

# **GREEN BANK STAR QUEST XIX**

**JULY 3 – JULY 7, 2024**

<http://caacwv.com/>

<http://greenbankstarquest.org/>

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

| <b>WEDNESDAY- JULY 3, 2024</b> |  |                                  |
|--------------------------------|--|----------------------------------|
| <b>TIMES</b>                   | <b>EVENT</b>   | <b>Location</b>                  |
| <b>9:30am-11:00am</b>          | <b>GBT Tour (sign-up sheet)<br/>(Three Groups of Seven)</b>  | <b>Meet at Registration Desk</b> |
| <b>12:00pm-1:00pm</b>          | <b>Lunch Break</b>   |                                  |
| <b>1:00pm-2:00pm</b>           | <b>The 2024 Solar Eclipse Image And Video Capture, Post Processing Steps<br/>Brent Maynard</b>                         | <b>Faraday Computer Lab</b>      |
| <b>1:30pm-2:30pm</b>           | <b>Chillin' Across The Cosmos: A Cool Journey Through Ice In The Solar System<br/>Caitlin Ahrens</b>                   | <b>Classroom</b>                 |
| <b>1:30pm-3:00pm</b>           | <b>Children's Activities<br/>Stomp Bottle Rockets; (Straw Rockets For Littles)<br/>Josh Revels</b>                     | <b>Star Lab Room</b>             |
| <b>2:30pm</b>                  | <b>40' Radio Dish Orientation #1<br/>GBO Staffer<br/>20 person max. (sign-up sheet)</b>                                | <b>Meet at Registration Desk</b> |
| <b>2:30pm</b>                  | <b>High Tech Tour of the GBT Control Room<br/>(sign-up sheet)</b>  | <b>Meet at Registration Desk</b> |
| <b>2:45pm-3:45pm</b>           | <b>Killer Dust From Outer Space: Moon Dust Is More Interesting Than You Think!<br/>Ramin Lolachi</b>                   | <b>Classroom</b>                 |
| <b>2:45pm-4:15pm</b>           | <b>Apollo Flight Simulation<br/>Tim Hamilton</b>   | <b>Faraday Computer Lab</b>      |
| <b>5:00pm-6:30pm</b>           | <b>Dinner Break</b>  |                                  |
| <b>7:00pm-7:15pm</b>           | <b>Vetting Eclipse Glasses<br/>Sue Ann Heatherly</b>   | <b>Auditorium</b>                |
| <b>7:15pm-8:15pm</b>           | <b>A STAR IS BORN: INSIGHTS INTO THE COLD, DARK CLOUDS THAT HOST STELLAR NURSERIES<br/>DR. JIM JACKSON<br/>KEYNOTE</b> | <b>Auditorium</b>                |
| <b>11:00pm-</b>                | <b>40' Dish Observation Sessions</b>   | <b>40' Radio Dish</b>            |

