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Currents

NOAO at the January AAS Meeting

NOAO invites you to attend these events at the AAS meeting in Kissimmee, FL (**4-8 January 2016**):

- **NOAO Transformed: A Status Report (a.k.a. NOAO Town Hall)**
(Wednesday 6 January 6:30 - 7:30 pm *Note: Time and Date change*)
- **US National Gemini Office Workshop on Adaptive Optics**
(Wednesday, 6 January 2016 at 2:00 - 3:30 pm)
- **TMT Open House** (Wednesday 6 January 5:30 - 6:30 pm)
- **TMT Thermal IR Science & Instrumentation Workshop**
(Thursday 7 January 5:30-7:30 pm)

[Read more below.](#)

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Welcome ([Adam Bolton Joins NOAO](#)) NOAO welcomes Adam Bolton as the new Associate Director of the NOAO System Science and Data Center. He brings to NOAO technical expertise in imaging and spectroscopic surveys that is motivated by his research interest in galaxies, dark matter, and dark energy.

Opportunity ([Call for Membership in TMT ISDTs](#)) Applications for membership in the Thirty Meter Telescope (TMT) International Science Development Teams (ISDTs) are now being accepted. The deadline is **15 January 2016**.

Save the Date ([NOAO Events at January AAS Meeting](#)) Please join us for these events at the **4-8 January 2016** AAS meeting:

- [US National Gemini Workshop on Adaptive Optics](#)
- [NOAO Town Hall](#)
- [TMT Open House](#)
- [TMT Thermal IR Science and Instrumentation workshop](#)

From the Press Office ([New Missions for Kitt Peak Telescopes](#)) Recent press releases describe the following new programs at KPNO: Robo-AO on the 2.1-m telescope, NASA-funded exoplanet research at the WIYN 3.5-m telescope, and the Dark Energy Spectroscopic Instrument (DESI) at the 4-m Mayall telescope.

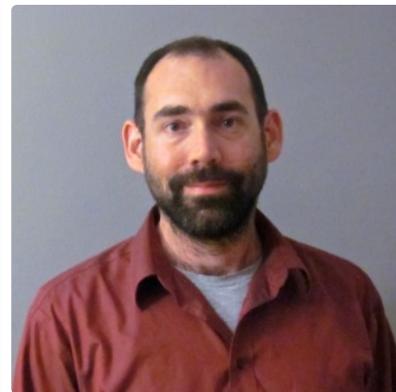
Citizen Science ([DECaLS Galaxies Now in Galaxy Zoo](#)) Since September 2015, images from the Dark Energy Camera Legacy Survey (DECaLS) have been hosted at Galaxy Zoo, where volunteer members of the public can classify galaxy morphologies and help untangle the history of galaxy formation.

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Adam Bolton Joins NOAO as Associate Director for the NOAO System Science and Data Center

NOAO welcomes Adam Bolton as the new Associate Director (AD) of the NOAO System Science and Data Center (NSSDC). Bolton brings to NOAO broad and deep technical expertise in imaging and spectroscopic surveys that is motivated by his research interest in galaxies, dark matter, and dark energy. He takes over from the outgoing NSSDC AD, Verne Smith.

Bolton comes to NOAO from a position as Associate Professor in the Department of Physics and Astronomy at the University of Utah, where he has been on the faculty since 2009. He previously held the Beatrice Watson Parrent postdoctoral fellowship at the University of Hawaii (2007-2009) and a CfA Postdoctoral Fellowship at the Harvard-Smithsonian Center for Astrophysics (2005-2007). He received his PhD in Physics from MIT in 2005.



Adam Bolton, Associate Director, NOAO System Science and Data Center

Bolton has extensive research experience in the analysis of astronomical imaging and spectroscopy, and in the application of new statistical methods to large surveys. His research interests include the use of strong gravitational lensing to measure the mass structure of galaxies, and the development of advanced spectroscopic analysis methods to enable and exploit new surveys of the universe beyond our own galaxy.

The Principal Data Scientist for the Sloan Digital Sky Survey (SDSS) since 2012, Bolton has also been a leader in proposing and designing the Dark Energy Spectroscopic Instrument (DESI), which is destined for the Mayall telescope on Kitt Peak, and its associated data management and analysis systems. His interest in and experience with large data sets will be an asset to NOAO as it evolves to meet the changing needs of the astronomical community.

In his view, "Astronomy, like any living science, is always undergoing transformation. In optical astronomy, we are experiencing a great turning towards large-scale surveys as a dominant mode of experimental design. These surveys produce large and complex digital data archives that support a huge variety of research projects, many of them requiring computationally intensive analysis. I am extremely excited to have the opportunity as NSSDC AD to serve in advancing survey science and open data access throughout astronomy."

In announcing the appointment, NOAO Director David Silva remarked, "One of our major goals at NOAO is to help the US community remain at the forefront of astronomical digital data management, processing and archiving. Adam is the right leader at the right time to help NOAO develop and deploy new services that the community can use to access and analyze large, rich catalogs of millions of objects across the entire celestial sphere."

