Welcome to the 2019 Advanced Imaging Conference!

On behalf of the AIC Board, I want to extend a very warm welcome to all the AIC 2019 attendees. The ever-changing landscape sculpted by social media like Facebook and YouTube has greatly impacted the astronomy based community. Many clubs have seen smaller ranks and several conferences have shut down. AIC, however, keeps getting stronger thanks to your support and the generous support of our sponsors and vendors. In fact, we had to turn away several vendors and registrations are at an all-time high. As a result of this, we are planning a special highlight event with our Saturday night Gala.

I would like to point out that this conference would not happen if it were not for the very hard work of the AIC board and its team. They have spent countless hours of planning, negotiating, website building, and marketing over the last two years. I want to thank R. Jay GaBany for many years of service on the AIC board as well as congratulate him for the 2019 Hubble Award Recipient. I would also like to thank our presenters for the high-quality workshops and presentations that we all enjoy and learn from. I am proud to say that the Advanced Imaging Conference is still the greatest gathering of astrophotographers under one roof. I hope you all have a great experience at this conference and leave with more knowledge and lasting memories.

This is our third year at the San Jose Convention Center. We’re excited to be back and I’m confident you will appreciate the venue’s sense of space and atmosphere. We want to make sure your experience is superb, so don’t hesitate to ask any of the AIC staff for assistance.

Please also remember, the Advanced Imaging Conference is a non-profit organization. Unlike other astronomical gatherings, the AIC does not financially benefit anyone involved with its organization. The AIC Board of Directors are unpaid volunteers who contribute thousands of hours to make these gatherings possible. We are rewarded by your decision to attend and we sincerely thank you, again!

In closing, AIC cannot take responsibility for the damage or loss of your personal belongings. So, keep them within arm’s reach whenever you are in the meeting venue, the Exhibition Hall, during breaks or at meals.

Ken Crawford
President and CEO
Advanced Imaging Conference

Thank You!
The Advanced Imaging Conference extends its sincere gratitude to the Van Vleet Foundation for its financial support of our proceedings through their generous donations.
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**2019 Agenda**

**Friday**

- **08:00 AM - 09:00 AM**
  - **WORKSHOP A**: Advanced Imaging Processing (J.P. Membreno)
  - **WORKSHOP B**: Image Processing and Processing (Christopher C. Wright)
  - **WORKSHOP C**: Imaging Processing and Imaging (Norman P. Miller)
  - **WORKSHOP D**: Imaging Processing and Imaging (Bob DeBoer)

- **10:00 AM - 11:40 AM**
  - **WORKSHOP A**: Advanced Imaging Processing (J.P. Membreno)
  - **WORKSHOP B**: Image Processing and Processing (Christopher C. Wright)
  - **WORKSHOP C**: Imaging Processing and Imaging (Norman P. Miller)
  - **WORKSHOP D**: Imaging Processing and Imaging (Bob DeBoer)

- **11:40 AM - 01:00 PM**
  - **LUNCH**

- **01:30 PM - 03:15 PM**
  - **WORKSHOP A**: Advanced Imaging Processing (J.P. Membreno)
  - **WORKSHOP B**: Image Processing and Processing (Christopher C. Wright)
  - **WORKSHOP C**: Imaging Processing and Imaging (Norman P. Miller)
  - **WORKSHOP D**: Imaging Processing and Imaging (Bob DeBoer)

- **03:30 PM - 05:15 PM**
  - **WORKSHOP A**: Advanced Imaging Processing (J.P. Membreno)
  - **WORKSHOP B**: Image Processing and Processing (Christopher C. Wright)
  - **WORKSHOP C**: Imaging Processing and Imaging (Norman P. Miller)
  - **WORKSHOP D**: Imaging Processing and Imaging (Bob DeBoer)

- **05:30 PM - 06:50 PM**
  - **WORKSHOP A**: Advanced Imaging Processing (J.P. Membreno)
  - **WORKSHOP B**: Image Processing and Processing (Christopher C. Wright)
  - **WORKSHOP C**: Imaging Processing and Imaging (Norman P. Miller)
  - **WORKSHOP D**: Imaging Processing and Imaging (Bob DeBoer)

- **06:50 PM - 08:00 PM**
  - **SPEAKERS**

**Saturday**

- **08:00 AM - 09:25 AM**
  - **LUNCH**

- **09:25 AM - 10:05 AM**
  - **WORKSHOP A**: Advanced Imaging Processing (J.P. Membreno)
  - **WORKSHOP B**: Image Processing and Processing (Christopher C. Wright)
  - **WORKSHOP C**: Imaging Processing and Imaging (Norman P. Miller)
  - **WORKSHOP D**: Imaging Processing and Imaging (Bob DeBoer)

