



Huntsville Alabama L5 Society

Founded 1983. *Ad Astra per Ardua - "To the Stars by Our Own Hands"*

Space advocacy, education outreach and technology development



2017 HUNTSVILLE ALABAMA L5 SOCIETY (HAL5) ANNUAL REPORT TO THE MEMBERSHIP

Founded in 1983, Huntsville Alabama L5 Society (HAL5) is a not-for-profit 501(c)(3) educational organization that advocates exploration and settlement of space. Like our parent organization, the National Space Society (NSS), we are a mix of enthusiasts of all walks of life who share the belief that space development will improve our world in the areas of education, energy, environment, new resources, and ultimately room for humanity to grow. This is a highlight of our activities for 2017.

MONTHLY PROGRAMS

For 2017, HAL5 holds free public lectures and membership meetings on the first Thursday of every month at the U.S. Space and Rocket Center (USSRC)'s Education Training Facility. Our thanks to USSRC for the use of their facility. Below is a summary of our 2017 monthly programs. A listing of our past monthly programs can be found at our website, www.HAL5.org

January: Annual election of officers, membership meeting on state of HAL5 and NSS, and upcoming activities.

February: Anton Kolomiets, United Launch Alliance (ULA), on "United Launch Alliance: America's Ride to Space."

March: Robin Soprano, Director of Simulations at USSRC on "Inspiring the Future - Exploring Mars at Space Camp."

April: Dr. Tyson B. Littenberg, NASA Marshall Space Flight Center (MSFC), "The Dawn of Gravitational Wave Astronomy."

May: A special sci-fi props making talk with Wayne Neumaier, A7L Props, "These ARE the Droids You Are Looking For" at Straight to Ale Campus 805 location.

June: Joint Pass the Torch talk with Dr. Martin Weisskopf, NASA MSFC Chief Scientist for X-Ray Astronomy on "The Imaging X-Ray Polarimetry Explorer: An Overview of the Mission and its Science."

July: with Omar Mireles, Research Engineer, NASA MSFC, on "Additive Manufacturing for Aerospace."

August: Andy Schorr, Deputy Manager, NASA SLS Spacecraft/Payload Integration and Evolution Element on "Space Launch System: The Next Steps Toward the Giant Leap."

September: Dr. Jessica Gaskin, NASA MSFC on "Looking Beyond WFIRST, the next large X-Ray Mission – Lynx."

November: Mason Hall, COLSA, Systems Engineer for NASA Huntsville Operations Support Center (HOSC) on "ISS Payload Operations: Science in the Spotlight."

OUTREACH AND SPECIAL EVENTS

2017 Panoply Arts Festival

For the fourth consecutive year, HAL5 participate in the annual Arts Huntsville Panoply Arts Festival's Science, Technology, Engineering, Art and Math (STEAM) Interactive activity. HAL5 hosted the CD Hovercraft activities where kids assembled their own hovercraft using pre-assembled hovercraft, pick a favorite balloon color and decorate the craft. For older kids, hot glue gun

was available for them to make the hovercraft from scratch. Volunteers discussed with the kids about how Newton's third law of motions (*For every action, there is an equal and opposite reaction*) is in play here. After the hovercraft has been assembled, it was onto the testing table to see Newton's third law of motion in action. Our thanks our awesome volunteers and to Yohon Lo and Teri Hartman (Designbyhart Pottery) for being the tent chairs.



Huntsville's National Arts in Education Celebration

HAL5 participated in the Huntsville's National Arts in Education celebration at the S.R. Butler Green Park on September 15 hosted by Arts Huntsville. HAL5 joined other organizations to show off various STEAM activities while enjoying some great food trucks foods and live music. Our activity was the binary beads necklace. The kids used ISO binary code standards and color beads to spells out their first name.



Von Braun Astronomical Society (VBAS) Astronomy Day

HAL5 participated in the annual VBAS Astronomy Day. In addition to our paper air rocket activity and *Pin the Payload on the ISS* activities, we introduced a new interactive that our member, Ron Creel (former NASA lunar rover engineer) has developed, LUROVA™ (LUNar ROVing Adventures). Over 130 kids partook in our various activities.

International Observe the Moon Night



This year was our first official participation in the annual International Observe the Moon Night at USSRC hosted by MSFC. We brought out the LUROVA lunar rover simulator that made its debut at Astronomy Day. We were accompanied by our NSS Middle Tennessee chapter, and we took turns cover for each

other's exhibits. The lunar rover simulator was very well received, and HAL5 will be adding it to our future outreach activities.