|                        | <b>THURSDAY- JULY 4, 2024</b>   |                                  |
|------------------------|---|----------------------------------|
| <b>TIMES</b>           | <b>EVENT</b>  | <b>LOCATION</b>                  |
| <b>8:30am-10:00am</b>  | <b>GBT Tour (sign-up sheet)<br/>(Three Groups of Seven)</b>   | <b>Meet At Registration Desk</b> |
| <b>9:45am-10:45am</b>  | <b>Meteorite Miscellany<br/>Dave Holden</b>   | <b>Classroom</b>                 |
| <b>9:45am-10:45am</b>  | <b>Introducing Computerized Astrophotography<br/>Featuring The SeeStar S50<br/>Brent Maynard</b>  | <b>Faraday Computer Lab</b>      |
| <b>10:00am-11:30am</b> | <b>Children's Activities<br/>Solar Observing<br/>John Revels</b>  | <b>Star Lab Room</b>             |
| <b>11:00am-12:00pm</b> | <b>Telescopes And Wildlife In Chile<br/>Debbie McKay</b>  | <b>Classroom</b>                 |
| <b>11:00am-12:00pm</b> | <b>Introduction to Radio Astronomy<br/>Sue Ann Heatherly, GBO</b>   | <b>Faraday Computer Lab</b>      |
| <b>11:00am</b>         | <b>40' Radio Dish Orientation #2<br/>GBO Staffer<br/>20 person max. (sign-up sheet)</b>   | <b>Meet at Registration Desk</b> |
| <b>12:00pm-1:00pm</b>  | <b>Lunch Break</b>  |                                  |
| <b>1:00pm-2:00pm</b>   | <b>The History Of Astronomy<br/>John Taylor</b>   | <b>Classroom</b>                 |
| <b>1:30pm-3:00pm</b>   | <b>Children's Activities<br/>Sun Art And Solar Cookies<br/>Josh Revels</b>  | <b>Star Lab Room</b>             |
| <b>2:15pm-3:15pm</b>   | <b>Extending The Hobby With Electronic<br/>Assisted Astronomy: Pertinent To Differently-<br/>Abled Or Aging Space Enthusiasts<br/>Paul Lowell</b> | <b>Classroom</b>                 |
| <b>2:30pm</b>          | <b>40' Radio Dish Orientation #3<br/>GBO Staffer<br/>20 person max. (sign-up sheet)</b>   | <b>Meet at Registration Desk</b> |
| <b>2:30pm-5:00pm</b>   | <b>Adult Model Rocketry<br/>Jeremy Bumgardner and Eddie Zelenick</b>  | <b>Basement</b>                  |
| <b>3:15pm-4:15pm</b>   | <b>Apollo Flight Simulation<br/>Tim Hamilton</b>  | <b>Faraday Computer Lab</b>      |
| <b>3:30pm-4:45pm</b>   | <b>MERAL<br/>(Mid-East Regional Astronomical League)<br/>Don Knabb</b>  | <b>Classroom</b>                 |
| <b>4:00pm</b>          | <b>High Tech Tour of the GBT Control Room<br/>(sign-up sheet)</b>   | <b>Meet at Registration Desk</b> |
| <b>5:00pm-6:30pm</b>   | <b>Dinner Break</b>   |                                  |
| <b>7:00pm-8:00pm</b>   | <b><b>FAST RADIO BURSTS: A COSMIC<br/>MYSTERY<br/>DR. DUNCAN LORIMER<br/>KEYNOTE</b></b>  | <b>Auditorium</b>                |
| <b>11:00pm-</b>        | <b>40' Dish Observation Sessions</b>  | <b>40' Radio Dish</b>            |

