

Science with the Dark Energy Survey at NOIRLab

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and the DES Data Release Team

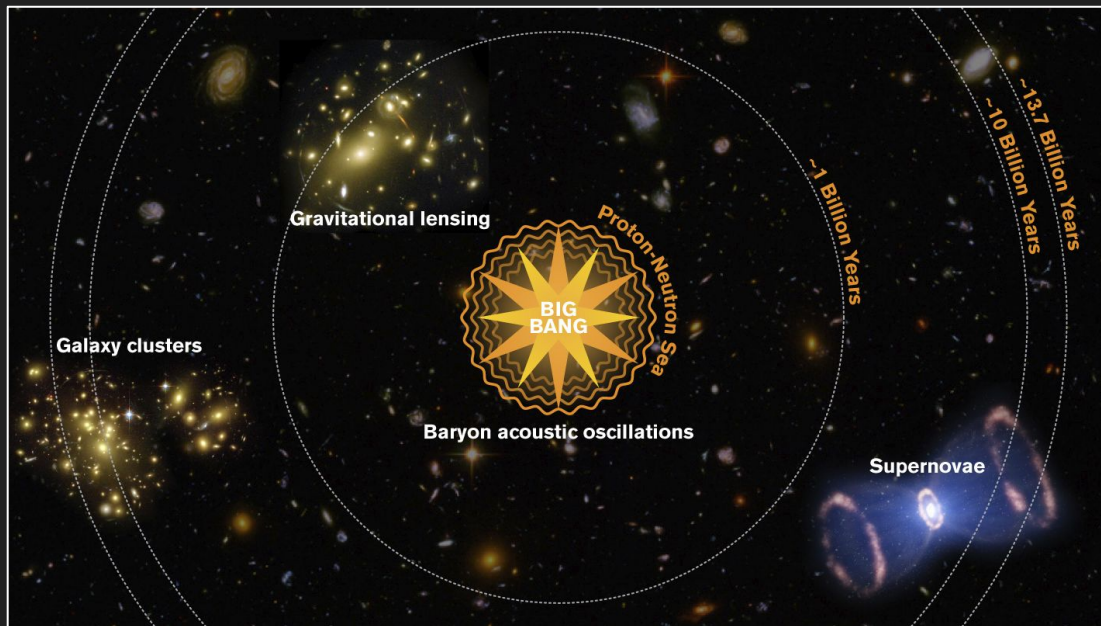
On behalf of the DES Collaboration

<https://des.ncsa.illinois.edu>

January 12th, 2021 - AAS 237

DES Science

DES is designed to improve our understanding of **cosmic acceleration** and the **nature of dark energy** using four complementary probes of the expansion history and growth of cosmic structure....

