Springfield Telescope Makers

presents

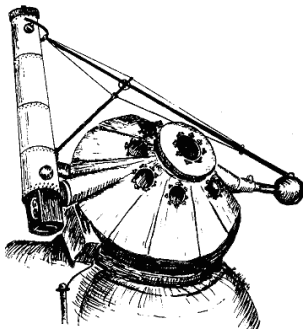
The Hartness House Workshop
Eclectic Astronomy III

August 1, 2024

Welcome to the Hartness House Workshop 2024
Eclectic Astronomy III

Webb Telescope image of Jupiter

Chairman Thomas Spirock
Co-chair and Registrar Dan Lorraine



Hartness House Workshop August 1, 2024
Eclectic Astronomy III

8:30 – 9:00 **Registration and Coffee**
Host Dan Lorraine, Seagrave Memorial Observatory, Skyscrapers, Inc.

9:00 – 9:10 **Words of Welcome**
Cecilia Detrich, President, Springfield Telescope Makers
Thomas Spirock, Chairman of the Hartness House Workshop

9:10 – 9:50 **Observing on Breezy Hill, with the James Webb Space Telescope, and with Future Giant Telescopes**
Robert A. Simcoe, MIT

9:50 – 10:30 **Found on a Shelf**
Bart Freid, Antique Telescope Society

10:30 – 11:00 **BREAK**

11:00 – 11:40 **Super Resolving Targets by Quantum Enhanced Measurements**
Santosh Kumar, Stevens Institute of Technology

11:40 – 12:20 **Engaging Students in Astronomy Research Through the Observational Study of Asteroids**
Jose Matilla, Phillips Academy, Andover

12:20 – 1:40 **LUNCH**
The Hartness-Porter Musem of Amateur Telescope Making is open

1:40 – 2:20 **A Universe Full of Small Black Holes**
Roy Kilgrad, Wesleyan University

2:20 – 3:00 **Catching the Nearest Star**
Frank Melillo, ALPO

3:00 – 3:40 **Russell Porter Before the Telescope**
Rick Hunter, Springfield Telescope Makers

3:40 – 4:10 **BREAK**

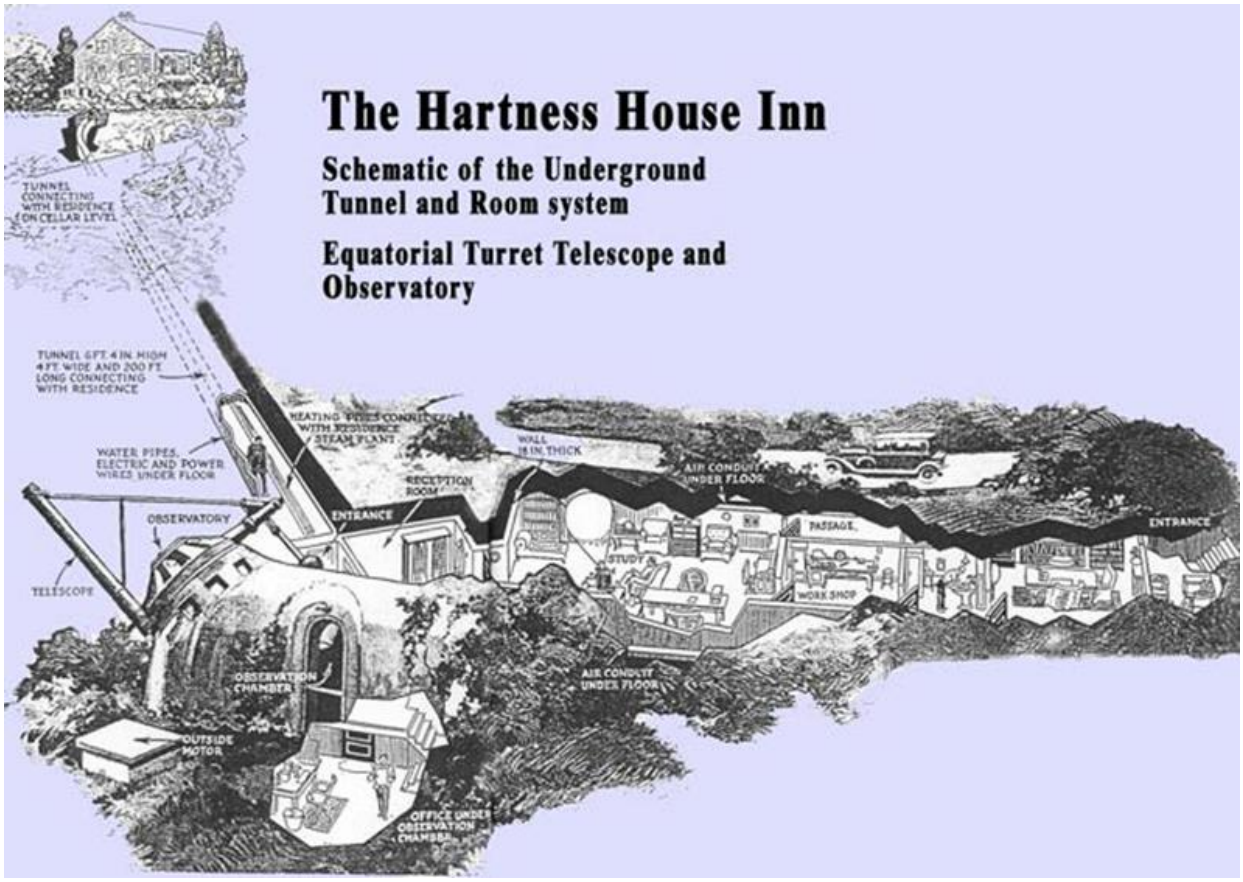
4:10 – 4:50 **Meteor Science from Lowell Observatory**
W. Lowell Putnam IV, Lowell Observatory

