

DARTMOUTH



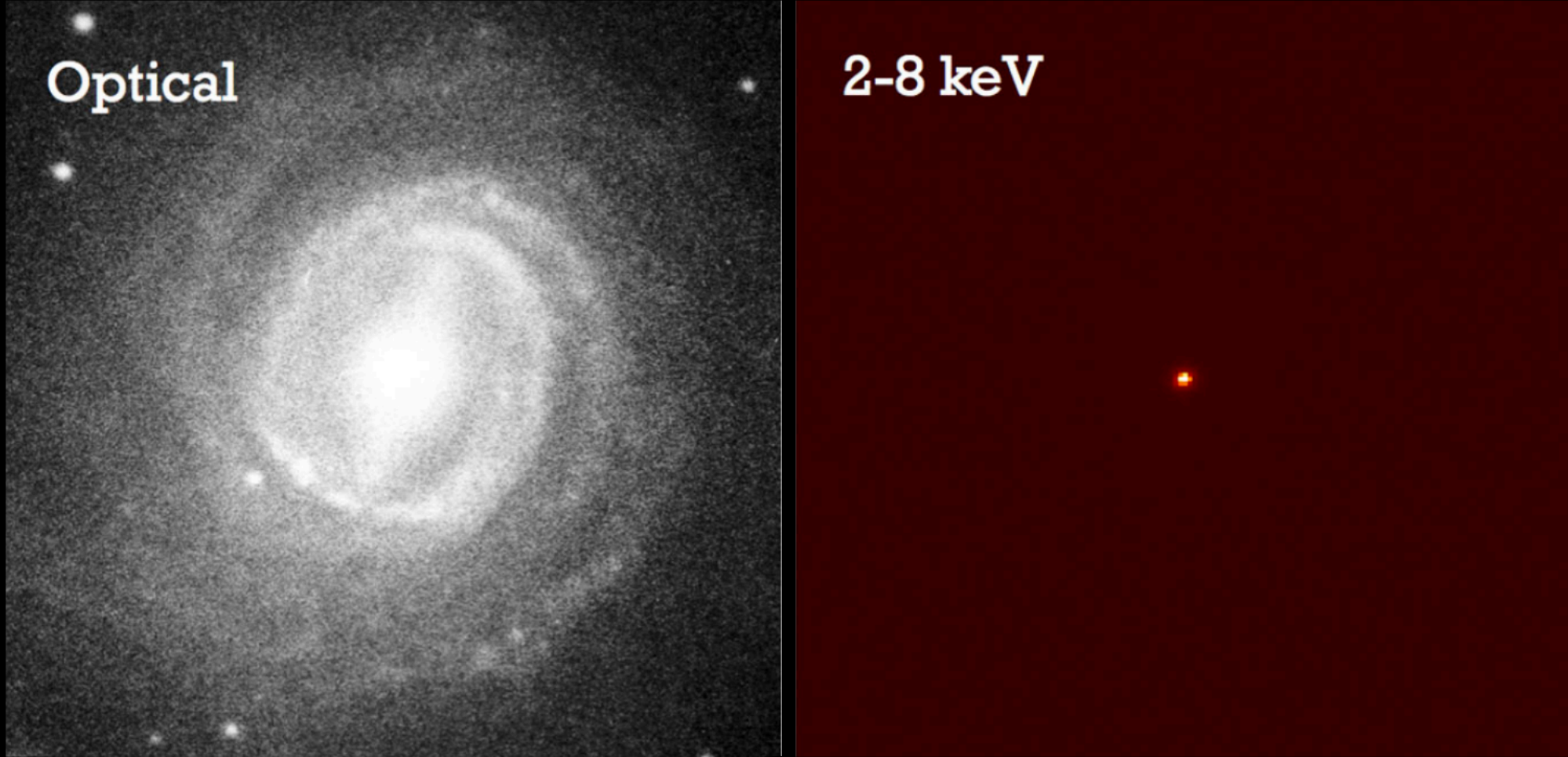
CHANDRA 20 YEARS SYMPOSIUM

CDWFS: A NEW CHANDRA SURVEY IN BOOTES