| <b>FRIDAY- JULY 5, 2024</b> |   |                                      |
|-----------------------------|---|--------------------------------------|
| <b>TIMES</b>                | <b>EVENT</b>  | <b>LOCATION</b>                      |
| <b>9:45am-10:45am</b>       | <b>Mt. Palomar And The 200" Hale Telescope<br/>Don Knabb</b>  | <b>Classroom</b>                     |
| <b>10:00am-11:30am</b>      | <b>Children's Activities<br/>Plasma Balls<br/>Josh Revels</b>   | <b>Star Lab Room</b>                 |
| <b>10:00am-11:00am</b>      | <b>Capturing Data For Astrophotography; Deep<br/>Sky And Planetary Techniques<br/>Brent Maynard</b>                       | <b>Faraday<br/>Computer Lab</b>      |
| <b>10:45am-12:00pm</b>      | <b>Preparing Sericho, Habaswein, Or Pallasite<br/>Meteorites For Etching<br/>Dave Holden</b>                              | <b>Basement</b>                      |
| <b>11:00am-12:00pm</b>      | <b>Ten Illusions Of The Night Sky<br/>Tom Reinert</b>   | <b>Classroom</b>                     |
| <b>11:00am</b>              | <b>40' Radio Dish Orientation #4<br/>GBO Staffer<br/>20 person max. (sign-up sheet)</b>                                   | <b>Meet at Registration<br/>Desk</b> |
| <b>12:00pm-1:00pm</b>       | <b>Lunch Break</b>  |                                      |
| <b>1:00pm-2:00pm</b>        | <b>Nancy Grace Roman Telescope Update/Make<br/>A Mini-Space Telescope<br/>Nathan Tehrani</b>                              | <b>Classroom</b>                     |
| <b>1:30pm-3:00pm</b>        | <b>Children's Activities<br/>Rocket Building<br/>Josh Revel</b>   | <b>Star Lab Room</b>                 |
| <b>2:15pm-3:15pm</b>        | <b>Restoring A Fisk Objective<br/>Bob Royce</b>   | <b>Classroom</b>                     |
| <b>2:30pm</b>               | <b>40' Radio Dish Orientation #5<br/>GBO Staffer<br/>20 person max. (sign-up sheet)</b>                                   | <b>Meet at Registration<br/>Desk</b> |
| <b>3:30pm-4:30pm</b>        | <b>Siril, A Powerful Image Processing Software<br/>For Windows, MacOS, Or Linux<br/>Brent Maynard</b>                     | <b>Faraday<br/>Computer Lab</b>      |
| <b>3:30pm-4:30pm</b>        | <b>Signatures Of Nuclear Isomers And Gamma-<br/>Ray Bursts From Binary Neutron Star Mergers<br/>Maria Babiuc-Hamilton</b> | <b>Classroom</b>                     |
| <b>4:00pm</b>               | <b>High Tech Tour of the GBT Control Room<br/>(sign-up sheet)</b>   | <b>Meet at Registration<br/>Desk</b> |
| <b>5:00pm-6:30pm</b>        | <b>Dinner Break</b>   |                                      |
| <b>7:00pm-7:15pm</b>        | <b>Vetting Eclipse Glasses<br/>Sue Ann Heatherly</b>  |                                      |
| <b>7:15pm-8:15pm</b>        | <b>DETECTING MONSTER BLACK HOLES<br/>WITH A GALAXY-SIZE OBSERVATORY<br/>DR. MAURA MCLAUGHLIN<br/>KEYNOTE</b>              | <b>Auditorium</b>                    |
| <b>11:00pm-</b>             | <b>40' Dish Observation Sessions</b>  | <b>40' Radio Dish</b>                |

| <b>SATURDAY- JULY 6, 2024</b>    |   |                                  |
|----------------------------------|---|----------------------------------|
| <b>TIME</b>                      | <b>EVENT</b>  | <b>LOCATION</b>                  |
| <b>9:45am-10:15am</b>            | <b>GROUP PHOTO</b>  | <b>Outside Visitor Center</b>    |
| <b>10:30am<br/>(after photo)</b> | <b>Children's Rocket Launch<br/>Adult Rocket Launch</b>   | <b>Airstrip</b>                  |
| <b>11:00am-12:00pm</b>           | <b>General Discussion On<br/>Astrophotography: Equipment, Tools,<br/>Software, Techniques, Tips, Etc.<br/>Brent Maynard</b> | <b>Faraday Computer Lab</b>      |
| <b>12:00pm-1:00pm</b>            | <b>Lunch Break</b>  |                                  |
| <b>1:00pm-2:00pm</b>             | <b>Exploration Of The Kuiper Belt With<br/>New Horizons<br/>Mark "Indy" Kochte</b>  | <b>Classroom</b>                 |
| <b>2:15pm-3:15pm</b>             | <b>Women In Astronomy<br/>Kristin Hendershot</b>  | <b>Classroom</b>                 |
| <b>3:30pm-4:30pm</b>             | <b>Adena Astronomical Observatory, Mid-<br/>Kanawha River Valley, WV<br/>William Scott Blake</b>                            | <b>Classroom</b>                 |
| <b>4:00pm</b>                    | <b>High Tech Tour of the<br/>GBT Control Room<br/>(sign-up sheet)</b>   | <b>Meet at Registration Desk</b> |
| <b>5:00pm-6:30pm</b>             | <b>Dinner Break</b>   |                                  |
| <b>7:15pm-8:30pm</b>             | <b>OSIRIS- REX RETURNED A PIECE OF<br/>THE EARLY SOLAR SYSTEM<br/>DR. JASON DWORKIN<br/>KEYNOTE</b>                         | <b>Auditorium</b>                |
| <b>8:30pm-10:00pm</b>            | <b>Raffle Drawing / Certificate Awards<br/>MUST BE PRESENT TO WIN</b>   | <b>Auditorium</b>                |

