



February 2021 • Issue 74

## Currents

### In this Issue...

**Second Issue of *The Mirror* Available:** The January 2021 issue of NOIRLab's newsletter, *The Mirror*, features recent science results and technical developments from across NOIRLab, introductory information about the Tohono O'odham Nation (where Kitt Peak National Observatory is located), as well as perspectives on the peer review process and inclusion and diversity in astronomy. [Read more...](#)

**DECam Narrow-Band Filters Available:** As a result of projects led by survey PIs, new DECam narrow-band filters are now available for use by the community subject to scientific and technical rules. The rules and available filters are described in this article. [Read more...](#)

**La Serena School for Data Science:** Undergraduate and graduate students are invited to apply to participate in the La Serena School for Data Science, which will be hosted fully online this year, 2-13 August 2021. Full scholarships are available for students at US, Chilean, and Ecuadorian institutions. The application deadline is **2 April 2021**. [Read more...](#)

**Rubin Observatory's Data Preview 0 and Science Platform:** Simulated LSST-like data products will soon be available in the Rubin Science Platform (RSP) to up to 300 members of the broad science community to provide feedback on the RSP and prepare for early science with LSST. The application process to participate in the Data Preview will open in **March 2021**. [Read more...](#)

**Astronomy and Satellite Constellations at AAS237:** Special session #422 at the January AAS meeting focused on the impact of satellite constellations on astronomy and ongoing mitigation efforts. This article links to a summary and accompanying video of the event. [Read more...](#)

### From the Gemini e-Newscaat:

- **Dual Anonymous Review for Fast Turnaround Proposals.** Gemini North and South are accepting proposals for the Fast Turnaround (FT) program, with a Dual Anonymous process implemented beginning this month. Further details are available in the [current call for proposals](#). The next deadline is **28 February 2021**.

### In this Issue

[Mirror Issue 2](#)

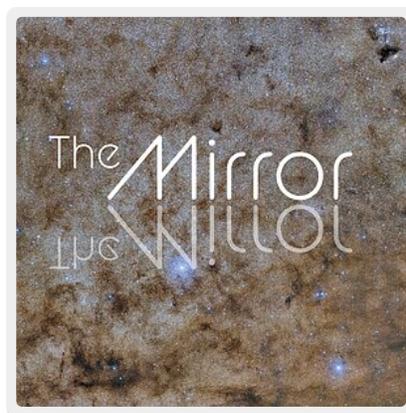
[DECam Filters](#)

[Data Science School](#)

[Rubin Data Preview](#)

[Satellite Constellations](#)

[Contact Us](#)





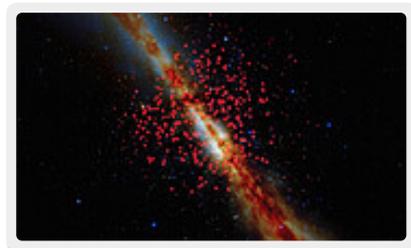
### NOIRLab in the News:

- **Solar System’s Most Distant Known Object Is Indeed Farfarout:**

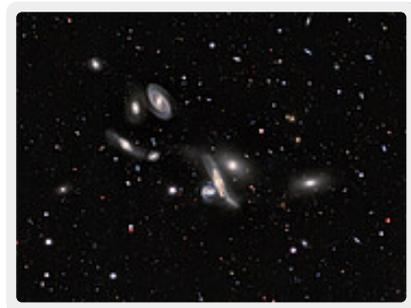
Astronomers have confirmed that the faint object discovered in 2018 and nicknamed “Farfarout” is currently 132 au from the Sun. [Read More...](#)



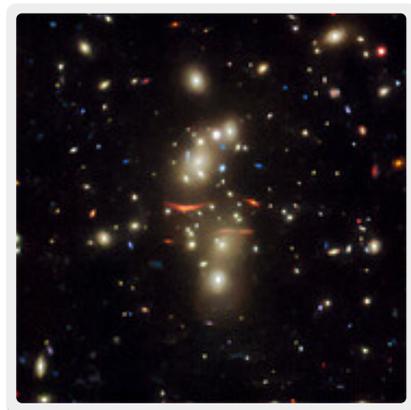
- **Mapping our Sun’s Backyard:** An unprecedented census and 3D map of 525 cool brown dwarfs within 65 light-years of the Sun has emerged, in part, from the work of thousands of volunteers participating in the Backyard Worlds citizen science project. The results include 38 new discoveries and relied on observations from the DESI Legacy Imaging Surveys. [Read more...](#)