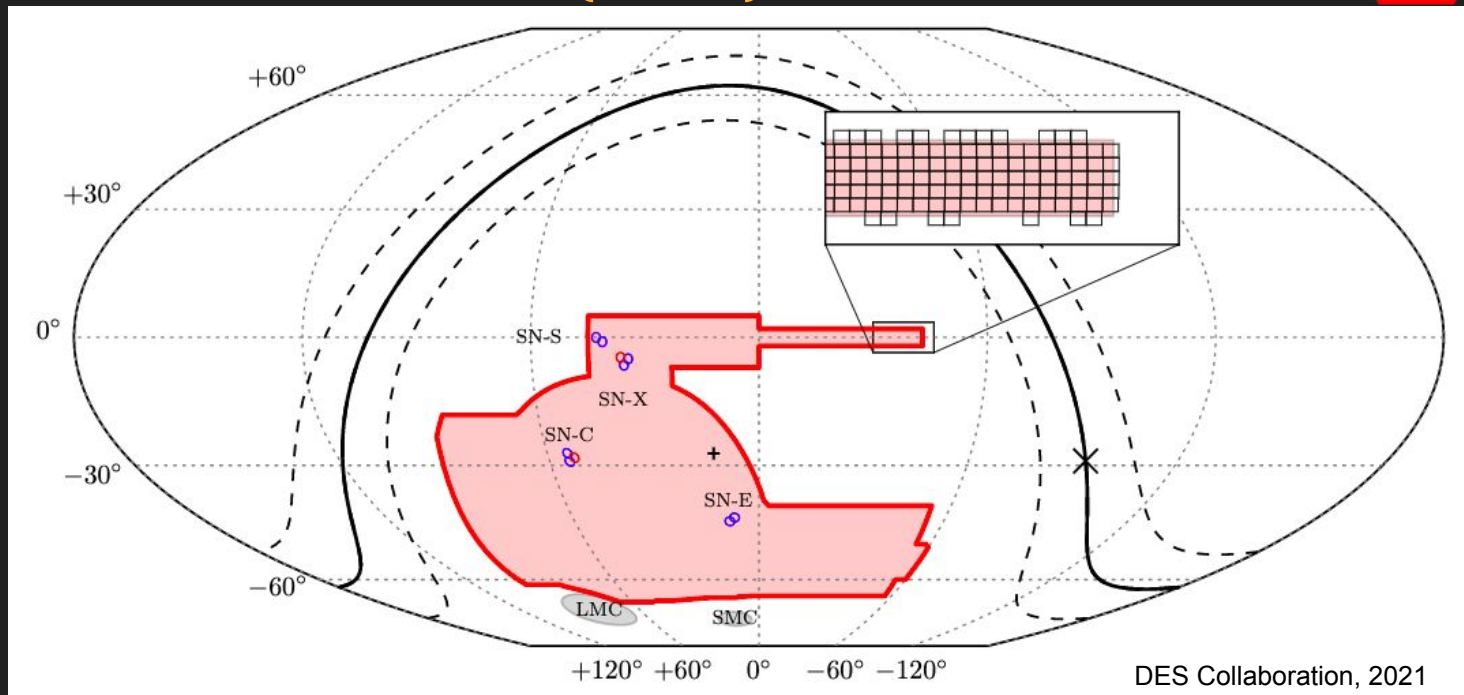


Like other large-area surveys, DES enables a wide range of science including the **Solar System**, **Milky Way**, **low-redshift**, and **high-redshift Universe**

See talks in the [DES Special Session \(501\)](#) on Friday 1/15 at 12PM EST.

See *The Dark Energy Survey: more than dark energy - an overview*
[DES Collaboration, arXiv:1601.00329](#)

DES Data Release 2 (DR2)

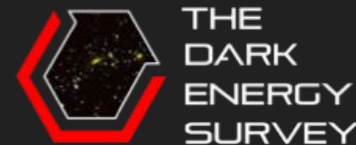


Dark Energy Survey (DES)

Wide-field Survey: 5000 deg², 10 visits in each of *grizY*
S/N = 10 coadd depth ~24 mag

Supernova Survey: 27 deg², observed at weekly cadence

DES DR2 Coadd Summary Statistics



Parameter	Value
Observations (6 years of operations)	681 distinct nights from Aug 2013 to Jan 2019
Number of DECam Exposures	~76,200
Sky Coverage in <i>grizY</i>	4913 deg ²
Delivered Seeing (FWHM)	$g = 1.11, r = 0.95, i = 0.88, z = 0.843, Y = 0.90$ arcsec
Relative Astrometric Precision	27 mas
Photometric Precision/Uniformity	< 1 % absolute, ~2 mmag uniformity
Coadd depth (S/N = 10 in 1.95" Aperture)	$g = 24.7, r = 24.4, i = 23.8, z = 23.1, Y = 21.7$ mag
Distinct Coadd Objects in 10,169 tiles	~700M: ~540M galaxies and ~145M stars after basic quality cuts ~ 35,000 galaxy clusters @ $z \sim 1$

Largest photometric dataset to date at the achieved depth and photometric precision