4:50 – 5:30 **Brown University's Ladd Observatory**
Dave Targan and Francine Jackson, Brown University

5:30 – 6:30 **Cocktail Hour at the Telescope Tavern, Hartness House Inn**

6:30 – 7:30 **Banquet at Hartness House Inn**

7:30 – 8:30 **Keynote Address**
Beauty and Discovery with Webb
Tony Hull, University of New Mexico



Abstracts and Biographies

Robert A. Simcoe – Observing on Breezy Hill, with the James Webb Space Telescope, and with Future Giant Telescopes

Abstract: I was a regular attendee at the Stellafane convention in the late1980s and early 1990s. This led into a dream job in observational astronomy research and building optical / IR imagers and spectrometers for large telescopes. A highlight of these years has been the opportunity to be among the first users of JWST. I will describe my team's early experiences and findings about the early universe using this amazing observatory, and preview a new generation of 25+ meter ground-based optical telescopes that are envisioned for the next decade.

Bio: Rob Simcoe is a native of Westborough, Massachusetts, where he first acquired an interest in astronomy and telescope making as a family hobby through trips to the Stellafane convention. As an undergraduate, he participated in development of the photometric camera for the Sloan Digital Sky Survey, after which he moved to Caltech for graduate school. While there, he collaborated with Mark Metzger on construction of a prime focus camera for the 200″ Hale Telescope at Palomar Observatory, and completed a thesis on chemical enrichment of the intergalactic medium with Wal Sargent, using the Keck Telescopes. In 2003 he moved to MIT as a Pappalardo Postdoctoral Fellow, to make use of the newly commissioned 6.5-meter Magellan Telescopes, and joined the MIT faculty in 2006. Three years later he installed the FIRE infrared spectrometer at Magellan, which has played a key role in exploration of cool stars in the nearby universe, and the discovery and characterization high redshift quasars and measurements of intergalactic matter in the first billion years after the Big Bang. His research group is now focused on construction of a new hyperspectral imager for Magellan named LLAMAS, as well as the first dedicated telescope using InGaAs detectors for astronomical surveys of the transient infrared sky, and preparations for scheduled observations with the upcoming James Webb Space Telescope. In 2019, Simcoe was appointed Director of the MIT Kavli Institute for Astrophysics and Space Research.