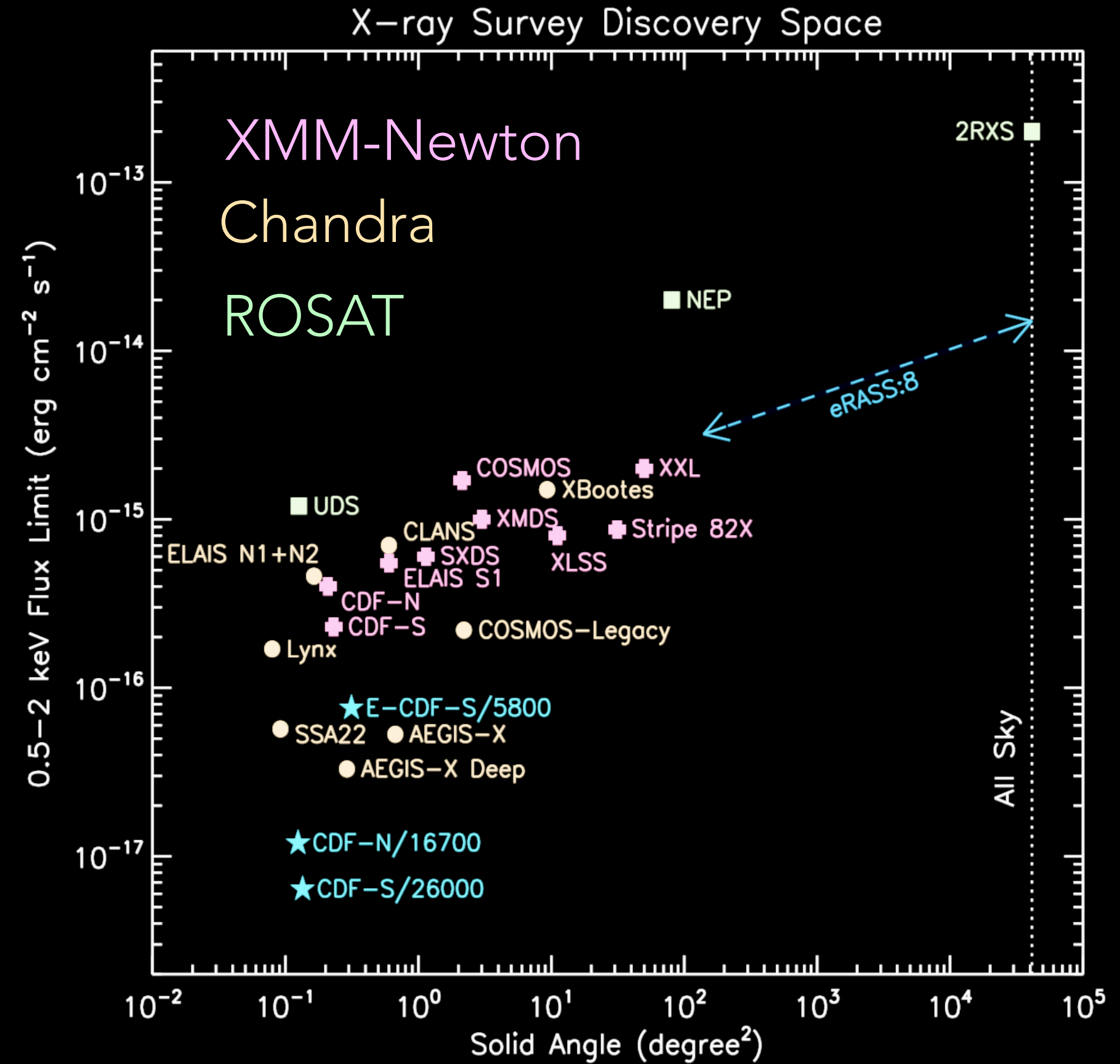
ALBERTO MASINI
WITH RYAN HICKOX



X-RAY SURVEYS AS A TOOL