

Have Spacesuit Will Travel

2015 Program Summary



Sixth grade student at Fallston Middle School in Fallston, Maryland, tries on Peggy Whitson's Sokol spacesuit after reading *Have Spacesuit Will Travel* as part of an after-school STEM program.

Prepared by Don Thomas

January 18, 2016

Executive Summary

The Heinlein Prize Trust's *Have Spacesuit Will Travel* program was continued in conjunction with Dr. Don Thomas during 2015. A total of 263 students from three area schools participated by reading Heinlein's book and completing a space-themed project. This brings the total number of students participating in the full HSWT program between 2009-2015 to 1,763 students.

The footprint of the *HSWT* program was significantly expanded once again during 2015 to include classroom visits and presentations at 20 additional schools within Maryland as well as at schools in New Jersey, Ohio, Delaware, Florida and Washington, D.C. HSWT also visited three science-based summer camps where the Sokol spacesuit was on display for the students, two of these in Maryland and the third in Syracuse, NY. In 2015 HSWT went international with 8 school visits in Dubai, U.A.E. and 7 school visits in Mumbai, India. Overall these presentations and programs involved over 6,630 students, teachers, and family members.

Of special note, HSWT also participated in a live webcast with the Smithsonian National Air & Space Museum that was also broadcast on NASA TV. Part of their interactive classroom program series "*STEM in 30*", this episode titled "*Space Junk: Fast Trash*" focused on space debris and the important role that spacesuits play in protecting our astronauts in space.



Have Spacesuit Will Travel

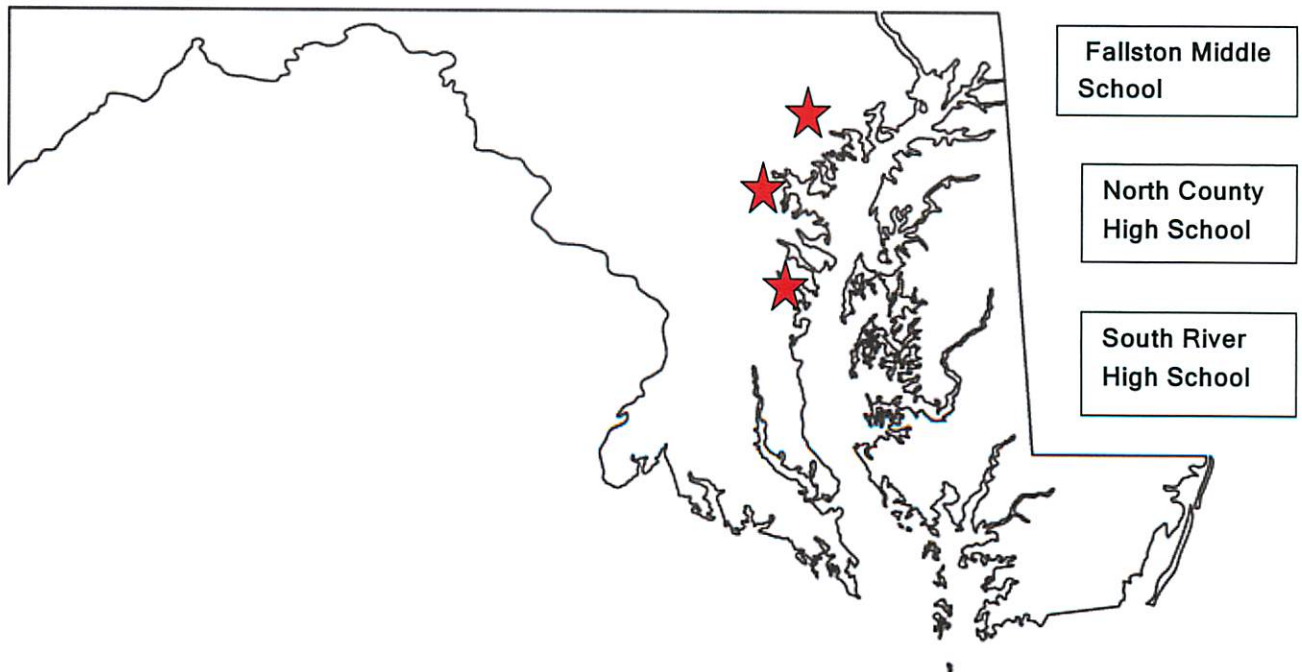
2015 Program Summary

During 2015 the Heinlein Prize Trust together with Dr. Don Thomas presented the full *Have Spacesuit Will Travel* program at three different public schools in Maryland. These schools included:

Fallston Middle School (Harford County Public Schools)
2303 Carrs Mill Rd.
Fallston, Maryland 21047

North County High School (Anne Arundel County Public Schools)
10 1st Avenue E.
Glen Burnie, Maryland 21061

South River High School (Anne Arundel County Public Schools)
201 Central Avenue E.
Edgewater, Maryland 21037



North County High School and South River High School participated in the **HSWT** program previously in 2009, 2010, 2011, 2012, 2013, and 2014, and continue to be strong advocates for the program. Both of these schools are STEM (Science, Technology, Engineering, and Mathematics) magnet schools with rigorous science and math programs and curriculum designed to attract the best students into STEM and to prepare them for college entry and technical careers in the future.