- **Giant Map Charts the Way to Dark Energy:** Astronomers using images from KPNO and CTIO have created the largest-ever map of the sky, comprising over a billion galaxies. The ninth data release from the ambitious DESI Legacy Imaging Surveys sets the stage for the Dark Energy Spectroscopic Instrument (DESI) survey, which will probe the nature of dark energy. [Read more...](#)

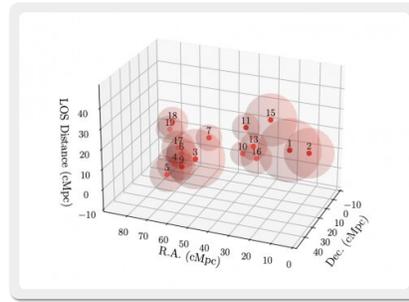


- **Doubling the Number of Known Gravitational Lenses:** The DESI Legacy Imaging Surveys data have also revealed over 1200 new gravitational lenses. Discovered using machine learning trained on real data, and incorporating the work of undergraduate researchers, these warped and stretched images of distant galaxies are new targets for future measurements of the Hubble constant. [Read more...](#)



- **A Distant Protocluster of Galaxies in the Lifting Cosmic Mist:** Astronomers have used DECam to discover the most massive galaxy protocluster yet found in the epoch of reionization ( $z = 6.93$ ). The result—

made by the LAGER consortium (Lyman Alpha Galaxies in the Epoch of Reionization) and published in *Nature Astronomy*—opens new avenues to understand how such overdensities formed in the early Universe and ionized the gas around them. [Read more in the Carnegie press release...](#)



- **Earliest**



**Supermassive Black Hole and Quasar:** The most distant quasar discovered to date, J0313-1806 is observed just 670 million years after the Big Bang and is 1000 times more luminous than the Milky Way. It is powered by the earliest-known supermassive black hole, which weighs in at more than 1.6 billion solar masses. [Read more...](#)

- **Shining a New Light on Dark Energy:**

The Dark Energy Survey has released a treasure trove of astronomical data and calibrated images for public exploration. The second data release in the Survey's seven-year history, DR2 includes data on nearly 700 million astronomical objects. [Read more...](#)



If you have a NOIRLab-related result that we can help publicize, please let us know! Contact NOIRLab Press Officer Amanda Kocz ([amanda.kocz@noirlab.edu](mailto:amanda.kocz@noirlab.edu)) or *Currents* editor Joan Najita ([najita@noao.edu](mailto:najita@noao.edu)).

## DECam Narrow Band Filters

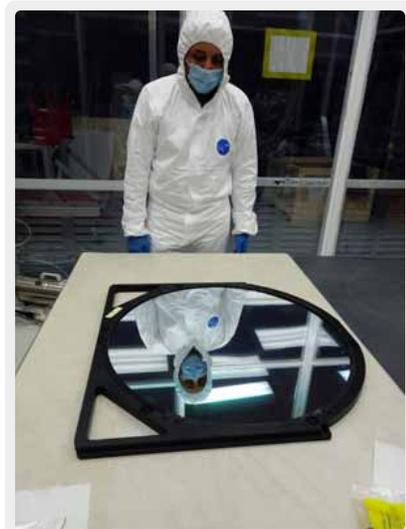
*Alistair Walker, Steve Heathcote*

Three new DECam narrow-band filters have been acquired in the past few months, through survey projects led by Dr. Kyoungsoo Lee (Purdue) and Dr. Alexie Leauthaud (UCSC), with two additional filters still to arrive in connection with these projects. The ODIN survey (PI: K. Lee) will search for Ly $\alpha$  emitters at redshifts of  $z \sim 2.4$ , 3.1, and 4.5, straddling the epoch in which the mass assembly of cluster galaxies is thought to peak, while the Merian Survey (PI: A. Leauthaud) will use two custom narrow-band filters to study the properties of star-forming dwarf galaxies at  $z = 0.04$ - $0.1$ . These filters are available for use by the community for other programs subject to scientific and technical rules summarized below. In particular two of the filters for the ODIN survey, N501 and N673, were deliberately designed as "dual use" filters supporting the filter PI's science at high redshift but also enabling community proposals to study emission nebulae in our own or nearby galaxies.

