & Technology 11. University of California, Riverside 12. University of California, San Diego 13. University of Hawaii 14. University of Maryland 15. University of Texas, Austin 	<ol style="list-style-type: none"> 1. Concordia University 2. École de Technologié Supérieure (Montréal) 3. Indraprastha Institute of Information Technology, Delhi 4. Istanbul Technical University, ITUNOM 5. M.S. Ramaiah Institute of Technology 6. Mukesh Patel School of TM&E, NMIMS University 7. Munich University of Applied Sciences 8. Northern India Engineering College 9. R. V. College of Engineering 10. Technion, Israel Institute of Technology 11. Université de Sherbrooke 12. University of Alberta 13. University of Toronto 	<ol style="list-style-type: none"> 1. Flint Hill School 2. The Gilman School

2016 Teams

Flight Readiness Review = 24



U.S. National Schools	International Schools	High Schools
<ol style="list-style-type: none"> 1. Christopher Newport University 2. Cornell University 3. Embry Riddle Aeronautical University - ANDRONE 4. Michigan State University 5. Mississippi State University 6. North Carolina State University 7. University of California, Riverside 8. University of California, San Diego 9. University of Hawaii 10. University of Texas, Austin 	<ol style="list-style-type: none"> 1. École de Technologié Supérieure (Montréal) 2. Indraprastha Institute of Information Technology, Delhi 3. Istanbul Technical University, ITUNOM 4. M.S. Ramaiah Institute of Technology 5. Mukesh Patel School of TM&E, NMIMS University 6. Munich University of Applied Sciences 7. Northern India Engineering College 8. R. V. College of Engineering 9. Technion, Israel Institute of Technology 10. Université de Sherbrooke 11. University of Alberta 12. University of Toronto 	<ol style="list-style-type: none"> 1. Flint Hill School 2. The Gilman School

2016 Teams

Flight-Mission Demo = 24



U.S. National Schools	International Schools	High Schools
<ol style="list-style-type: none"> 1. Christopher Newport University 2. Cornell University 3. Embry Riddle Aeronautical University - ANDRONE 4. Michigan State University 5. Mississippi State University 6. North Carolina State University 7. University of California, Riverside 8. University of California, San Diego 9. University of Hawaii 10. University of Texas, Austin 	<ol style="list-style-type: none"> 1. École de Technologié Supérieure (Montréal) 2. Indraprastha Institute of Information Technology, Delhi 3. Istanbul Technical University, ITUNOM 4. M.S. Ramaiah Institute of Technology 5. Mukesh Patel School of TM&E, NMIMS University 6. Munich University of Applied Sciences 7. Northern India Engineering College 8. R. V. College of Engineering 9. Technion, Israel Institute of Technology 10. Université de Sherbrooke 11. University of Alberta 12. University of Toronto 	<ol style="list-style-type: none"> 1. Flint Hill School 2. The Gilman School

Judges and Scoring

- Stable of 115 Volunteer Judges and 3 Scorers
- Judges Per Phase
 - 44 Judges for Journals
 - 24 Judges for FRR Presentations
 - 28 Judges for Flight-Mission Demonstration
 - Judges from MD, VA, FL, NY, CA, TN
 - Additional Boundary Judges from Civil Air Patrol

Humorous Heard by Judges

- “The only other time we got SRIC was when we crashed into it.”
- UC Riverside won the “closest to Karl” bonus award!
- “You see my system, you will be very impressed” “We find them all.” “We always find them all!”
- “Tape, any kind of tape, we need to strap this camera on”
- Judges saw the most repaired wing ever seen, but it flew
- Got flight clearance 2 days ago, but have been flying for months
- Turned in interoperability secret message prior to mission time
- Executed autonomous take off & landing perfectly
- ITU Best judge’s bribery award (Turkish Delight)
- “We have a good idea of what will happen during failures because we’ve experienced them all”
- Most stylish on the flight line, guess who’s wearing Lederhosen

Goods

- Recruiting Fair and Info Session was well attended
- FRR method worked well, quieter, and allowed time for flight
- First year the Mission Demonstration flown on Thurs
- Accomplished all flights without needing Sunday rain date
- Teams worked very well with us to deal with the storm delays
- Volunteer was excellent in all areas dealing with the rain
- Several first year teams were impressive this year.
- Ugliest plane out there – most likely to fly again after a crash
- Technion - Excellent preflight brief – thorough concise expectations for everyone
- Entire Cornell team worked targets during post-processing
- Michigan used very colorful vests for safety

