
# GREEN BANK STAR QUEST XXI

## JULY 15 – JULY 18, 2026

http://caacwv.com/

http://greenbankstarquest.org/

| | GENERAL INFORMATION | |
|---|---|---|
| **TIME** | **EVENT** | **LOCATION** |
| **9:30am-6:00pm** | **Registration/Welcome** | **Registration Desk** |
| **9:30am-5:30pm** | **Vendor Area Open** | **Visitor Center** |
| **10:30am-5:30pm** | **Starlight Cafe**<br>**Last hot food order by 5:00 pm** | **Visitor Center** |
| **10:30am-5:30pm** | **Gift Shop** | **Visitor Center** |
| **10:00am-5:00pm** | **GBO Hourly Tours** | **Visitor Center** |
| **10:00am-2:00pm**<br>**DAILY** | **Daily Solar Observing**<br>**(Weather Permitting)** | **Visitor Center** |
| | **Reminder:**<br>**Check at the registration desk for daily schedule updates / revisions** | |
| | **Don't forget to purchase**<br>**Raffle Tickets! $1.00 each/$5.00 for 6** | |
| | **Check out our Star Quest T-Shirts**<br>**STAR QUEST MEMORABILIA** | |
| | **MEAL TICKETS AVAILABLE** | **Starlight Cafe** |
| **8:30am-9:30am** | **BREAKFAST** | **GBO Cafeteria** |
| | **LUNCH**<br>**On Your Own**<br>**Consider Visiting the Starlight Cafe** | |
| **5:00pm-6:30pm** | **DINNER** | **GBO Cafeteria** |
| **Dusk till Dawn** | **Observing** | **Your Site** |
| **8:30pm-10:00pm** | **Field Session**<br>**Weather Permitting** | **Field** |
| **11:00pm-3:00am**<br>**Wednesday,**<br>**Thursday and Friday** | **40' Dish Observation Sessions** | **40' Radio Dish** |

| | WEDNESDAY- JULY 15, 2026 | |
|---|---|---|
| **TIMES** | **EVENT** | **Location** |
| **1:00pm-2:00pm** | **"What's New with SIRIL Image Processing Software" Workflows for Deepsky, Planetary, Photometric and Comet Processing**<br>**Brent Maynard** | **Faraday Computer Lab** |
| **1:30pm-2:45pm** | **Angle of Diffraction**<br>**(Adults and Big Kids)**<br>**Josh Revels** | **Classroom** |
| **2:30pm** | **40' Radio Dish Orientation #1**<br>**GBO Staffer**<br>**20 person max. (sign-up sheet)** | **Meet at Registration Desk** |
| **2:45pm-4:15pm** | **"Apollo Flight Simulation"**<br>**Tim Hamilton** | **Faraday Computer Lab** |
| **3:00pm-4:30pm** | **Galaxy In A Jar**<br>**(Little Kids)**<br>**Josh Revels** | **Star Lab Room** |
| **4:00pm** | **40' Radio Dish Orientation #2**<br>**GBO Staffer**<br>**20 person max. (sign-up sheet)** | **Meet at Registration Desk** |
| | | |
| **5:00pm-6:30pm** | **Dinner Break** | |
| **7:00pm-8:00pm** | **TOPIC TBA**<br>**DR. TONY REMIJAN** | **Auditorium** |

