THE UNIVERSITY OF SCRANTON
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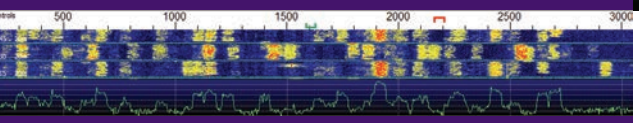
HamSCI NEWSLETTER

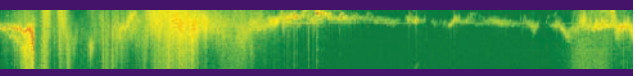
VOL.1 NO.3 | FALL 2025



PSWS Database Design
WE NEED YOUR INPUT

As the Personal Space Weather Station network evolves, we want to hear from you — hams, scientists, station maintainers and educators — about how you use, or want to use, PSWS data.

Please scan the QR code or visit **hamsci.org/charrette** to fill out our survey. Your input will help inform the design of the website, Python package, documentation and more.



To learn more about our Personal Space Weather Station, please visit the HamSCI web page.

hamsci.org

Welcome to the Q3 2025 Edition of the
HamSCI NEWSLETTER!

VY 73 de Nathaniel W2NAF

As the summer comes to a close and a new academic year is upon us, it is a good moment to reflect on the fantastic progress we have seen on current projects during HamSCI's big year, as well as to celebrate the start of some of HamSCI's new initiatives.

Much of the activity this summer has revolved around the installation of new Personal Space Weather Station systems at high-profile sites such as the K3LR Super Station on and the United Astronomy Clubs of New Jersey (UACNJ) observatory in Hope, New Jersey.

In addition to serving as high-quality observation sites, these installations have given the teams from the University of Scranton, New Jersey Institute of Technology, Case Western Reserve University, and HamSCI volunteers a unique opportunity to work with the PSWS equipment hands-on in the field and gain important insights as they prepare for a wider PSWS deployment during 2026 (see hamsci.org/site-search). Real-time WSPR spot data from these systems can be found at **wspr.rocks**, look for K3LR and UACNJ.

Just a week ago during the Perseids Meteor shower, HamSCI kicked off the first event in its latest initiative – the Meteor Scatter QSO Party (MSQP, hamsci.org/msqp). The MSQP, originally the idea of HamSCI member McKenzie Denton KO4GLN, is an on-the-air effort to better understand meteor scatter propagation. It is particularly timely, as recent changes to FCC rules now allows U.S. amateurs to operate the MSK144 meteor scatter mode on 10 m. This allows us to address an important question: which band is better for meteor scatter: 10 m or 6 m? The August 2025 MSQP is only the first of a series.

I hope you will join us for the next MSQP from 12-13 December 2025 during the Geminid Meteor Shower; we can both contribute to science while having some on-the-air fun!

— Dr. Nathaniel Frissell, Ph.D. W2NAF

HAMSCI PARTNERS WITH ARRL FOR APRIL HAM RADIO OPEN HOUSE EVENT

HamSCI and ARRL partnered with SciStarter in April to celebrate World Amateur Radio Day and Citizen Science Month. As part of this collaboration, 52 amateur radio clubs across the country officially hosted events that contributed to the global Citizen Science Month campaign, One Million Acts of Science. There were many more clubs which participated on their own.

ARRL's Public Relations and Outreach Manager Sierra Harrop W5DX commented:

> ARRL Ham Radio Open House was a **perfect collaboration**. By combining the citizen science approach of HamSCI, the programmatic lift of SciStarter and the structural elements of the ARRL Field Organization, we were able to put amateur radio's best foot forward and show how modern and innovative the Amateur Radio Service is.

SciStarter's Director of Programs and Operations, Emma Giles, attended the Ham Radio Open House at the National Capital Radio & Television Museum in Maryland to witness the energy firsthand.

"The enthusiasm and expertise of these hobbyists was inspiring," said Giles. "They're incredible contributors to both the NASA Citizen Science and Amateur Radio communities. I'm already looking forward to the next opportunity to connect with them."

The ARRL plans to continue the event next year based on the 2025 goal for the activity and the initial event enthusiasm shown by ARRL member clubs.

HamSCI IN THE NEWS

HamSCI – The Ham Radio Science Citizen Investigation, has been featured in the August 2025 issue of ARRL's QST Magazine with fourteen pages devoted to the citizen-scientist initiative.

The special section begins with articles by Dr. Nathaniel Frissell W2NAF on the background behind HamSCI, and Drs. Ethan Miller K8GU and Frissell on traveling ionospheric disturbances. The section continues with highlights of presentations given at the 2025 HamSCI workshop held recently at New Jersey Institute of Technology. These highlights include Gary Mikitin AF8A on expanding the HamSCI Personal Space Weather Station network, Dr. V. Lynn Harvey on the role of the polar vortex in atmospheric-ionospheric coupling, Steve Cerwin WA5FRF on radio wave propagation and antenna fundamentals, Mindy J. Hull KM1NDY on an overview of the HamSCI workshop poster session, Owen Ruzanski KD3ALD on the development of a contesting and DXing dashboard, McKenzie Denton KO4GLN on the upcoming HamSCI Meteor Scatter QSO Party (MSQP), Steve Stroh N8GNJ/Martin Alcock VE6VH on the IP400 networking, and many others.

"We at HamSCI are both honored and excited to collaborate with the ARRL on the advancement of both radio and science. The ARRL and its membership already has more than a century-long tradition of radio science innovation; it is wonderful to have the opportunity to build on that and carry it forward" said HamSCI founder Dr. Nathaniel Frissell W2NAF upon publication.