- **10:05 AM - 10:20 AM**
  - **WORKSHOP A**: Advanced Imaging Processing (J.P. Membreno)
  - **WORKSHOP B**: Image Processing and Processing (Christopher C. Wright)
  - **WORKSHOP C**: Imaging Processing and Imaging (Norman P. Miller)
  - **WORKSHOP D**: Imaging Processing and Imaging (Bob DeBoer)

- **10:20 AM - 10:35 AM**
  - **SPEAKERS**

- **10:35 AM - 11:15 AM**
  - **WORKSHOP A**: Advanced Imaging Processing (J.P. Membreno)
  - **WORKSHOP B**: Image Processing and Processing (Christopher C. Wright)
  - **WORKSHOP C**: Imaging Processing and Imaging (Norman P. Miller)
  - **WORKSHOP D**: Imaging Processing and Imaging (Bob DeBoer)

- **11:15 AM - 11:30 AM**
  - **SPEAKERS**

- **11:30 AM - 01:00 PM**
  - **SPEAKERS**

- **01:00 PM - 01:30 PM**
  - **WORKSHOP A**: Advanced Imaging Processing (J.P. Membreno)
  - **WORKSHOP B**: Image Processing and Processing (Christopher C. Wright)
  - **WORKSHOP C**: Imaging Processing and Imaging (Norman P. Miller)
  - **WORKSHOP D**: Imaging Processing and Imaging (Bob DeBoer)

- **01:30 PM - 02:30 PM**
  - **SPEAKERS**

- **02:30 PM - 03:00 PM**
  - **WORKSHOP A**: Advanced Imaging Processing (J.P. Membreno)
  - **WORKSHOP B**: Image Processing and Processing (Christopher C. Wright)
  - **WORKSHOP C**: Imaging Processing and Imaging (Norman P. Miller)
  - **WORKSHOP D**: Imaging Processing and Imaging (Bob DeBoer)

- **03:00 PM - 03:30 PM**
  - **SPEAKERS**

- **03:30 PM - 04:10 PM**
  - **WORKSHOP A**: Advanced Imaging Processing (J.P. Membreno)
  - **WORKSHOP B**: Image Processing and Processing (Christopher C. Wright)
  - **WORKSHOP C**: Imaging Processing and Imaging (Norman P. Miller)
  - **WORKSHOP D**: Imaging Processing and Imaging (Bob DeBoer)

- **04:10 PM - 05:50 PM**
  - **SPEAKERS**

- **05:50 PM - 06:00 PM**
  - **SPEAKERS**

**Sunday**

- **08:00 AM - 09:20 AM**
  - **LUNCH**

- **09:20 AM - 10:50 AM**
  - **WORKSHOP A**: Advanced Imaging Processing (J.P. Membreno)
  - **WORKSHOP B**: Image Processing and Processing (Christopher C. Wright)
  - **WORKSHOP C**: Imaging Processing and Imaging (Norman P. Miller)
  - **WORKSHOP D**: Imaging Processing and Imaging (Bob DeBoer)

- **10:50 AM - 11:15 AM**
  - **SPEAKERS**

**Exhibition Hall**

**Operating Hours:**

- **Friday**: 09:00 AM - 09:00 PM
- **Saturday**: 09:00 AM - 09:00 PM

The exhibit hall will be closed during the Saturday night gala from 6:00 PM to 7:00 PM.

Please wear your AIC registration name tag when visiting the Exhibition area.
R. Jay GaBany has the reputation for producing some of the finest deep-sky photographs in the world. His images have been featured and published countless times in magazines, books, movies, and of course Astronomy Picture of the Day. His many contributions to the astro-imaging community are vast. Best known for his work with an international team of astrophysicists, led by Dr. David Martinez-Delgado, he helped pioneer the use of modest sized telescopes using off-the-shelf equipment to produce long exposure images that revealed ancient galactic merger remnants in the form of star streams surrounding nearby galaxies that were previously undetected. His long exposures and special processing methods managed to capture details not seen in professional images. GaBany’s scientific collaboration with professional astronomers has resulted in his participation as co-author of 16 peer-reviewed papers. His writings include over 50 published articles in numerous popular astronomical magazines, books, and online blogs. GaBany was awarded the 2010 American Astronomical Society (AAS) Chablis Amateur Achievement Award. Time magazine included GaBany with their compilation of the 25 Most Influential People in Space and Parade magazine included Jay in the list of the 10 Most Influential People in Space. Jay also served as board member and President of AIC, helping to plan conferences, writing code for registration, creating the AIC website, and producing the newsletter. Jay retired from AIC in December 2018 and is currently living in San Jose with his wife Anne.
Rogelio Bernal Andreo
Astrophotographer, master image processor, and author
Bringing Out Faint Structures in Your Deep-Sky Images

One of the measures of master image processors is their ability to display the faint structures hiding in the field of view. Rogelio, who produces images that redefine our art, will share his techniques for drawing out subtle nebulosity and the like.

