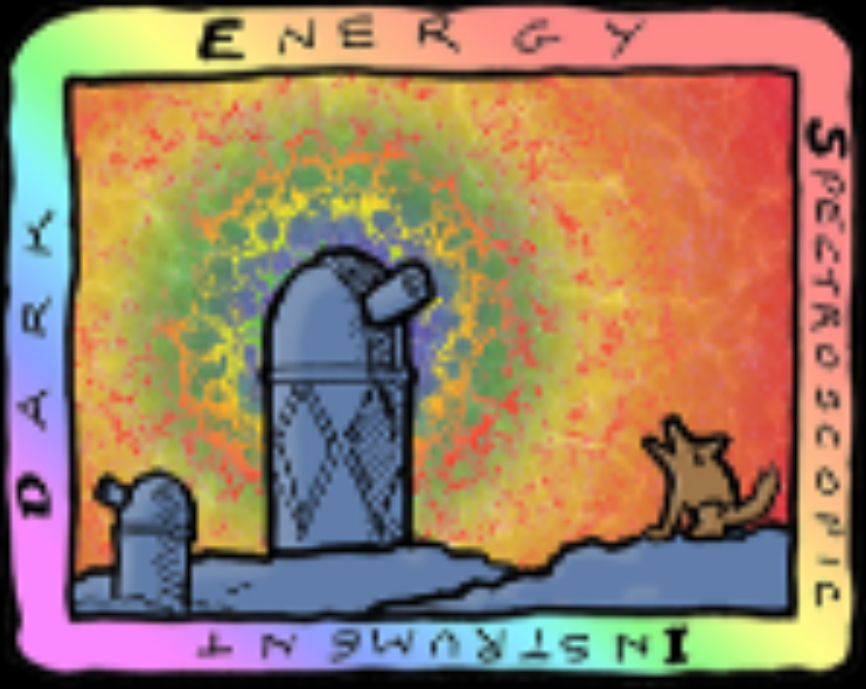


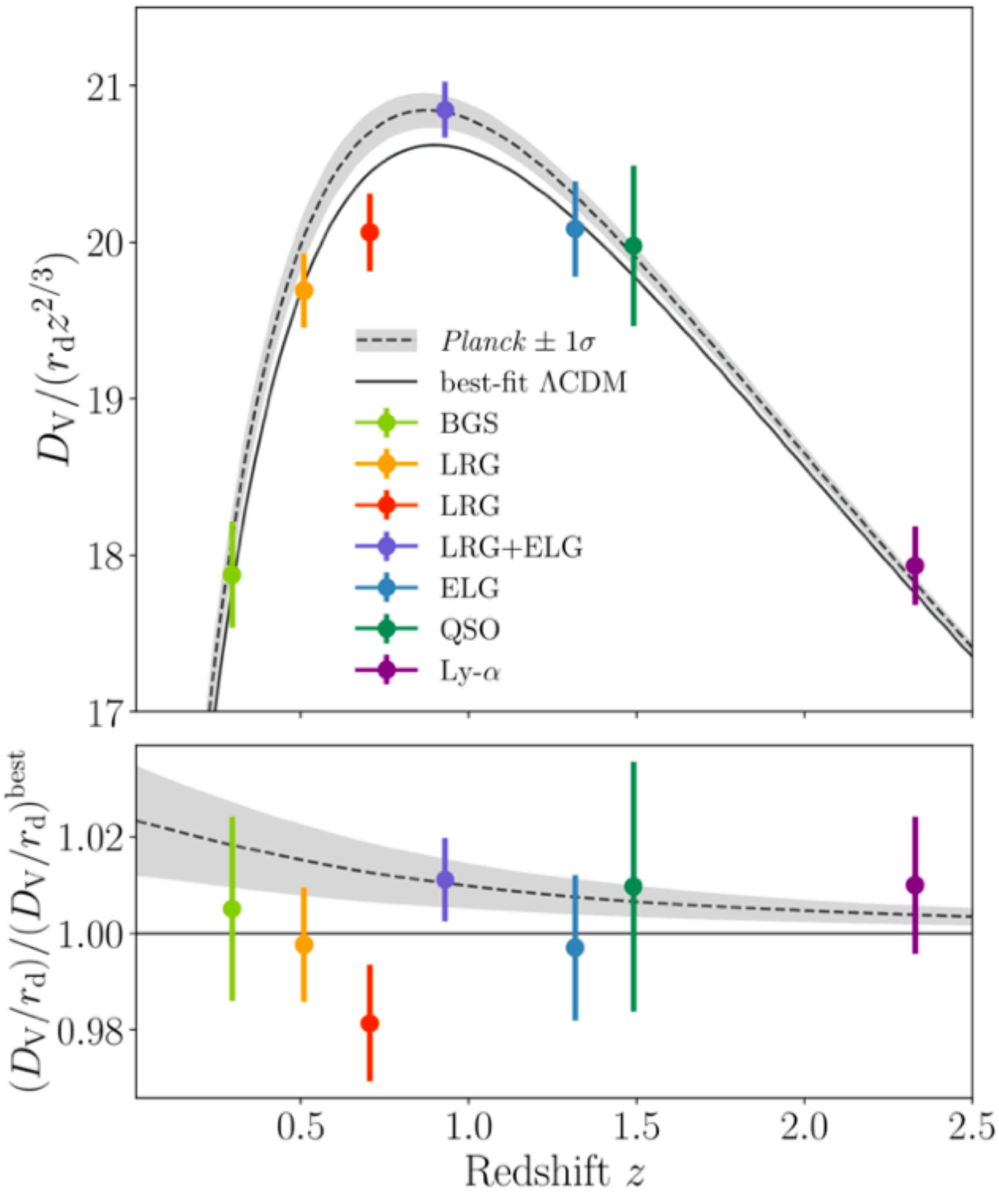
DARK ENERGY SPECTROSCOPIC INSTRUMENT

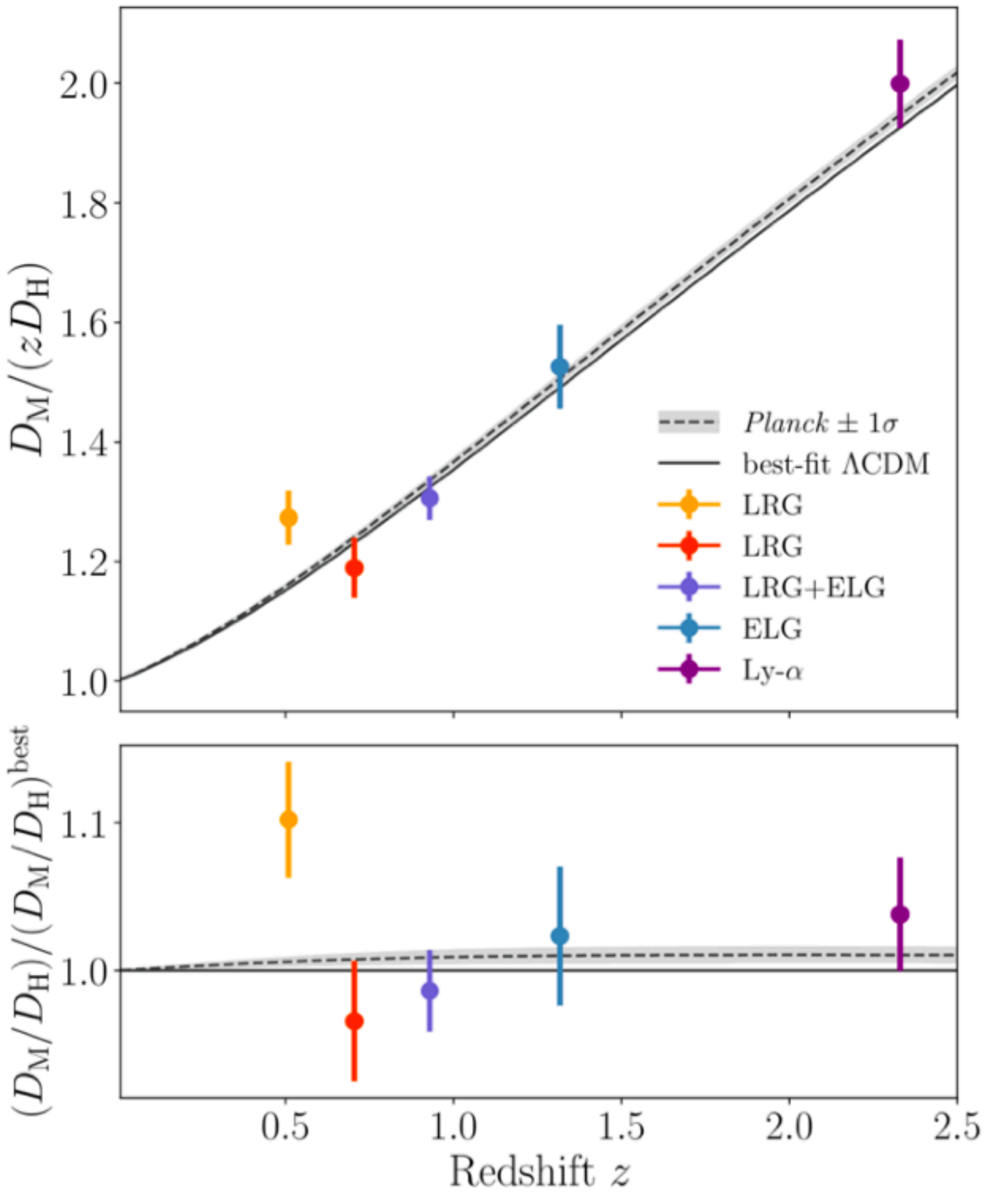