| | THURSDAY- JULY 16, 2026 | |
|---|---|---|
| **TIMES** | **EVENT** | **LOCATION** |
| 9:45am-10:45am | Meteorite Miscellany<br>Dave Holden | Classroom |
| 9:45am-10:45am | "Artificial Intelligence in Astrophotography" How AI can be a benefit and/or detriment in processing your Astro Photos. We will look at current tools available to use in the image processing workflow.<br>Brent Maynard | Faraday Computer Lab |
| 10:00am-11:30am | Sun Bubble Art (Little Kids)<br>Spectroscopy of Stars (Big Kids)<br>Josh Revels | Star Lab Room |
| 11:00am-12:00pm | "It's Not What You Look At That Matters, It's What You See"<br>Terry Mann | Classroom |
| 11:00am | 40' Radio Dish Orientation #3<br>GBO Staffer<br>20 person max. (sign-up sheet) | Meet at Registration Desk |
| 12:00pm–1:00pm | Lunch Break | |
| 1:00pm-2:00pm | Secrets of the Mysterious SEYFERT Galaxies<br>Tim Hamilton | Classroom |
| 1:00pm-3:00pm | SETI TOUR<br>GBO Staffer<br>20 person max. (sign-up sheet) | Meet at Registration Desk |
| 1:30pm-3:00pm | Glow in the Dark Constellations (Little Kids)<br>Stellarium Activities (Big Kids)<br>Josh Revels | Star Lab Room<br>Faraday Computer Lab |
| 2:15pm-3:15pm | Keeping Dark Skies Dark: Radio Frequency Interference and Spectrum Management<br>Riley Dunnagan | Classroom |
| 2:30pm-5:00pm | Adult Model Rocketry<br>Jeremy Bumgardner, Eddie Zelenick | Basement |
| 3:15pm-4:15pm | "Apollo Flight Simulation"<br>Tim Hamilton | Faraday Computer Lab |
| 3:30pm-4:30pm | You Can Build Your Own Telescope<br>John Dennis | Classroom |
| 3:30pm | 40' Radio Dish Orientation #4<br>GBO Staffer<br>20 person max. (sign-up sheet) | Meet at Registration Desk |
| 4:00pm | High Tech Tour of the GBT Control Room<br>20 person max. (sign-up sheet) | Meet at Registration Desk |
| 5:00pm-6:30pm | Dinner Break | |
| 7:00pm-8:00pm | ***Ad Solem per Aspera*: Through Hardships, to the Sun – The Story of Parker Solar Probe**<br>**JOHN WIRZBURGER** | Auditorium |

| | FRIDAY- JULY 17, 2026 | |
|---|---|---|
| **TIMES** | **EVENT** | **LOCATION** |
| 9:45am-10:45am | "The Abundant Richness of the Cygnus Milky Way" A discussion of naked eye, binocular and telescopic sights that pass overhead on summer nights John Raymond | Classroom |
| 10:00am-11:00am | "Capturing the Aurora Borealis Above the Arctic Circle in Tromso Norway" We will cover planning, equipment (cameras, lenses, tripods, etc.), power, and weather forecast reliability Brent Maynard | Faraday Computer Lab |
| 10:00am-11:30am | Digital STARLAB Show Little Kids and Big Kids Josh Revels | Star Lab Room |
| 10:45am-12:00pm | Meteorite Miscellany David Holden 15 person max. (sign-up sheet) | Basement |
| 11:00am-12:00pm | "Nancy Grace Roman Space Telescope – Ready For Launch" Nate Tehrani | Classroom |
| 11:00am | 40' Radio Dish Orientation #5 GBO Staffer 20 person max. (sign-up sheet) | Meet at Registration Desk |
| 12:00pm–1:00pm | Lunch Break | |
| 1:00pm-2:00pm | "Forgotten Dreams of Spaceflight: Unbuilt Rockets, Lost Missions, and the Futures We Almost Chose" Ramin Lolachi | Classroom |
| 1:30pm-3:00pm | Little Kids and Big Kids Rocket Building Josh Revels | Star Lab Room |
| 2:15pm-3:15pm | "No Blueprint for the Moon: A Guide to Lunar Architecture" Caitlin Ahrens | Classroom |
| 2:30pm | 40' Radio Dish Orientation #6 GBO Staffer 20 person max. (sign-up sheet) | Meet at Registration Desk |
| 3:30pm-4:30pm | "How to Manage and Process over 10,000 Aurora Images" We will use Adobe Camera Raw/Lightroom to preprocess timelapse images and a variety of video tools to create timelapse videos. Also, we will use Photoshop to process the best single images. Brent Maynard | Faraday Computer Lab |
| 3:30pm-4:30pm | "The Abundant Richness of the Cygnus Milky Way" A discussion of naked eye, binocular and telescopic sights that pass overhead on summer nights John Raymond | Classroom |
| 4:00pm | High Tech Tour of the GBT Control Room 20 person max. (sign-up sheet) | Meet at Registration Desk |
| 5:00pm-6:30pm | Dinner Break | |
| 7:00pm-8:00pm | THE HISTORY AND FUTURE OF MARS EXPLORATION DR. CATHERINE REGAN | Auditorium |