Bart Freid – Found on a Shelf

Abstract: An old workshop sat behind the family home of a medical doctor in the farming community of Peconic, New York. After the doctor's death in 1934, the workshop sat undisturbed for 87 years. In 2021, a small amateur made 6-1/2 inch reflecting telescope was found collecting dust on a shelf and it, along with many other family heirlooms, was put up for auction. The $2k-$3k estimate turned out to be embarrassingly low and the bidding for the diminutive telescope rapidly escalated until it sold for the astonishing price of $31,250!

This talk will survey the historical developments that led to the construction of this extraordinary amateur telescope, as well as the historical background which caused it to sell for such a high price today.

Bio: Bart is the founder of the Antique Telescope Society and is the current president. He is the recipient of the ATS' Isaac Newton Medal for meritorious service to the Society. As a recognized authority on the history of the telescope, he has lectured for several decades around the U.S., the U.K., Ireland and Canada, and he has over 30 published articles can be found in Sky & Telescope magazine; the Journal of the Antique Telescope Society; Eyepiece newsletter of the Amateur Astronomers Association and numerous other journals and publications. Bart is an avid observational amateur astronomer, and when time permits, he enjoys skiing, biking, scuba diving and telescope history research. He resides in New York City with his wife Eva. They have two children and two lovely granddaughters.

Santosh Kumar - Super Resolving targets by Quantum Enhanced Measurements

Abstract: Since Lord Rayleigh proposed the diffraction limit, many attempts have been made to improve optical resolution. This limit was long accepted for classical intensity measurements until quantum metrology suggested using additional light properties to extract more information. In this work, we utilize spatial-mode projective measurements via nonlinear optics to distinguish between one light source and two sources separated well within the Rayleigh limit, without prior knowledge of their exact centroid or brightness. Our technique holds promise for applications in astronomy, remote sensing, and biomedical imaging.

Bio: Santosh Kumar is a Research Assistant Professor at Stevens Institute of Technology, NJ, USA. He completed his Ph.D. in physics from JNU, New Delhi, India. During his Ph.D., he was a visiting scholar at CNRS Laboratoire Aimé Cotton, France. He conducted his postdoctoral research in quantum optics at the University of Oklahoma, USA.

Jose Matilla - Engaging Students in Astronomy Research Through the Observational Study of Asteroids

Abstract: I will share my experience teaching high school students astronomy, through observational projects. The photometric study of asteroids is particularly well suited to initiate them in astronomy. It is relatively accessible, allows students to engage at different levels and in different capacities, and the possibility of contributing new knowledge inspires and empowers them to continue their studies in astronomy or other STEM fields. Amateur astronomers have pioneered the development of techniques and equipment that make astronomical research accessible at the secondary education level. There is an opportunity for

the education community to adopt these advancements and collaborate with amateur observers.

Bio: I teach physics and astronomy to high school students at Phillips Academy in Andover, Massachusetts, and during the summer at the SSP (Summer Science Program). Before this, I was engaged in astronomy education during graduate school, instructing both undergraduate students majoring in Astronomy, and high school students in Columbia's Science Honors Program. Prior to transitioning to full-time teaching, I worked as a postdoctoral researcher. My research lay at the intersection of cosmology and data science.

Roy Kilgrad - A Universe Full of Small Black Holes

Abstract: Stellar mass black holes don't get the same amount of attention as their supermassive cousins, but they play just as important a role in the lives of galaxies. Over the past 25 years, the Chandra X-ray Observatory has looked at hundreds of nearby galaxies, and from those observations we have compiled a catalog of tens of thousands of actively accreting "small" black holes. They are amongst the most persistently luminous objects in the universe and shape the galaxies they inhabit in powerful ways, regulating star formation and driving the distribution of material. When they eventually merge, we can feel the ripples in space time across vast distances. Our survey represents the most complete sample of stellar mass black holes ever constructed, and from the data we can explore the limits of accretion, the abundance "ultraluminous" pulsars, and the merger rates of black holes in globular clusters, amongst other topics. I will discuss this survey, the legacy of the Chandra X-ray Observatory, and the future of high spatial resolution X-ray astronomy.