U.S. Department of Energy Office of Science

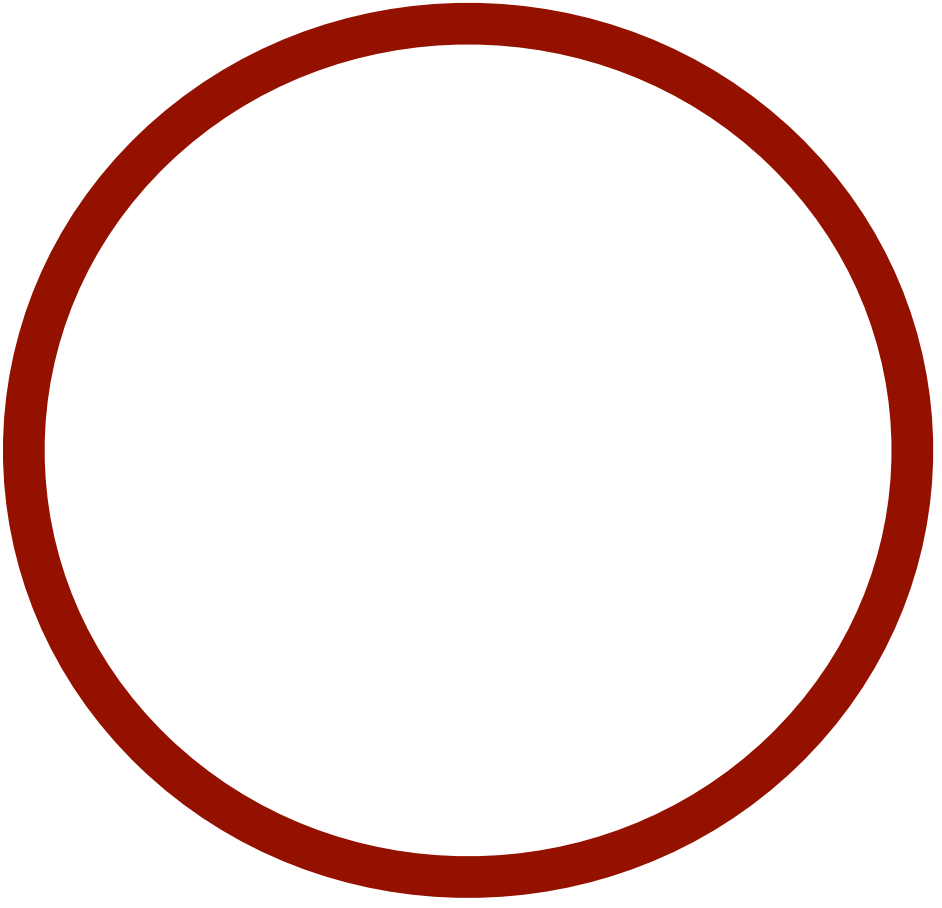
DESI VI. Cosmological constraints - Aug 2024 XII ICNFP @ Crete, Greece, 2024