In 2015 the **Have Spacesuit Will Travel** program was also presented at Fallston Middle School which has participated in the program previously under the leadership of sixth grade science teacher Liz Blackwell.

A total of 263 students participated in the program from these three schools in 2015, reading Robert Heinlein's book **Have Spacesuit Will Travel** and completing various technology development and art projects as part of the program. With the previous 1,500 students that participated in **HSWT** between 2009- 2014, the total student participation in the full **Have Spacesuit Will Travel** program has grown to 1,763 students.

Since its inaugural year in 2009, **HSWT** has been extremely popular and continues to receive strong support at both North County and South River High Schools. Plans are in place to continue the **HSWT** program at both schools with their incoming freshman class in the fall 2016. Since the **HSWT** program was initiated with these two schools in 2009, every one of their STEM student has participated in the program. Once again this year I continued to have some of the older students that participated in **HSWT** in previous years come up to me to say how much they enjoyed **HSWT**. Their teachers praise the program and continue to tell me it is truly one of the highlights of their STEM program and one they are extremely proud and excited about. South River High School named me the **STEM Volunteer of the Year** for 2015 in recognition of the contributions made with the **HSWT** program.



A wall-sized display of their signature STEM programs at South River High School prominently features **Have Spacesuit Will Travel** as one of their project based learning activities.

HSWT at Fallston Middle School Fallston, MD

In 2015 we continued the collaboration with Fallston Middle School where Mrs. Elizabeth Blackwell, the participating sixth grade science teacher and strong HSWT advocate, returned after being out on maternity leave the previous year.

The first event this year was a school visit by Dr. Don Thomas on April 13. During his visit Dr. Thomas gave his presentation on living and working in space to all classes of the Fallston Middle School sixth grade which involved 160 students. Peggy Whitson's Sokol spacesuit was also put on display for the students to examine.

Thirteen of the sixth-grade students then signed up to participate in an after-school book club project. After reading *Have Spacesuit Will Travel*, all of the students completed projects related to spacesuits. One design featured adding cameras to the spacesuit helmets to allow astronauts better visibility in space. Another featured a set of "rocket boots" to allow astronauts to move around effortlessly in space. Yet another design called the "Space Arm" featured a robotic arm attached to the spacesuit to assist the astronaut during complex tasks.

After completing their projects, on May 18, 2015, I visited their school to review their work and allowed a few of the students to try on the Sokol spacesuit. Each of the students presented their work and we talked about some of their ideas. Parents and grandparents attended as well as they didn't want to miss the excitement of seeing their child in the Sokol spacesuit!



A proud parent (left) and her son pose with Don Thomas and Fallston Middle School 6th grade teacher Liz Blackwell.

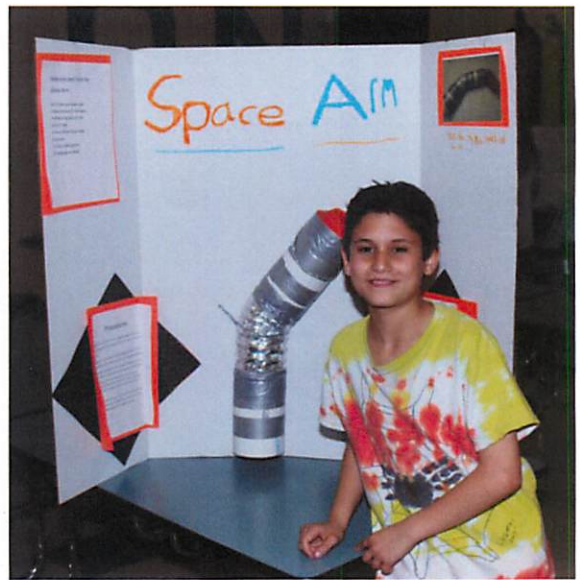


Fallston Middle School students examine Peggy Whitson's Sokol spacesuit and try on an old Russian high-altitude helmet.

