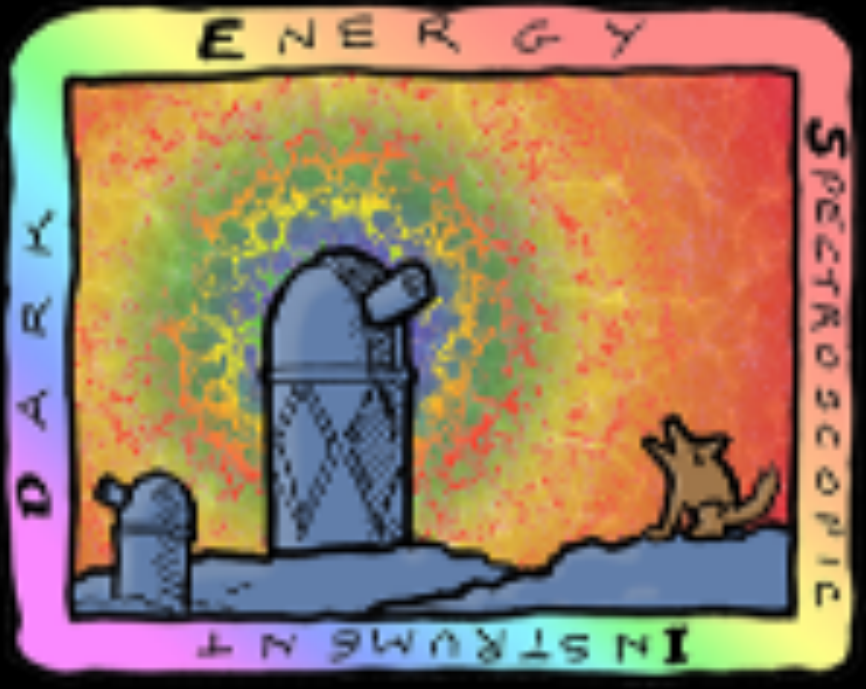


DARK ENERGY SPECTROSCOPIC INSTRUMENT

U.S. Department of Energy Office of Science

DESI VI. Cosmological constraints - Aug 2024 XII ICNFP @ Crete, Greece, 2024

Uendert Andrade (UMichigan)