Alabama Power Grid Defense Conference Planning Committee

After our successful inaugural Alabama Power Grid Defense conference in 2016, the group continued to meet throughout the year to advance the cause, and to work on the details for our second conference on August 9 – 1, 2018. For more information about the cause and how you can participate and support, please visit www.PowerGridDefense.org

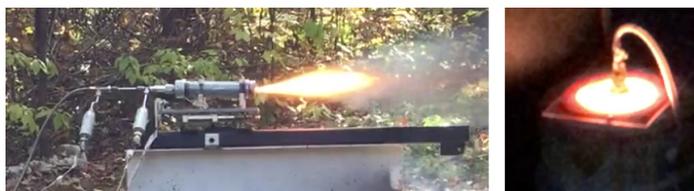
Other Education Outreach Social Activities

Make and launch paper air rocket at Columbia Elementary School in Madison in March. David Hewitt presented our educational outreach activities at the 2017 AIAA Propulsion and Energy Forum's Propulsion Education track and at DragonCon. Also, at DragonCon, David also demonstrated our hybrid suitcase rocket.

HAL5 and VBAS held a joint summer potluck picnic and grill out on Sept. 23 at the VBAS observatory in the Monte Sano State Park. Our own Amy and Bryan kept the members cool and dry with their large tent. The picnic was followed by the VBAS weekly planetarium show. We wrapped up the year with our annual Christmas party at Robert Bijvoet's residence on December 3rd. Live music was provided by Robert, and the party concluded with a dirty Santa gift exchange and door prizes.

Project HALO

Project HALO is open to HAL5 members and meets once a week. In 2017, we continued to work on our upper stage flight test article: performing several garage-made igniter vacuum tests (see below picture right), machined and performed two ground launch guiderail tests. On the R&D side, we finally completed testing of our 1" Hydroxyl-terminated polybutadiene (HTPB) and coal dusts hybrid motors, and we are in the process of writing up the tests results for publication. On the "fun side", we tested out an induction smelting device that we used to recycle aluminum and zinc to cast usable metals for Project HALO use.



ADMINISTRATIVE

The HAL5 Executive Committee met every month to review society business. Event announcements are posted on our website, on Facebook, on various local event calendars, sent out via our email list and on WLRH public radio when possible. Paid members received special invitations and discounts to HAL5 hosted events and social activities. The regular annual membership dues are \$16, and \$8 for students and senior citizens. New member dues are prorated based on the month of joining with all membership expires at end of the calendar year. The dues allow us to support our various outreach hands-on activities and projects, competitions, membership gatherings and monthly programs. Project HALO support is a separate donation item from the regular membership dues. We ended 2017 with 51 paid members.

Evelyn Sabino Memorial Scholarship

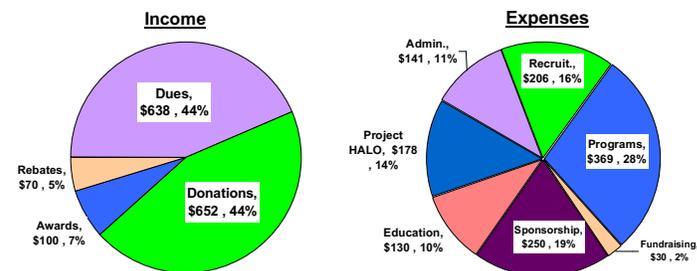
Evelyn was a former HAL5 officer and frequent volunteer of many local groups. Evelyn passed away in December 2016, and to honor her passions for STEM and particularly girls in STEM, HAL5 has worked with American Chemical Society (ACS), an organization Evelyn was very active in, to identify an existing ACS scholarship fund in support of women engineers. Donation can be made either directly to ACS *Women's Chemistry Overcoming Challenges* or through HAL5.

Co-Sponsorship of Voyager 40th Student Competition

VOYAGER GOING INTERSTELLAR HAL5 and Janet's Planet Foundation officially kicked off the has the Voyager 40th student competition to re-imagine the famous Voyager Golden Disc. The competition runs till end of 2018. HAL5 is a co-sponsor that provides financial and logistics support. More information at www.Voyager40.space

Financial

The HAL5 bank accounts had a net increase of \$351 in 2017 to \$7,059; however, since \$300 was money owed to us from last year, we pretty much broke even. Total income was \$1,460 (dues, donations, rebates, & award money), while total expenses were \$1,303 — a change in net worth of \$157. Programming, events, and social activities resulted in \$369 in expenses. We spent \$250 to co-sponsor the 2017 Tennessee Valley Interstellar Workshop Symposium. Educational outreach was only \$130 since we were reimbursed for our Panoply expenses. Project HALO activity was \$178 mostly for N2O tank rental. Administrative, recruitment, and fundraising totaled \$376.



Farewell

This year we're sad to report that we lost a long time HAL5 member and supporter, David L. Christensen. He passed away at his home in Texas on September 1, 2017 at the age of 78.

2017 HAL5 Officers

President: Yohon Lo Vice President: Robert Bijvoet
Treasurer: Ronnie Lajoie Secretary: David Newsome
Membership: Robin Scott Education: David Hewitt
Publicity: Vacant (Not filled in 2017)

In closing, we thank you for your continued support, and welcome your feedback on how to better serve our community. By the way, if you shop on Amazon, please consider supporting HAL5 on the AmazonSmile program, search under "National Space Society Huntsville AL" at smile.amazon.com. Unfortunately, you will have to login and purchase from smile.amazon.com from a web browser for us to get credit.