| <b>SUNDAY- JULY 7, 2024</b> |                                 |  |
|-----------------------------|---------------------------------|--|
| <b>7:00-10:30am</b>         | <b>Sunday Morning Breakfast</b> | <b>Visitor Center<br/>Starlight Café</b> |

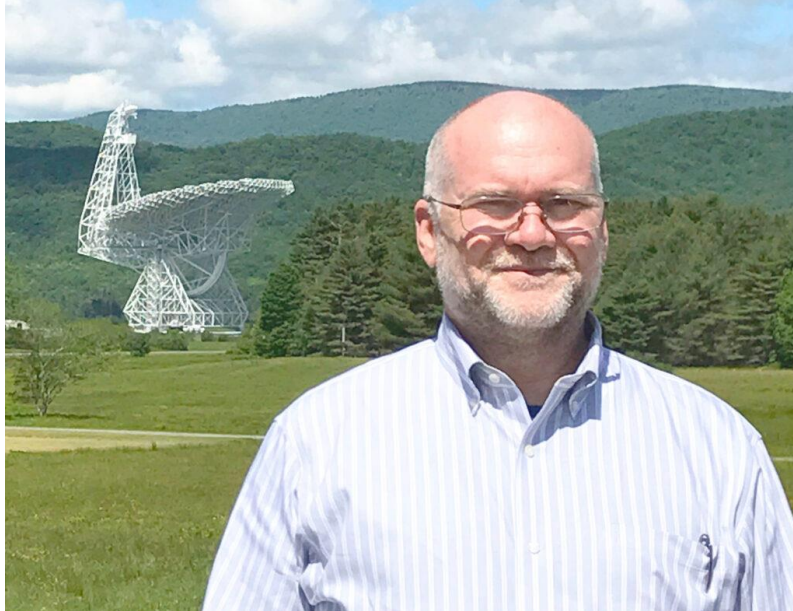
**HOLD THE DATE FOR STAR QUEST XX:**

## **Dr. James Jackson – Keynote**

**WEDNESDAY - JULY 3, 2024**

**7:15 pm – 8:15 pm**

### **BIO**



James Jackson is the Director of the Green Bank Observatory, home of the 100-meter diameter Green Bank Telescope, the world's largest fully steerable telescope. Previously, he has served as the Associate Director for Research at NASA's SOFIA airborne observatory in the Silicon Valley, the Head of School of Mathematics and Physical Sciences at the University of Newcastle in Australia, and the Associate Dean for Research at the College of Arts and Sciences at Boston University. Jackson received his bachelor's degree from Penn State, his PhD from MIT, and worked as a postdoc at Berkeley and the Max Planck Institute for Extraterrestrial Physics in Munich, Germany.

Jackson's research focuses on the formation of stars. He uses radio and infrared telescopes to study the gas clouds from which stars condense and form. He is perhaps best known for his work on the cold, dense, and filamentary clouds called Infrared Dark Clouds, now known to host the earliest stages of high-mass stars, at least 8 times more massive than the Sun. Jackson has used telescopes around the world (in Massachusetts, Australia, and West Virginia) to map thousands of star-forming clouds in order to characterize their physical and chemical properties. He has authored or co-authored over 150 scientific papers.

When not managing or using telescopes, Jackson enjoys playing and listening to music, especially blues and post rock, and photographing uncooperative, skittish birds.