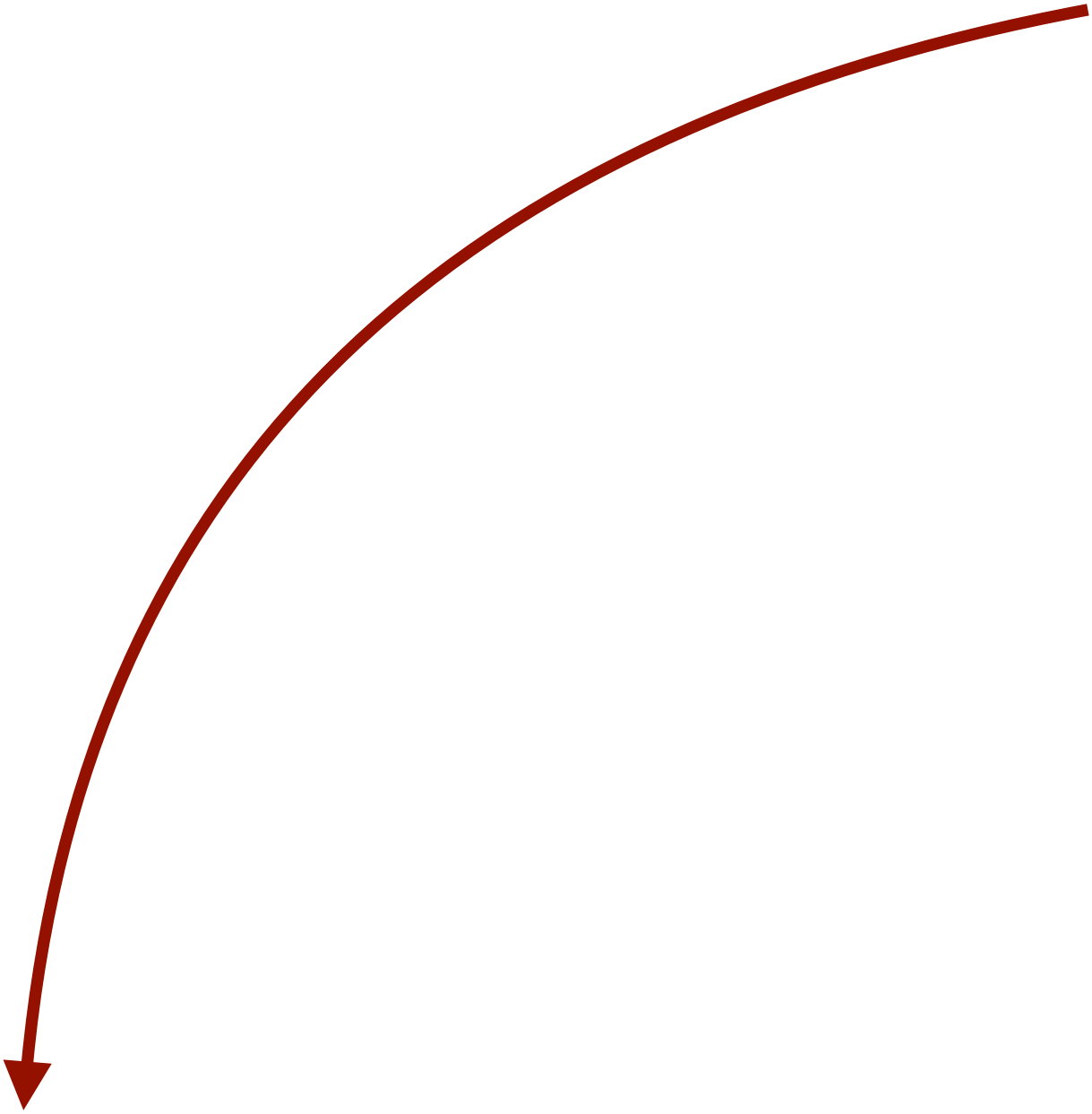
Uendert Andrade (UMichigan)

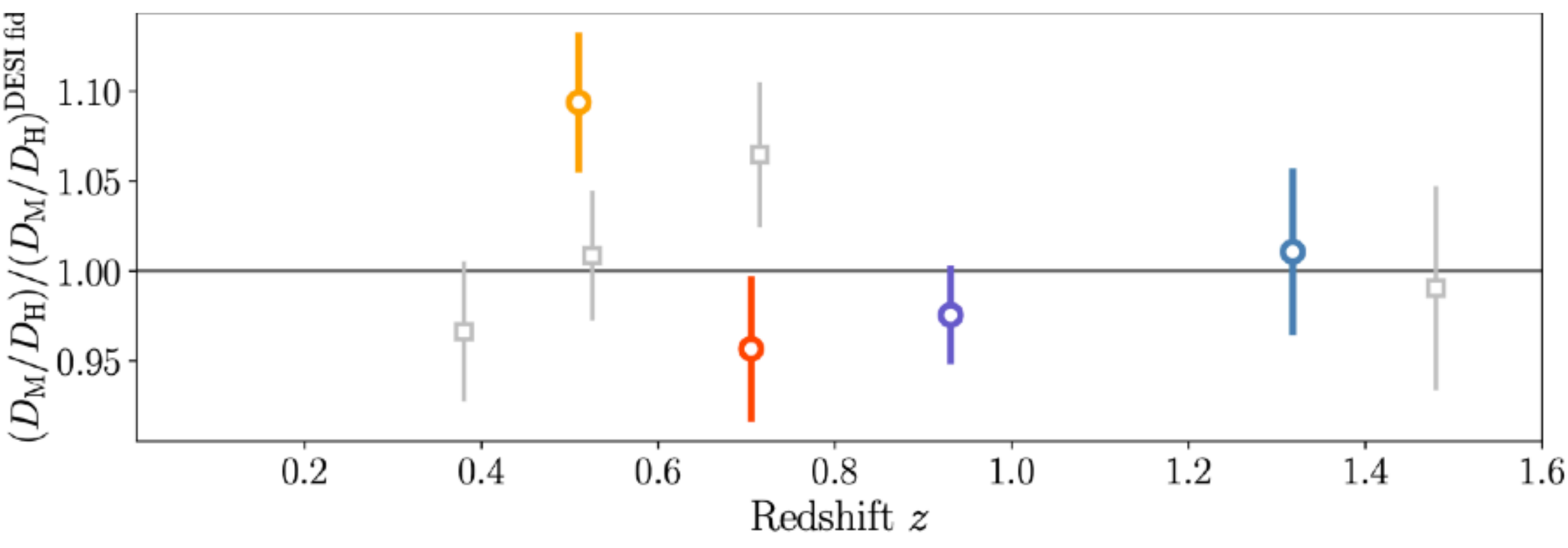
27


$D_V/(r_d z^{2/3})$
21
20
19
18
17
Planck ± 1σ
best-fit ΛCDM
BGS
LRG
LRG
LRG+ELG
ELG
QSO
Ly-α
$(D_V/r_d)/(D_V/r_d)^{best}$
1.02
1.00
0.98
0.5
1.0
1.5
2.0
2.5
Redshift z

