

Perlan School Experiment: Tin Whiskers

Written By

Aditya A. & Nicolas M. 8th Grade Students

What do you think of when you hear the phrase tin whiskers? At first you may think that they have something to do with cats, but they are actually metal filaments that form or 'grow' off of metal solders. Metal whiskers are not widely known, but they can cause some major problems. They are very important to electronic part manufacturers because tin whiskers can cause short circuits that may possibly result in electrical failures.

Our middle school, CREC's Academy of Aerospace and Engineering in Windsor, CT, USA, designed an experiment that investigates the detachment of tin whiskers due to flight induced stresses. The detachment of tin whiskers in flight has never been studied before and is crucial to preventing short circuiting in future

electronics. It took several months to design and build this experiment. It will fly in August of 2016, on the Perlan Glider II in El Calafate in Patagonia, Argentina, which has the perfect conditions to attempt to break the world record for highest altitude in unpowered aircraft.

As I mentioned above, these tin whiskers are not widely known, so we were fortunate to get help from NASA Goddard Tin Whiskers Investigation Team. They were able to send us much needed advice, materials, and insight.

What do students say working on the Perlan experiment has meant to them?

"As a student I think that being able to work on a hands on project where we are able to build and do in depth research, which will be used worldwide to further investigate the topic of tin whiskers, gives us pride to know that what we did here in a tiny part of the United States of America made such a large difference everywhere in the world." - **Aditya A., Student**

"The Perlan Project has really inspired me to continue and persevere at my dreams to become an astrophysicist. Working on this has taught me what it really takes to pursue a career in a field that overlaps Science, Engineering, Technology, and Math; STEM." - **Nicolas M., Student**

"The Perlan Project really brings out the Aerospace and Engineering aspect of our school. Working on the project takes a lot of time management, leadership, and teamwork skills to get the job done." - **Johnathan B., Student**

Next Stop, Argentina

The Teachers In Space, Inc. ground crew were pleased with the test flights conducted for nine student experiments aboard the Perlan II out of Minden, Nevada over April 20th through April 30th. "This helped us pinpoint improvements that can be made in physical components - such as the rack, as well as procedural components - such as loading, unloading, and data gathering" said Liz Kennick. These improvements are already underway in preparation for the next milestone, the test flights out of Argentina. The experiments were selected through a competition earlier this year, sponsored by Teachers in Space, Inc., and Perlan. Follow your favorite (or all the) experiment(s) at: <http://teachers-in-space.com/perlan-cubesat-participants-for-2016>

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Ground Crew Needed for Argentina

It is not too late to sign on as volunteer ground crew in Argentina. **You do not have to be a teacher!** TiS needs a few more people to fill spots from about August 30 to end of September. As this time is within the school-year, TiS is accepting non-teachers for these spots. A bargain price is now available to everyone, thanks to the lodging discount the Perlan team has negotiated! Total duration is ideally 10 days for the \$4000.

This price includes:

- airfare
- 1BR in a 2BR cabin
- Food
- Ground Transport
- 40 hours professional development credit in STEM subjects (atmospheric science, computer science, programming, engineering, technology management, etc.)
- 50% payments by 30 June and balance by 30 July. You can use credit cards! **We want you with us!**
- Friday night - Saturday travel from US to Buenos Aires and then on to El Calafate
- Saturday afternoon El Calafate receive handover from departing crew
- Sunday - Friday 6 days ground crew program
- Saturday afternoon turnover responsibilities to new crew, depart El Calafate
- Saturday night - Sunday travel back to US

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