What is LightBuckets?

LightBuckets is a global network of world-class, large-aperture telescopes available for rent online by astronomers, astrophotographers, researchers, students/teachers, and anyone interested in astronomy. We deliver the best of breed in telescopes, optics, cameras, mounts, and locations combined with our easy-to-use interface to give you an unmatched online astronomy experience. Our telescopes are strategically positioned around the world, in the darkest sky locations, to provide you with 24x7 sky coverage of both the northern and southern hemispheres. LightBuckets brings large-aperture, high-quality telescopes within reach of everyone…anytime.

Why Choose LightBuckets?

Easy to Use
To put it simply, LightBuckets gives you immediate online access to the top astronomy imaging platforms in the world. We have spent years designing and engineering the robust and sophisticated technology that has gone in to LightBuckets. But all that technology is meaningless without a simple way to use it. With that in mind, we have custom engineered a powerful, yet easy-to-use online interface for selecting which observatory to use, setting up your targets, scheduling your plans, downloading your images, managing your account, sharing your results, and more. What this means for you is that there is nothing to download and nothing to update. When you sign in to your LightBuckets account, you are assured of always using the latest and greatest software we have to offer.

Best-of-the-Best
Each of our observatories provides virtually "unobtanium" components from optics to cameras to mounts…only the best will do. All of our Ritchey-Chrétien telescopes are from RC Optical Systems and feature ion-milled optics, a time consuming and expensive process for figuring the telescope's mirrors, but one that is well worth it for our customers. The resulting extremely high surface smoothness reduces scatter and delivers the highest contrast possible. Our wide-field refractors are ortho apochromats from Takahashi using color-free objectives and knife-edge baffling for ultra-high contrast images. We employ cameras from both Apogee and SBIG, pairing the optimum camera with each telescope. For example, the Apogee Alta U42 CCD sports a quantum-efficiency of over 90% at 550nm…this is incredible photon collecting power…available online only at LightBuckets.

Location, Location, Location
With astronomy location is everything. Dark skies. Perfect weather. Excellent seeing. LightBuckets delivers them all. No more packing up your telescope, mount, computer, batteries, and cold weather gear and driving hours to that "nearby" dark sky site. The days of spending countless hours setting up and tearing down equipment at odd hours of the morning, while nearly freezing to death, are now behind you. And, with the high price of gas these days, a few 150 mile round trip visits to your dark sky

site starts to add up. With LightBuckets you image from the comfort of your home…when your schedule permits…without the hefty fuel bill and time away from your family.

Zero Cost of Ownership

Let's put things in perspective. The smallest aperture Ritchey-Chrétien telescope in the LightBuckets Telescope Network is a 14.5" RC Optical Systems carbon truss with ion-milled optics located in Pingelly, Western Australia. With mount, camera, and all the accessories, this set up costs approximately $70,000. To have the telescope hosted in a dark sky location in Australia would cost about $2,500 per month…or $30,000 per year. Add in the Internet bandwidth and server expenses and you're looking at another $6,000 per year. Throw in $4,000 to configure the observatory and some general maintenance throughout the year. And, don't forget the automation software to run everything…another $4,000. The initial year of telescope operations in Australia would cost upwards of $115,000. It's easy to see how the total cost of ownership of even the smallest telescope in the LightBuckets Telescope Network is prohibitive for most astronomers. What's more, most owners would probably never use the roughly 3,000 hours of imaging time available every year. A large percentage of the time, the telescope would be dormant waiting for something to do. Now you can see where LightBuckets really makes sense. We take on the expense of buying, installing, maintaining, and running the telescopes so you can focus on imaging. With our sophisticated, custom-developed technology infrastructure we are able to easily manage thousands of customers across five, ten, twenty, or more telescopes to ensure valuable telescope time isn't wasted or unused. The bottom line…with LightBuckets you pay for only the time that you use, not for the time that the telescope is sitting idle.

Who Uses LightBuckets?

The LightBuckets Telescope Network of telescopes is available to everyone interested in astronomy. Whether you are just curious about the latest comet in the sky or a researcher interested in studying Gamma Ray Bursts, LightBuckets delivers the instruments you need at a price that is affordable.

Astrophotographers

Many people find astrophotography challenging from both a technical and creative standpoint. With LightBuckets, astrophotographers can apply their creativity in capturing both deep space and wide-field images. Having telescopes in both the northern and southern hemisphere also allows astrophotographers to image objects they might otherwise never have the opportunity to capture. And, our large aperture instruments are generally beyond what the typical, and even advanced, astrophotographer might have in their backyard. LightBuckets opens up new skies and more advanced instruments to astrophotographers of all skill levels and experience.

University Researchers

More often than not, telescope time on university owned telescopes is reserved weeks or even months in advance. If an unplanned event happens, such as a supernova erupting in a distant galaxy, getting time on a university owned telescope can be next to impossible due to prior commitments. This is where LightBuckets comes in. The LightBuckets Telescope Network gives researchers nearly real-time access to research-grade instruments in both the northern and southern hemisphere. LightBuckets is also a valuable tool for ongoing research programs as well. Search for minor planets, asteroids, or comets. Study variable stars. Discover the next NEO (Near Earth Object). The research possibilities are only limited by your imagination.