| | SATURDAY- JULY 18, 2026 | |
|---|---|---|
| **TIME** | **EVENT** | **LOCATION** |
| 9:30am-11:30am | SETI TOUR<br>GBO Staffer<br>20 person max. (sign-up sheet) | Meet at Registration Desk |
| 9:45am-10:15am | GROUP PHOTO | Outside Visitor Center |
| 10:30am<br>(after photo) | Little Kids' Rocket Launch<br>Big Kids' Rocket Launch | Field |
| 12:00pm–1:00pm | Lunch Break | |
| 1:00pm-2:00pm | Open Discussion on Anything Related to Astrophotography and Image Processing<br>Brent Maynard | Faraday Computer Lab |
| 1:00pm-2:00pm | "Listening to Neutron Star Collisions: What Gravitational Waves Tell Us About the Most Extreme Matter in the Universe"<br>Maria Hamilton | Classroom |
| 2:15pm-3:30pm | The Return of Star Harvey featuring "The Unfair Astronomy Game"<br>Mark "Indy" Kochte | Classroom |
| 4:00pm | High Tech Tour of the GBT Control Room<br>20 person max. (sign-up sheet) | Meet at Registration Desk |
| 5:00pm–6:30pm | Dinner Break | |
| 7:15pm–8:30pm | "HELIOPHYSICS: OUR STAR AS A LABORATORY AND GATEWAY TO THE UNIVERSE"<br>DR. FERNANDO CARBABOSO MORALES | Auditorium |
| 8:30pm–10:00pm | Raffle Drawing / Certificate Awards<br>MUST BE PRESENT TO WIN | Auditorium |

| | SUNDAY- JULY 19, 2026 | |
|---|---|---|
| 7:00-10:30am | Sunday Morning Breakfast | Drake Room<br>Residence Hall |

# HOLD THE DATE FOR STAR QUEST XXII:

# TONY REMIJAN – Keynote

## WEDNESDAY – JULY 15, 2026

## 7:00 pm – 8:00 pm

Remijan is a distinguished astrophysicist and scientific leader who has played a pivotal role in advancing molecular astrophysics and radio astronomy throughout his more than two decades with the NSF NRAO and the Atacama Large Millimeter/submillimeter Array (ALMA), of which the NSF NRAO is a partner. He most recently served as Interim Director of the NSF GBO.

Across his career, Remijan has helped shape astronomers' understanding of the chemistry of the interstellar medium, exploring how complex molecules form and evolve in space and what they reveal about the origins of life. His research bridges astronomy, chemistry, and planetary science, demonstrating the power of interdisciplinary investigation to uncover the molecular foundations of the cosmos.

Prior to his new role, Remijan served as the NSF NRAO's Assistant Director for Science Support and Research. He contributed extensively to the commissioning and scientific optimization of ALMA, and is recognized for his leadership in fostering collaboration, mentorship, and scientific communication.

"Tony's leadership exemplifies how global cooperation and cutting-edge instrumentation can open new windows on the molecular universe," said Tony Beasley, Director of the NSF NRAO, "His experience and vision will continue to strengthen Green Bank's world-class scientific capabilities."

The NSF Green Bank Telescope continues to deliver outstanding science, with major new projects such as the Ultra-Wideband Receiver (UWBR), the next data processing software for the GBT based on python interface (Dysh), and the next-generation radar system (ngRADAR) expanding the Observatory's scope of services. With additional support from the NSF, significant upgrades to Green Bank's infrastructure are already underway—setting the stage for an exciting new era of research.

# DR. JOHN WIRZBURGER– Keynote

## THURSDAY- JULY 16, 2026

## 7:00 pm – 8:00 pm

After receiving a B.S. in Aerospace Engineering from Virginia Tech (Go Hokies!) and an M.S. in Applied Physics from Johns Hopkins University (Go Blue Jays!), John spent 12 years working his way up from Flight Controller to Lead Pointing Control System Engineer for the Hubble Space Telescope and through 3 Space Shuttle Servicing Missions prior to joining the Johns Hopkins Applied Physics Laboratory. Since joining APL 16 years ago, John has played key roles in the Guidance and Control development, integration, test, and flight operations for the Van Allen Probes and Parker Solar Probe spacecraft along with numerous concept developments. Although he considers himself a Guidance and Control Engineer, John currently serves as the Parker Solar Probe Mission Systems Engineer and Assistant Group Supervisor of the Astrodynamics and Control Group of the Space Exploration Sector. He is a current member of American Institute of Aeronautics and Astronautics. John is proud to be part of the Parker Solar Probe Team recognized with numerous awards, including The National Space Club and Foundation Jackson Award, the American Astronautical Society Neil Armstrong Space Flight Achievement Award, and the National Aeronautic Association Robert J. Collier Trophy.