From left to right: RSGB President, Mr. Bob Beebe GU4YOX, Dr. Nathaniel Frissell W2NAF, Dr. Stuart Bryant G3YSX

Dr. Nathaniel Frissell W2NAF was recognized by the RSGB with the Les Barclay Memorial Award for his work on space weather at the Dayton Hamvention.

HamSCI founder and lead scientist Dr. Nathanel Frissell W2NAF and Gwyn Griffiths G3ZIL were recently featured as part of the Radio Society of Great Britain's "Tonight at 8" series on leading topics in amateur radio

Find the video online at: youtube.com/watch?v=xZS5ZMUHIF0

HamSCI scientist Dr. Patricia Reiff W5TAR appeared on CNN on May 9th to discuss the reentry of Russian satellite Cosmos-482 and possible implications. She discussed data from both the European Space Agency and Space Force and the varying paths the satellite might take upon reentry. Dr. Reiff is an American space physicist at Rice University, known for her research on space weather and for engaging the public about science.

The annual HamSCI workshop was also featured in several news articles. The March event at New Jersey Institute of Technology in Newark was featured in ***ARRL News*** *(arrl.org/news/ham-radio-students-and-scientists-at-the-2025-hamsci-workshop)*, ***NASA Science*** *(science.nasa.gov/get-involved/citizen-science/amateur-radio-scientists-shine-at-the-2025-hamsci-workshop)* and ***Big News Network*** *(bignewsnetwork.com/news/278161236/ham-radio-students-and-scientists-at-the-2025-hamsci-workshop#google_vignette)* among others.

SCIENTIST PROFILE
GARETH PERRY KD2SAK

By Mary Lou West KC2NMC

Gareth Perry, a solar-terrestrial physicist at NJIT in Newark, New Jersey, grew up near Vancouver, British Columbia, Canada. He enjoyed drums, soccer, hockey, and running as well as political discussions and reading. After his 2015 Ph.D. in physics and engineering physics at the University of Saskatchewan, he was a postdoc at the University of Calgary studying the high latitude ionosphere and magnetosphere with the Enhanced Polar Outflow Probe (e-POP).

Gareth's background in radio science, plasma physics and dynamics, and data analysis of high frequency propagation is a great fit for HamSCI. He first learned about HamSCI in 2015 when he heard Dr. Nathaniel Frissell talk about his work at a National Science Foundation CEDAR conference. He has been intrigued ever since, and became a licensed ham in 2019, but rarely finds time for it.

When he saw his first total solar eclipse last year in Dallas through patchy clouds he thought it looked fake, a common reaction for first-timers. "It's really fun to find things out" Gareth says, and he really appreciates the technical expertise, enthusiasm, and mentoring in the active HamSCI community. He helped arrange the HamSCI Workshop at NJIT, March 14-15, 2025, a very successful meeting with 100 participants in person and another 75 online.

Currently Gareth and his NJIT colleagues and students are involved with HamSCI's NASA grant to study the 2023 and 2024 solar eclipses with raytrace modeling. They are also taking part in another grant to deploy the DASI2 Personal Space Weather Stations with their RX888 SDR radio, ground magnetometer, and VLF equipment at dozens of sites.

When you see him next, ask this friendly tall physicist who STEVE is.

DARREN KALMBACK KC0ZIE SK

Dareen Kalmback KC0ZIE pictured in the background with Mark WS7M along with a SteppIR element loaner

Darren Kalmbach, KC0ZIE, QSYed to Silent Key on February 28, 2025. Darren was the first President of the WWV ARC at its inception in January 2019, nine months before the 2019 100th Anniversary of WWV. He also was extremely active in local Northern Colorado amateur activities, heading the amateur communications for the Quad Rock 50-miler for years as well as other local road races. He was a Board Member of the Northern Colorado Amateur Radio Club (NCARC) holding numerous positions over more than a decade.

He helped design and manage the WWV ARC website as well as establish an FTP repository that was the initial data collection for the HamSCI Grape I legacy project. The FTP site continues to collect Grape I legacy and Grape 2 data as the project transitions to the University of Alabama. Darren was the backbone behind the scenes for the WWV 100th, the WWV ARC website and FTP repository and a major contributor to the Northern Colorado amateur radio community. He left us too early. TNX to Dave Swartz W0DAS.

Ed Efchak WX2R

Gathering of HamSCI community at the 2025 Hamvention HamSCI booth.

Gene Niemiec K2KJI, Ray Novak N9JA, and Nathaniel Frissell W2NAF

HamSCI AT DAYTON

HamSCI once again participated in the largest global amateur radio party as hams from around the world met on May 16-18 for the annual Dayton Hamvention in Xenia, OH.

We had the opportunity to talk about our mission, projects and people to many interested hams who had questions and comments about the work we are doing and the contributions that we have made to bring scientists and hams together.

The HamSCI forum was well attended despite being late in the Saturday afternoon program. Gary Mikitin AF8A discussed “HamSCI’s Personal Space Weather Station: Hosts Wanted!” The talk was followed by Dr. Kuldeep Pandey from NJIT on “Science Results from the 2023 and 2024 Solar Eclipse QSO Parties.” Ed Efchak WX2R spoke on “The HamSCI Meteor Scatter QSO Party,” and Dr. Kristina Collins KD8OXT discussed “Visualizing Personal Space Weather Observations with OpenSpace.” The panel was moderated by Dr. Nathaniel Frissell W2NAF.