DES DR2 Coadd Summary Statistics

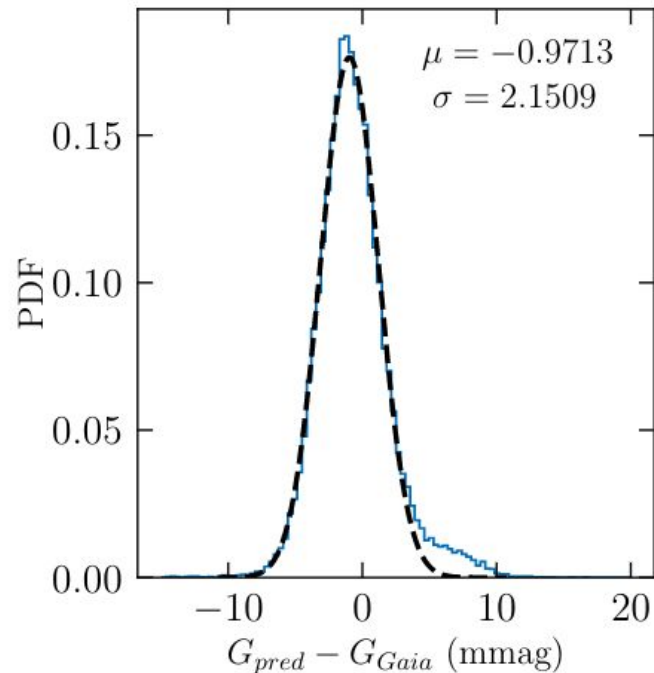
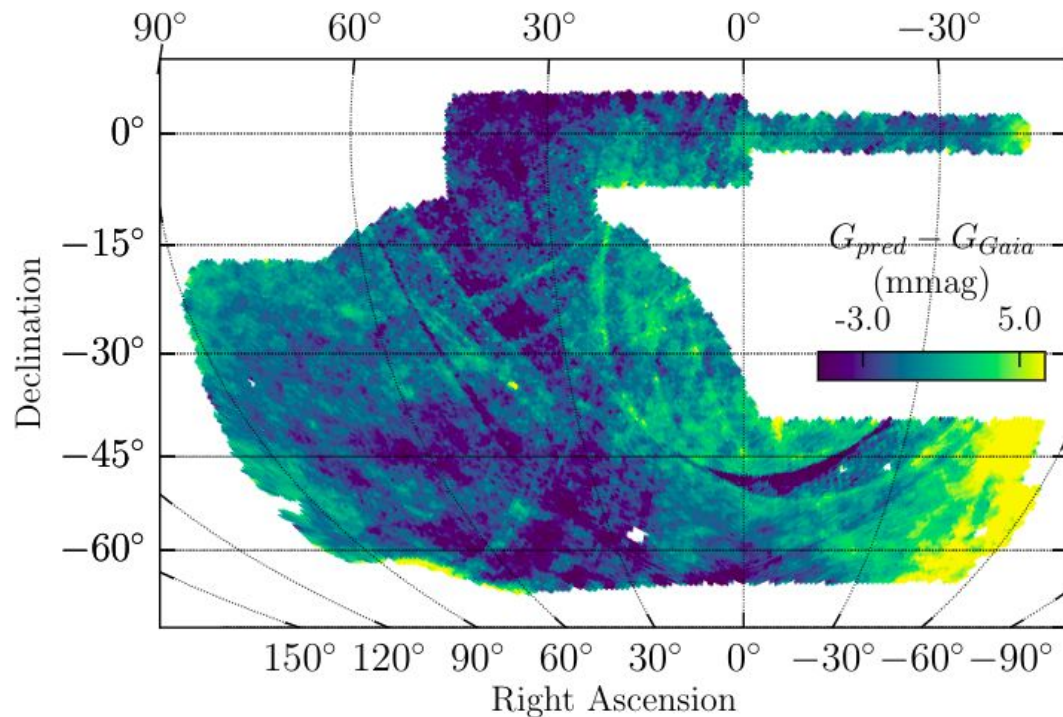


