



High Altitude Balloon Meeting Minutes

2/8/2018

The UND High Altitude Ballooning team met in the Space Studies Conference Room on February 8, 2018. The following were in attendance:

- Caitlin Nolby
- Marissa Saad
- Denise Buckner
- Peter Henson
- Nelio Bautista
- Devi Dinah
- Rakesh Shankar
- Kayla Daniels
- Anamika
- Sophie Orr
- Taren Wang

The **second** official meeting of the 2018 spring semester was held starting at 12:30 PM.

The purpose of the meeting was to

1. Walk the students through the unmanned ballooning sub part from the Federal Aviation Regulations (FAR)
2. Show the students the timeline and some opportunities for the Fargo Mega Launch
3. Discuss the High Altitude Student Platform and UND's role in the NASA proposal

A. FAR Interpretation

Those present were shown the FAR subpart regarding unmanned free balloons. This document can be found on the North Dakota Space Grant AESIR Ballooning website. The main issues covered were:

- Weight/size ratio for each payload
- Total payload train weight
- Rope used has to be able to be severed by 50 pounds of force or less
- Cannot operate in restricted/prohibited airspace or anywhere with special operations going on
- Avoid hazardous activity – sharp objects, explosives, etc.
- Our tether has tick marks every 50 ft to count how high we our balloon has reached
- Calling in a NOTAM general information - how high you're going, how long you're operating for
- At night lights are needed
- If balloon does fly away, call NOTAM office right away
- Operations between sunrise and sunset

B. West Fargo "Megalaunch"

This will be another STEM education outreach project with middle school students in the West Fargo area, expected to be similar to the Near-Space Ballooning Competition (NSBC) this past fall semester, yet less hectic. Expected date will be in the spring, but it is yet to be determined.

Today's updates: We learned that the teacher for these 7th graders is very organized and on top of things, with a detailed schedule and plan for these kids to be involved in this ballooning event, and has done ballooning experiments in the past. We also learned that these kids are learning about the aerospace field in general, and that we will need UND student mentors for 14 total 7th grade students of 4 different groups. The mentoring will involve attending skype or google hangout calls with the kids, answering their questions during these calls, and guiding them through their payload experiment throughout the semester. Ideas discussed for their experiments included popcorn kernels, seeds, and UV paper. A visit to their school in Fargo



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could be possible, but for now would just involve digital hangouts. Payload kits will be prepared this time for the students to put together to avoid having poorly made payload containers. This will standardize the integrating of the payloads and stringing them to the balloon. We still haven't heard when the days will be, but they will be put on the AESIR Google Calendar once they are found out.

C. High Altitude Student Platform (HASP)

Also, a NASA-sponsored project, the High Altitude Student Platform is an opportunity for twelve accepted proposal payload packages to be flown on a NASA balloon in September. The University of North Dakota has collaborated with the University of North Florida (UNF) since 2008. Our proposal just got accepted earlier last week. UND's ballooning team will, again, provide the test flights and science teams for this payload package. The focus of the experiment is to study the nocturnal vs. daytime ozone profiles.

Today's updates: UNF has finished fabricating a new version of 8 nanocrystalline indium tin oxide (ITO) thin film gas sensors to detect ozone gas. They reached out to us and will send it to us soon. In addition, improved version of 8 nanocomposite In_2O_3 +ITO thin film gas sensors will be developed and used for detection of bad ozone in pollutant gases and smog in the atmosphere and troposphere. Multiple balloon launch days and times are expected but yet to be determined when and where just yet. Tentative dates proposed were weekly, each Friday, starting on March 2nd.

D. Lab Time

Since the weather is still cold, our team will mainly be planning for above listed activities as well as preparing payload systems including two different cutdowns, an iridium satellite tracking modem, and sensor networks. The sensors will be integrated using Arduinos and Raspberry Pi's like last semester. The cutdown, which we have used before, utilizes a razor blade on a motor, started through an email command. The other cutdown makes use of NiChrome wire (the same wire used to make your toaster hot) to melt through the nylon rope. Our prototype NiChrome cutdown system preliminary test has been successfully performed. We will continue testing throughout the semester. For projects requiring lots of hands, notification will be sent out to work on it together. Otherwise, students are willing to stop by Clifford 210 at any time to help. A tentative timeline for projects was presented in the powerpoint.

Action Items:

All students interested in getting involved with ballooning:

- [Fill out NASA Media Release Form and Balloon Regulations agreement document and email to Marissa \(msaad@space.edu\) by next Friday, 2/9/18.](#)
- If you are interested in being a student mentor to middle school students in West Fargo, also email Marissa by this Friday.

The next meeting will be next Wednesday at 12:30 PM. The meeting ended at 1:05 PM.