Booth talks included “Space Weather Effects on Quantum Communication Networks” by Major Michael Seery USAF and “The 2024 Solar Eclipse” by Bill Mader K8TE.

Many thanks to our volunteers and friends who lent their support to make the weekend a success.

AMATEUR PROFILE
ANDREW RODLAND KC2G

Q: How did you learn about HamSCI and how did you get involved? How have you been involved in the past? What is your current involvement?

A: I think I heard about HamSCI during Contest University 2020. I contacted Dr. Frissell to see how I could get involved, which led to me presenting a poster at HamSCI Workshop 2021. I keep in touch about the development of my site, prop.kc2g.com, and also participate a little bit in the WSPRDaemon side of PSWS (the Personal Space Weather System).

Q: What HamSCI projects interest you?

PSWS stuff mostly. But in general, I love the ingenuity of hams doing remote sensing with very modest means. Some of the eclipse projects were very impressive.

What skills do you have that are best suited to HamSCI? How might other amateurs obtain similar skills?

Mostly software skills, from 20 years of professional coding, and background on the physics stuff, from reading everything I can find and talking with anyone who will pay attention. My hardware and electrical engineering skills are average at best.

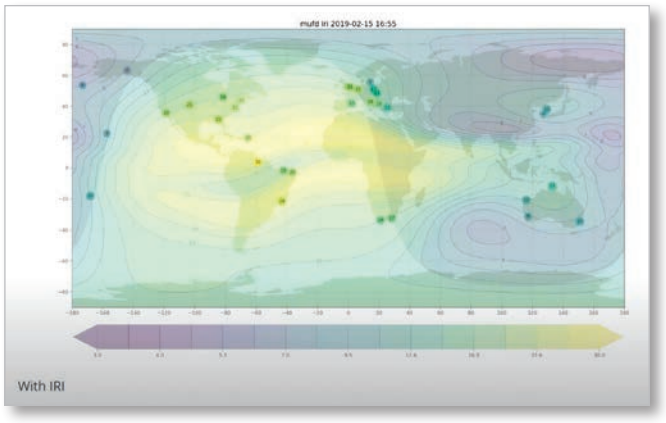
Q: What type(s) of equipment do you have in your shack? Antennas?

A Flex-8600M, SPE 1.3K-FA amp, 6-band Hexbeam @ 35', and a 160m horizontal loop in the trees (30-50 feet up) make up my HF station. A LZ1AQ preamplified loop at the property line serves as a RX antenna for the Flex and also feeds an RX888 running WSPRDaemon.

Q: How active a ham would you say you are? When were you first licensed? License class?

Less active than I'd like to be. I get on for SSB contests, and I POTA (Parks on the Air) a few times a year, but I don't find as much time for casual operating as I'd like.

I've been licensed since 2017 and had my Extra since 2018.



Q: What would you say is the future of HamSCI? What should HamSCI be doing to increase its awareness and provide more value to you as a ham?

A: My hope is crowdsourcing more data and getting it in front of more people!

Q: Finally (and importantly) a brief bio about yourself and your contribution to HamSCI as well as to scientific research.

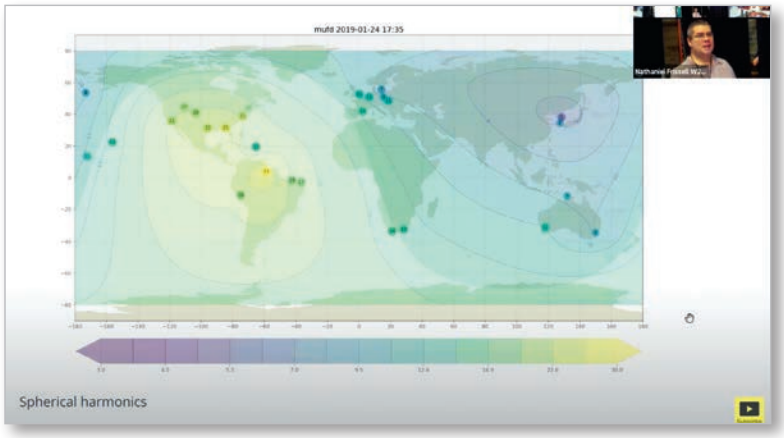
A: I've been a ham since 2017, but I was always interested in electronics and that sort of thing. As a kid I used to experiment with how far the cordless phone would go (about to the end of the driveway), and I remember wardriving when Wi-Fi was a new thing. Wardriving is the act of searching for Wi-Fi wireless networks as well as cell towers, usually from a moving vehicle, using a laptop or smartphone.

A teacher gave me a book about BASIC and set me in front of a computer to keep me distracted when I was 10 years old, and that set me on a course that's lasted the rest of my life.

My ham activities include SSB contesting, messing around with digimodes, and, of course, propagation studies.

I started prop.kc2g.com in 2019 when I couldn't find a decent MUF map anywhere else. It started off with me adopting an abandoned project by Matt AF7TI but ended up with me rebuilding the predictive model almost from scratch, learning more than I ever expected about ionospheric physics as well as data science, meeting W2NAF, W1PJE and lots of other great people, and even travelling to Greece to give a talk at COSPAR Assembly.