Rogelio was born in Spain, and has lived in the United States for thirty years. He began producing astronomical photographs eleven years ago. His work has been featured on APOD sixty times, published in several astronomy publications, used in planetariums, museum astronomy exhibits, and appeared in the IMAX/Warner Bros. movie production Hubble 3D.

Rather than simply trying to obtain a great image, Rogelio constantly challenges himself to ensure that the final picture connects with the viewer, by experimenting with new processing techniques and new compositions. Interestingly, Rogelio does not have a permanent observatory and his imaging requires extensive traveling to dark sites. As are many of his astrophotography peers, ‘RBA’ is also a fine musician.

Visit rogelio’s web site at www.deepskycolors.com

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Frank Barnes
Astrophotographer, master user of CCDAutoPilot, and AIC board member
Automation Using CCDAutoPilot

Frank will discuss CCDWare’s CCDAutoPilot for image acquisition. Frank has years of experience using AutoPilot to acquire images, both locally and remotely. Frank will discuss how the program works and make suggestions for optimizing it to allow imagers to collect the highest quality images from their equipment and observing location.

Frank has been imaging since 2000, starting out by setting up his equipment in his South Carolina backyard. After many nights of setting up and breaking down equipment, he decided to build an observatory in his back yard. Later he expanded his observatory sites, first at New Mexico Skies, and later at Sierra Remote Observatory in California. Frank often enjoys simultaneous image acquisition from his backyard observatory and his observatory on the other side of the United States. He has continuously used CCDAutoPilot to control image acquisition since its first release.

Frank has used his extensive experience to become a go-to person who shares his expertise on various forums, where he routinely answers questions posed by users.

Frank has been a member of the board of directors of AIC for many years where his work has helped produce AIC conferences, including this year’s meeting.

To follow Frank visit www.skyimager.com
Gaston Baudat, PhD

Artificial Intelligence Expert, Inventor, and Lecturer

‘Telescope Collimation by the Numbers Using Artificial Intelligence’

Gaston will discuss collimation of the telescope optical elements with a novel approach which uses artificial intelligence for doing wavefront sensing (WFS) without any specific hardware other than a focuser, an imaging camera, and a computer. This lecture will discuss the basics of optical aberrations, WFS, point spread functions (PSF), and optical element mis-alignment effects.

Gaston was born in Switzerland near Lake Geneva. He received his engineering degree in electronic and computer science from the Swiss University for Applied Sciences at Yverdon-les-Bains. In 2006, Gaston received his PhD in computer science in the field of machine learning from the Conservatoire National des Arts et Métiers (Paris). Gaston has been involved in opt-electronics and analog/digital sensor designs, as well as optical document sensing and pattern recognition, filing many patents, and publishing papers in scientific journals and conferences in advanced statistics, machine learning and artificial intelligence. He eventually moved to the US becoming the senior research director for a U.S. corporation from which he retired in 2018.

His passion for astronomy started many years ago while reading space magazines and books, as well as watching the first moon landing. In 1986 he went to Madagascar to take pictures of Halley’s Comet. One of them won a contest in the French science magazine “Science & Vie”. Over time, his interest in astronomy, especially for astrophotography, has grown. He created and designed the on-axis guider technology (ONAG), an award-winning novel approach for auto-guiding. Gaston is a co-founder of Innovations Foresight (IF), a Pennsylvania-based company, for making innovative products, such as the ONAG, live focusing, full frame guiding technologies, or wavefront sensing using artificial intelligence, all either are patented or in a patent pending status. Gaston has given many lectures on astronomical topics on seeing theory, wavefront analysis, and optimal guiding and focusing. He is also a private pilot and accomplished diver.

See Gaston’s webpage at www.innovationsforesight.com
The Stellarvue's Flagship 152 mm f-8 Apochromatic Triplet Refractor with conventional front, Ohara FPL-53 center and Lanthanum rear element for extremely sharp and high contrast performance. This model comes with the Moonlute Nitecrawler 3.5" rotating focuser. SVX series optics are rated at .98 - .996 Strehl with exceptional optical correction.

This level of optical accuracy requires us to go beyond traditional polishing, so we’ve developed proprietary processes at our facility in Auburn California. Each SVX series refractor comes with a Zygo interferometric test report taken in our shop, documenting the final accuracy of your premier objective!

Setting A New Standard
SVX152T-WR35

"The resolution I’m getting with the SVX152T-WR35 is just as good as my 10" reflector." - Jon Talbot

Adam Block
Professional Astronomy Researcher, Renowned Astrophotographer, Professional Image Processing Instructor, AIC Hubble Award Recipient, AIC Board Member
Advanced PixInsight Processing

In this workshop Adam will discuss and demonstrate advanced techniques for processing images in PixInsight. It is likely he will highlight some of his latest innovations as well as demonstrate methods for solving common problems.