Others

- When the Air Boss says “Your Next”, it means... Your next!!
- EDTS Dronolab helped India team troubleshoot in Pit!
- Check when your interop shows your location is in India!
- Some teams definitely needed more team members
- Backup aircraft looks better than primary aircraft
- Don’t give us your entire iTunes playlist on our imagery stick
- Innovative use of plastic as landing skid/crash protection
- UCSD – excellent ‘systems of systems’ team skills
- Mukesh Patel NMIMS – outstanding controllability, fabulous
- FOD Award – left flight line in a hurry, left bolts/ tool behind
- Yard sale! Most pieces needing to be recovered from field...
- It didn’t fly backwards, although the propeller was reversed

Next Year

- Provide lessons from Your experience from this competition
- Make recommendations for changes to Rules, facilities, etc.
- Rules May or May Not change again – we’re exploring;
 - Get students to come earlier for Start of Job Fair
 - Potential to fly on Thurs.... again!
 - No Limit to # of Teams Registering – earlier gates/increased thresholds
 - Remote Skype/Hangout Flight Readiness Reviews (FRR) presentations
 - No limit on any RF transmitter freq., not even 900 MHz transmitters
 - Focus on RF and antenna engineering
 - Telemetry & Target data over Interoperability Network as requirement
 - Actionable Intel submitted over the SRIC
 - Add Cybersecurity secondary task, non intrusive
 - Use Interoperability Network to provide hand out data to teams
 - Expand on Sense, Detect and Avoid
- University Day – Call in – It’s FREE (it’s BEFORE Registration)
- Make Each Team Conference Call (Kick-off, Mid-Way, Ready)!
- Registration (Including Payment) online, may close **EARLIER!!**

TEAM SPECIAL AWARDS

2016 SUAS Team Special Awards

- Best Overall Rotary Wing Award
- Best Overall High School
- Arthur Reyes Memorial Safety Award
- JustJoe Sportsmanship Award
- Dawn Jaeger Tenacity Award
- Best Overall Cyber Security (Journal Appendix)



Best Overall Rotary Wing Award

- École de Technologié Supérieure (Montréal),
Dronolab

Best Overall High School Award

- Flint Hill School

Arthur Reyes Memorial Safety Award

- Munich University of Applied Sciences,
Student Aviation Munich (SAM)

JustJoe Sportsmanship Award

- Christopher Newport University (CNU)
IMPRINT

Dawn Jaeger Tenacity Award

- Northern India Engineering College, New Delhi

Cyber Security Award

- University of California, Riverside

Detailed Mission Stats



Prize Barrels

24	Participation	5	Actionable Intelligence
24	Successful Flight	1	Off Axis Target
18	Autonomous Take Off	2	Emergent Target
21	Autonomous Navigation	3	Autonomous SRIC Message Upload
13	Autonomous Landing	4	Autonomous Air Drop
19	Auto Search	13	Interoperability
16	Locate/Classify Targets	0	SDA Missed Stationary Obstacles
2	QRC Target	1	SDA Missed Moving Obstacles
0	Secret Message		
1	Auto Target Detection		
1	Autonomous Target Localization		
1	Autonomous Classification		

2016 SUAS Team Ranking

- Overall Team Rankings – Top 10
 - Announce 6-10
 - Present 1-5
- All Cash Prize Barrels are scored and awarded
- TOTAL PRIZE MONEY AWARDED = **\$53,800**

OVERALL TEAM RANKING

(corrected)

2016 SUAS Overall Rankings

Overall Rank	University	Mission Rank	Journal Rank	FRR Rank	Prize Money
1	Université de Sherbrooke	1	5	4	\$ 6,950
2	Cornell University	2	12	2	\$ 4,500
3	North Carolina State University	4	7	9	\$ 4,900
4	Technion - Israel Institute of Technology	5	1	1	\$ 3,750
5	M.S. Ramaiah Institute of Technology	3	2	14	\$ 3,300
6	Mississippi State University	5	8	3	\$ 2,000
7	Munich University of Applied Sciences	5	9	5	\$ 2,500
8	University of California, Riverside	5	6	7	\$ 2,300
9	Embry Riddle Aeronautical University	5	11	6	\$ 2000
10	University of Toronto	5	10	8	\$ 800
11	University of California, San Diego	5	3	15	\$ 1,700
12	Istanbul Technical University	5	4	16	\$ 2,600
13	Christopher Newport University	5	21	10	\$ 1,900
14	Michigan State University	5	20	11	\$ 1,400
15	University of Texas at Austin	5	16	12	\$ 1,600
16	University of Alberta	5	14	19	\$ 800
17	University of Hawaii	5	19	17	\$ 1,000
18	RV College of Engineering	5	13	20	\$ 1,000
19	Mukesh Patel School of TM&E, NMIMS University	5	24	13	\$ 1,600
20	Indraprastha Institute of Information Technology	5	15	21	\$ 1,400
21	Flint Hill School	5	23	18	\$ 1,650
22	The Gilman School	5	26	22	\$ 1,400
23	École de Technologie Supérieure	5	27	23	\$ 2,050
24	California State Polytechnic University Pomona	n/a	17	n/a	\$ -
25	Northern India Engineering College, New Delhi	5	30	24	\$ 1,500
26	Monroe Community College	n/a	18	n/a	\$ -
27	Concordia University	n/a	22	n/a	\$ -
28	University of Maryland	n/a	25	n/a	\$ -
29	Norfolk State University	n/a	28	n/a	\$ -
30	South Dakota School of Mines and Technology	n/a	29	n/a	\$ -