Find Andrew's presentation from the 2024 HamSCI workshop, "Five Years of prop.kc2g.com: Evolution of an HF Forecasting Tool" at: **youtube.com/watch?v=Yn5-FdgssoY**



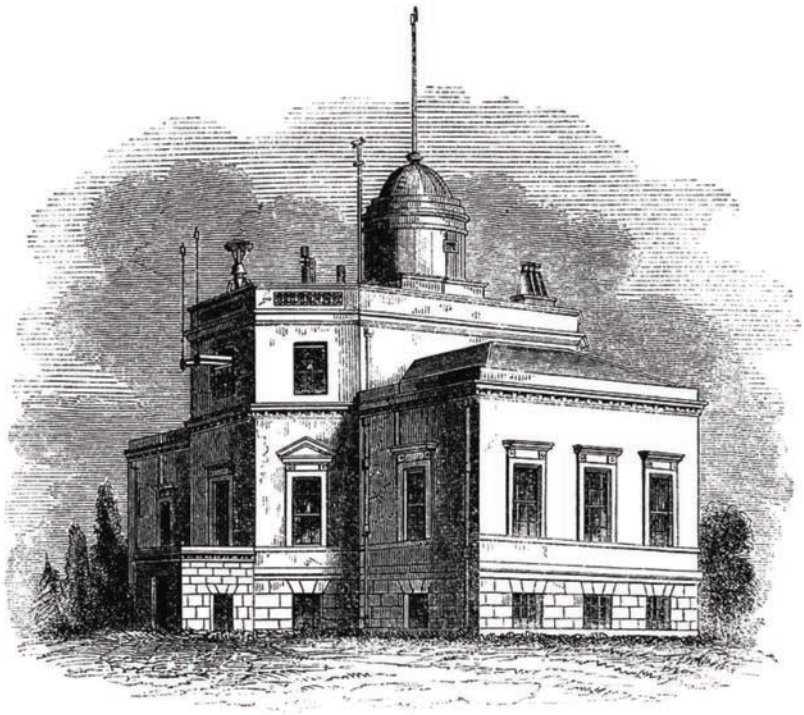
CONTRIBUTOR COLUMN

How Was the Ionosphere Discovered?

By Ron Wilcox KF7ZN

Sometimes we may think that the ionosphere was discovered by Heaviside and Kennelly, and that Richard Carrington observed the first solar flare, but there is much more to the history of our understanding of the ionosphere. In the words of Paul Harvey, "And now you know...the rest of the story."

Let's start in November 1828, in Edinburgh, Scotland, when Balfour Stewart was born. He became a famous physicist and meteorologist, especially interested in terrestrial magnetism. In 1859, he was made the director of the Kew Magnetic Observatory in London where he made many important discoveries. At the observatory, there was a heliograph which the staff used as they were making a detailed study of the sun. This played an important role for Stewart.

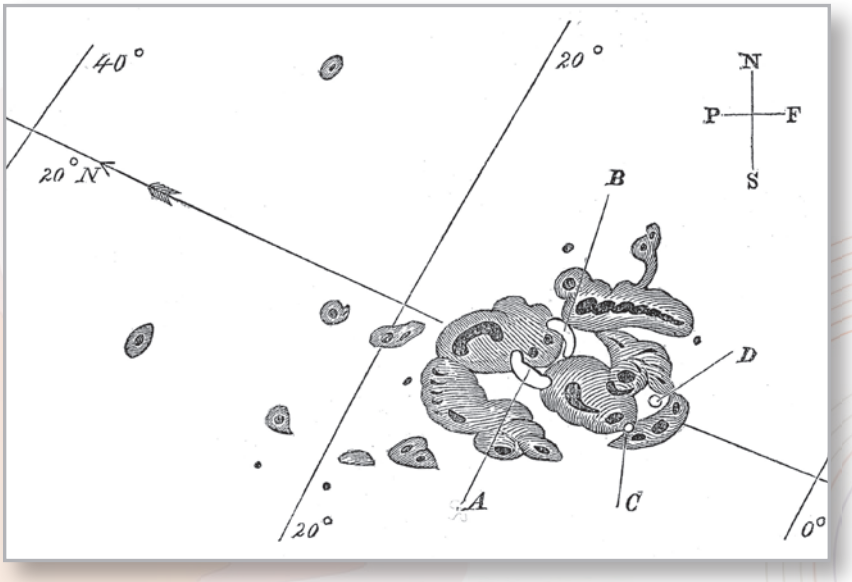


Kew Magnetic Observatory

Coincident with Stewart's arrival at the observatory came one of the largest solar storms ever recorded. Stewart recorded on August 28, 1859, what was called a remarkable geomagnetic disturbance and a "magnetic disturbance of unusual violence." He wrote a paper and gave a presentation to the Royal Society on this disturbance and his conclusions. Richard Carrington and Richard Hodgson were able to optically see a disturbance on the sun four days later. Richard Carrington presented these findings to the Royal Astronomical Society at the same time period as Stewart's presentation.

In April 1892, another famous scientist was born in Brechin, Scotland. He was very successful in his studies with significant achievements. While attending the University of St. Andrew, he won a top prize in chemistry and a medal in "Ordinary Nature Philosophy." This student was Sir Robert Watson-Watt. Soon after the Carrington event, Stewart had published the first known paper presenting evidence of an electrified atmospheric layer. Robert Watson-Watt later named this the "ionosphere."