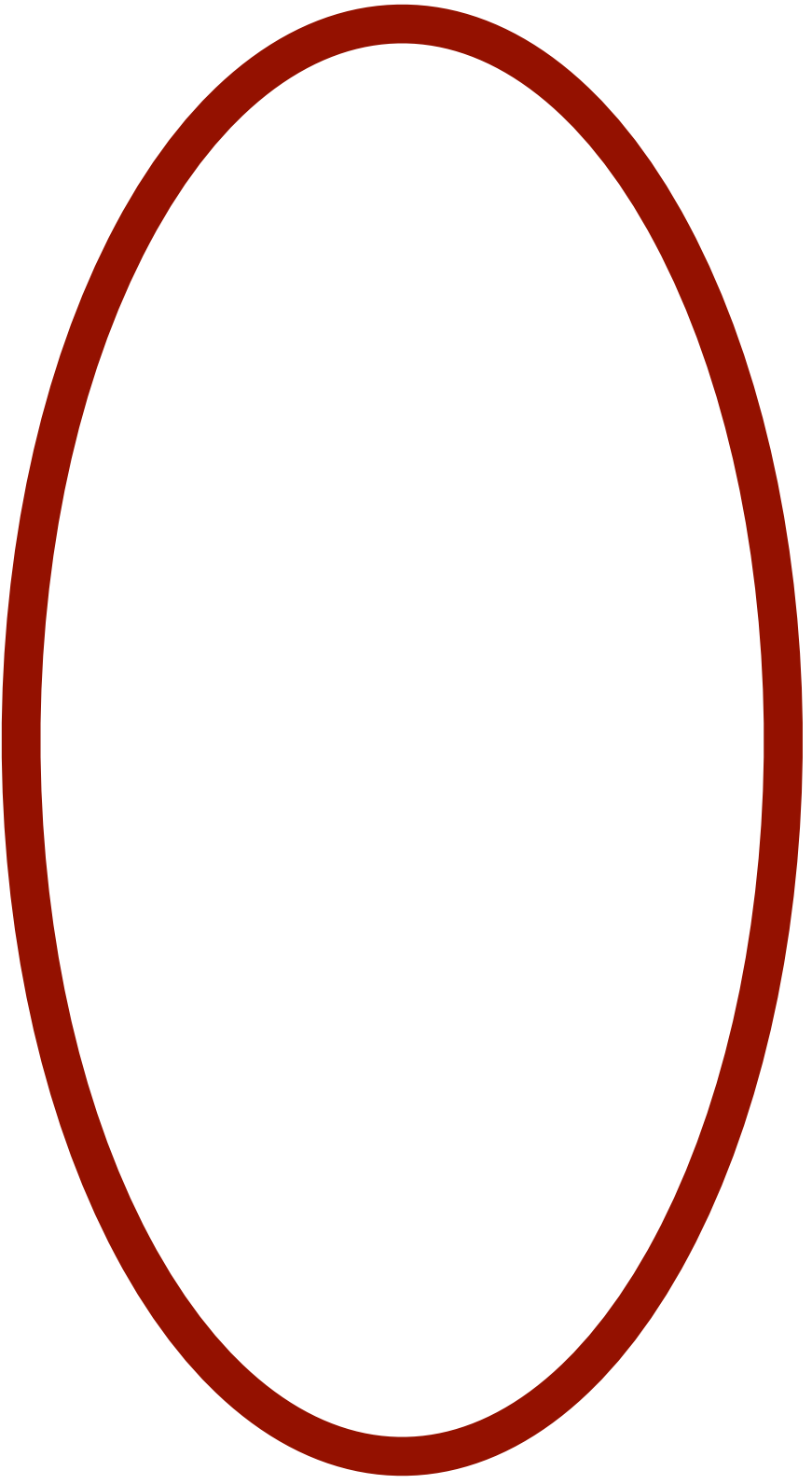

$D_M/(zD_H)$
2.0
1.8
1.6
1.4
1.2
1.0
Planck ± 1σ
best-fit ΛCDM
LRG
LRG
LRG+ELG
ELG
Ly-α
$(D_M/D_H)/(D_M/D_H)^{best}$
1.1
1.0
0.5
1.0
1.5
2.0
2.5
Redshift z