# Dr. Catherine Regan– Keynote – Keynote

**FRIDAY – JULY 17, 2026**

**7:15 pm – 8:30 pm**


Dr. Catherine Regan is a planetary space physicist working at West Virginia University (WVU). Her research focuses on the transfer of energy from the solar wind down into the Martian environment through data analysis from multiple missions at Mars. She is a science team member for NASAs MAVEN (launched 2013) and ESCAPADE (launched 2025) satellites, as well as the European Space Agency (ESA)'s Mars Express (launched 2003), Rosalind Franklin Rover (launching 2028) and current mission candidate M-MATISSE. Catherine's research interests focus on how the entire Martian system is coupled, from space weather down to surface conditions.

Catherine received her PhD from University College London (UCL) in 2024 at the Mullard Space Science Laboratory (MSSL). Her thesis is titled 'The influence of Dust Storms on Mars' Induced Magnetosphere' and utilizes data from Mars Express and MAVEN to investigate how global scale dust storms affect Mars' magnetic environment. Catherine also holds a Master of Science in Planetary Science from UCL, and a Bachelor of Science from the University of East Anglia in Environmental Geophysics. Having not got a physics or astrophysics degree, Catherine is eager to highlight that careers in space are open to anyone that has a passion for learning more about our solar system and beyond.

During her time at MSSL-UCL Catherine was involved in multiple outreach projects, including leading the award-winning project Eyes on Mars, which reached over 10,000 young people in the UK. The project highlighted the UK contributions to the upcoming Rosalind Franklin rover, particularly PanCam, the panoramic camera that sits on top of the rover. In 2025 Catherine was awarded the Institute of Physics' Jocelyn Bell Burnell award for her contributions to science and outreach. Catherine has given multiple invited talks across the UK and USA and led the WVU effort at the Mars New Year festival in Mars, Pennsylvania. She is also involved in a NASA funded project to bring space data analysis into rural, underserved schools in West Virginia.

# Dr. Fernando Carcaboso Morales – Keynote

**SATURDAY – JULY 18, 2026**

**7:00 pm – 8:00 pm**

Dr. Fernando Carcaboso Morales is a dynamic researcher in Heliophysics, currently serving as an Assistant Research Scientist at the University of Maryland, Baltimore County (UMBC) in partnership with the NASA Goddard Space Flight Center. He earned his PhD in Space Research and Astrobiology from the University of Alcalá in Spain, where he also completed his Master's in Science and Technology from Space and a Bachelor's in Electronic and Industrial Automation Engineering. Prior to his current position, he served as a NASA Postdoctoral Program (NPP) Fellow at Goddard Space Flight Center.

Dr. Carcaboso's research career focuses on analyzing multi-spacecraft data from solar and heliospheric observatories, including Solar Orbiter, Parker Solar Probe, STEREO, and Wind. His work aims to unravel the topology of the interplanetary magnetic field by leveraging large-scale plasma and particle measurements. A major component of his research involves the study of Coronal Mass Ejections (CMEs)—massive, explosive eruptions of solar plasma—and exploring their evolution, statistical properties, and interaction with the solar wind as they propagate through the inner heliosphere. To investigate these powerful phenomena, he utilizes suprathermal electrons, solar energetic particles (SEPs), and artificial intelligence as "multi-messengers" that complement his broader investigations into our solar system.

In addition, he is deeply passionate about science communication and public outreach. He actively organizes workshops and regularly conducts outreach interviews for public media regarding solar eclipses and space exploration.

## **GUEST SPEAKERS**:

CAITLIN AHRENS – Ph.D., Assistant Research Scientist, Center for Research and Exploration in Space Science & Technology, University of Maryland College Park/NASA Goddard Space Flight Center.