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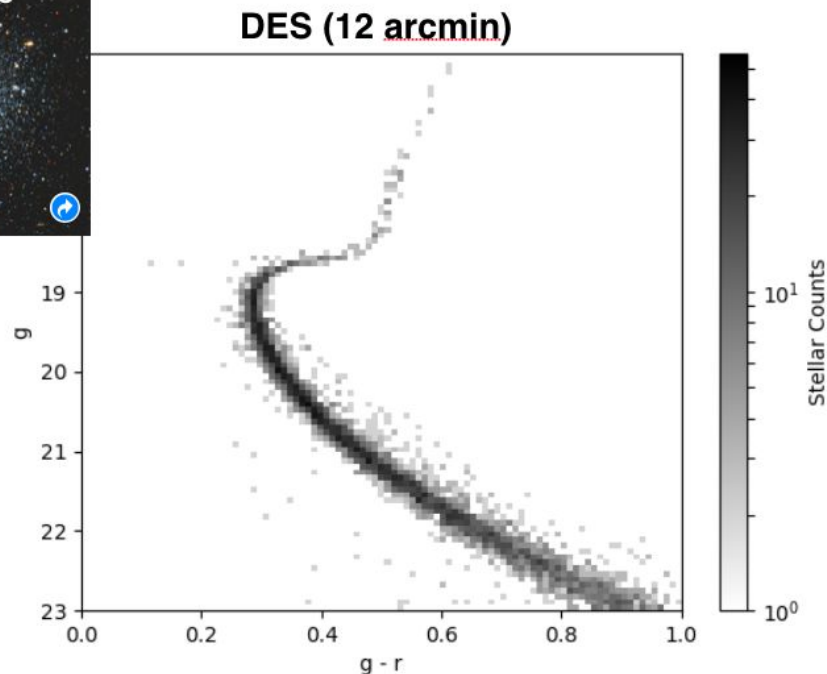
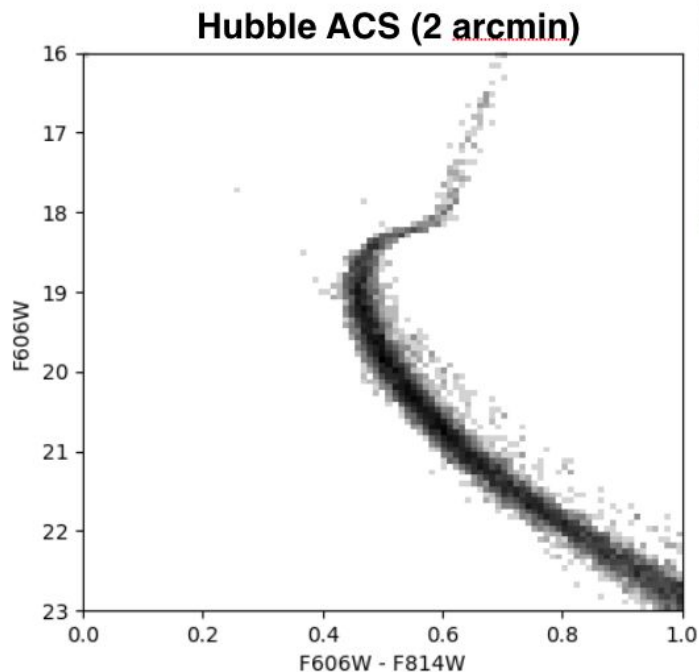
See talk from Matias Carrasco Kind at [Session 501](#) on Friday 1/15 at 12PM EST

Largest photometric dataset to date at the achieved depth and photometric precision

Wide Area and Photometric Uniformity



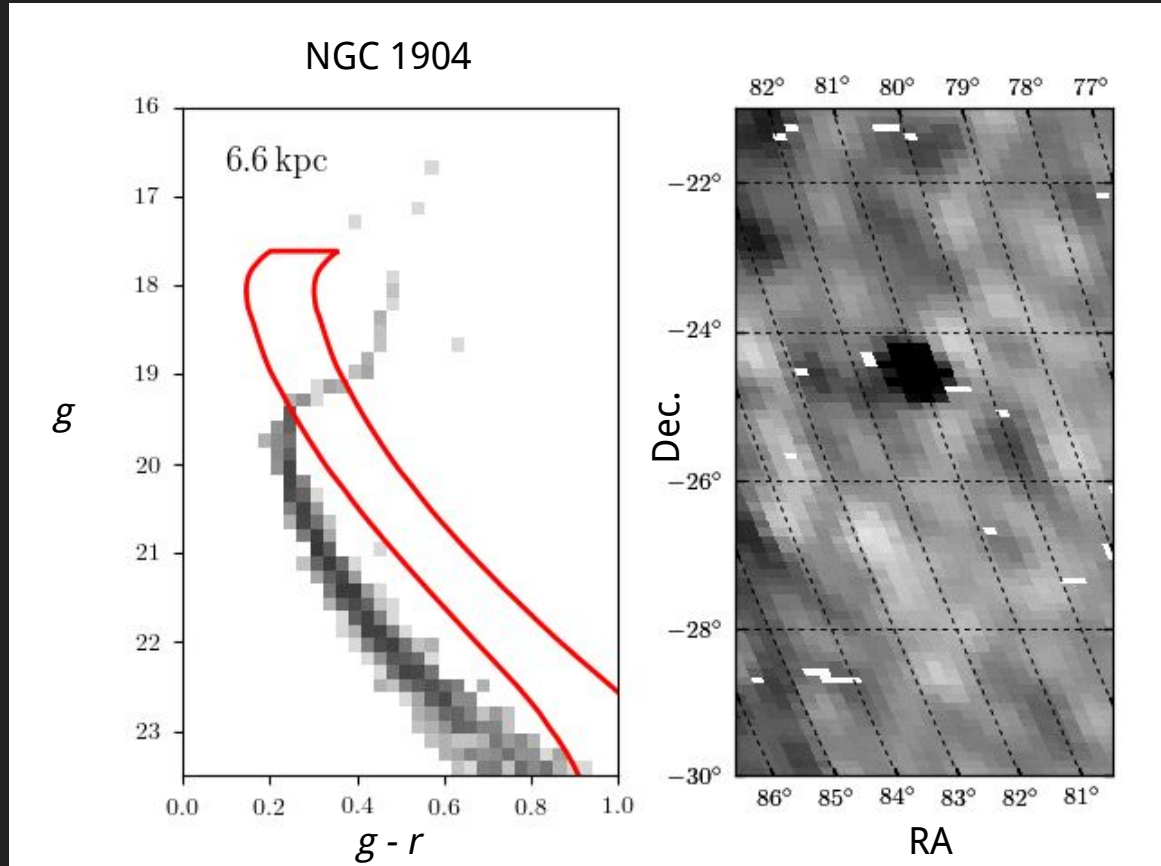
Milky Way Science with DES at the Astro Data Lab