Bio: Professor Kilgard is an astrophysicist whose background is in high-energy astrophysics. Prior to his move to Wesleyan, he spent almost a decade at the Harvard-Smithsonian Center for Astrophysics, where he worked on the Chandra X-ray Observatory–one of NASA's Great Observatories, and the X-ray counterpart to the Hubble Space Telescope. Professor Kilgard researches black holes in nearby galaxies with an interest in black hole growth and evolution across cosmic time. His lectures cover a wide variety of astronomical topics, including black holes and galaxies, X-ray astronomy, historical astronomy, and astrostatistics. Professor Kilgard grew up in south Georgia but has purged his southern accent through many years in Boston, England, and now Connecticut. His love for all things space was inspired and encouraged by his grandfather, a veteran of the space program through the Gemini and Apollo eras. In addition to his work on black holes, he has become an amateur historian, working on both the restoration of Wesleyan's historic Clark refracting telescope and an exhibition on the history of astronomy in central Connecticut, which is on permanent display in the Van Vleck Observatory library. When not researching X-ray binaries, he is an incurable nit-picker of sci-fi minutiae. This has infected his teaching, leading him to design courses on

the intersection of science fiction and astronomy, as well as his outreach, with regular guest appearances at science fiction and fantasy conventions.

Frank Melillo – Catching the Nearest Star

Abstract: There are so many stars in our Universe. But one star is so special because we can study it up close. The nearest star is our Sun! There is so much to learn yet. We, as amateur astronomers, have many opportunities to study the sun like sunspots, flares and towering prominences. But there are other features to study our star if one equipped to isolate certain wavelengths to study the different layers of the solar atmosphere. There are few solar professional astronomers today but there are using the data results from the space mission. Amateur astronomers can fill in the gap for basic solar research and how it can affect the earth. This presentation can show what are the projects that amateurs can do to help out the professional community.

Bio: Frank has been interested in astronomy since the age of 11 when Apollo 11 went to the Moon and he was attracted to the beauty of the universe. He used a Tasco 4.5 inch reflector throughout the 1970's. In 1980, he purchased a Celestron 8-inch Schmidt-Cassegrain which he still uses today. He started doing astrophotography and joined the Astronomical Society of Long Island (ASLI) in 1982, then the AAVSO, the IAPPP and ALPO in 1984. In 1997, Frank joined the world of CCD imaging and got more interested in planetary imaging. Frank has been more active in ALPO than in any other national organization since the beginning of his career in Astronomy. In 2001, he became the Mercury coordinator for ALPO. That same year, Frank received the '2001 Walter Haas' award for the most outstanding contribution to planetary astronomy. In addition to his Celestron 8 inch telescope, he has a Meade 10 inch LX200, several webcams for planetary imaging and the Quantum Hydrogen Alpha 0.6 angstrom Solar Filter. All of these accessories have helped Frank further his planetary and solar studies of our Solar System.

Rick Hunter – Russell Porter Before the Telescope

Abstract: This presentation will help those who wonder how Russell Porter managed to fit so many activities and events into one life to understand the chronology of a busy and creative man. Starting with his background as son of a Springfield family, it covers his education and activities before his 1928 career change to Caltech and work on the famous 200 inch (five meter) Hale reflector, for a time the world's largest telescope. It closes with some possibly surprising facts about his educational history, and asks the question "was Russell Porter a true Renaissance man?"

Bio: Bunni Putnam: This program was researched and prepared by Rosanne "Bunni" Putnam, past-president of the Springfield Art and Historical Society (2015-2023). A Springfield native, Bunni's interest in Springfield history got underway in 2009 when she began writing a weekly column for the Springfield Reporter called Picture the Past; writing a description to accompany old photographs and postcards recalling Springfield's history. This later changed to The Picture of the Week and, together totaled over 500 articles. In 2011, while president of the Friends of the Springfield Town Library, she wrote the book, Images of America: Springfield, (127 page/224 photos) published by Arcadia Books, as a fundraiser for the Library, still available on Amazon.