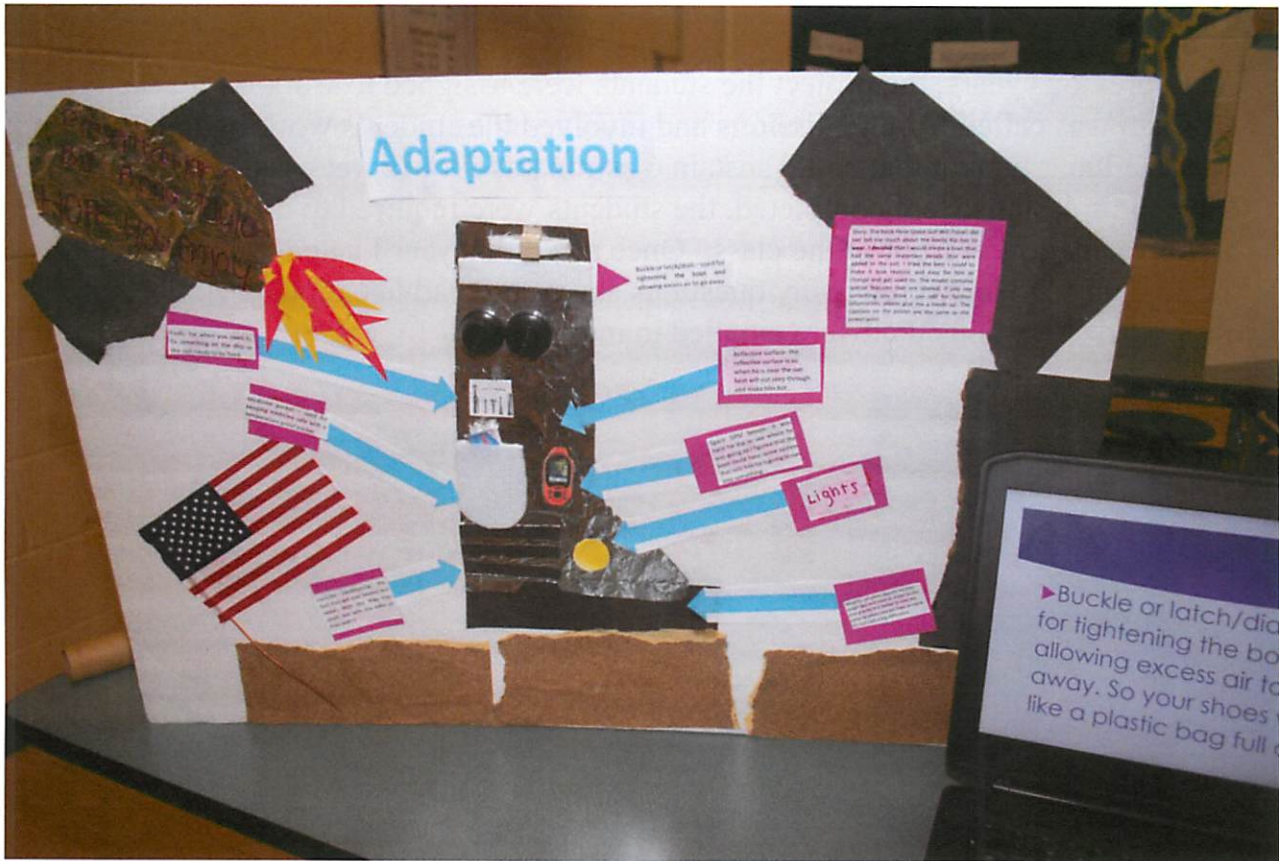




Both students and teachers were able to try on Peggy Whitson's Sokol spacesuit. Liz Blackwell, the teacher supporting the HSWT program is shown in the Sokol (above right) along with two of her participating students.



Some of the student projects included a special camera to be mounted on the helmet of the spacesuit and the development of a Space Arm to assist a suited astronaut.



One of the students designed a new set of space boots that featured built-in tools and medicines, GPS sensors, lights for walking in the dark, and added weights when used on planets with lower gravity than on Earth.

HSWT at South River High School Edgewater, MD

Once again *Have Spacesuit Will Travel* was a summer reading requirement for the 125 incoming freshmen into the STEM program at South River High School which was coordinated by Hillary Catan, the STEM program coordinator, and Jennifer Ward, the ninth grade STEM teacher. Having already read the book over the summer, the students were more than ready for the Sokol suit to arrive at their school.

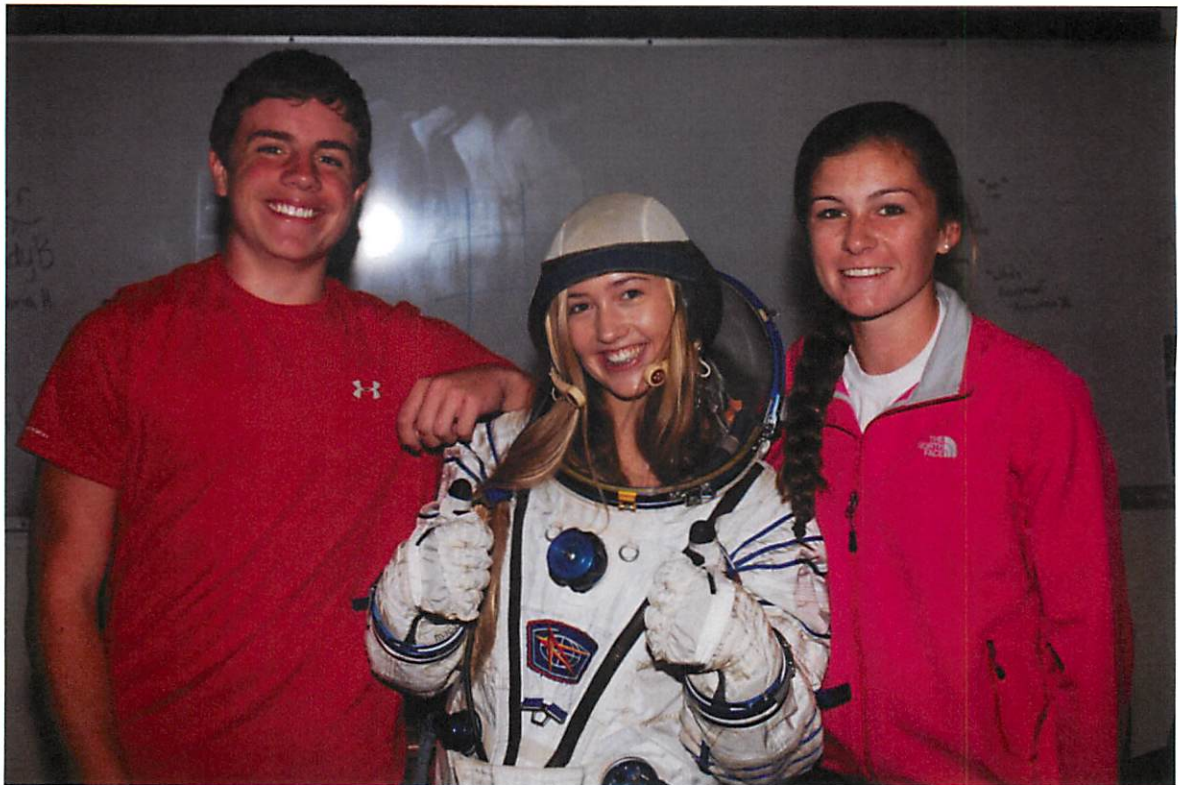
On October 12 and 13, Dr. Don Thomas brought the Sokol suit and met with four different classes of students. For each class a presentation was given on the background of spacesuits, describing their function, the various components that make up a spacesuit, and explaining the different types of spacesuits. Then 3-4 of the students in each class were given the opportunity to try on the Sokol. At this point the students began their projects associated with **HSWT**.