In the year 1902, independently and almost simultaneously, a prediction was made about a reflective layer above the Earth. Arthur Kennelly was an engineer who was involved in research relating to electricity, including the use of complex numbers in alternating current. Shortly after he completed this work, he investigated the electrical properties of the radio spectrum and independently came up with the concept of the reflective layer that sent radio waves back to earth. Oliver Heaviside was an English mathematician and physicist who, while he was working on magnetic forces and electromagnetic phenomena, independent of Professor Kennelly, proposed the existence of a reflective layer in the atmosphere. Heaviside's proposal included means by which radio signals are transmitted around the Earth's



Richard Carrington created this drawing of the sunspots at the peak of the Carrington Event in 1859.

curvature. This proposed layer was called the Kennelly-Heaviside layer or what we now call the E layer.

After Watson-Watt graduated in engineering from University College, Dundee, in 1912, a position was offered there by Professor Peddie, who was over the physics department. Professor Peddie started Watson-Watt on the path of wireless telegraphy. Watson-Watt soon developed two main areas of research, wave propagation and radio frequency oscillators. He became interested in using radio for the detection of thunderstorms. This was of great importance and of concern for the war department. Lightning was a major problem for communications with airplanes. Due to this research, in 1916, he was offered a position with the meteorological office in London. His first experiments there were successful and soon he could detect thunderstorms out to 1,500 miles.

Sometime after this in 1924, Edward Victor Appleton was named professor of physics at London University. While there, he began to investigate radio signals coming from the BBC radio station located in London. As he analyzed the data, he discovered that during the day, the received signal was fairly constant, but night was a different story, with the signal varying with an almost regular rise and fall. He suggested that, at night, there were two waves being received by the apparatus at Cambridge. He theorized that one wave was traveling directly, and the other was reflected up in the atmosphere.

Meanwhile, Watson-Watt continued with his research. In 1927, he became the director of the Radio Research Station and with his teams, became interested in static radio signals. From his work with lightning and the static radio signals, the distant signals over the horizon had to be reflected off of the upper atmosphere. This study was the first support for the Kennelly-Heaviside layer. The layer had been dismissed as improbable and considered inaccurate by many scientists.

As we see, this history about our understanding of the ionosphere and the discoveries of its mysteries has a rich heritage of famous scientists who, with their love of science, laid a groundwork for future discoveries of the ionosphere.

SOURCES:

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HamSCI FIELD TRIP TO JENNY JUMP STATE FOREST

A large HamSCI-led team recently made a field trip to Jenny Jump State Forest (NJ), surveying the United Astronomy Clubs of New Jersey (UACNJ) site. It is located on a rustic, park-like property, where the UACNJ hosts scientific instruments from many US-based institutions, including the New Jersey Institute of Technology (NJIT) and HamSCI. The trip's primary goals:

1) Assess maintenance needs of the existing Personal Space Weather Station (PSWS) equipment

2) Develop a plan for upgrading to the current generation of PSWS (DASI Track 2)

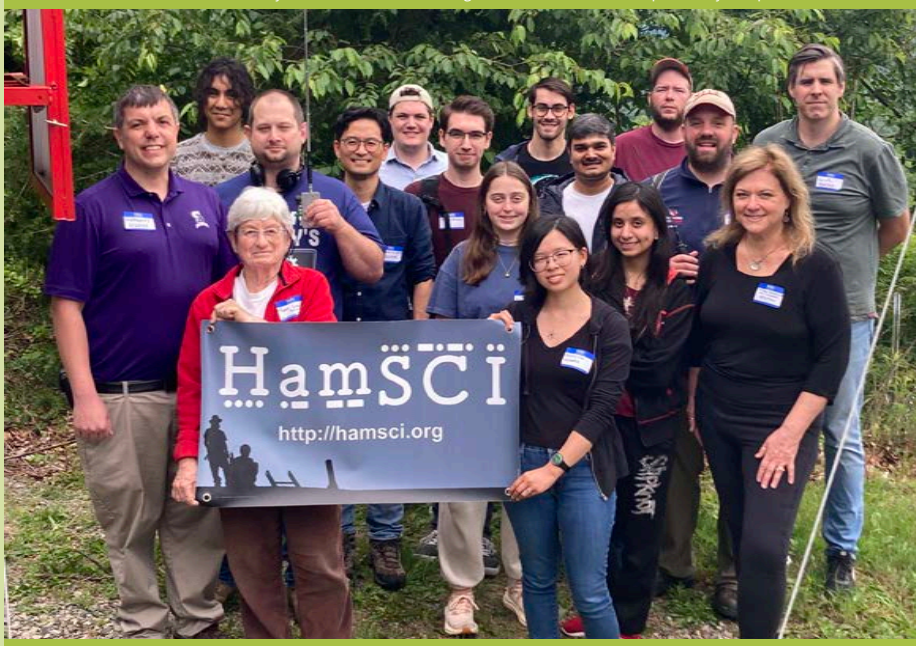
The findings were mostly positive: The HF receive antennas (a DXEngineering active vertical and a DXE receive loop) are generally in good condition, though animals have done some damage to cabling. The Reverse Beacon Network (RBN) receiver is currently off-line, in need of attention.

The trio of PSWS instruments (GRAPE Rx, VLF Rx and magnetometer) represents the next generation of PSWS. It will be one of approximately 25 such systems to be deployed in 2025/2026. Collectively, the systems will form a space weather data collection network, the first of its kind to simultaneously monitor HF (shortwave), VLF (~8 kHz) and the Earth's magnetic field. Using data collected by the Network, HamSCI researchers hope to gain a better understanding of the local, regional, and global scale processes that influence the ionosphere. This may lead to improved propagation predictions, new tools to predict radio wave behavior during solar storms, and, perhaps, new insights regarding solar cycles and other heliophysical phenomena.