TO STUDY AGN POPULATIONS

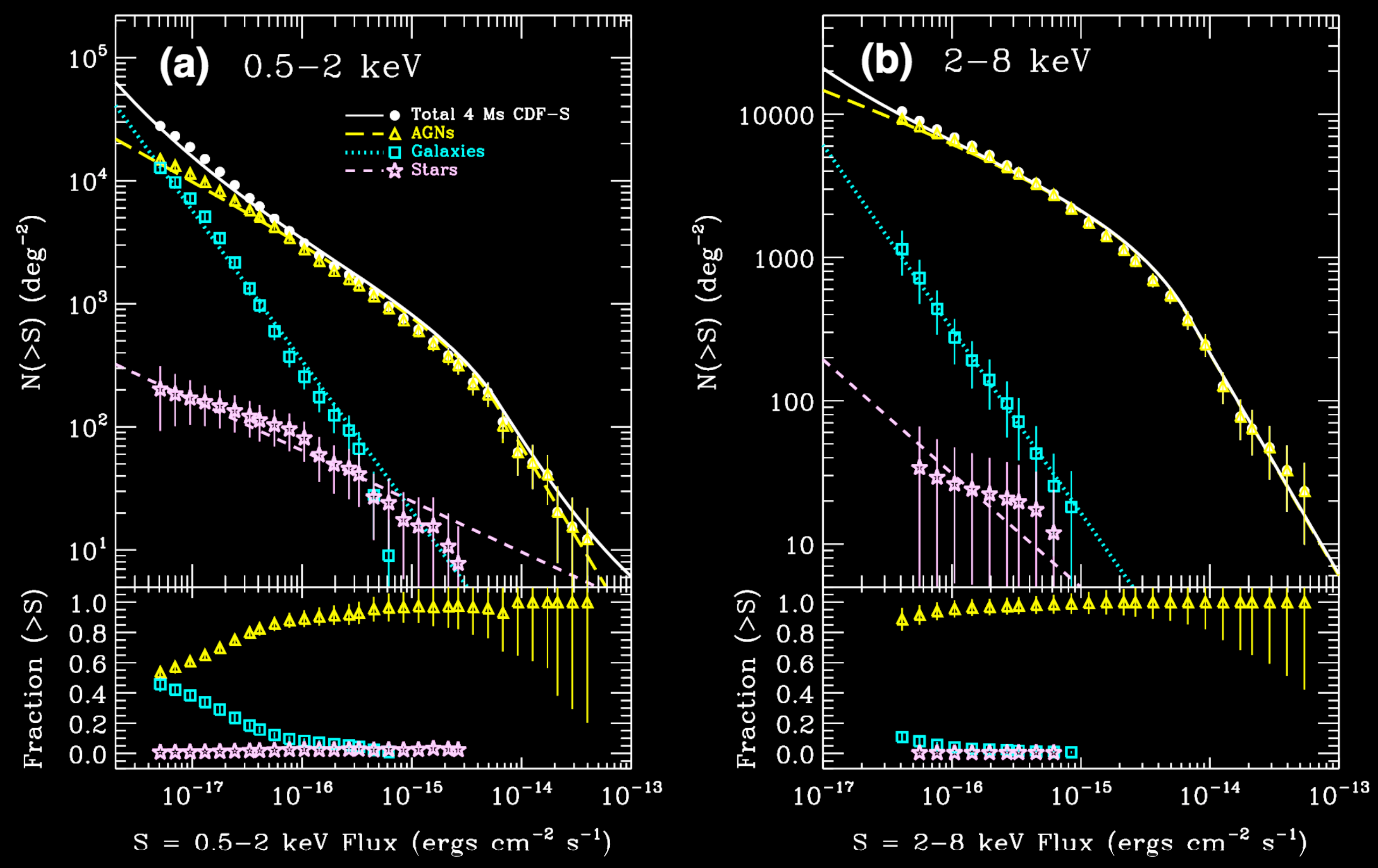


Adapted from Brandt & Alexander (2015)