As in previous years, the project the students were assigned to work on for the **HSWT** program was called **Moon Missions** and involved the students working in groups to design a lunar habitat that could sustain 6 astronauts for a 3 week stay on the moon. Once their designs were completed, the students were required to do a 5-10 minute oral presentation in front of the class. Once again this year I acted as a resource for the students and answered many questions and offered advice on their projects and designs via questions that were emailed to me.





Ninth grade teacher from South River High School, Ms. Jennifer Ward, poses with one of her students trying on the Sokol spacesuit during the HSWT visits to their school on October 12-13, 2015.



Students from South River High School try on the Sokol spacesuit during the HSWT visits to their school on October 12-13, 2015.

HSWT at North County High School Glen Burnie, MD

Once again this year the **HSWT** student projects were associated with their freshman STEM art class led by Mr. Bernstein. Because of scheduling conflicts, Don Thomas will visit the school during the spring semester 2016 and will bring the Sokol spacesuit with him at that time and meet with the students to discuss their projects.

2015 Special Event:

Smithsonian “STEM in 30” Episode

In conjunction with the **Smithsonian Institution National Air & Space Museum**, **HSWT** participated in one of their “**STEM in 30**” episodes titled “**Space Junk: Fast Trash**”. **STEM in 30** is a thirty minute interactive classroom program for middle school students broadcast live via a webcast by the Smithsonian National Air & Space Museum and also on NASA TV so it enjoys a very large and diverse audience. This episode focused on space debris orbiting around the Earth and its impact on spacecraft, satellites, and astronauts in space. The episode was filmed on February 11, 2015 at the Friendship Public Charter School in Washington, D.C. and originally aired on February 18, 2015. An archived version can be found on **YouTube** by searching “**Space Junk: Fast Trash – STEM in 30**”

The **HSWT** segment of the program featured a hands-on activity where students designed their own spacesuits using a variety of materials to protect a potato from impact with a sharp object, simulating the actual testing of real spacesuits for impact resistance.





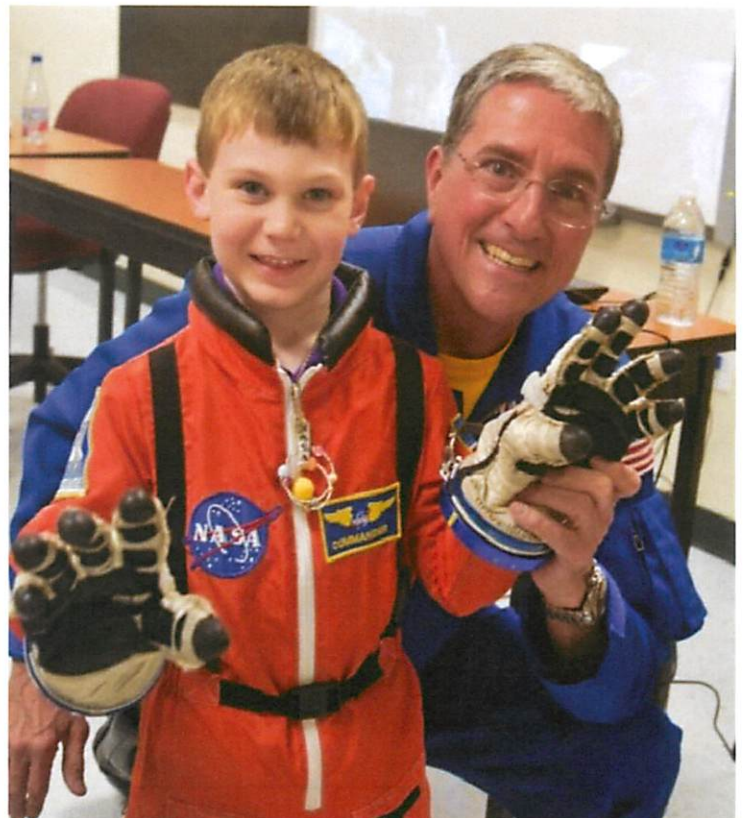
Visit to the Friendship Public Charter School in Washington, D.C. to film *STEM in 30* episode broadcast via a Smithsonian webcast and also on NASA TV. A few of the students were able to try on the Sokol spacesuit after filming.