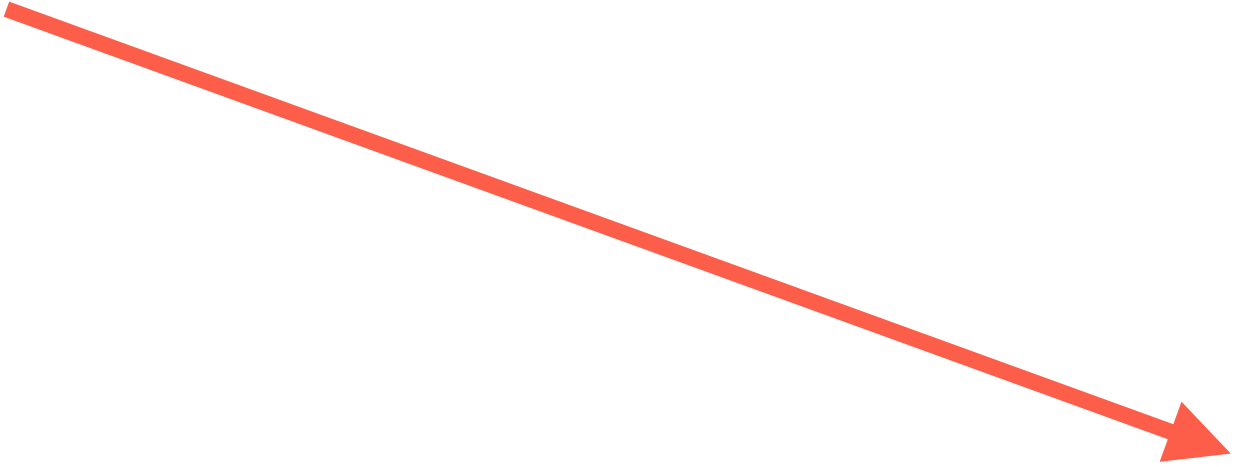
5

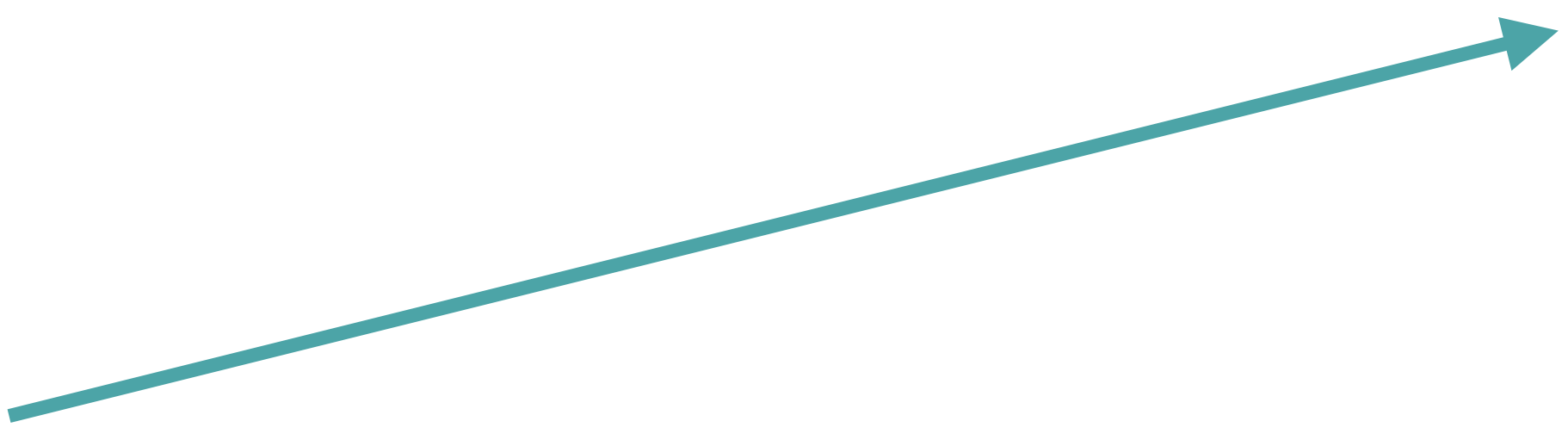
16 million Emission Line Galaxies ($0.6 < z < 1.6$)

8 million Luminous Red Galaxies
(0.4 < z < 1)

13.5 million Bright Galaxies
(0.0 < z < 0.4)

3 million
Quasars ($0.9 < z < 2.1$)
+ Ly-a forest ($2.1 < z$)