Adam developed the public observing programs at Kitt Peak National Observatory (1996-2005). Later he founded the Mount Lemmon SkyCenter (2007) at the University of Arizona, which uses 24-inch and 32-inch telescopes for public outreach. He currently continues to work in the Department of Astronomy at the University of Arizona.

Adam’s images are used as references by amateurs and professional researchers alike. The Space Telescope Science Institute, Chandra Observatory, Spitzer, and many observatories around the world have used his images for various purposes. The images have also appeared in Nature, Time, and National Geographic magazines, and other popular astronomy literature. Some of his work has permeated into worldwide popular culture, being featured as cover art for Dance/Electronica musical artist Paul van Dyk, and sold on high-quality silk scarves in Europe. He has discovered asteroids, a supernova, and a galactic star stream. In his off-time, Adam is a competitive Table Tennis player.

To follow Adam and see his images visit www.adamblockphotos.com
Ron Brecher, PhD
Astrophotographer, author, and instructor

Getting Started in Deep Sky Astrophotography: Choosing and Using Equipment

Ron’s presentation will help those who are considering trying their hand at deep sky astrophotography. He will cover the basic equipment, software and techniques you’ll need to get going in this challenging, rewarding hobby.

Ron has been an avid amateur astronomer for over twenty years, and began photographing the sky in 2006. His deep-sky, Sun and Moon images and articles are regularly featured in print and online magazines, scientific journals, CD covers, websites, calendars and more. Ron uses PixInsight for processing his deep-sky images, acquiring his data mostly from his home observatory north of Guelph, Ontario.

Ron writes regularly for Sky & Telescope and other publications, most recently The Quest for Round Stars in the June 2019 S&T. He is the Technical Reviewer for both editions of Warren Keller’s, Inside PixInsight, published by Springer.

Ron offers private tutoring online, and teams up with Warren Keller to teach two and three-day deep-sky image processing workshops. Ron is a regular speaker at star parties and conferences in the U.S. and Canada.

Ron and his wife Gail live under Bortle 4 skies with two dogs, two cats and two kids in university. In “real life,” Ron holds a PhD and is a board-certified toxicologist with more than 30 years’ consulting experience, specializing in risk assessment and risk communication. To round things out, he plays guitar and sings lead vocals in the R&B band The Exceptions.

Visit Ron’s website at www.Astrodoc.ca
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Bob Denny is a software engineer who has revolutionized automated control of astronomy equipment and software through his development of the astronomy common object model (ASCOM) standard, the new ASCOM Alpaca standard, and the most widely-used web-based astronomy control family of software, ACP Observatory Control. ACP has been continuously upgraded to include more features, to be usable on computers and mobile devices, and to keep up with changes in software and hardware. It is used by amateur and professional astronomers around the world to remotely control their equipment, be it for pretty pictures, or science.

Bob is also a pilot, and a recently retired 18-year volunteer for the local county sheriff in his home state of Arizona.

See Bob’s very informative website discussing ACP Expert at www.dc3.com

Bob Denny is a master developer of astronomy communication and control software:

Workshop: ACP Expert: Technology Overview and Applications to Astro-Imaging

Tech Briefing: ASCOM Alpaca: Not Just for PC’s Anymore

Bob Denny
Master developer of astronomy communication and control software

Workshop Description: Bob will discuss the artificial intelligence scheduling and remote control of astronomy imaging hardware and software through the ACP Observatory Control family of software. He will cover the advantages of using mobile devices and web interface to simplify image acquisition and maximize observatory productivity. Also covered will be automatic delivery of images via Dropbox, iCloud, etc. Finally, Bob will discuss remote operation with astronomy clubs, students, and public, and how to avoid the need for training on complex acquisition software, and protect against people “adjusting” things and upsetting the installation. This will not cover installation of ACP and/or commissioning of observatories.

Tech Briefing: Bob will discuss ASCOM Alpaca, a new standard, that provides internet communication between astronomy software programs and astronomy devices on multiple operating systems such as: iOS, Linux, Android, and Mac. This will allow WiFi-connected mobile devices and astronomy instruments connected by WiFi. Alpaca is fully compatible with existing unmodified devices, drivers and programs on Windows.
R. Jay GaBany, master image processor, past president of AIC, and 2019 Hubble Award winner

In Praise of Amateurs

R. Jay GaBany will explore the role of amateur astronomers in society, contributions they have made throughout history and scientific opportunities that remain available. He will also discuss the challenges and rewards of working with professional astronomers along with highlights of his favorite non-scientific imaging projects.