## **Dr. Duncan Lorimer – Keynote**

**THURSDAY- JULY 4, 2024**

**7:00 pm – 8:00 pm**

**BIO**



Duncan Lorimer currently holds the rank of Professor of Physics and Astronomy and serves as Associate Dean for External Research Development in the Eberly College of Arts and Sciences at West Virginia University (WVU). After graduating with a BSc in Astrophysics from the University of Wales in Cardiff in 1990, where he was mentored by Prof. Bernard Schutz, Lorimer got his PhD in 1994 for his contributions to Pulsar Astronomy from the University of Manchester in the UK working under the supervision of Profs. Andrew Lyne, Dick Manchester and Matthew Bailes. Since then he has held positions at the University of Manchester (Lecturer; 1994-5); the Max-Planck-Institute for Radio Astronomy (Postdoctoral Fellow; 1995-8); Cornell University (Postdoctoral Fellow; 1998-2001); University of Manchester (Royal Society Research Fellow; 2001-6) and at WVU (Faculty; 2006-present). While at WVU, Lorimer has received a Cottrell Scholar Award (2008) from the Research Corporation for Scientific Advancement and has received both College and University awards for excellence in teaching (2009, 2010) and for research as a Benedum Scholar (2019). Lorimer has been a Fellow of the Royal Astronomical Society since 1994 and in 2018 was named a Fellow of the American Physical Society in recognition of his contributions to our understanding of pulsars, and for the discovery of fast radio bursts. In 2023, he was the co-recipient of the Shaw Prize in Astronomy along with Maura McLaughlin and Matthew Bailes for the discovery of fast radio bursts. Lorimer was elected a Fellow of the Royal Society (FRS) in 2024.

## **Dr. Maura McLaughlin – Keynote**

**FRIDAY - JULY 5, 2024**

**7:15 pm – 8:15 pm**

**BIO**



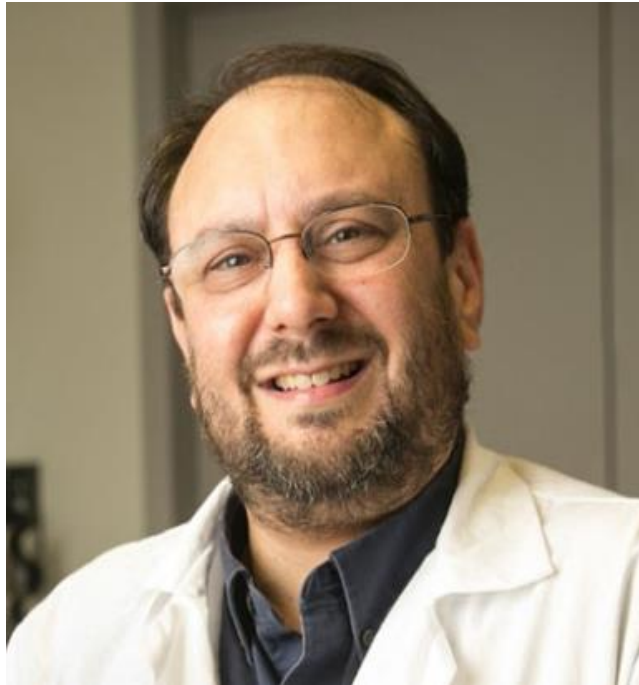
Maura McLaughlin is the Eberly Distinguished Professor of Physics and Astronomy at West Virginia University. She graduated from Penn State, received her PhD from Cornell, was a postdoctoral fellow at the Jodrell Bank Observatory. She is Co-Director of the NANOGrav Physics Frontiers Center, which aims to characterize the gravitational-wave universe using high-precision timing observations of exotic cosmic clocks called pulsars using the world's largest radio telescopes. She received the Research Corporation's Cottrell Scholar Award, an Alfred P. Sloan Fellowship, an APS Fellowship, the Shaw Prize in Astronomy, and the Cottrell IMPACT Award. She also co-founded the Pulsar Science Collaboratory program, which has involved over 2000 high-school students in pulsar searches over the past decade.