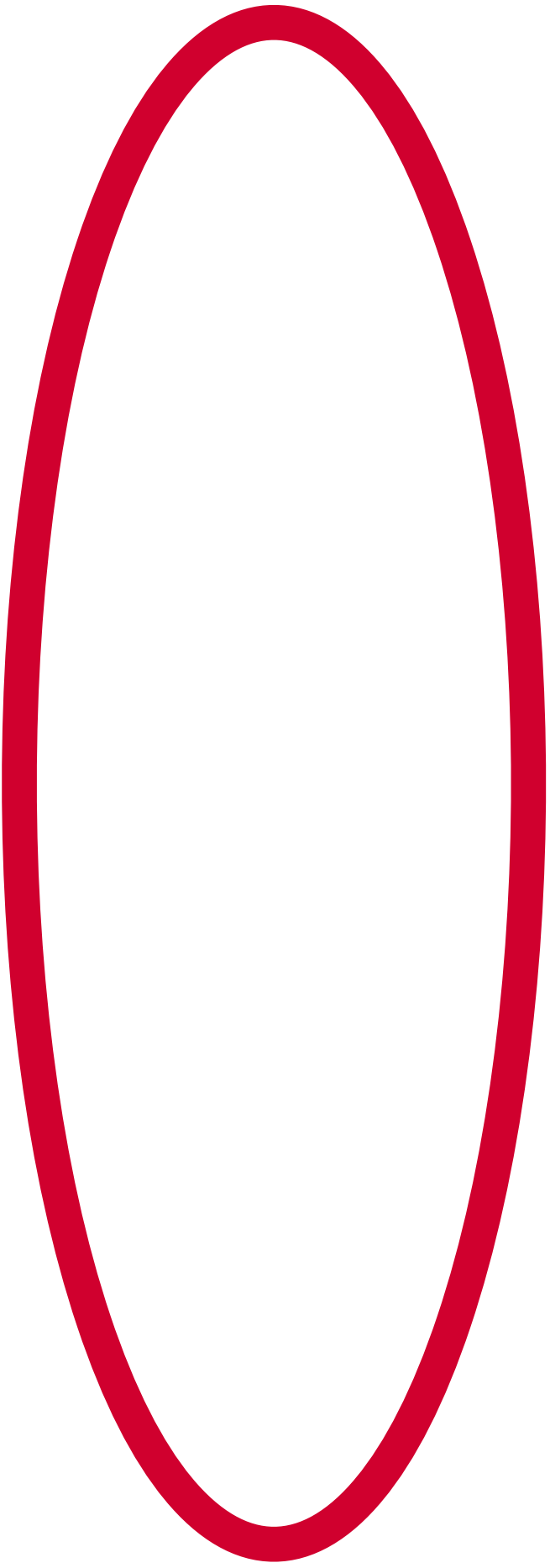



$(D_M/D_H)/(D_M/D_H)^{DESI\ fid}$
1.10
1.05
1.00
0.95
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Redshift z