Jay is the ultimate image processing guru who is known for stunning images. He developed many of the Photoshop-based techniques universally used to process images. He has also had a distinguished career collaborating with professional astronomers where he “spawned a new research direction in the exploration of galaxy evolution via low-surface brightness imaging of galaxy halo substructure.” In this collaboration, Jay was a co-author of 16 peer-reviewed papers. For this work he was awarded the 2010 Chambliss Amateur Achievement Award, which is given annually to one North American amateur astronomer by the American Astronomical Society for an important contribution to astronomical research.

In addition, Jay has had his images shown around the world, many as APODs and in published books. He is also a co-author of several books on astronomical imaging. In the fall of 2012, Time magazine included Jay in the compilation of The 25 Most Influential People in Space, in the New Space Discoveries Special Edition, and he was named as one of the 10 Most Influential People in Space by Parade magazine. Jay has lectured on astroimaging all over the world.

He served on the board of directors of AIC from almost its beginning, and very capably served as its president for several years. In this capacity, Jay is very responsible for the experiences you will enjoy at the 2019 AIC conference.

View Jay’s stunning images at www.cosmotography.com
Andy will discuss optimizing guiding with PHD2, the popular open-source guiding program for beginning and advanced astrophotographers.

Andy images remotely from his home in Massachusetts using two telescopes in his fully automated roll off observatory located under dark skies in New Mexico. Andy is the maintainer of the Open PHD Guiding project which develops and supports PHD2. He also created ansvr, plate solving software that allows imaging applications like SGP, ACP and others to use the astrometry.net plate solving engine locally on a Windows computer without an internet connection.

Andy will be joined by Bruce Waddington, his colleague and fellow collaborator on PHD2. Bruce has been imaging since 2005 and working on PHD2 since 2013.

Open PHD Guiding (PHD2) www.openphdguiding.org

Andy’s web site www.adgsoftware.com
Christopher Go
Master planetary and lunar astrophotographer, collaborator with professional astronomers, and discoverer of planetary features.

Workshop A: High Resolution Solar System Imaging
Workshop B: Image Processing Tricks for Solar System Imaging

Chris will offer two workshops. Workshop A will discuss his techniques to acquire and process stunning planetary and lunar images. Workshop B will be more hands on, where he discusses some of the tricks that he uses to process solar system imaging. You should take Workshop A if you want to fully profit from Workshop B.

Christopher lives in Cebu City, Philippines, where he has been active since 1986 in amateur astronomy, and who took his first astrophotograph in 1990. Beginning in 2003, he has developed many techniques to obtain stunning images of the planets and the Moon. In 2006, he discovered a spot on Jupiter, now known as Red Spot Jr. (or Red Jr.), which was subsequently imaged by professionals, with Christopher as part of their team, using the Hubble Space Telescope and the Keck Observatory in Hawaii. In that same year, Christopher became a member of the American Astronomical Society. He has co-authored two papers published in the Journal Nature. In 2015 the International Astronomical Union officially named the asteroid “Christophergo” in his honor. He images from Cebu City using a Celestron C14 on an Astro-Physics AP900GTO mount and a QHY290M cooled CMOS camera.

Visit Christopher’s webpage to enjoy his images at www.astro christone.net
Terry Hancock
Astrophotographer and master Photoshop-based image processor

Post Processing Techniques in Photoshop

Terry will discuss his Adobe® Photoshop processing techniques, the qualities of a good image, and how to get there for both broadband and narrowband.

Born in England, Terry migrated with his parents as a child to Australia, where he soon became enchanted by the writings of astronomer Sir Patrick Moore and the dark skies of the Australian outback. In the mid-1980s Terry moved to the United States, where he decided to combine his two loves—photography and astronomy. His images have been published by NASA’s APOD, and featured in Astronomy, Sky at Night, Sky & Telescope, Astronomy Now, and National Geographic magazines, as well as The Daily Mail, and Yahoo.com, Space.com, and many other well-known online publications.

For many years, Terry imaged from his backyard, but upon retirement, he project-managed the construction of Grand Mesa Observatory in Colorado, where he currently serves as Director. He also is a major contributor to astronomy education in Colorado, where he speaks at schools, clubs, libraries, and other organizations. He runs an on-line astrophotography tutorial service, teaching about equipment use and image processing, which reaches students worldwide.

View Terry’s work at www.downunderobservatory.com
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Capture spectacular wide-field deep sky images in seconds with Celestron’s new portable astrograph, the 8" Rowe-Ackermann Schmidt Astrograph (RASA). This incredibly fast f/2.0 system is the perfect companion to today’s color astronomical CMOS cameras, smaller CCD cameras, and mirrorless cameras. Thanks to its fast focal ratio and patented optical design, you can produce sharp, detailed images and, in many cases, skip the autoguider completely. Weighing in at just 17 pounds, it’s easy to transport your RASA setup to the most remote dark sky locations.