JEREMY BUMGARDNER - Jeremy Bumgardner has been a member of the Central Appalachian Astronomy Club since its inception. He currently serves as the Director of Observatory Operations for the club's observatory. Jeremy studied Astrophysics at Penn State University, and owns Insight Astronomy in Bridgeport, WV. Jeremy has been involved in amateur rocketry from a young age, and now builds high power rockets as a member of the National Association of Rocketry.

FERNANDO CARCABOSO MORALES – SEE KEYNOTE – SATURDAY 7/18

JOHN DENNIS – RN, BS in Biology and General Science, MEd

RILEY DUNNAGAN – Riley Dunnagan is the National Radio Quiet Zone Assistant and a member of the Green Bank Interference Protection Group, and she coordinates with all fixed, permanent, and intentional transmitters within the NRQZ to mitigate interference for the telescopes at the Green Bank Observatory. Riley previously attended Rose Hulman Institute of Technology in Terre Haute, IN, majoring in Physics with a double minor in Astronomy and Mathematics. Her research background is firmly in radio astronomy, studying star formation and astrochemistry in the center of the Milky Way. Riley plays double (or triple?) duty as a first responder, serving as a nationally certified and WV-licensed EMT and a certified rope rescue technician for both the GBO and the local community.

MARIA BABIUC HAMILTON - Ph.D., Professor of Physics, College of Science, Marshall University, Huntington, WV

TIM HAMILTON – Ph.D., Professor of Physics, Shawnee State University, Director of the Clark Planetarium.

DAVE HOLDEN – The Meteorite Man

MARK “INDY” KOCHTE – Received a degree in Astronomy & Physics from The Ohio State University; has worked on various space exploration missions including the Hubble Space Telescope, FUSE (Far Ultraviolet Spectroscopic Explorer), MESSENGER, and CRISM (Compact Reconnaissance Imaging Spectrometer), and on the Mars

Reconnaissance Orbiter. He is currently Mission Planner on both the New Horizons and the Parker Solar Probe missions, and is the instrument engineer for the Suprathermal Ion Spectrograph on the ESA mission Solar Orbiter. (He is also a long-time fan and attendee of Star Quest.)

RAMIN LOLACHI - Ph.D., Assistant Research Scientist, University of Maryland, Baltimore County/ NASA, Goddard Space Flight Center; Center for Research and Exploration in Space Science & Technology (CRESST) II.

TERRY MANN – Vice-President of the Astronomical League, Chair of the Great Lakes Region of the AL, Host for Astronomical League Live on-line program astro-imager, and Aurora Chaser.

BRENT MAYNARD – MS, Adjunct Faculty CECS; Senior Director IT (Retired), Marshall University.

JOHN RAYMOND – John Raymond is past president of the Richmond Astronomical Society. He has completed the Planetary Nebulae, Binocular Messier, Carbon Star, and Multiple Star observing programs of the Astronomical League.

CATHERINE REGAN – SEE KEYNOTE – FRIDAY, 7/17

TONY REMIJAN – SEE KEYNOTE – WEDNESDAY, 7/15

JOSH REVELS – Education Outreach Specialist at Fairmont State University's Sci Tech ERC, NASA Solar System Ambassador, Citizen Science Trainer for the GLOBE Program and GLOBE at Night, Geoscience Educator at Fairmont State University, Instructor for both Earth and Space Science Passport Program and the WV Climate Change Professional Development Project, National Association of Rocketry and WV Rocketry Association member, Judge Advisor for the WV Robotics Alliance, and Executive Board Member for the West Virginia Science Teachers Association. Recipient of NASA's 2013 Service Award for Leading the Solar Observing Station at the National Boy Scouts of America's Jamboree and NASA's Diversity, Equity, Inclusion, and Accessibility Agency Honor Medal for two years.

NATE TEHRANI – Guidance, Navigation & Control Engineer, NASA, Goddard Space Flight Center (MCSG Technologies).

JOHN WIRZBURGER – SEE KEYNOTE – THURSDAY, 7/16

EDDIE ZELENICK – Director of Quality, Engineering, and Research & Development at BlueRidge Fiber Solutions, a #1 global independent provider of glass filament media. Eddie started in rocketry as a young child with water-propelled rockets and over the years has built level 1-5 rocket kits, then went on to design and build high-powered rockets that require a certification and FAA clearance. Eddie has also been involved with astronomy and outreach for many years and enjoys meeting people from all over at star parties.

# NOTES