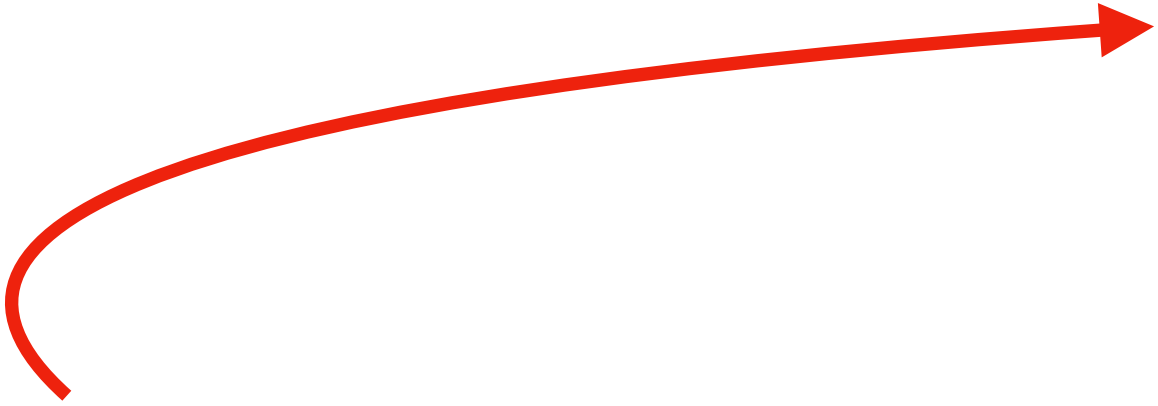
SDSS

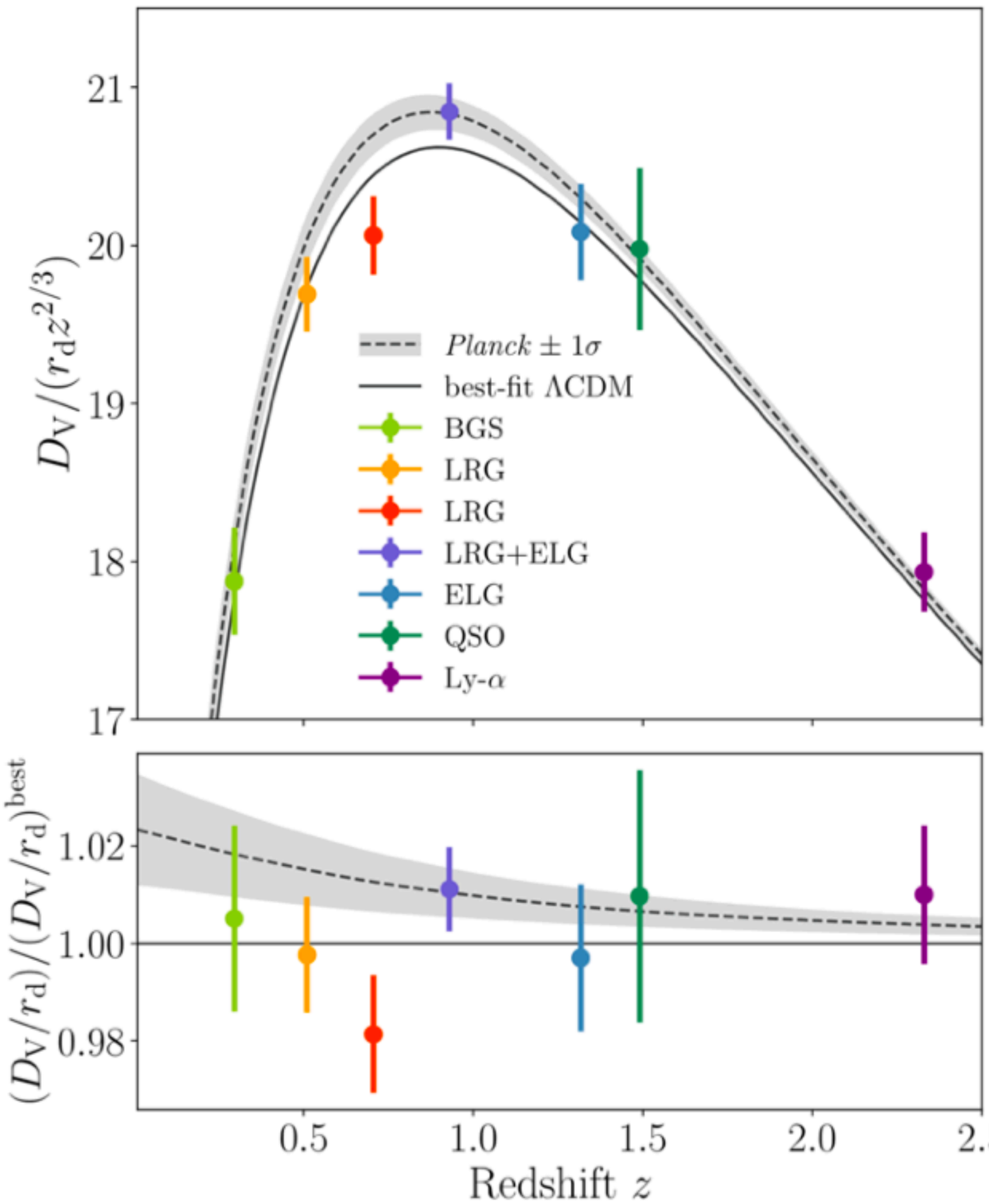


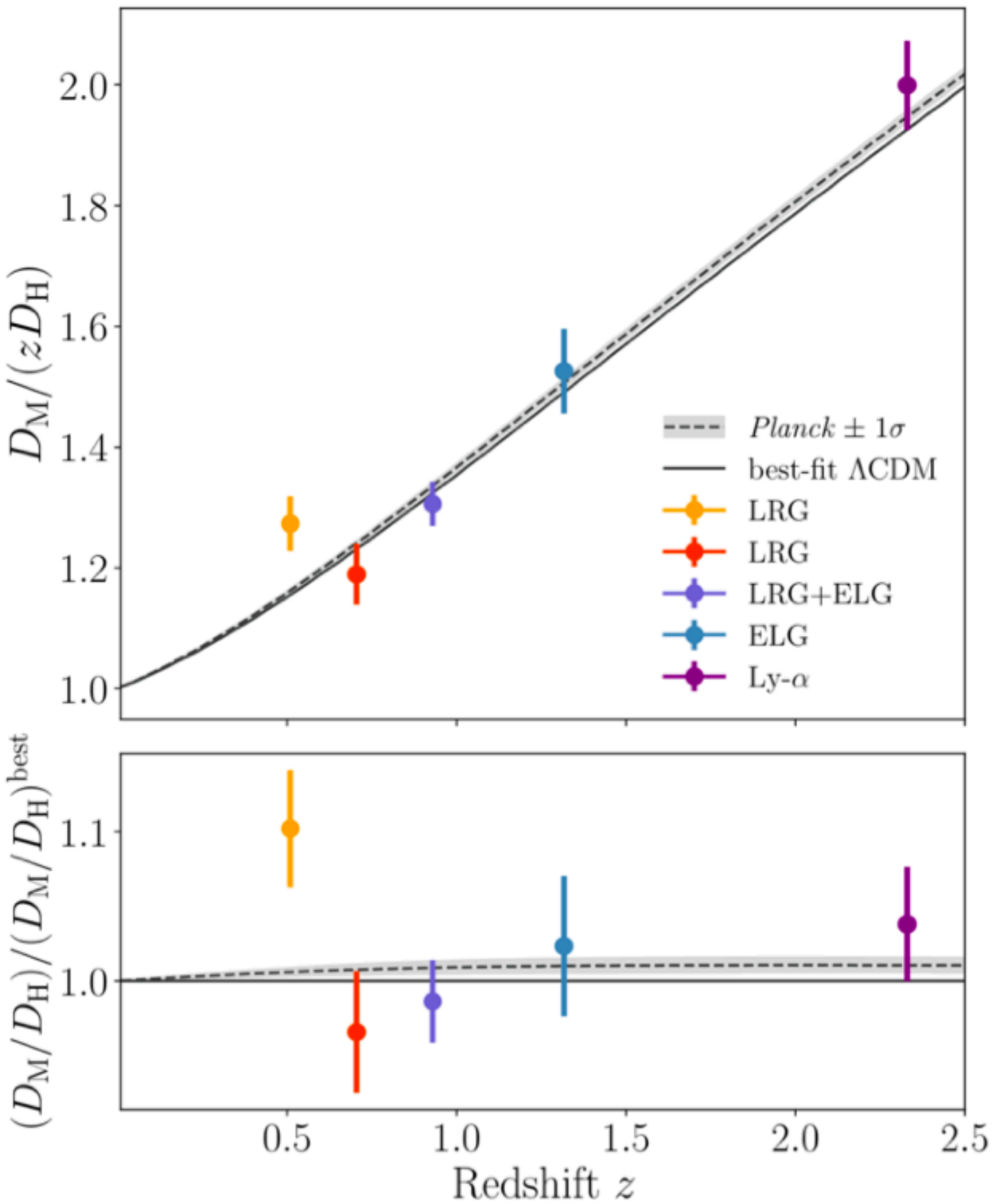
agrees $\sim 1\sigma$.