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Artistic by nature, it’s less about cosmology, and more about the thrill of the hunt for the beautiful shapes and colors throughout the universe. Warren has the ability to reduce the difficult concepts of astro-imaging to the essentials and effectively teach it to others. Through his books, his tutorials, and presentations he has given thousands of amateur astronomers the world over, a quick start to taking their own great images.

He is proud to have been published as an author and photographer in Sky & Telescope, Astronomy, Sky at Night, Astronomy Now, CNAA (China), and many places on the World Wide Web, most notably, NASA’s APOD.

He was Atik CCD’s North American representative and was a consultant to Celestron where he co-designed AstroFX software. In 2016, he wrote the definitive book on PixInsight for Springer, Inside PixInsight, the first edition being their top seller in 2016.

Warren has presented at astro-imaging conferences and star parties all over the world. As a board member of AIC, he is V.P. of exhibitor sales.

You can see Warren’s images at www.billionsandbillions.com

Learn more at celestron.com/RASA

Warren Keller

Author, teacher, master astrophotographer and image processor, and AIC board member

Easy as Pi(e) - Getting Started With PixInsight

A SPEAKER


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Warren Keller

Author, teacher, master astrophotographer and image processor, and AIC board member

Easy as Pi(e) - Getting Started With PixInsight
Kerry-Ann Lecky Hepburn
Astrophotographer, Senior Meteorologist – The Weather Network
Lightscaping, Making Every Pixel Count

Kerry-Ann will share her best tips and techniques in post-processing nightscape images. You will learn how to bring the most out of your images no matter what light you have. Using novice to advanced methods in Lightroom and Photoshop CC, we will make every pixel count. Some of these techniques will also prove valuable in deep sky image processing and can help you define or refine your personal style.

Kerry-Ann's interest in astronomy started from a young age when she heard in the news that Halley's Comet would be making a close approach to Earth. After getting her first telescope at the age of 11 and then her first SLR film camera as a teenager, she began to think of the possibilities of astrophotography.

As a space science undergraduate student at York University in Toronto she was a volunteer at the observatory where she aided in tours, observing sessions and research. Over the course of more than 15 years she dabbled in astrophotography but it wasn’t until the beginning of 2007 that she started to make big strides in the hobby.

She worked hard to improve her post-processing skills while dealing with light pollution and equipment shortfalls. Her work has ended up winning awards and has been featured in science textbooks, astronomy related calendars, magazines and online publications such as Sky & Telescope, Sky News and NASA APOD. She shares her knowledge by doing speaking engagements and workshops for star parties, astronomy and camera clubs, and the general public.

While enjoying this intensive hobby, Kerry-Ann lives in the Niagara region of Ontario Canada with her husband and two girls. She works for The Weather Network (a Canadian National TV station) as a senior meteorologist and in her spare time flies small airplanes and travels around the world to capture unique nightscapes.

See Kerry-Ann’s images at www.weatherandsky.com

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I image over 223 nights per year.
Vik Kohli

The Skies are so GOOD, that I can see Mag 8.5+ Objects WITH MY NAKED EYE!!! (M1, Virgo Supercluster, etc.)
Vik Kohli

NEW MEXICO SKIES ASTRONOMY ENCLAVE
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SPEAKER
Steve Mazlin, MD
Astrophotographer and master image processor
Photoshop for Those in Their “Right” Mind

Image processing can be approached in a highly methodical and technical fashion; hence, the tremendous success of programs like PixInsight. However, for some amateurs a more “right brain” approach could be desirable; this is especially true for beginners who are first climbing the steep learning curves of this hobby. For twenty years, Steve Mazlin has used what he considers fairly basic Photoshop skills to create some amazing images. Only half-jokingly he claims that with the lasso and feather tools he can “rule the world”. Even if you have mastered PixInsight (as Steve hopes to do “after retirement”), a basic mastery of Photoshop is always a useful skill to have in your processing tool box.

A lifelong photography enthusiast and armchair astronomer, Steve dove headfirst into the world of astrophotography in the late 1990’s, erecting an observatory dome in his backyard before he had even taken a single image! He has continued to pursue mostly narrowband imaging from his Bortle 5.0-5.5 skies 30 miles outside of Philadelphia, but is perhaps best known in the amateur astronomy community for being a prolific member of Star Shadows Remote Observatory (SSRO) since 2007. SSRO was one of the first remote imaging group ventures, initially stationed at New Mexico Skies, but eventually relocating to CTIO (Chile) in an arrangement with UNC-Chapel Hill -- Steve currently serves as the SSRO team leader. In August 2006, with fellow amateurs Jim Misti and Bob Benamati, Steve organized the “East Coast Conference on Astronomical Imaging”. Several of his images were featured in the traveling exhibit known as “Starstruck: The Fine Art of Astrophotography”, which toured three art museums between 2012 and 2014. Steve’s work has also been published in multiple print and online venues, including APOD. He authored a chapter on imaging workflow/processing in the 2013 edition Lessons From the Masters: Current Concepts in Astronomical Image Processing (edited by Robert Gendler). Just turning 60 a few months ago, Steve still works part time as a clinical neurologist in Bucks County, Pennsylvania. His alter ego, “Mazlinthegreat”, can be found on YouTube performing magic, singing “The Elements”, or concocting political satire.