Increasing the Footprint of HSWT at Home and Abroad:

Additional School Visits and Community Events

In order to increase the footprint of the HSWT program and allow for more schools and students to learn about the human body in space and the engineering and technology of spacesuits, the Russian Sokol spacesuit was brought to a wide range of presentations from public lectures to classroom visits to STEM Nights at area schools, from Maryland and Washington, D.C. to New Jersey, Delaware, Ohio, and Florida. The Sokol gloves from Peggy Whitson's spacesuit even traveled to Dubai, UAE, and Mumbai, India where additional hundreds of students got to see them with many of them actually trying the gloves on. **These presentations and appearances involved 5,330 students, parents, and teachers at the following locations:**

- 1/14/15 **Presentation on living and working in space along with Sokol spacesuit display at Bunker Hill Elementary School in Middletown, DE as part of their Family STEM Night program.**
- 1/15/15 **Presentation on living and working in space plus spacesuit presentation for 300 students, teachers, and family members at the Davenport School for the Arts in Davenport, Florida, (near Orlando), as part of their 10th annual Family Space Night celebration.**



The Sokol spacesuit is shown to the students at the Davenport School for the Arts. One young aspiring astronaut tried on the Sokol gloves to compliment his own spacesuit.

- 2/11/15 Discussion of spacesuits with 30 sixth grade students at the Friendship Public Charter School in Washington, D.C. (see Special Events “STEM in 30” above).
- 3/9/15 Presentation on achieving your dream and living and working in space along with the Sokol spacesuit display for 100 students at Patapsco High School in Baltimore.
- 3/11/15 Presentation on living and working in space along with the Sokol spacesuit display shown to 150 elementary students at The River School in Washington, D.C. The request for this school visit came from Rachel Goldsten, the assistant head of school at the River School. She attended the Heinlein Prize Trust dinner at the NASM on November 14, 2014 and requested to Art Dula that we bring the HSWT program to her school. Mission accomplished!

In thank you letters I received after the visit, some of the second graders wrote:

“I might want to be an astronaut some day.”

“I wish you could have brought a man astronaut suit.”

“It was awesome. I almost fainted when you gave me your autograph. It was so cool to touch the space glove!”

“I wish I could have tried the helmet on.”



Students pose with their teachers, astronaut Don Thomas, and Peggy Whitson's Sokol spacesuit at The River School in Washington, D.C. on March 11, 2015.



Students pose with their teachers, astronaut Don Thomas, and Peggy Whitson's Sokol spacesuit at The River School in Washington, D.C. on March 11, 2015.

- 3/29/15** Two presentations on “The Day a Woodpecker Attacked the Space Shuttle” together with the Sokol spacesuit on display at the New England Air Museum in Windsor Locks, CT as part of their annual Space Day Celebration.
- 4/13/15** Presentation on living and working in space together with the Sokol spacesuit display at the Harford Day School in Bel Air, MD.
- 6/10/15** Presentation on living and working in space with spacesuit display for 100 fourth graders at Bester Elementary School in Hagerstown, MD.
- 6/11/15** Presentation on living and working in space with spacesuit display for 200 eighth graders at Western Heights Middle School in Hagerstown, Maryland (Washington County). This is a Title I school with a significant percentage of the students considered high-risk and from low-income families.



The first “selfie” with a student and Peggy Whitson’s Sokol spacesuit at Western Heights Middle School in Hagerstown, MD.

6/14/15 Program on spacesuits and living and working in space to 50 students and parents in a local scout troop in Towson, MD.

6/18/15 Program on spacesuits and living and working in space to 80 school teachers from around the world participating in the Honeywell Educators @ Space Academy Program at the U.S. Space & Rocket Center in Huntsville, AL.



Middle school teacher participating in the Honeywell Educators @ Space Academy Program at the U.S. Space & Rocket Center in Huntsville, AL.

Honeywell
EDUCATORS @ SPACE ACADEMY



7/13/15 Program on spacesuits and living and working in space to 50 students in grades 7-9 attending the Maryland Summer Center for Space Engineering Robotics program at the Howard B. Owens Science Center in Lantham, MD (located directly across from the NASA Goddard Space Flight Center). This two-week summer camp is run by the Maryland State Department of Education and targets gifted and talented students.



Group picture with summer camp students and the Sokol spacesuit at the Owens Science Center, located across from the NASA Goddard Space Flight Center.



Students from the Maryland Summer Center for Space Engineering Robotics Program at the Owens Science Center in Maryland.

7/13/15 Program on spacesuits and living and working in space to 20 students in grades 5-8 attending the Rockville Science Center Space Science Summer Camp.



Students attending the Rockville Science Center summer camp on space science were thrilled with the opportunity to examine a Russian Sokol spacesuit up close.