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Call for new membership in the TMT International Science Development Teams (applications due 15 January 2016)

Applications for membership in the [Thirty Meter Telescope \(TMT\) International Science Development Teams](#) (ISDTs) are being accepted until **15 January 2016**. The ISDTs are research groups that provide scientific guidance and feedback to the TMT project, stimulate planning for future TMT observing programs, and build connections between TMT and the international astronomical community. They foster scientific collaboration across the TMT partnership and beyond, into the broader astronomical community. ISDT membership is open to all qualified Ph.D. scientists, including astronomers from the US astronomical community.



Artist's rendition of the Thirty Meter Telescope

Recently, ISDT members have contributed extensively to rewriting and updating the [TMT Detailed Science Case](#), the fundamental description of the science drivers for building a Thirty Meter Telescope. The ISDTs organized a day of topical parallel sessions at the annual [TMT Science Forum](#), and have recently written a set of concept studies for TMT Key Project observing programs, with a second round planned for early 2016.

There are nine ISDTs, organized around the following science themes:

- Fundamental physics and cosmology
- Early universe, galaxy formation and the intergalactic medium
- Supermassive black holes
- Milky Way and nearby galaxies
- Stars, stellar physics and the interstellar medium
- Formation of stars and planets
- Exoplanets
- Our solar system
- Time domain science

Applicants may also propose to form new ISDTs to focus on science that does not fit well within the scope of the existing groups, or on subtopics drawn from one or more of the existing ISDTs that merit additional emphasis within TMT planning.

Application instructions are available at the [TMT ISDT web site](#), where you can also find more detailed information about the ISDTs, their organizers, and their activities. ISDT membership entails a commitment of time and effort. Applications will be evaluated by the ISDT organizers and the TMT Science Advisory Committee, based on the candidate's scientific qualifications, the activities that he or she proposes to carry out in support of the ISDT and TMT, and the level of effort that he or she can commit to investing in ISDT activities.

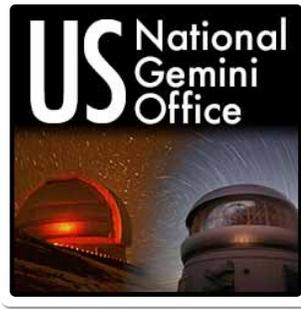
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Save the Date: NOAO Events at the January AAS Meeting

US National Gemini Office Workshop on Adaptive Optics

Wednesday, 6 January 2016 at 2:00 - 3:30 pm in St. George 114 at the Gaylord Palms Resort and Convention Center.

The [NOAO US National Gemini Office](#) will offer a mini-workshop on “Adaptive Optics: from planning observations through data reduction”. This second-in-a-series workshop is aimed at community members who are interested in or currently carrying out AO observations on 4-m to 8-m class telescopes. The workshop will start with a presentation on the fundamentals of AO by Dr. Claire Max (University of California, Santa Cruz), with a focus on data taking and reduction. Presentations by Dr. Tim Davidge (Herzberg Inst. of Astrophysics) and Dr. Franck Marchis (SETI) will feature results from AO science. The speakers will address the observational setup and data reduction challenges of working with AO data, how these were resolved, and lessons learned. Audience interaction is encouraged.



NOAO Transformed: A Status Report (a.k.a. NOAO Town Hall)

Wednesday 6 January 6:30 - 7:30 pm (Note: Time and Date change)

NOAO is deploying a new suite of research capabilities for the community-at-large in partnership with NSF, DOE, NASA, and various major science collaborations. Instrumentation capabilities available now include the ultra-wide field optical imager [DECam](#) as well as new optical and infrared medium-resolution spectrometers. Capabilities available in the near future include the [Dark Energy Spectroscopic Instrument](#) (DESI), an ultra-wide-field, 5000-fiber optical spectrometer destined for the Mayall telescope, and the [Extreme Precision Doppler Spectrometer](#) (EPDS) for the WIYN telescope. Wide-field optical surveys with DECam in the South and [Mosaic 3](#) in the North are delivering major new data products to the NOAO Science Archive for community use. In support of those new data products, NOAO is developing catalog exploration, exploitation, and visualization tools within the [Data Lab](#) project. Meanwhile, NOAO remains active as the [US Gateway to Gemini](#) and its recently improved instrument suite. NOAO may also be poised to act as the US OIR System coordinator. Join us for a presentation by the NOAO Director. There will be ample opportunity for community discussion.

TMT Open House

Wednesday 6 January 5:30 - 6:30 pm

With an order of magnitude more collecting area than today’s 8-10m telescopes, and nearly 5 times better angular resolution than JWST at similar infrared wavelengths, the Thirty Meter Telescope will make fundamental contributions to most areas of astronomy and astrophysics, from planetary systems (in and out of our own solar system) to galaxy formation and cosmology. This Open House will describe the status of TMT, highlighting new developments in instrumentation, adaptive optics, and science planning. Michael Bolte (UC Santa Cruz) will present the latest news about the project and the TMT partnership. Mark Dickinson (NOAO) will discuss [US community liaison activities](#) being carried out as part of a cooperative agreement with the NSF to develop a model for possible US national participation in TMT. Members of the [US TMT Science Working Group](#) (SWG) will attend the Open House, and there will be ample time for questions and discussion. Complimentary refreshments and hors d’oeuvres will be served.