All efforts at this site, from planning to equipment construction, configuration and installation is a collaboration between the University of Scranton and NJIT. Conveniently, the site is located exactly halfway between the two schools. Beyond station implementation, the schools partner on data collection, data analysis and research efforts.

Photos courtesy of Ann Marie Rogalcheck-Frissell and Nathaniel Frissell

Nathaniel Frissell W2NAF and Hyomin Kim KD2MCR standing with active HF receive loop at Jenny Jump State Forest.



Top row: Joshua Turi (NJIT), Daniel Clancy (NJIT), Joseph Visone (NJIT), Chris Callie (UACNJ), Dr. Gareth Perry KD2SAK **Middle row:** Dr. Nathaniel Frissell W2NAF (Scranton), Jonathan Rizzo KC3EEY (Scranton), Dr. Hyomin Kim KD2MCR (NJIT), Jeremy McLynch (NJIT), Dr. Kuldeep Pandey (NJIT), Ryan Tolboom (NJIT) **Bottom Row:** Dr. Mary Lou West KC2NMC (Montclair State), Nina Tormann KD3BJV (Scranton), Rebecca Potter KE2EBI (Scranton), Ana Duque KD3BNA, Dr. Christine Zakzewski KE2FDW (Scranton)

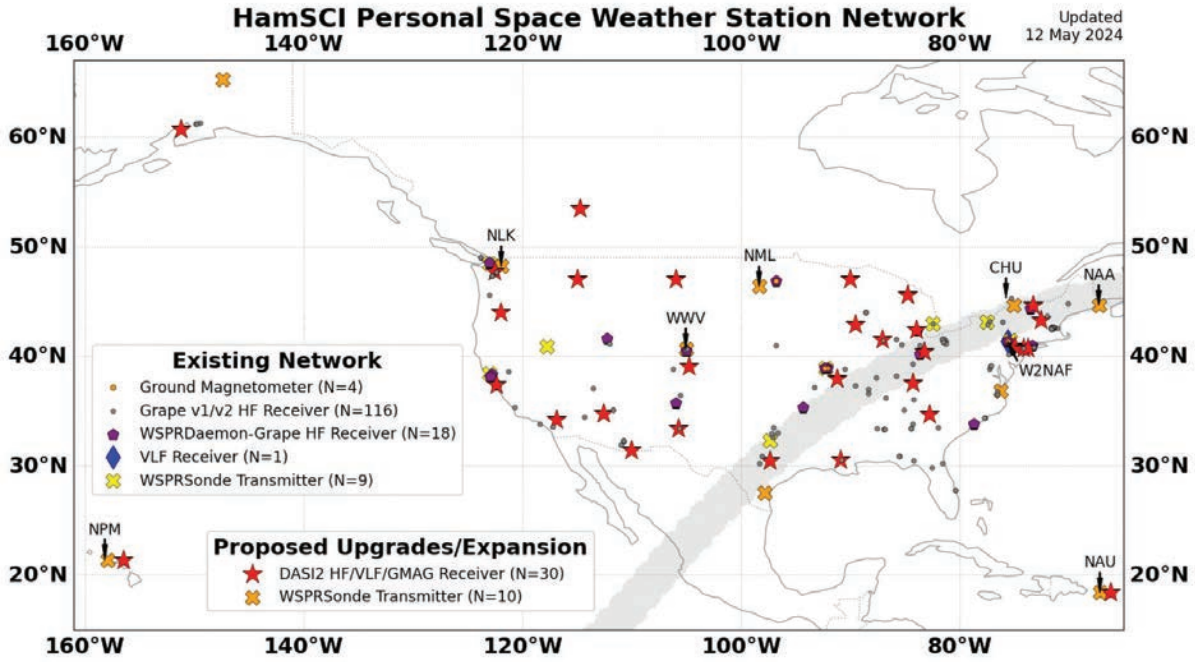
EXPANDING THE NETWORK OF PERSONAL SPACE WEATHER STATIONS