~40 million

DARK ENERGY SPECTROSCOPIC INSTRUMENT

U.S. Department of Energy Office of Science

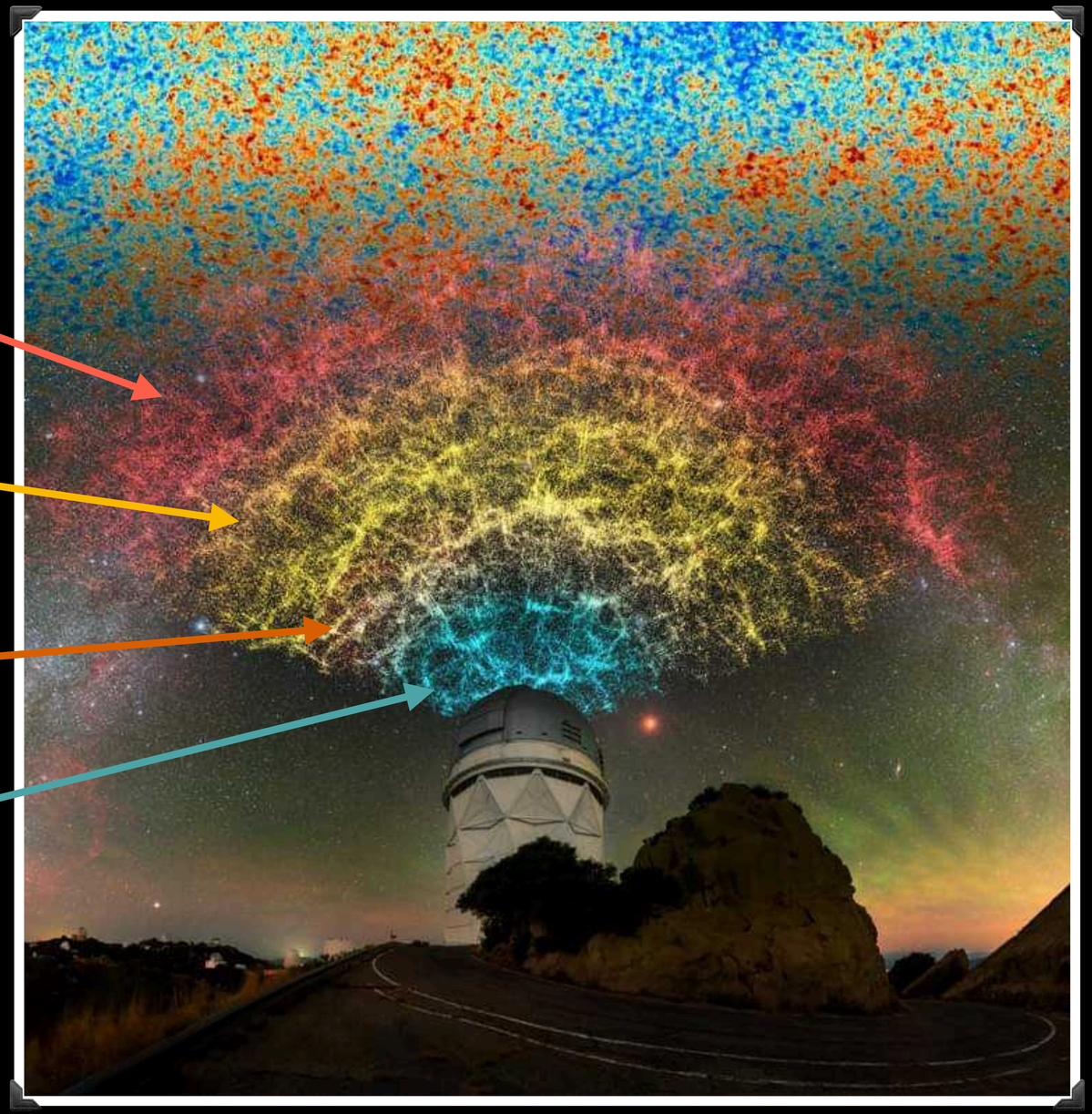
DESI Survey: Making the Largest 3D Map of the Universe

3 million
Quasars ($0.9 < z < 2.1$)
+ Ly-a forest ($2.1 < z$)

16 million Emission Line Galaxies
($0.6 < z < 1.6$)

8 million Luminous Red Galaxies
($0.4 < z < 1$)

13.5 million Bright Galaxies
($0.0 < z < 0.4$)