Globular Cluster Periphery

See contributed
[notebook](#) on the Astro
Data Lab

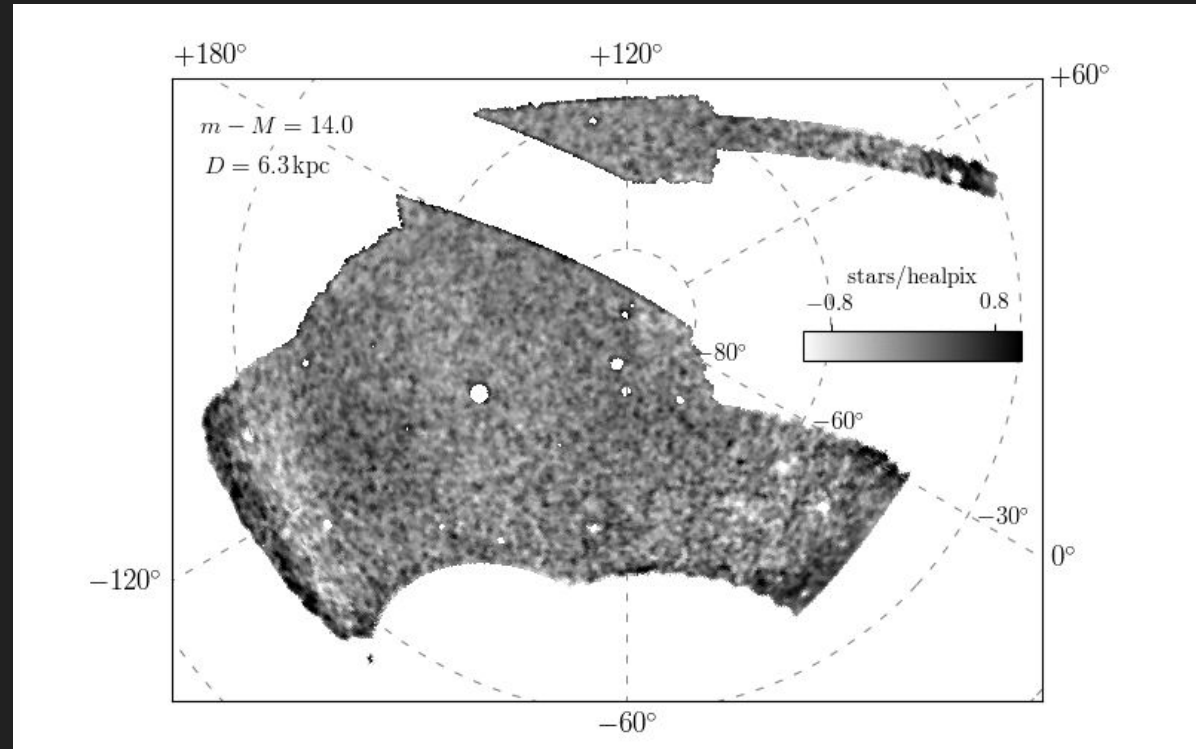
More discussion of Milky
Way Science at the Data
Lab [Splinter Session](#) on
Thursday 1/14 @ 4:10 PM
EST