Astronomers

You don't have to be a seasoned astrophotographer to use LightBuckets. Perhaps you want to check out the latest comet you just read about in the news. Maybe you want to capture an image of an asteroid as it hurdles through space. Or possibly someone gave you a gift of a star being named in your honor…with LightBuckets you can take a real live picture of it. Whether you are just curious about astronomy, a beginning to advanced astronomer, or a seasoned researcher, nothing in the sky is out of reach when you use LightBuckets.

Students/Teachers

LightBuckets is the proud founder, host, and lead sponsor of the Catch A Star Program. The goal of Catch A Star is to encourage students to have a greater interest in science and technology through astronomy. To make this a reality, LightBuckets provides pro bono time on our telescope network to students who submit an imaging proposal. Student proposals must include a project overview, expected outcomes, a time allotment request, and contact information including student's name, student's email, grade, class, teacher's name, and teacher's email. Once a student's proposal is approved, they may log on and use any telescope in the LightBuckets Telescope Network for their project. We also request that students send us a one-page follow up report within 30 days explaining their results (along with any pictures from their imaging run) and how the results compared with what they expected. We would also like to hear how the project and information was shared with fellow classmates. All requests for imaging time should be sent via email to catchastar@lightbuckets.com. Only requests that have a complete proposal will receive a response so be certain that your information is thorough and accurate.

How Does LightBuckets Work?

Behind the scenes at LightBuckets a lot of sophisticated technology is working hard to make sure everything runs smoothly 24 hours a day, 7 days a week, all year long. The best way to envision how LightBuckets works is to think of a computer network. The "server" within the LightBuckets Telescope Network is a high-end server with an extremely fast quad-core processor, enormous amounts of disc storage (over 4 terabytes), and an ultra high-speed connection to a primary Internet backbone residing at a data center in Dallas, Texas. The LightBuckets server runs our proprietary management system that

handles everything from the LightBuckets.com website to the front-end interface you see as a LightBuckets customer to observatory management (start up, job queuing, scheduling, status reporting, maintenance, shut down, etc.) to customer account management (point purchases, job reporting, alerts, billing, etc.). Continuing the network analogy, each LightBuckets observatory can be thought of as an individual "computer" on the network. Just as a computer has an operating system, each observatory in the LightBuckets Telescope Network has an Observatory Operating System that ensures that all of the components are working and communicating with each other. Within each observatory there are many components that make it function. These include the telescope, mount, camera, filter wheel, focuser, instrument rotator, dome/observatory structure, computer, network, Internet connection, and many other pieces that all need to work seamlessly together to produce an image. Each of the components has software that controls them as they perform their tasks. A typical imaging session works like this. You tell LightBuckets what you want to do – which observatory to use, what targets you want to image, how many images to take, the duration of each image, the filter to use, the binning level to use, and so on. Next, the LightBuckets server tells the observatory what to do, when to do it, and where to send the information when it is done. The Observatory Operating System tells each component in the observatory what to do such as slew to a target, select a specific filter, take an image of a set duration, or some other observatory function. And finally each individual component, for example the mount, handles the particular task of slewing to the target and then tracking it with a high level of precision while imaging. Without a doubt it is a very complex and involved system. The LightBuckets team has gone to great lengths to ensure that everything works in concert and that the only thing you need to think about as a LightBuckets customer is what you want to image.

How Much Does LightBuckets Cost?

We have worked diligently to bring the absolute best telescopes in the world to you at reasonable prices. When you consider that our observatories cost anywhere from $100,000 to well over $400,000 to bring online we think you'll agree that there is tremendous value with LightBuckets. Each telescope in the LightBuckets Telescope Network has a different per hour rental rate that is based on the telescope design, aperture, camera, and location. Our wide-field refractors typically have a lower rental rate than our large-aperture Ritchey-Chrétien's. Telescopes in the southern hemisphere are generally more expensive than a similarly sized instrument in the northern hemisphere. If you image while the Moon is up, LightBuckets will automatically calculate and include a Moon discount rate for your time used based on the amount of the Moon visible during your imaging session. Are you part of a group, astronomy club, or class? You can effortlessly set up groups on LightBuckets, purchase all the points under a group leader account, and manage point distribution to all of the members quickly and easily. How cool is that? Unlike other online telescope providers, we have come up with one simple rental rate for each telescope, no matter who you are…astronomer, astrophotographer, researcher, or student. And, we don't charge more for things that should be included with our service. We don't charge for storing your images on our server - we do delete image data that is older than 3 months. We don't

charge extra for using the scheduler - we really want you to use the scheduler. And we don't charge more for private file storage - we believe that your files should ALWAYS be private. Everything is straight forward with LightBuckets. No complicated plans, no extra charges, and always the best telescopes on the planet. Ready to get started?

About LightBuckets

LightBuckets was founded by software industry veteran Steve Cullen. His mission is to make it simple and affordable to access world-class telescopes by anyone interested in astronomy from beginners to astrophotographers to university researchers. LightBuckets is a privately held company headquartered in the quiet southwestern town of Rodeo, New Mexico.

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