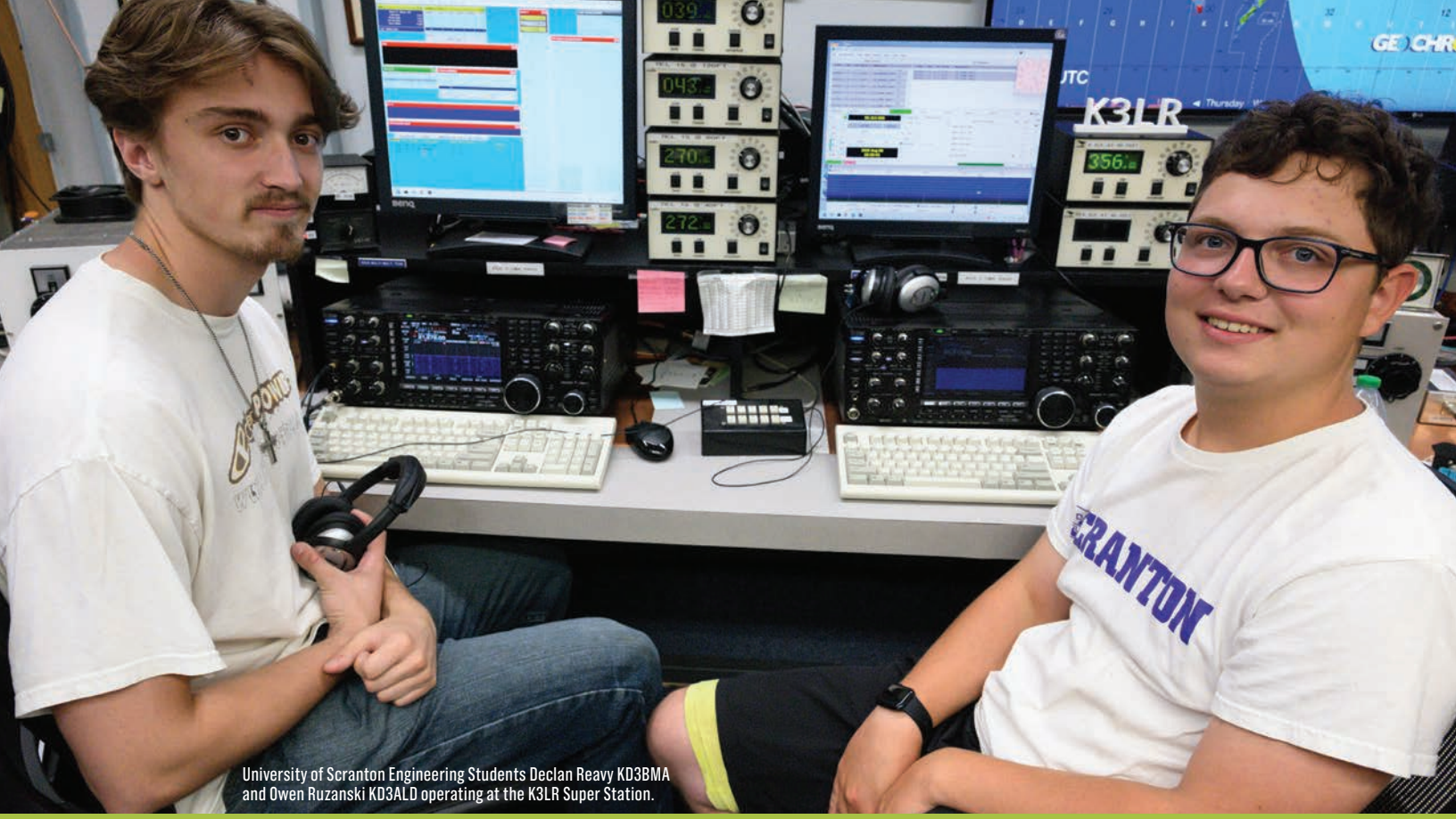
HamSCI has long studied the ionosphere by analyzing data collected during rare events, such as solar eclipses. Many readers may be aware that data collection also occurs on a daily basis, thanks to volunteers hosting GRAPE receivers, which monitor standard frequency stations such as WWV/H and CHU (**hamsci.org/grape-science**). Today, over 50 GRAPES are operating as a 'network' of receivers. The network's technical name is a Distributed Array of Small Instruments Track 1, or simply DASI1. Informally, it is better known as the HamSCI Personal Space Weather Station (PSWS) Network (**hamsci.org/psws**).

Using data collected by the Network, HamSCI is working to gain a better understanding of the local, regional, and global scale processes that influence the ionosphere. In short, HamSCI seeks to gain a better understanding of how radio waves propagate over great distances. This may lead to improved propagation predictions, new tools to predict radio wave behavior during solar storms, and, perhaps, new insights regarding solar cycles and other heliophysical phenomena.

HamSCI plans to expand its research efforts, so a more capable network is needed, one with broader geographic coverage and greater technical capabilities than today's Network. Beginning in 2025, hams are needed to host DASI Track 2 (DASI2) stations, each one comprised of three instruments: a software defined receiver (SDR) for recording the HF (high frequency) spectrum, a VLF (very low frequency) receiver, and a ground magnetometer designed to monitor changes in the Earth's magnetic field. Planning for 30 new PSWS sites is well underway.

Site selection will be challenging. Ideally, we hope to find sites which are 'RF quiet' on the HF bands. VLF reception has its own unique requirements and ground magnetometers requires careful placement. You can learn more about the site requirements, decide if you might be a candidate, and join the mailing list for potential hosts at **hamsci.org/site-search**.





University of Scranton Engineering Students Declan Reavy KD3BMA and Owen Ruzanski KD3ALD operating at the K3LR Super Station.

HamSCI INSTALLS PSWS AT K3LR

HamSCI recently completed its first ever multi-day field exercise (August 4-7, 2025), when components of the Personal Space Weather Station (PSWS) were successfully installed at the world-class ham station K3LR, West Middlesex, PA. Students, professors, research associates and community volunteers were hosted for four days by station owner Tim Duffy.

The field exercise had three goals:

1. **installation of a PSWS ground magnetometer and a WSPR Daemon/ RX888 wide band SDR, plus active antenna;**
2. **exposure to ham radio and practical applications of the applied physics which make HF communication possible;**
3. **a chance for all attendees, including invited members of the ham community from western PA and eastern Ohio, to enjoy Tim's special brand of hospitality.**

The team's efforts included assembling a DX Engineering active vertical receive antenna, ground rod installation, excavating a hole for, then burying, a HamSCI/TAPR ground magnetometer, plus laying of cables for data and received signals.

Once fired up, the WSPR Daemon/RX888's waterfall display was very clean, meaning there's a chance that K3LR will be one of the top spotters, worldwide, of WSPR signals. Most of the hard work was done by the end of the second day, leaving plenty of time for tours and operating.

The team's "free time" kicked off with a two-hour tour of the K3LR antenna farm, with detailed explanations of what, why and how nearly every system (14 towers, 50+ antenna systems) functioned.