Rick Hunter: who is delivering Bunni's program today: is a long time amateur astronomer and telescope maker (first Stellafane optical entry, 4 1/4" f/5 reflector, 3rd place in 1982) and STM member since 2002. He was a Physics BS who then turned to Philosophy, teaching it for over 20 years, and he repairs and tunes church pipe organs just for variety... He has been a Porter fan since reading about Stellafane and Porter long ago, either in high school or college, so Bunni knew she could count on him to deliver the talk with both accuracy and style.

W. Lowell Putnam IV – Meteor Science from Lowell Observatory

Abstract: A presentation about Lowell Observatory Cameras for All-Sky Meteor Surveillance (LO-CAMS), a network of off-the-shelf security cameras that scan the night sky for meteors. Multiple camera stations can triangulate meteor trails to provide pre-impact orbits and, for big enough events, predictions for the location of meteorite falls. LO-CAMS is based on two other meteor camera projects: CAMS (http://cams.seti.org) and the Global Meteor Network (http://globalmeteornetwork.org). The presentation includes details about the project, videos of observations and how interested amateur astronomers can participate.

Bio: W. Lowell Putnam is the **s**ole Trustee of Lowell Observatory. He is serving as the 5th Sole Trustee of Lowell Observatory, having succeeded his father, Bill, in 2013. Putnam also serves as one of seven members of the Board of Trustees of the Lowell Observatory Foundation. In 1984, Putnam founded Video Communications, Inc. (VCI), a software company specializing in business systems for TV networks, cable channels and local TV Stations. Clients included The Weather Channel, Comcast, Univision and about 25% of the TV stations in the US and Canada. In 2010, Putnam sold the company and became the Trust Administrator for the Observatory. He is also currently on the Board of Directors of Acceleron Bank. Putnam holds a BS in Psychology from American International College in Massachusetts and is a Life Member of the American Alpine Club and The Nature Conservancy. He was awarded an honorary doctorate degree from Northern Arizona University in 2018.

Targan & Jackson – Brown University's Ladd Observatory

Abstract: Since its dedication in 1891, Brown University's Ladd Observatory has served as the public astronomy sanctuary for Rhode Island and Southeast New England. Notably, it has remained almost entirely unmodified, well-preserved, and maintained by generations of professional and amateur astronomers, physicists, machinists, and telescope makers. Built before electrification reached the then-rural high point of Providence, the telescope and dome are still hand-powered. While other observatories were upgrading to computerized controls in the 20th century, Ladd maintained its analogue tradition. The auxiliary equipment at the observatory remains in its original condition. Old clocks, transit scopes, sextants, spectroscopes, historical plates, lantern slides, artwork, and direct views through the eyepiece or the 12" Brashear telescope, work together to generate the experience of awe that many amateur astronomers will recall from their first encounters with the night sky. On our regularly scheduled open house events, Providence visitors feel that same sense of awe as they enter our 19th century observatory and experience the mysteries of the cosmos unmediated by computers or CCDs. One particularly notable Providence visitor was a teenager who received the observatory keys from director Winslow Upton, a family friend. This young enthusiast spent many nights with the main 12-inch refractor and even wrote a monthly column for one of Providence's major newspapers. Unfortunately, his scientific ambitions were stifled by the educational requirements for becoming a professional astronomer, leading him to pursue a different path in which he gained enduring fame. That person was Howard Phillips (H.P.) Lovecraft. Our talk will explore the history of Ladd Observatory, its central role in Lovecraft's life, and how its historic role of portraying the newly discovered wonders of the universe may have inspired his unique vision and writing.

Bio: Together, Francine Jackson and Dave Targan have over a century of engagement with Brown University's Ladd Observatory.