Firstly, all of the narrow-band filters have been purchased by teams to carry out specific science projects, and the use of these privately-owned filters is governed by MOUs with AURA. The MOUs make the filters available to the NOIRLab and Chilean communities for use in their own programs, but do not permit duplication of the science for which the filter was purchased. Any community scientist wishing to use a DECam narrow-band filter should therefore initiate a correspondence with the relevant filter PI well before writing a proposal. Any resulting proposal should include a summary of the correspondence with the filter PI. As an exception to this general requirement, the “dual use” N673 and N501 filters may be freely used for proposals to study emission line objects at low redshift without prior approval.

Secondly, the current inventory of filters (the new filters plus the existing u, g, r, i, z, Y, VR, N662, and N964 filters) now exceeds the total number of DECam filters that can be installed at any given time (eight). Because installing and removing filters from DECam is a non-trivial procedure that needs to be carried out with great care, we do not anticipate changing filters more than a few times each semester. While the g, r, i, and z filters will always be available, the other filters will not be available at all times. For this reason, although the Blanco scheduler will make every effort to schedule highly ranked DECam proposals, it may not be possible to schedule some projects with excellent TAC grades.

The narrow-band filters that will be available in semester 2021B are listed in the Table below. The filter passbands are approximately rectangular in shape, and so are characterized by a center wavelength and the width at half-peak transmission. Further details are available from Alistair Walker ([awalker@ctio.noao.edu](mailto:awalker@ctio.noao.edu)) and should soon appear on the DECam webpages.



DECam filter in the Blanco Cleanroom after installation into its frame by Roberto Tighe, Guillermo Dubbo, and Juan Andrade. (Image credit: Roberto Tighe)

### DECam Narrow Band filters available in 2021B

Name	CWL	Width	Manufacturer	Program	Filter PI
	Å	Å			
N501	5010	75	Asahi	2021A-0201	Kyoungsoo Lee, <a href="mailto:soolee@purdue.edu">soolee@purdue.edu</a>
N662	6620	160	Asahi	2021A-0923	Eric Peng, Thomas Puzia, <a href="mailto:ewpeng@gmail.com">ewpeng@gmail.com</a> , <a href="mailto:tpuzia@gmail.com">tpuzia@gmail.com</a>
N673	6730	100	Asahi	2021A-0201	Kyoungsoo Lee, <a href="mailto:soolee@purdue.edu">soolee@purdue.edu</a>
N708	7080	275	Asahi	2021-0288	Alexie Leauthaud, <a href="mailto:alexie@ucsc.edu">alexie@ucsc.edu</a>
N964	9645	94	Materion	2018B-0327	Junxian Wang, <a href="mailto:jxw@ustc.edu.cn">jxw@ustc.edu.cn</a>

## Announcing the 2021 La Serena School for Data Science

Guillermo Jose Damke (AURA/University of La Serena, Chile), Dara Norman (NOIRLab)

There is no question that the new generation of astronomers, as well as researchers in several other disciplines, will lead cutting-edge research by taking advantage of the increasingly large datasets that are becoming available online. In preparation for this new scenario, the La Serena School for Data Science (LSSDS) seeks to provide late-undergraduate and early-graduate students with the statistical and computational tools to succeed in this quest.

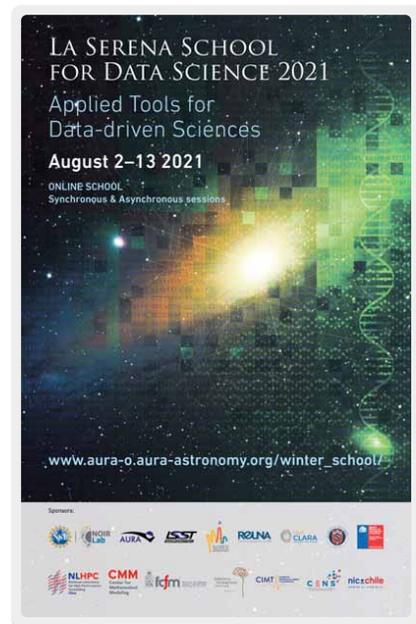
Hosted annually at the AURA campus in La Serena, the school has gained popularity steadily since it was first launched in 2013. In 2019, it received about 250 applications, mainly from students in the US and Chile. While the school was canceled in 2020 due to the COVID-19 pandemic, it will be **hosted fully online**—for the very first time—this year, **2-13 August**, because of the continuing uncertainty regarding the pandemic.