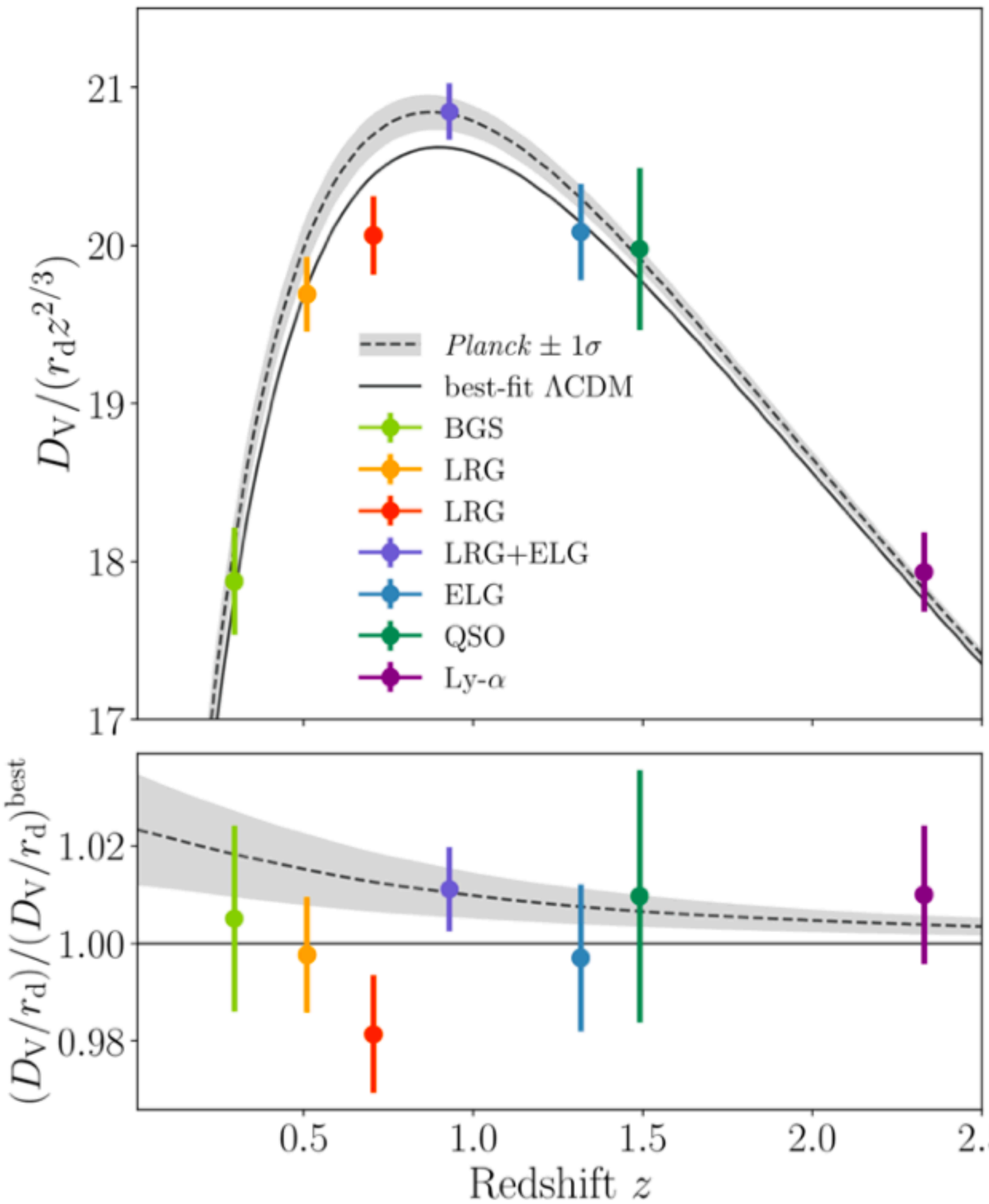


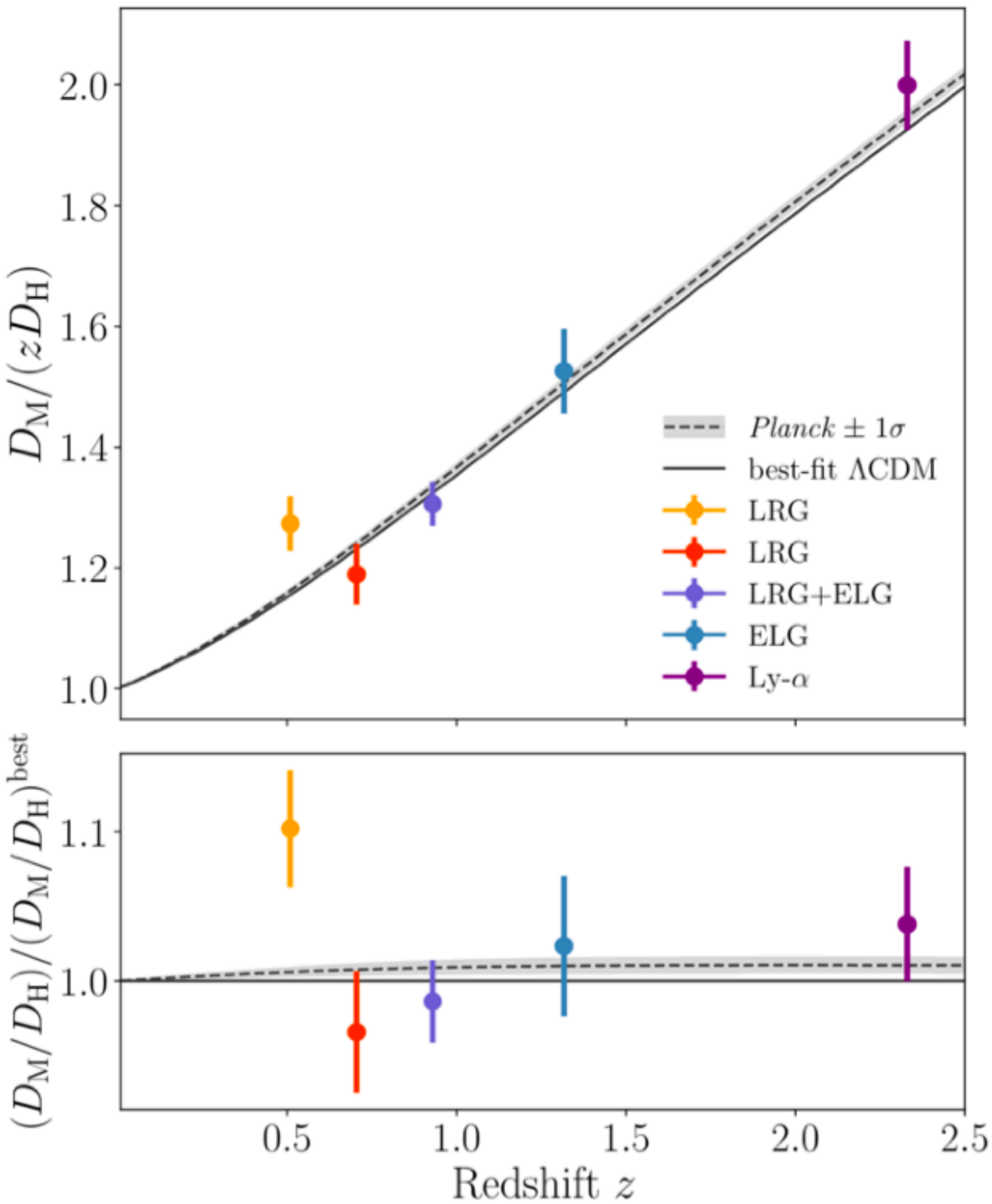
$\sim 2.7 - 3\sigma$ discrepant




$D_V/(r_d z^{2/3})$
21
20
19
18
17
Planck ± 1σ
best-fit ΛCDM
BGS
LRG
LRG
LRG+ELG
ELG
QSO
Ly-α
$(D_V/r_d)/(D_V/r_d)^{best}$
1.02
1.00
0.98
0.5
1.0
1.5
2.0
2.5
Redshift z


$D_M/(zD_H)$
2.0
1.8
1.6
1.4
1.2
1.0
Planck ± 1σ
best-fit ΛCDM
LRG
LRG
LRG+ELG
ELG
Ly-α
$(D_M/D_H)/(D_M/D_H)^{best}$
1.1
1.0
0.5
1.0
1.5
2.0
2.5
Redshift z