7/15/15 Program on spacesuits and living and working in space for 75 middle school students from Central New York school districts and 35 students from inner-city Syracuse schools participating in the Honeywell Summer Science Week at the Museum of Science and Technology (MOST) in Syracuse, NY.



Presentation at Museum of Science and Technology in Syracuse, NY.

- 7/16/15 Program on spacesuits and living and working in space to 80 school teachers from around the world participating in the Honeywell Educators @ Space Academy Program at the U.S. Space & Rocket Center in Huntsville, AL.
- 8/11/15 Smithsonian Associates course titled "*Science Among the Stars: The History of Space Stations*" along with the Sokol spacesuit display presented at the Smithsonian Institution in Washington, D.C.
- 10/22/15 Presentation on spacesuits and the space shuttle program along with the Sokol spacesuit display at an evening public lecture held at Kent State University, Trumbull County Campus near Youngstown, Ohio.
- 10/23-27/15 Presentations on spacesuits and living and working in space at 6 schools in Dubai, Unites Arab Emirates. The gloves from Peggy Whitson's Sokol spacesuit where displayed and tried on by many of the students.

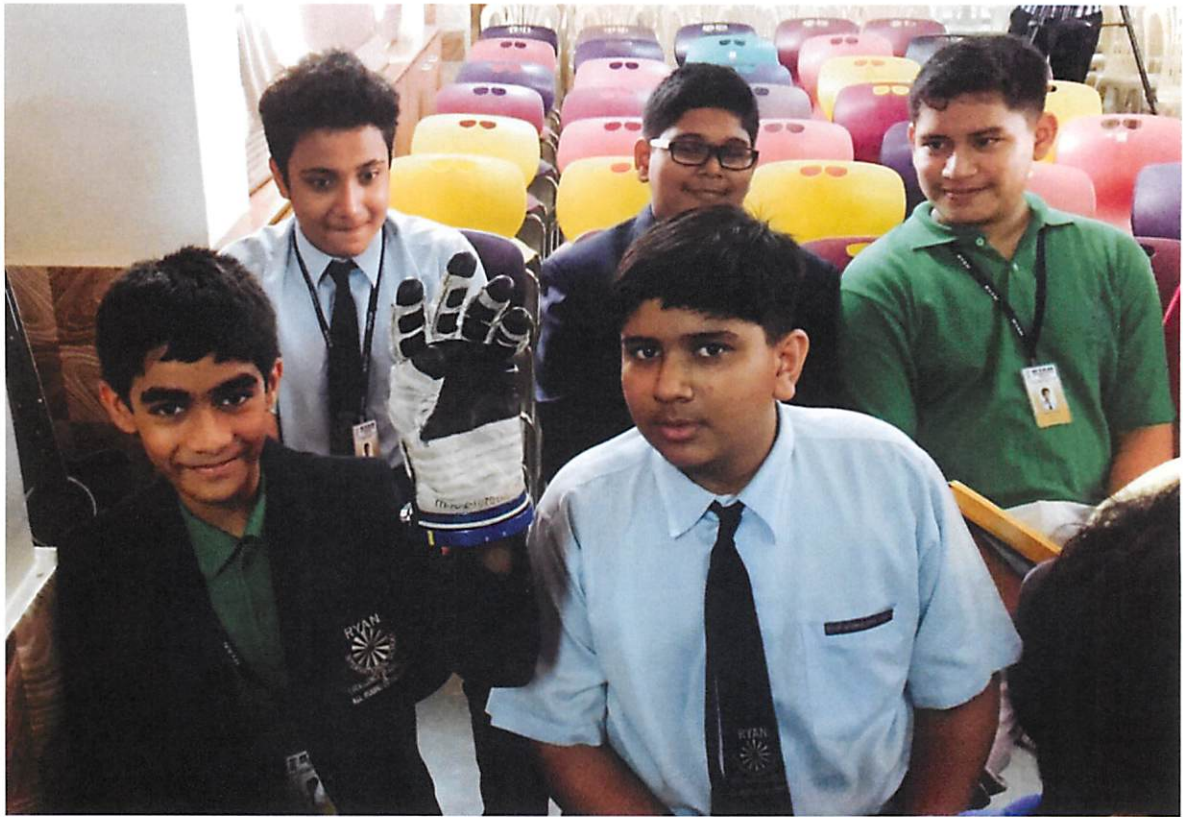


Students pose with one of the gloves from Peggy Whitson's Sokol spacesuit at the GEMS Winchester School- Oud Metha in Dubai, United Arab Emirates, on October 27, 2015.



Cat Boy, one of the top morning DJs in Dubai (92 Rock) tries on one of the Sokol gloves during a visit to the station (United Arab Emirates).