## **Dr. Jason Dworkin – Keynote**

**SATURDAY - JULY 6, 2024**

**7:15 pm – 8:15 pm**

**BIO**



Dr. Jason Dworkin is the NASA Goddard Space Flight Center's Solar System Exploration Division Senior Scientist for Astrobiology. He started researching the origin of life, now called astrobiology, as a high school intern at the University of Houston in 1985 under Professor Joan Oró. He received his Ph.D. in biochemistry from the University of California San Diego in 1997 under Professor Stanley L. Miller. He did a post-doctoral fellowship at NASA Ames Research Center under Drs. Louis Allamandola and Scott Sandford.

Dr. Dworkin founded the Astrobiology Analytical Laboratory at Goddard in 2002. He served as Chief of the Astrochemistry branch from 2008 to 2019 and acting Deputy Director Solar System Exploration Division in 2019. He began working on the OSIRIS asteroid sample return mission concept in 2004, became project scientist and contamination control scientist for the OSIRIS-REx mission, which was selected in 2011, arrived at asteroid Bennu in 2018, collected a sample in 2020, and delivered it to Earth in 2023. He has also participated in NASA's Stardust, Mars Curiosity (SAM instrument), ExoMars (MOMA instrument), and Mars Sample Return missions and JAXA's Hayabusa2 and Martian Moons eXploration missions.

Dr. Dworkin's objective is to assess the organic species available for the origin and early evolution of life with a focus on understanding the extraterrestrial input and origin of molecules relevant for life. This objective has been to study increasingly documented and constrained systems, from plausibly early Earth chemistry, chemistry of astrophysically relevant laboratory ices, organic and chiral analysis of meteorites (2002-), to analysis of sample returned material and how to protect that material from contamination. This research employs modern analytical methods to examine authentic samples of the early solar system as well as laboratory models of ancient environments.

## **GUEST SPEAKERS:**

Caitlin Ahrens – Ph.D., Postdoctoral Research Scientist, Center for Research and Exploration in Space Science & Technology (CRESST) II, University of Maryland, College Park, NASA, Goddard Space Flight Center.

William Scott Blake - NASA Solar System Ambassador, Adena Astronomical Observatory.

Jason P. Dworkin – Ph.D., Senior Scientist for Astrobiology in the Solar System Exploration Division at NASA Goddard Space Flight Center and Project Scientist for NASA’s OSIRIS REx mission.

Maria Babiuc-Hamilton – Ph.D., Professor, Department of Physics, College of Science, Marshall University

Tim Hamilton – Ph.D., Professor of Physics, Shawnee State University, Coordinator of the Clark Planetarium.

Kristin Hendershot – “The Astro Ranger” Former Solar System Ambassador and Interpretive Park Ranger for the National Park Service. Currently working on the Astronomical League Herschel Program.

Dave Holden – The Meteorite Man.

Jim Jackson - Ph.D., Director of the Green Bank Observatory

Don Knabb – Chair, Mid-East Region of the Astronomical League; Treasurer, Chester County Astronomical Society

Mark “Indy” Kochte – (aka Star Harvey) 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) on the Mars Reconnaissance Orbiter; currently Mission Planner on the New Horizons mission and an instrument engineer on the ESA mission Solar Orbiter. (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.

Duncan Lorimer – Ph.D., WVU Eberly College, Professor of Physics and Astronomy, Associate Dean for External Research Development.

Paul Lowell – High-Altitude Ballooning Hobbyist (using weather balloons to send cameras and experiments into the stratosphere).

Brent Maynard – Adjunct Professor, Marshall University, Computer Science; Senior Director (Retired) Information Systems, Marshall University.

Debbie McKay – Astronomy in Chile Educator Ambassador Program (ACEAP).

Maura McLaughlin – Ph.D., WVU Eberly College, Distinguished Professor of Physics and Astronomy. Chair, NANOGrav Collaboration; PI on National Science Foundation, Partnerships for International Research and Education (NSF PIRE).

Thomas Reinert – President, DarkSky International

Josh Revels – NASA IV&V Education Resource Center, Education Outreach Specialist; Educator.

Bob Royce – Precision Optician

Nate Tehrani – Guidance, Navigation & Control Engineer, NASA, Goddard Space Flight Center

# NOTES