A Tour Through the Galactic Halo

See contributed
[notebook](#) on the Astro
Data Lab

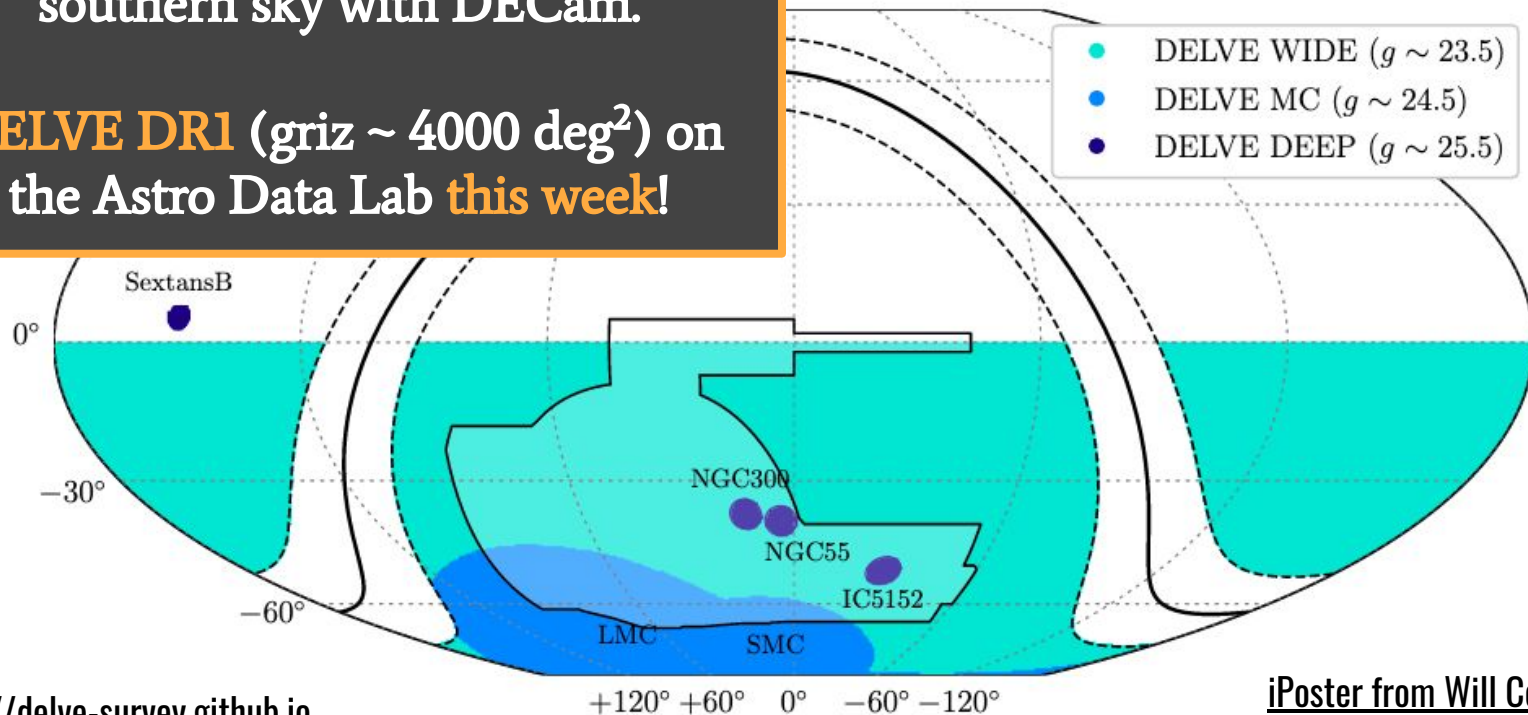
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DECam Local Volume Survey

Cover **all** of the high-Galactic-latitude southern sky with DECam.

DELVE DR1 ($griz \sim 4000 \text{ deg}^2$) on the Astro Data Lab **this week!**



Thanks!



<https://www.darkenergysurvey.org>

<https://des.ncsa.illinois.edu>

<https://delve-survey.github.io>