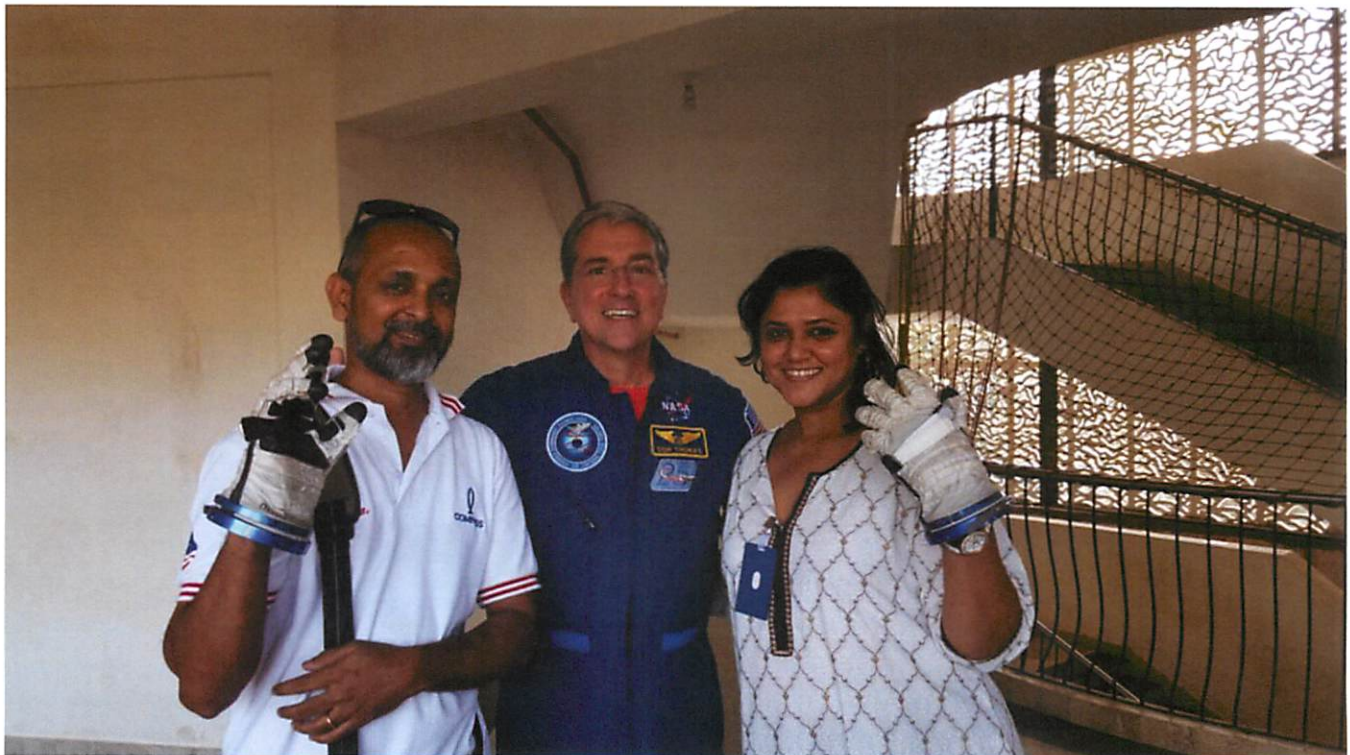
10/27-31/15 Presentations on spacesuits and living and working in space for 7 school visits in Mumbai, India. The gloves from Peggy Whitson's Sokol spacesuit were displayed and tried on by many of the students. The gloves were also a big hit during an interview at one of the local radio stations in Mumbai (see photo below).



Students at the Ryan Global School in Mumbai, India, try on a glove from Peggy Whitson's Sokol spacesuit on October 30, 2015.