Following the antenna session, Tim invited everyone into his award-winning ham station for a tour and operating session. The most recently licensed hams in the group were given seats on four different bands, and paired up with experienced ops. Over 400 QSOs were made worldwide on 10, 15, 20 and 40 meters. The station performed very well, and it is the reason that Tim has millions of contacts in his log, going back to 1972. Tim credits the success of his station to uncompromising engineering, meticulous maintenance, and a crew of operators dedicated to being the best at what they do.

In summary, a hearty thanks to all who participated, and we can't say enough about the support and enthusiasm from station designer/builder/operator Tim Duffy, K3LR, and the company he runs, DX Engineering. DXE is a longtime supporter of HamSCI, and we thank them for providing supplies and expertise, helping make the field work highly successful. We are looking forward to gigabytes of data being generated from West Middlesex, PA!

Owen Ruzanksi KD3ALD and Nina Tormann KD3BJV installing magnetomter at K3LR.

University of Scranton team presents K3LR with a school pennant. Left to right: Rebecca Potter KE2EBI, Declan Reavy KD3BMA, Owen Ruzanski KD3ALD, Tim Duffy K3LR, Nina Tormann KD3BJV, and Nathaniel Frissell W2NAF.

Katie Campbell KE8LQR mentoring Nina Tormann KD3BJV on operating K3LR.

NEW HamSCI GOOGLE GROUP

HamSCI has launched a new Google Group, dedicated to the Personal Space Weather Station project: **hamsci-psws**

We invite everyone interested in the following PSWS instruments and systems to join: Grape 1/2 Doppler receivers, WSPRDaemon SDR, HamSCI/TAPR Ground Magnetometer, VLF Receiving System, WSPRSonde Network and the PSWS Central Control System.

The new group replaces the hamsci-grape Google Group, which served the community well for the past five years. The Grape group has been 'frozen', with all its contents available for viewing and searching.

hamsci-psws

JOIN HamSCI

We welcome you to join the HamSCI community! We are a group of amateur radio operators and scientists working together to study the ionosphere and further amateur radio. HamSCI consists of many different types of projects accessible to a variety of skill levels with various focuses on science to engineering to pure amateur radio.

The easiest way to participate in the HamSCI Community is by joining the HamSCI Google Group. The HamSCI Google Group is an e-mail discussion forum to facilitate communication between hams, the professional space and atmospheric science communities, and anyone else interested. When requesting to join, please include some information about who you are and why you would like to join. WELCOME!!

ABOUT CITIZEN SCIENCE

Citizen science is scientific work undertaken by members of the general public, often in collaboration with or under the direction of professional scientists and scientific institutions.

HamSCI engages amateur radio operators to help with the collection and analysis of data to help better understand the changing conditions of "space weather" within the ionosphere. As a HamSCI citizen scientist, you help collect valuable scientific data that can make a meaningful impact to scientific research.

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The HamSCI silhouette photo is by Ann Marie Rogalcheck-Frissell KC2KRQ. Newsletter design by Vikki Lawhon, University of Scranton Creative Services.

WHAT IS HamSCI?

HamSCI, the Ham Radio Science Citizen Investigation, is a platform for the publicity and promotion of projects that are consistent with the following objectives:

- Advance scientific research and understanding through amateur radio activities.
- Encourage the development of new technologies to support this research.
- Provide educational opportunities for the amateur community and the public.

HamSCI serves as a means for fostering collaborations between professional researchers and amateur radio operators. It assists in developing and maintaining standards and agreements between all people and organizations involved.

HamSCI was started by ham-scientists who study upper atmospheric and space physics. These scientists recognized that projects such as the Reverse Beacon Network, WSPRNet, PSKReporter, DX Cluster, ClubLog, and others are generating big data sets that could provide useful observations of the Earth's ionosphere and related systems. Because of this, HamSCI's initial focus is on these fields of research. In the future, other researchers may join HamSCI and broaden its scope.

For scientists, working with the amateur radio community is a way to access individually managed stations, available by the hundreds in dozens of countries, with receive and transmit capabilities across the electromagnetic spectrum, easily identified in areas of interest and deployed to remote locations, for free.

RECENT HamSCI PRESENTATIONS

HamSCI's Thursday meetings often feature presentations by prominent scientists and amateurs that provide context to the weekly discussions.

Check the link for recent contributions from our members.
https://hamsci.org/telecons

Join our mailing list to be notified of upcoming topics and speakers.

HamSCI WEEKLY MEETINGS

There are numerous ways to learn about and participate in HamSCI activities. We meet three times a week on various aspects of our work:

TAPR/HamSCI Technical Session: This weekly telecon is hosted on Mondays at 9 PM Eastern by TAPR and The University of Scranton to support collaborative HamSCI-TAPR projects.

GRAPE-Low Cost PSWS Session: This weekly telecon is on Thursdays at 10 AM Eastern hosted by Case Western Reserve University to support the Grape Low-Cost Personal Space Weather Station Project.

The HamSCIence Telecon: Ths telecon takes place on the second Thursday of each month at 4 PM Eastern to discuss data collection, analysis and conclusions related to HamSCI's scientific research efforts. All backgrounds, including researchers, data analysts and citizen scientists, are welcome and encouraged to attend.

HamSCI Partners:

Case Western Reserve University · University of Alabama · NJIT New Jersey Institute of Technology · MIT Haystack Observatory · TAPR · NSF · ARDC Amateur Radio Digital Communications · NASA Partner · The University of Scranton A Jesuit University