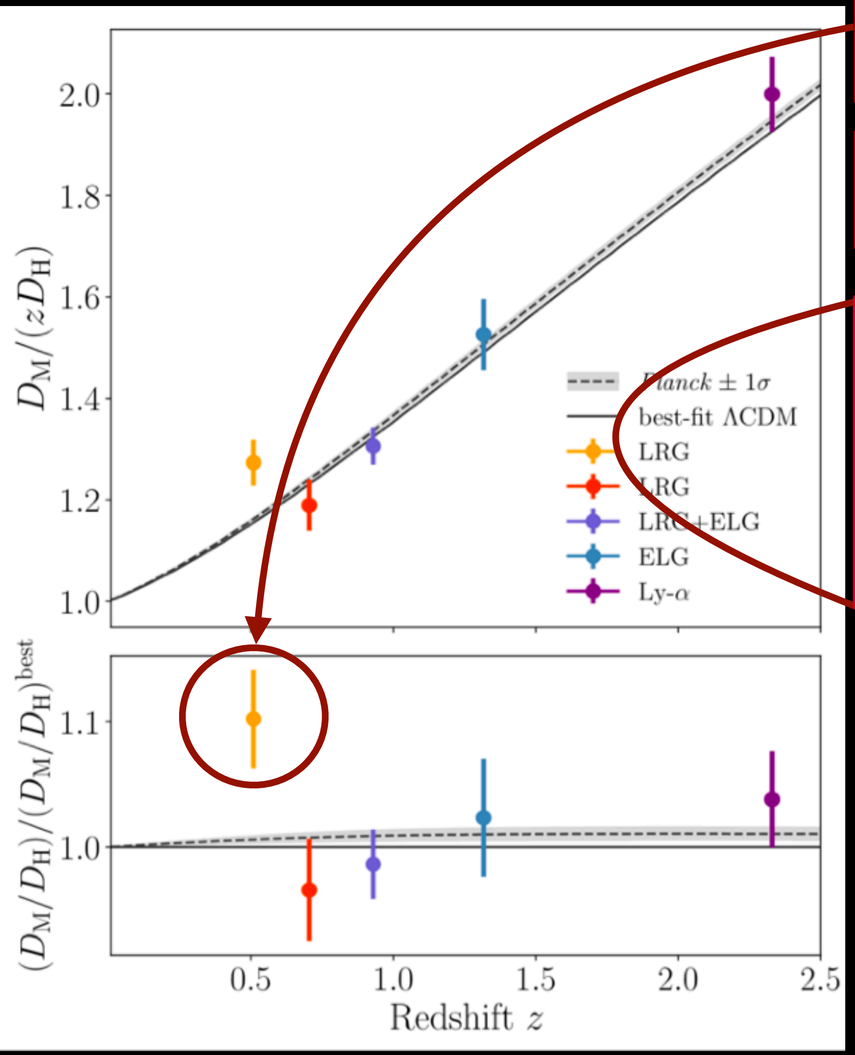

$D_V/(r_d z^{2/3})$
21
20
19
18
17
Planck ± 1σ
best-fit ΛCDM
BGS
LRG
LRG
LRG+ELG
ELG
QSO
Ly-α
$(D_V/r_d)/(D_V/r_d)^{best}$
1.02
1.00
0.98
0.5
1.0
1.5
2.0
2.5
Redshift z


$D_M/(zD_H)$
2.0
1.8
1.6
1.4
1.2
1.0
Planck ± 1σ
best-fit ΛCDM
LRG
LRG
LRG+ELG
ELG
Ly-α
$(D_M/D_H)/(D_M/D_H)^{best}$
1.1
1.0
0.5
1.0
1.5
2.0
2.5
Redshift z

DARK ENERGY SPECTROSCOPIC INSTRUMENT

U.S. Department of Energy Office of Science

Distance Measurements

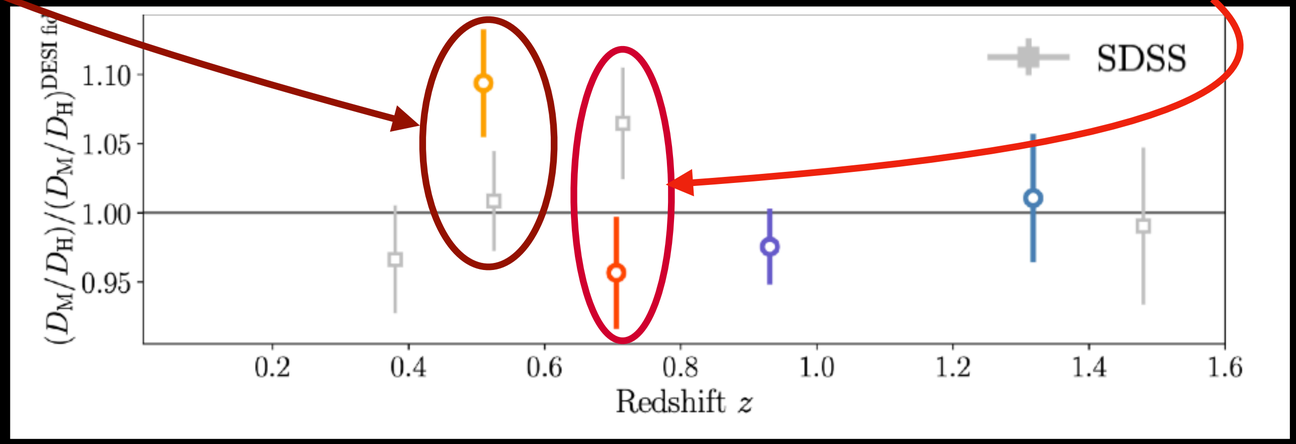


Most anomalous @ $z = 0.51$;offset at $\sim 2\sigma$ from ΛCDM.

Results @ $z = 0.51$ from DESI and SDSS **agrees** $\sim 1\sigma$.

Although LRG2 $0.6 < z < 0.8$ is $\sim 2.7 - 3\sigma$ discrepant.

Cause of this difference unclear. Might be due to an unlucky sample variance fluctuation.



DARK ENERGY SPECTROSCOPIC INSTRUMENT

U.S. Department of Energy Office of Science

BAO dataset from DESI + SDSS

Combing DESI and SDSS to get the most precise BAO measurements ever made.