Dave Targan: After graduating from the University of Illinois at Urbana-Champaign with a degree in Astronomy in 1972, Jackson returned to her home state of Rhode Island and quickly became involved with Ladd Observatory, which was then in a state of decline and transition. She worked to continue the tradition of keeping the facility open to the public while obtaining her Master's in Adult Education from the University of Rhode Island. Jackson became both a formal and informal educator at planetariums and educational institutions along the East Coast. She is an award-winning astronomy writer who has written a weekly astronomy note for Ladd Observatory for almost 20 years and has published numerous essays in the Griffith Observer. She is a fellow of the Middle Atlantic, Great Lakes, and International Planetarium organizations. Dave Targan, a protégé of Ladd Director Charles Smiley, began his engagement with Ladd Observatory when he started his undergraduate studies in Astronomy at Brown in 1974. After graduating, he studied under

George Abell at UCLA and conducted research at Lick, Mt. Wilson, and Table Mountain Observatories. In 1982, he transferred to the University of Minnesota to complete his PhD while simultaneously teaching astronomy and directing the observatory and planetarium at St. Cloud State University. During his tenure in Minnesota, he resurrected Camp Uraniborg, a summer program he had participated in while in high school, originally located in Rhode Island and California.While on sabbatical from St. Cloud, he assumed the directorship of Ladd Observatory from Hendrik Gerritsen, who was himself on sabbatical. When Hendrik returned, Targan continued to teach and direct the observatory, working closely with Francine Jackson and other local professional and amateur astronomers and telescope makers, to further protect and preserve Ladd and its public mission. He helped to secure funds for a major renovation that preserved the observatory's style while making significant improvements and turning the surrounding lot into a public park. He also served as Associate Dean for Science Education. Although he has retired from teaching and administration, Targan continues to serve as Ladd's Director while spending his newly free time hiking and observing in the mountains of New Hampshire.

Tony Hull – Beauty and Discovery with Webb

Abstract: Above the door of the STM Clubhouse are the words "The heavens declare the glory of God' Psalm" [19:1]. At a boy at Stellafane in 1962, this was the first time I had seen these words, and I felt their impact in this context. I loved looking through telescopes and had been tutored in seeing by neighbor and AAVSOer Clint Ford for years. Hubble images are breathtaking. And now we have the Pillars of Creation revealed in unsurpassed glory by Webb. I am deeply privileged that so many events of my life have culminated with playing a small roll on The Webb Telescope, now making such astounding insights dressed in great beauty, exploding our understanding of The Universe. Such Webb images we will share.

Bio: Mentored as a boy by neighbor and dedicated variable star observer Clint Ford, I learned to love being at the eyepiece of a telescope looking at objects in the sky. I remember discovering ATM, books 1-3 at Johnson's Bookstore in Springfield MA, and locked myself in my bedroom for a week, mother indulging me with a sick excuse, allowing me to devour these books. I set out to design an 8" Newtonian, taking mechanical drawing in high school to help along the way. Alas, it was never finished though I was inspired and informed by Stellafane. Clint had warned me "There are telescope makers and there are astronomers, but rarely do they do both." College started in engineering at Penn, and I even dated Walter Scott Houston's daughter Margaret as a freshman. Though while in Engineering, I totally focused on astronomy, even helping the method to correct the pointing errors of MIT's just built Haystack antenna. Having a graduate fellowship at Penn, I continued in astrophysics but took many advanced engineering classes. Now I think of myself as an astronomer, one who builds telescopes for space. My first career job was working with Clyde Chivens of Boller &

Chivens. Almost immediately, I was making space telescopes exploring Earth, Jupiter, Mars, Our Moon and even Venus. Going to JPL, I led design sessions for new telescopes, was involved in all wavelengths from X-Ray to Sub-Millimeter and became NASA's technologist for Terrestrial Planet Finder, now resurrected as Habitable Worlds Observatory. When Webb's cost grew impacting TPF development, I went to Tinsley as Director of Large Optics and Program Manager leading a team of 60 for shaping all the Webb Mirrors. I feel like I was born for this! Difficult beyond measure, we were successful. Since then, as Professor of Astronomy and Physics at UNM, I am active in developing NASA missions, chair an Astronomical Telescope Conference for SPIE and am on panels to define the technology for Habitable Worlds Observatory, the Great Observatory for a quarter century from now. Estimates are that HWO is 100x harder than Webb. And through all this, I feel my Stellafane roots!