View Steve’s images at www.ourcolorfulcosmos.com
Since 2002 Alpine Astronomical has distributed and supported the full range of Baader Planetarium products for North America. Whether your interest is imaging of Deep Sky and Planets, or visual observation, our selection of unique Baader products gives you the high-quality tools you need.

Baader's products span an industry-leading range of imaging and visual filters to a wide array of compatible adapters for visual and imaging configurations limited only by your imagination. New products like the Universal Filter Changer modular system and the Baader Flip Mirror II enable many new applications for controlling the light output and redirecting to various cameras, off-axis guider, eyepieces, or scientific instruments.

Alpine Astronomical is pleased to unveil AstroMounts.com — our new sister website dedicated to high-precision telescope mountings and related components from 10Micron of Italy and Baader Planetarium of Germany. The 10Micron HPS system utilizes fully integrated absolute encoders and a standalone sophisticated control system that manages all control and pointing of the mount. These mounts deliver precision, stability, and tracking accuracy that allows completely automatic and unattended remote imaging.

Alex will discuss the use of Sequence Generator Pro (SGP), which controls equipment to easily acquire lights, darks, flats, and bias images. He will also discuss Sequence Generator Pro's mosaic creation capability.

Alex's first experience as an astronomer was as a 7-year-old looking at Saturn through the Zeiss 12” refractor at Griffith Observatory in the 1950s. His first telescope was an 80 mm refractor, which he purchased in 1986 to view Halley's comet. He discovered star parties while viewing Comet Hayakutake in 1995.

He began attending the Riverside Astronomical Society meetings in Southern California and the Riverside Telescope Makers Conference (RTMC), where he exhibited two hand-built telescopes, and was the recipient of an RTMC Merit Award. At the Riverside Astronomical Society, Alex has been a member of the Board of Trustees and has served for 4 years as its president, having previously been its Vice President, newsletter editor, and star party coordinator. While president, he helped establish the Riverside Astro Imaging Group, the Riverside Astro Imaging Workshop (RAW), and the Nightfall Imaging Workshop.

He also helped establish the Astro Imaging Channel (TAC) on Google+. He also has earned the status of Master Observer from the Astronomical League.

Alex is a very experienced user of Sequence Generator Pro, which he uses to control his own equipment when taking images, and he's authored a book on the subject for Springer Nature.

Alex is a retired school teacher and administrator and world traveler (50 states and 115 countries) who lives in Moreno Valley, California.

You can see Alex's images at www.alexastro.com

Alex McConahay
Astrophotographer, author, and expert user of Sequence Generator Pro
SGP: Catch the Photons While Catching Your ZZZZZ's
Finnish astrophotographer J-P Metsävainio will discuss and demonstrate his powerful techniques for narrowband processing, including LRGB processing.

J-P Metsävainio is a master image processor and a prolific producer of images. His background is in visual arts, technology and science.

By day, he works as a visual artist, photographer, and entrepreneur. He has an observatory in his home town of Oulu, Finland, located near the Arctic Circle, where he enjoys six months of darkness, the price of which is six months of almost continuous daylight. He produces his images using a Celestron Edge HD 1100 and camera lenses like Tokina 300mm f2.8 and Canon EF 200mm f1.8.

His images have been published by NASA (APOD), the Official Vatican Observatory calendar for 2018 and 2019, in magazines such as National Geographic, Sky and Telescope, Smithsonian, Discover and Ciel & Espace, and in online publications PetaPixel, Universe Today, MailOnline, Wired, and BuzzFeed. His work has been featured in the Oulu Museum of Art (Oulu, Finland), UK’s National collection of Royal Museums of Greenwich, National Maritime Museum, Science Photo Library and photo collections of National Geographic Magazine.

He has received various awards, including the 2009 Stella Arcti prize by the Finnish Astronomical association URSA and third place in Astronomy Photographer of the Year 2014 competition by the Royal Observatory of Greenwich.

J-P's images can be viewed at: www.astroanarchy.blogspot.com
CMOS sensors are displacing the longstanding CCD as the sensor of choice in many applications. While CMOS sensors are a reasonable alternative to the CCD, they are not “drop-in” replacements. Understanding the differences between the two technologies will allow for the astrophotographer-imager to weigh the benefits and trade-offs of each.

Jim was one of the founding owners of Finger Lakes Instrumentation (FLI), which has recently been acquired by IDEX Health and Science. Throughout his career with FLI, he participated in the design of the ProLine and Micro-
Martin Pugh
Dedicated astrophotographer and accomplished image processor.