TMT Thermal IR Science & Instrumentation Workshop

Thursday 7 January 5:30-7:30 pm

This workshop will discuss concepts and science cases for a thermal-infrared instrument for TMT, focused on imaging and low- and high-resolution (up to $R = 120,000$) spectroscopy. In preparation for an anticipated call for proposals for TMT

second generation instrumentation, a group of scientists based mostly in the USA and Japan have been studying an instrument concept optimized to operate at approximately 7.5 to 25 microns, and are now exploring additional science cases made possible by changing the optimization to the 3 to 14 micron range [see [summary sheet](#) (.docx file) for details]. This AAS workshop aims to engage US and Canadian astronomers in this process, and will focus on the development of science cases that will help guide the technical drivers for such an instrument. There will be presentations about TMT second-generation instrumentation planning in general, specific thermal-infrared instrument concepts, science drivers ranging from disks and young stellar objects to exoplanets to AGN, and scientific and operational synergies with JWST. If you are interested in giving a presentation at the workshop, please contact Chris Packham (UT San Antonio; Chris.Packham@utsa.edu).

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From the Press Office: New Missions for Kitt Peak Telescopes

2.1-m Telescope: A team led by the California Institute of Technology has been selected to transform the 2.1-m telescope into the first dedicated adaptive optics (AO) observatory for astronomy. This system, Robo-AO KP, will allow astronomers to study, at high angular resolution, large numbers of astronomical objects, spanning science from planetary to stellar, and exoplanetary to extragalactic. Two months of observing time each year will be available to the US astronomical community. [Read More in NOAO Press Release 15-07](#).



Aerial view of Kitt Peak showing the WIYN 3.5-m on the far left, the 2.1-m third from left, and the Mayall 4-m telescope on the far right.

3.5-m WIYN Telescope: NSF and NASA have partnered to advance exoplanet science through the use of the NOAO share of the WIYN telescope. As its cornerstone, the partnership is funding the development and deployment of an extreme precision radial velocity spectrometer to measure the subtle motion of stars produced by their orbiting planets. The partnership has also established this year an exoplanet-related Guest Observer research program on WIYN using existing instrumentation. The new spectrometer will be included in the Guest Observer program beginning in 2018. [Read More in NOAO Press Release 15-02](#)

4-m Mayall Telescope: The Dark Energy Spectroscopic Instrument (DESI), destined for the Mayall, will chart out the role of dark energy in the expansion history of the universe. The US Department of Energy recently announced its approval of Critical Decision 2 (CD-2) for the DESI project, authorizing its scientific scope, schedule, and funding profile. To carry out its mission, DESI will use its 8 square degree field of view, 5000-fiber multi-object spectrograph to measure the redshifts of more than 30 million galaxies and quasars and study how dark energy and gravity have competed over time to shape the structure of the universe. [Read More in NOAO Press Release 15-06](#).

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DECaLS Galaxies Now in Galaxy Zoo

The citizen science project Galaxy Zoo and the Dark Energy Camera Legacy Survey (DECaLS) have launched a new scientific collaboration. Since September 2015, images from the [first data release of DECaLS](#) (DR1) have been hosted at [Galaxy Zoo](#), where volunteer members of the public can classify galaxy morphologies and help untangle the history of galaxy formation. More than half a million classifications of DECaLS images have been carried out to date.

Designed to be significantly deeper and to have better image quality than the earlier Sloan Digital Sky Survey (SDSS) or Pan-STARRS surveys, DECaLS will cover 6700 square degrees of extragalactic sky using the Dark Energy Camera on the 4-m Blanco telescope. Because of their superior image quality, the DECaLS images reveal critical details not apparent in SDSS images, such as tidal tails and extended debris of stars and gas stripped off galaxies by mergers or interactions.



The collaboration aims for a total of 1.3 million classifications of DECaLS images (40 per image) to compare the morphologies inferred from DECaLS and SDSS images of the same galaxies. The results will provide clues to the roles of low-luminosity galaxies and minor mergers in galaxy evolution.

New images from DECaLS will continue to be incorporated into Galaxy Zoo over the next several years as the survey is completed. The Zooniverse, which operates Galaxy Zoo, is the largest set of citizen science projects in the world, with more than 1.4 million users across a wide range of research disciplines.



Images of the same galaxy imaged by DECaLS (left) and SDSS (right).

Questions about the DECaLS + Galaxy Zoo project may be addressed to Kyle Willett (University of Minnesota; willett@physics.umn.edu).

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Contact Us

Your input is welcome on any of these issues. Please send your thoughts to: currents@noao.edu.

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

NOAO is the national center for ground-based nighttime astronomy in the United States and is operated by the Association of Universities for Research in Astronomy (AURA), Inc. under cooperative agreement with the National Science Foundation.

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