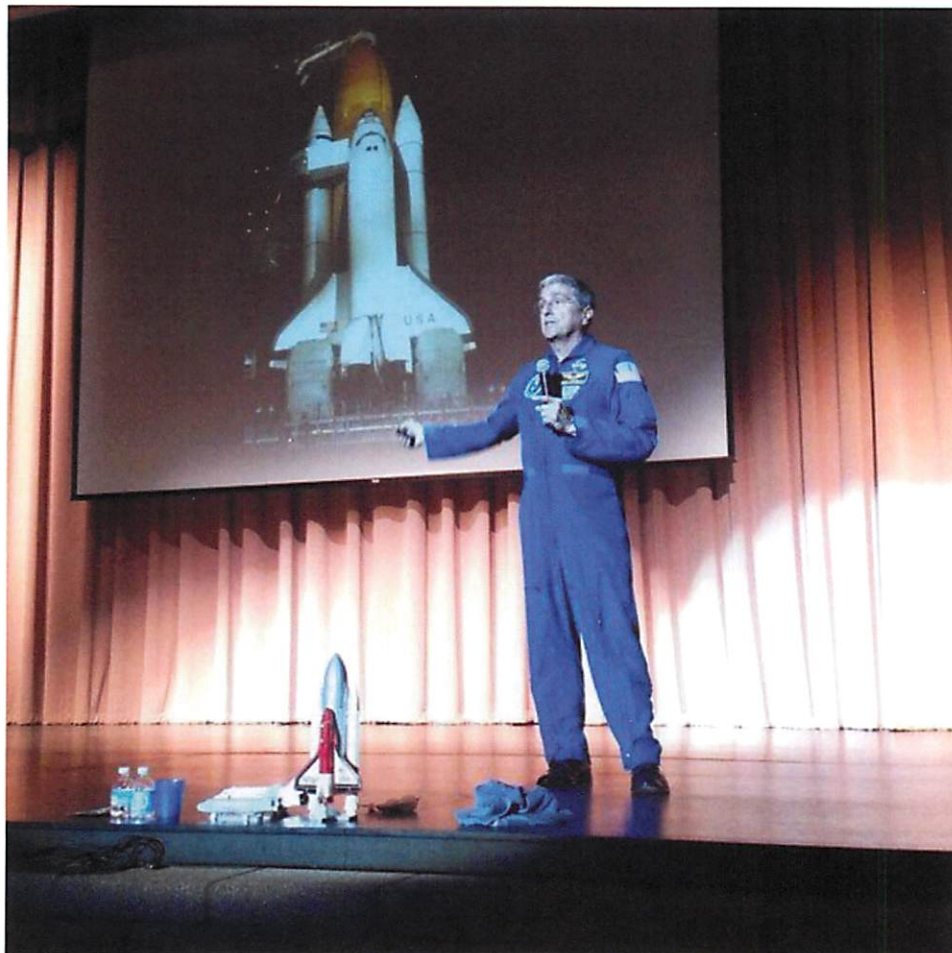


DJ at one of the local Mumbai radio stations tries on the Sokol glove after an interview session.



Even one of the well-known Bollywood film producers in Mumbai, known as Balakrishnan (left), enjoyed trying on the Sokol gloves along with his wife, Chitra, at one of the school visits.

11/7/15 Presentation on living and working in space along with autograph session and Sokol spacesuit display at the Spaceflight America Museum in Prince Frederick, MD.



11/16/15 Four presentations on living and working in space along with the Sokol spacesuit display for 350 elementary and middle school students at the St. Albert the Great School in North Royalton, Ohio.

11/17/15 Presentation on living and working in space along with Sokol spacesuit display for nearly 500 students at Barnesville Middle School in Barnesville, Ohio. Also participated in an after-school science club activity where we discussed spacesuits and a few of the students were able to try on Peggy Whitson's Sokol spacesuit.



11/18-19/15 Supported the Heinlein Prize Trust exhibit booth at SpaceCOM 2015 at the George Brown Convention Center in Houston, TX.



12/1/15 Presentation on exploring space along with Sokol spacesuit display for 150 fifth grade students at Jefferson Elementary School in Maplewood, NJ.

Summary of 2015 Activities

Three public schools in Maryland participated in the full *Have Spacesuit Will Travel* program in 2015 involving a total of 263 students. Together with the students that participated from 2009-2014, **a total of 1,763 students have participated in HSWT to date.**

The excitement that the *Have Spacesuit Will Travel* program generates with the students is difficult to put into words but hopefully some of that excitement has been captured in the pictures presented in this report. Just one indication of their enthusiasm was the numerous pictures of themselves and their classmates in the Sokol suit that were posted on their Facebook pages the very next day! Once a student gets into the Sokol spacesuit everyone pulls out their cell phones to snap a few pictures for posting on social media sites. The students really appreciate what a unique opportunity it is for them to get inside a Sokol spacesuit that has actually flown in space! I know the female students have particularly enjoyed the opportunity to see Peggy Whitson's Sokol spacesuit this year (although one young boy in second grade wrote that he would have preferred to see a mens spacesuit)!

Besides being a lot of fun, the HSWT experience exposes the students to new technologies that are used in both spacesuits and spacecrafts, and provides them with an opportunity to look into the future and envision the space travel that may be possible within their lifetimes. The program also lets the students develop more of their creative talents with both their oral presentations and the drawings of the Sokol spacesuit that they do in their art classes. The presentations in front of their classmates, teacher, and an outside visitor are valuable skills that they will surely use in the future in whatever career field they enter.

Expanding the HSWT Footprint: During 2015 the footprint of the HSWT program was extended considerably by incorporating the Sokol spacesuit to programs and presentations done at area schools, including presentations in Maryland, Washington, D.C., Ohio, Delaware, New Jersey, and Florida. The Sokol gloves were also taken to over a dozen schools in Dubai, U.A.E., and Mumbai, India. The objective of this plan is to expose even more students to space exploration and what it is like in space beyond those reading *Have Spacesuit Will Travel* and participating in the formal HSWT program.

While an additional 4,000 students, teachers, and family members had the opportunity to learn more about spacesuits and living in space in 2014, this number was expanded considerably during 2015 with over 6,630 having access to the Sokol spacesuit. Besides Maryland, programs were conducted in Washington, D.C., New Jersey, Delaware, Ohio, Connecticut, Florida, and Alabama in 2015 with international visits to schools in the United Arab Emirates and India as well.

Recommendations and Future Plans

The HSWT program was expanded considerably during 2015 to include school visits, museums, and other community presentations thereby vastly expanding the footprint of the program. **These new opportunities allowed us to bring the HSWT program to a minority inner city school in Washington, D.C. and to schools in Dubai, U.A.E. and Mumbai, India.** These programs were very well received with the major draw being the Sokol spacesuit. I recommend continuing efforts in this expanded HSWT outreach program whenever opportunities present themselves.

Acknowledgements

I would like to thank **The Heinlein Prize Trust** for making the Sokol spacesuit available and in particular Art Dula, Buckner Hightower, and Anat Friedman for their leadership, support, and active involvement in the **HSWT** program . *Have Spacesuit Will Travel* helps provide a unique and invaluable learning experience for many students, some of which may become our country's (and other countries') next generation of explorers and commercial space advocates.