Image Processing Using Adobe Photoshop

Martin will demonstrate his image processing workflow and reveal innovative and highly effective image processing techniques using Adobe® Photoshop for LRGB, bi-color, and tri-color narrowband images.

Martin Pugh’s interest in astronomy coincided with the appearance of Comet Hale Bopp in 1997, and soon thereafter he began to explore astrophotography, practicing image acquisition and image processing. His astrophotography took a major step up when he immigrated to Australia, where he located his roll-off observatory under the dark skies near Yass, New South Wales. He soon began to produce images admired by many and to receive awards for his work. Since June 2006, he has produced 56 APODs. His awards include the 2008 South Pacific Star Party winner, 2008 David Malin Awards (Deep Sky and overall competition winner), 2009 Royal Observatory (Greenwich) Astronomy Photographer of the Year (Deep Sky and overall competition winner), 2011 David Malin Awards, Deep Sky Award winner, 2012 Royal Observatory (Greenwich) Astronomy Photographer of the Year (Deep Sky and overall competition winner), and 2013 David Malin Awards (Deep Sky and overall competition winner).

Martin’s images have appeared in many science publications, magazines, and videos all over the world. One of his images was used to create the special effects in the 2014 science fiction blockbuster movie ‘Interstellar.’ In 2012, several of his images were part of a travelling astrophotography exhibit entitled Starstruck: The Fine Art of Astrophotography, originating at the Bates College Museum of Art.

After 39 years of naval service, Martin has now retired and established his own remote imaging, data subscription, and telescope hosting business from his home in rural Australia.

You can see his work on his website at www.martinpughastrophotography.space
Richard S. Wright Jr.
Astrophotographer, author, image processor, and graphics programmer
Running Your Rig with New Tech

Richard will discuss how to set up and acquire images using cutting edge technologies such as the Raspberry Pi.

A computer programmer by profession, Richard is an author of the highly regarded OpenGL SuperBible. He has been involved in the astronomy hobby for years, both professionally and personally. Currently working for Software Bisque, Richard has developed software for both professional observatories, as well as the amateur community. In his role as Software Bisque’s ambassador, he has visited star parties and astronomical events all over the United States. In that capacity, he has a wealth of experience using all kinds of equipment, setting up for image acquisition, taking images, and processing them.

Richard is a Sky & Telescope blogger (https://www.skyandtelescope.com/astrophotography) and contributing author as well as a frequent contributor to the online magazines: Astronomy Technology Today (https://astronomytechnologytoday.com/) and Amateur Astronomy Magazine (http://amateurastronomy.com/). His tutorials covering image acquisition and processing which can be found at the Sky & Telescope blog above, and on his own website listed below. Of a less technical nature, Richard has also written a book entitled The Evening Show: Revealing the Universe Through Astrophotography, which is available on the Apple iBooks bookstore and on Kindle via Amazon.com.

Richard has his own observatory in Okeechobee County, Florida. In March 2019, Richard is very pleased to have joined the APOD club.

[View Richard’s images at www.eveningshow.com]
Professor Zabludoff will discuss how amateur and professional astronomers can work together to rapidly discover—perhaps within five minutes of the alert—the optical counterparts of new gravitational wave events. A quick response is critical for understanding the physics of the binary merger that produces the gravitational waves. She and her group are seeking to identify interested citizen observers world-wide.

A Pennsylvania native, Professor Zabludoff obtained S.B. degrees in Physics (1986) and in Mathematics (1987) from the Massachusetts Institute of Technology. She received a Ph.D. in Astronomy from Harvard University in 1993. After post-doctoral work, she joined the faculty in the Department of Astronomy at the University of Arizona (UA) in 1999. She is a member of UA’s Data Science Institute, with interests in machine learning, image analysis, and large-scale visualization.

She has led a wide range of studies across extragalactic astronomy and cosmology, exploring the first generation of stars and galaxies, galaxy transformation, gravitational lensing, dark matter, the intergalactic medium, galactic nuclear activity, galactic spectral classification, the baryon budget of the Universe, stellar disruption by supermassive black holes, and the evolution of structure. Her research involves analyses of large observational databases and theoretical cosmological simulations. She has worked on adaptations of astronomical instruments for new science.

Professor Zabludoff was a J. S. Guggenheim Foundation Fellow in 2013-14 and the Caroline Herschel Distinguished Visitor at the Space Telescope Science Institute during 2011–2013. She has been an invited visitor at institutes around the world, given review talks at more than twenty-five international conferences on a broad array of topics, and discussed new ways to detect the most distant galaxies in a TEDx talk. She has held leadership positions advising the NSF, NASA, and international research institutes on programs, facilities, and postdoctoral fellowships. She has mentored numerous junior scientists, with whom she continues to collaborate.

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