As in previous years, the 2021 curriculum is being carefully crafted by the Scientific Organizing Committee based, in part, on the content of previous, successful schools and feedback from former participants. The 2021 school will retain its usual hands-on focus, with lectures from international experts—on topics such as Supervised and Unsupervised Machine Learning, High Performance Computing (HPC), Databases, Statistics and Deep Learning—as well as the valuable “Group Projects”, in which interdisciplinary and diverse groups of students can apply the tools they have learned by solving problems under the guidance of a professor. The online format will include daily (limited) synchronous and asynchronous sessions over the 10-day program.

Thanks to funding from the NSF and other international partners, applications from students in US, Chilean, and Ecuadorian (members of CEDIA) institutions are eligible for full scholarships covering all school expenses. Participants from disciplines such as Astronomy and Astrophysics, Physics, Computer Science, Bioinformatics, Statistics, Math and any other data-intensive fields are welcome to apply.

**Applications will be accepted until 2 April 2021.**

Please, visit [http://www.aura-o.aura-astronomy.org/winter\\_school/](http://www.aura-o.aura-astronomy.org/winter_school/) to submit applications or to find further information about the school.



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## Opportunity to prepare for science with Rubin Observatory

Melissa Graham (University of Washington/Rubin Observatory)

On 30 June 2021, the Rubin Observatory will release Data Preview 0 (DP0), the first of three data previews, which will make simulated LSST-like data products available in the Rubin Science Platform (RSP) to Rubin Observatory staff and up to 300 individuals from the science community (“DP0 delegates”). One of Rubin Observatory’s goals for DP0 is to have scientists and students with diverse interests and expertise engage with the RSP and provide feedback.



Everyone is invited to learn more about DPO and consider participating. Applications to participate will open in early **March 2021**. The only requirement for participation is to possess Rubin Observatory data rights. As described in the [Data Policy](#), astronomers working in the US and Chile (including students) have data rights, as do named individuals on International Contributor teams. To learn more, please visit the links below.

- [Invitation to join: virtual information sessions about Data Preview 0](#)
- [Data Preview 0: An early opportunity to prepare for science with Rubin Observatory](#)
- [Data Preview 0: The Simulated Data Set from the DESC's DC2](#)

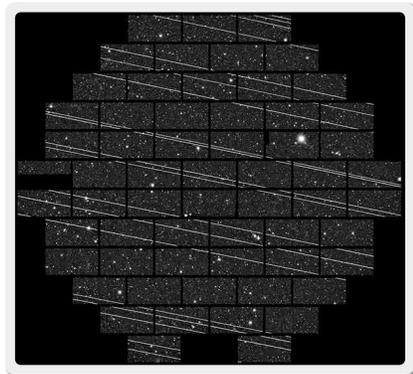
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3

## Astronomy and Satellite Constellations at AAS237

*Constance Walker*

Special session #422 at the January AAS meeting focused on the impact of satellite constellations on astronomy and ongoing mitigation efforts. The highly engaging session, attended by 170 interested people, featured six panelists: three astronomers (Patrick Seitzer from U. Michigan, Harvey Liszt from NRAO, and Aparna Venkatesan from U. San Francisco) and three from the satellite industry (Patricia Cooper from SpaceX, Julie Zoller from Amazon Project Kuiper, and Maurizio Vanotti from OneWeb). Each satellite industry representative described their mitigation efforts. One welcome piece of news that emerged from the meeting is that OneWeb has reduced the number of satellites filed with the FCC from 47,884 to 6,372. A summary of the entire session is available from AAS Nova's [coverage of Day 4 of the AAS237](#) as well as the video recording of the session from AAS. To access the latter, please visit the AAS's [archive of talks](#) and search for session #422. Simply double click on the play button or click the expansion button at the lower right of the thumbnail of the recording to expand and play the video.



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3

## Contact Us

We welcome your input on this issue of *Currents*. Please contact us at [currents@noao.edu](mailto:currents@noao.edu). We look forward to hearing from you!

*Currents* is a spark plug for communication between us and our community. It provides updates—and solicits community input—on observing opportunities and programs and policies on a more rapid timescale than is possible with our *Newsletter*.

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