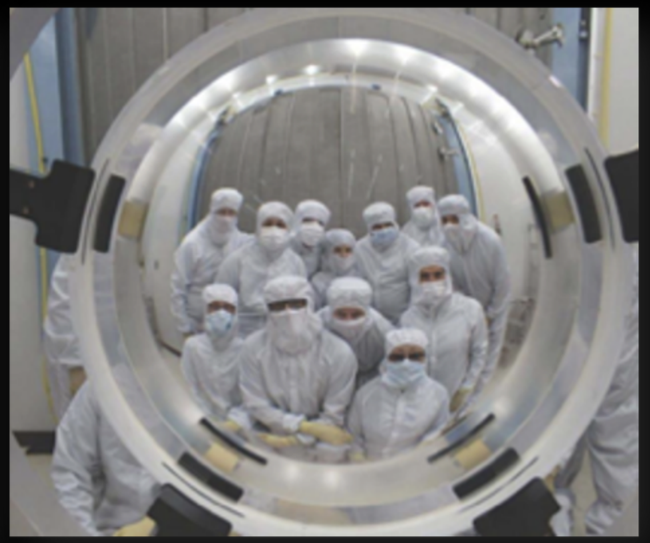
From 2021-2026 DESI will measure precise redshifts to ~40 million galaxies over 14,000 deg2 .

DARK ENERGY SPECTROSCOPIC INSTRUMENT

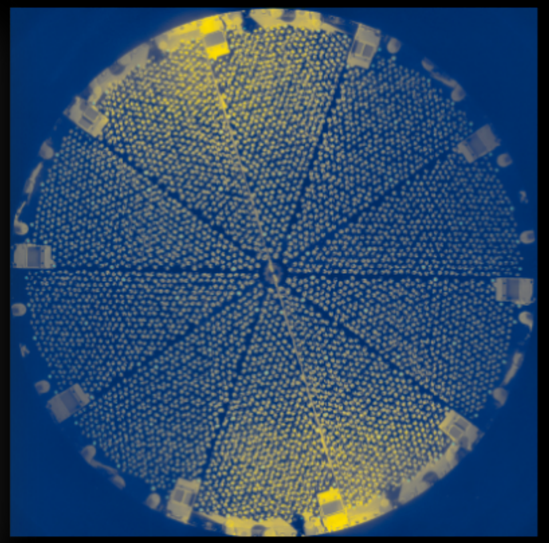
U.S. Department of Energy Office of Science

Key DESI Components

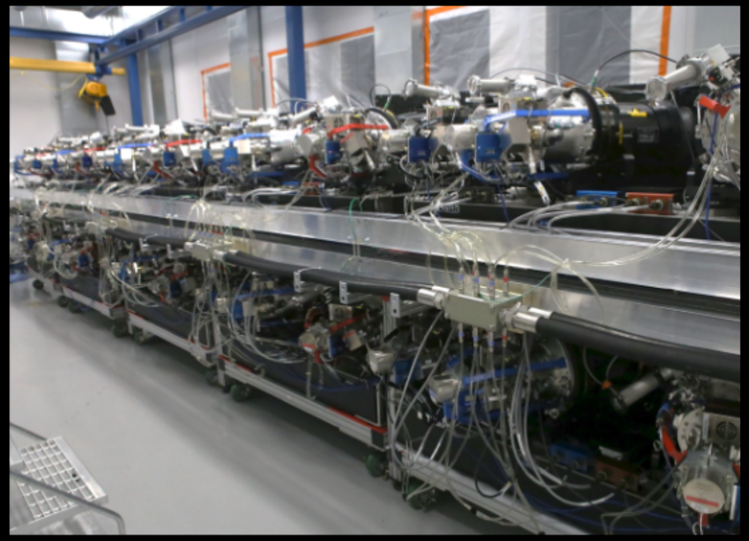
4m Mayall Telescope, KPNO, Arizona, USA



Wide Field Corrector 8 sq. deg. Field of View



Focal Plane with 5,000 Fiber Positioners



10 Multi-Object Spectrographs

Designed to optimize survey throughput:

- 5,000 fibers, wide field corrector, 10 spectrographs → maximum number of simultaneous targets
- remotely controlled fiber positioners; align, position, readout in parallel → minimum reconfiguration time
- dynamic field selection, exposure time calculator, autofocus → maximum operational efficiency