



## USU Get Away Special Team Experiment Selected for NASA's Vomit Comet

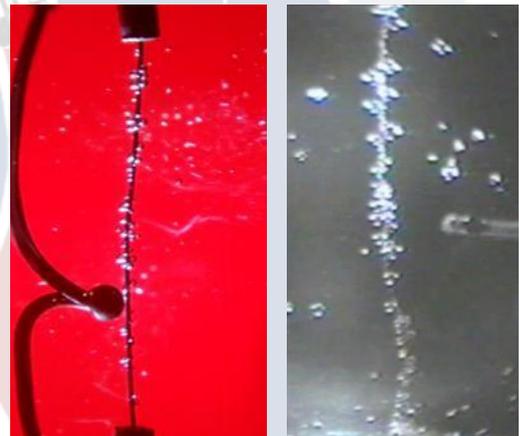


### NASA's Vomit Comet

Each year, NASA sponsors an outreach program that allows undergraduate university students the chance to perform experiments in microgravity. The students spend 10 days at Johnson Space Center and Ellington Air Force Base where they get to test their experiments in NASA's "Weightless Wonder" (affectionately known as the "Vomit Comet"), a plane that simulates microgravity. The GAS team has been selected to fly for the second year in a row, this time for the flight week of June 2-11, 2011. Five USU students will have the chance to experience weightlessness and conduct an exciting and innovative research project, aided by their student ground crew.

### Project

This year's project is a continuation of the GAS experiment flown on the Vomit Comet last year (which was a follow-up to an experiment that flew on the Space Shuttle Endeavor in 2001) that studied the effects of microgravity on nucleate boiling dynamics. The experiment's aim is to determine the effectiveness and robustness of two-phase heat transfer systems using water for thermal management systems in space. The application of these systems in space would greatly increase the capabilities of satellites and other spacecraft and provide new insight into the fundamental mechanics of fluid heat transfer.



This year's experiment will continue to study nucleate boiling heat transfer and also incorporate a new and unique concept: the use of an array of microheaters to cool the surface of a microchip. Based on the results of this experiment, the team will develop a new understanding of boiling dynamics in the absence of buoyancy to assess the feasibility of two-phase heat transfer systems for microgravity use.

Previous work by the GAS team in this area has led to an unprecedented contribution to scientific literature on this topic. Just this year, student members have presented two posters and four talks at regional and national meetings, written three scientific papers, submitted an article to the International Journal of Heat and Fluid Flow, and won numerous awards for their presentations.

### Outreach to K-12 Students and Community

For the last several years, the GAS team has been visiting K-12 schools to support teachers and cultivate students' enthusiasm for science. In order to encourage student interest, each presentation involves science demonstrations applicable to the grade's curriculum, excites students about the team's current experiments in microgravity, and provides teachers with

"I have already recommended this presentation to the parent of one of my students who teaches in Fielding, Utah area."

**-Fifth Grade Teacher**

"The students loved the things you brought to show science in action."

**-Third Grade Teacher**

resources normally unavailable to them. As teachers give feedback for improvement, our team adapts our presentation to meet the teachers' needs.

The GAS team is also working with community groups to help promote scientific learning. The team will have booths at Clarke Planetarium in Salt Lake City, StarHouse Discovery Center in Cache Valley, and USU Physics Day at Lagoon in Farmington, Utah. In addition to booths, displays will be placed in local libraries and on USU campus explaining the nucleate boiling experiment and the team's experience at NASA.

## What Can You Do to Help?

Although NASA has provided the GAS team with an opportunity to fly their experiment on the Vomit Comet, they provide no monetary support for the project. *That is where you can help!* The team needs \$30,000 to complete the project (including materials, fabrication, and travel for team members to Houston). In addition, extensive ground testing and data analysis will be required to evaluate the effects of microgravity on our experiment. Due to NASA documentation deadlines, this testing would require a significant summer time commitment. The remainder of the budget will provide stipends to support summer researchers.



Benefits of donation include:

- Support undergraduate research
- Support outreach to K-12 students (overtime website (gas.[usu.edu](http://usu.edu)) 3,000 to date)
- Tax deductible
- Great recruiting opportunity
- Company logo on experiment, posters, and
- Free advertisement during outreach activities and publicity
- Thank you sponsors link on team website

Any size donation would be appreciated and be well utilized. Contact Joseph Jenkins, development officer for the College of Science, at [joseph.jenkins@usu.edu](mailto:joseph.jenkins@usu.edu) or 435-797-3510 for donation details. Checks can be sent to Joseph at: 0305 Old Main Hill, Logan, UT 84322-0305.

## About the Team



USU's Get Away Special (GAS) team, is an undergraduate and graduate program inviting students to engage in hands-on research and design. Team members generate community interest in space exploration while developing microgravity experiments that stem from their own research interests.

Team members meet, largely on a volunteer basis, after classes and on weekends to design, plan, produce, and assemble the components that go into their projects. All Utah State University students are invited to participate, independent of educational background, experience level, and field of study.

Over the course of thirty years, the GAS team established Utah State University as the leading school in the space shuttle program. It has become known as one of the world's premier student space research teams. The team has been the leader in maintaining Utah State University's sterling reputation as the university that has flown more experiments into space than any other university in the world.