2016 SUAS Team Prize Barrels

Overall Rank	University	Prize Barrels
1	Université de Sherbrooke	Auto Takeoff, Flight, Auto Landing, Auto Search, Target Detection, QRC Target, Auto Detect, Auto Localize, Auto Classify, Actionable Intel, Off Axis Target, SRIC Upload, Interoperability, Participation
2	Cornell University	Auto Takeoff, Flight, Auto Landing, Auto Search, Target Detection, Actionable Intel, Emergent Target, Interoperability, Participation
3	North Carolina State University	Auto Takeoff, Flight, Auto Landing, Auto Search, Target Detection, Actionable Intel, Emergent Target, SRIC Upload, Auto Air Drop, Interoperability, Participation
4	Technion - Israel Institute of Technology	Auto Takeoff, Flight, Auto Search, Target Detection, QRC Target, Emergent Target, Auto Air Drop, Interoperability, Participation
5	M.S. Ramaiah Institute of Technology	Flight, Auto Search, Target Detection, Interoperability, SDA Moving, Participation
6	Mississippi State University	Auto Takeoff, Flight, Auto Search, Target Detection, Participation
7	Munich University of Applied Sciences	Auto Takeoff, Flight, Auto Landing, Auto Search, Target Detection, Actionable Intel, Auto Air Drop, Interoperability, Participation
8	University of California, Riverside	Auto Takeoff, Flight, Auto Landing, Auto Search, Target Detection, SRIC Upload, Auto Air Drop, Interoperability, Participation
9	Embry Riddle Aeronautical University	Auto Takeoff, Flight, Auto Landing, Auto Search, Target Detection, Actionable Intel, Interoperability, Participation
10	University of Toronto	Flight, Participation
11	University of California, San Diego	Flight, Auto Search, Target Detection, Interoperability, Participation
12	Istanbul Technical University	Auto Takeoff, Flight, Auto Search, Target Detection, Interoperability, Participation
13	Christopher Newport University	Auto Takeoff, Flight, Auto Landing, Auto Search, Target Detection, Participation
14	Michigan State University	Auto Takeoff, Flight, Auto Landing, Target Detection, Participation
15	University of Texas at Austin	Auto Takeoff, Flight, Auto Landing, Auto Search, Target Detection, Interoperability, Participation
16	University of Alberta	Flight, Participation
17	University of Hawaii	Flight, Auto Search, Target Detection, Participation
18	RV College of Engineering	Flight, Auto Takeoff, Participation
19	Mukesh Patel School of TM&E, NMIMS University	Auto Takeoff, Flight, Auto Landing, Auto Search, Target Detection, Interoperability, Participation
20	Indraprastha Institute of Information Technology	Auto Takeoff, Flight, Auto Search, Participation
21	Flint Hill School	Auto Takeoff, Flight, Auto Landing, Auto Search, Target Detection, Participation
22	The Gilman School	Auto Takeoff, Flight, Auto Landing, Auto Search, Participation
23	École de Technologié Supérieure	Auto Takeoff, Flight, Auto Landing, Auto Search, Target Detection, SRIC Upload, Interoperability, Participation
24	California State Polytechnic University Pomona	
25	Northern India Engineering College, New Delhi	Flight, Participation
26	Monroe Community College	
27	Concordia University	
28	University of Maryland	
29	Norfolk State University	
30	South Dakota School of Mines and Technology	



CONGRATULATIONS!



THANK YOU!

WE HOPE TO SEE YOU NEXT YEAR!



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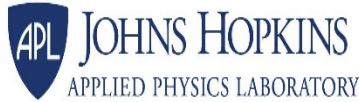
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