

# The UAH ARISS Program, Promoting STEM By Practicing Amateur Radio With Astronauts

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## Summary

Student amateur radio operators at the University of Alabama in Huntsville shared the experience of amateur radio and the love of space to 120 8th graders in March of 2013. The UAH Space Hardware Club hosted a series of educational courses at four middle schools that engaged four local classrooms in amateur radio, allowing each student to get hands on experiences with radio equipment. The UAH team then hosted a live, direct uplink to NASA Astronaut Tom Marshburn onboard the International Space Station using amateur radio where the students were able to have a 10 minute conversation with the Astronaut. The program, sponsored by NASA and the Amateur Radio Relay League, is called Amateur Radio on the International Space Station.

## Developing a Curriculum - 4 Classroom Visits

To prepare students for the ARISS activity day, SHC members designed four classroom visits to teach and practice skills:

- Day 1 – Radio Waves and Amateur Radio**
- Day 2 – How to be an Astronaut and the Simulated ISS**
- Day 3 – Tracking Satellites and Doppler Shift**
- Day 4 – Event Day Training**

The design, including handouts, instructions, and slides, was discussed with each teacher. The curriculum was modified to directly address the teaching requirements of the 8<sup>th</sup> grade science goals, as a way to not lose time in the classroom.



## Teaching the Students

With a set curriculum and four classrooms onboard, the four visits were performed with each of the classrooms. SHC members, USLI members, and other volunteers helped in each of the visits. Each student provided a question to be asked of the astronaut, and the four questions chosen for each classroom were asked by their authors.



## The Talk with the Astronaut March 21, 2013

Each of the classrooms were brought to the UAH Space Communications Lab for the event. Students toured this lab, the ChargerSat Cleanroom, and a space history area. With all preparations complete, and predictions that the ISS was within range, students began announcing on the radio for the astronauts: **"This is K4UAH, Station can you hear us?"** Soon, Astronaut Tom Marshburn replied loud and clear. All 16 questions were asked during the 10 minute flyover.

1. This is Debreiona. What is your greatest challenge on the Space Station?
2. This is Jordan. Is it fun to be an astronaut?
3. This is Carmen. How long is your training before you go to space?
4. This is Ada. How do you stay entertained in space?
5. This is Micah. Are astronaut suits comfortable?
6. This is Malya. Do the stars look bigger in space than they do on Earth?
7. This is Garrett. What does Earth look like from space?
8. This is Patrick. How is life in microgravity?
9. This is Shon'Derious. Is it fun to be in space, and is it scary?
10. This is Alex. Does floating in space make you nauseous?
11. This is Amelia. What do you miss most about Earth?
12. This is Cassie. What classes did you take in high school and college to prepare for being an astronaut?
13. This is Morgan. What is your inspiration to choose this career?
14. This is Rachel. What do you do while in space?
15. This is Aubrie. How does it feel to not have to get somewhere?
16. This is Joseph. Are there any tv's or internet to use for entertainment?



Curriculum Design  
June – December 2012

Classroom Activities  
February - March 2013

Event Day  
March 21, 2013

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## Evaluating Impact

Every student and volunteer involved had a different experience. The 8<sup>th</sup> graders each had hands on experience with amateur radio. Each performed all the training activities in the classroom visits. Through interviews and surveys, it was clear that students felt introduced and welcomed into the science community. Some commented on this being a door opened to a new set of opportunities previously thought unreachable. The UAH volunteers commented that they each felt a direct impact on the future of the students involved. The in depth, multiple visit instruction seemed to increase the program effectiveness significantly.

