Student Space Systems

at the University of Illinois at Urbana-Champaign

12.8.2014

Mission Statement: To engage students in modern high power rocketry and to promote the advancement of rocket research. We also give students the experience with working in propulsion, avionics, launch systems, structures, safety, and outreach while maintaining a professional setting.

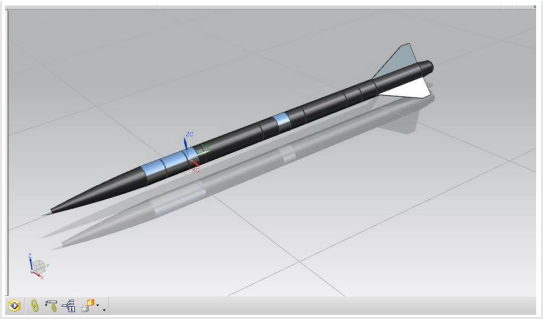
Outlook

- SSS has been named Engineering Council UIUC's Society of the Month! We receive $250 and a plaque. Keep up the leadership, community service, and dedication everyone!
- Sierra to launch from Ash Grove, IN on December 13th! All are invited to come watch!
  - Here are the driving directions!
  - Sign up to carpool! First come, first serve!

President Ben Wexler with fully painted Sierra!

Structures

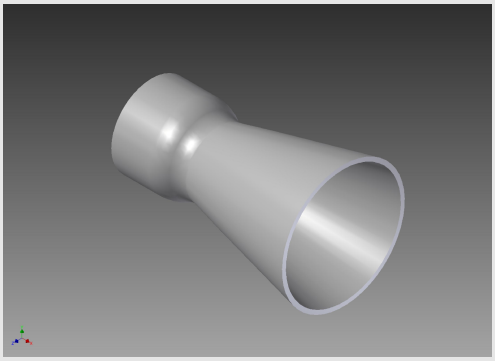
The Structures Department is currently wrapping up research for the Phase III rocket, and is preparing to hit the ground running next semester with the design and build phase. According to the current timeline, the design will be completed in early February, with construction lasting through to May.



Propulsion

The Propulsion Department is busy preparing the design review for the hybrid rocket engine. This comprehensive report will detail all the research and calculations done by each subsystem since the start of the semester. At the start of next semester, the executive board will vote on approving the design, after which, we may begin ordering parts for assembly and fuels for testing.

A special thank you to Spencer Gore for purchasing Rocket Propulsion Analysis software for the propellants subsystem. The software is useful in determining characteristics of each propellant-oxidizer combination such as specific impulse, thrust, chamber pressure, etc.



Avionics

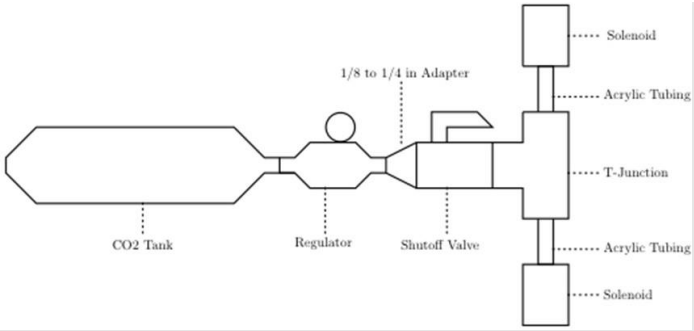
Currently, the Avonics team has four projects: Hummingbird, Launchbox, Robust Sensor Package, and Sierra Bays. Hummingbird will yield a fully functioning quadcopter with telemetry and Kalman filtering. The aim of Launchbox is to create a long range, NAR compliant ignition system for future launches. Its design is complete and it was recently presented to the executive board. Robust Sensor Package will create essentially an avionics bay on a chip. The parachute bay for Sierra is complete and will fly on Saturday's launch! Avionics projects are currently awaiting funding.

Director of Avionics Mathew Halm working on Sierra's payload.

Special Projects

As of last week, Max Archer, freshman, is the new Director of Special Projects! We look forward to working with him!

Special Projects is making progress with the Reaction Control System (RCS). It will allow handling of the rocket by expelling jets of compressed carbon dioxide. Its design is complete and it is awaiting funding. After receiving funding, the team can purchase the necessary materials needed to make RCS a reality. A working iteration will fly as early as next semester.



Launch Systems

Launch Tower designs are in progress. The goal of having launch rails for future launches is increased guidance and support as the rocket launches. This will hold especially true for us as we begin launching supersonic rockets. In addition, it is also a much safer way to launch high power rocketry than simply using a launch rod. Its construction is scheduled for completion in the Spring. This will require a team of builders skilled in grinding, welding, and soldering to put together!

Educational Outreach

After last month's enriching Educational Outreach event with a local 4-H group, SSS has focused outreach efforts on Activity Day and in our annual Engineering Open House (EOH) exhibit. Last year's EOH exhibit included a video demonstration of a test engine of an I-class motor firing with both high-speed and thermal imaging. While some SSS members explained posters on SSS and high-power rocketry to visitors, others ran an interactive "Sharpie Rocket" activity where kids learned about the basics components of a rocket while making their very own miniature model rocket. Stay tuned for opportunities to participate in EOH preparation, as well as a new corporate outreach committee that will soon be forming!

Director of Propulsion Florin Ghinet presenting to visitors at EOH.

In the news...

- NASA EFT-1 mission success! Orion launches on Delta IV Heavy from Cape Canaveral and splashes down in Pacific! For further reading
- SpaceX is developing a $1.5 billion constellation of 640 sattelites operating at 1,200km to provide unregulated internet access in conjunction with WorldVu Ltd. For further reading
- European Space Agency approves development of Ariane 6 rocket. It will be cheaper and more powerful than the Ariane 5 and its design is modular so that it can be tailored to range of satellites and missions. It is scheduled to fly in 2020. For further reading

Get involved! Here are the upcoming department meetings:

- Launch Systems - Director: Nick Campbell, nickcampbell94@gmail.com
  - Tuesday 6pm, Talbot 104
- Structures - Director: David Degenhardt, degenha2@illinois.edu
  - Tuesday 7pm, Talbot 225A
- Avionics - Director: Mathew Halm, mhalm2@illinois.edu
  - Wednesday 8pm, Talbot 225A
- Special Projects - Director: Max Archer, m4rch3r@gmail.com
  - Thursday 7pm, Talbot 225A
- Propulsion - Director: Florin Ghinet, ghinet2@illinois.edu
  - Saturday 7pm, Talbot 225A
- Educational Outreach - Director: Jake Goldrich, jjgoldr2@illinois.edu

Contact Us

- Check out our Facebook page!
- Follow us on Twitter!
- Learn more through our website! It is currently under construction.
- The best way to get in touch with us is by sending an email to uiuc.sss@gmail.com !