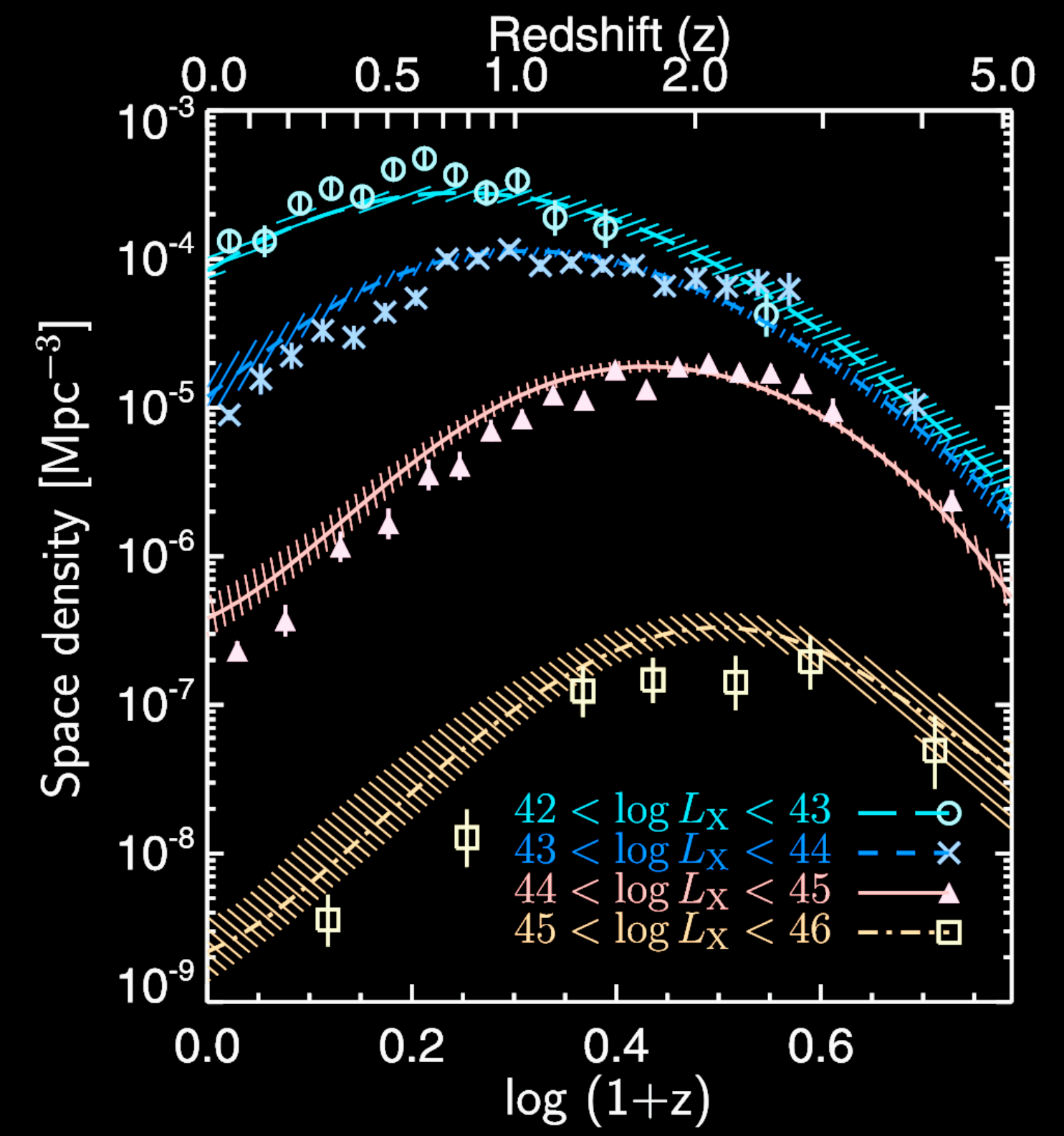


Adapted from Xue (2017)

X-RAY SURVEYS AS A TOOL TO STUDY AGN POPULATIONS

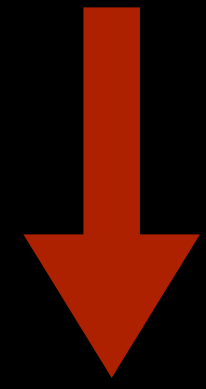


Adapted from Lehmer et al. (2012)

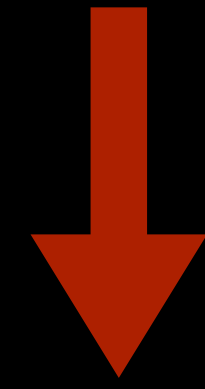


Adapted from Aird et al. (2015)

WHY A NEW DEEP SURVEY ON A WIDE FIELD?



9.3 deg²

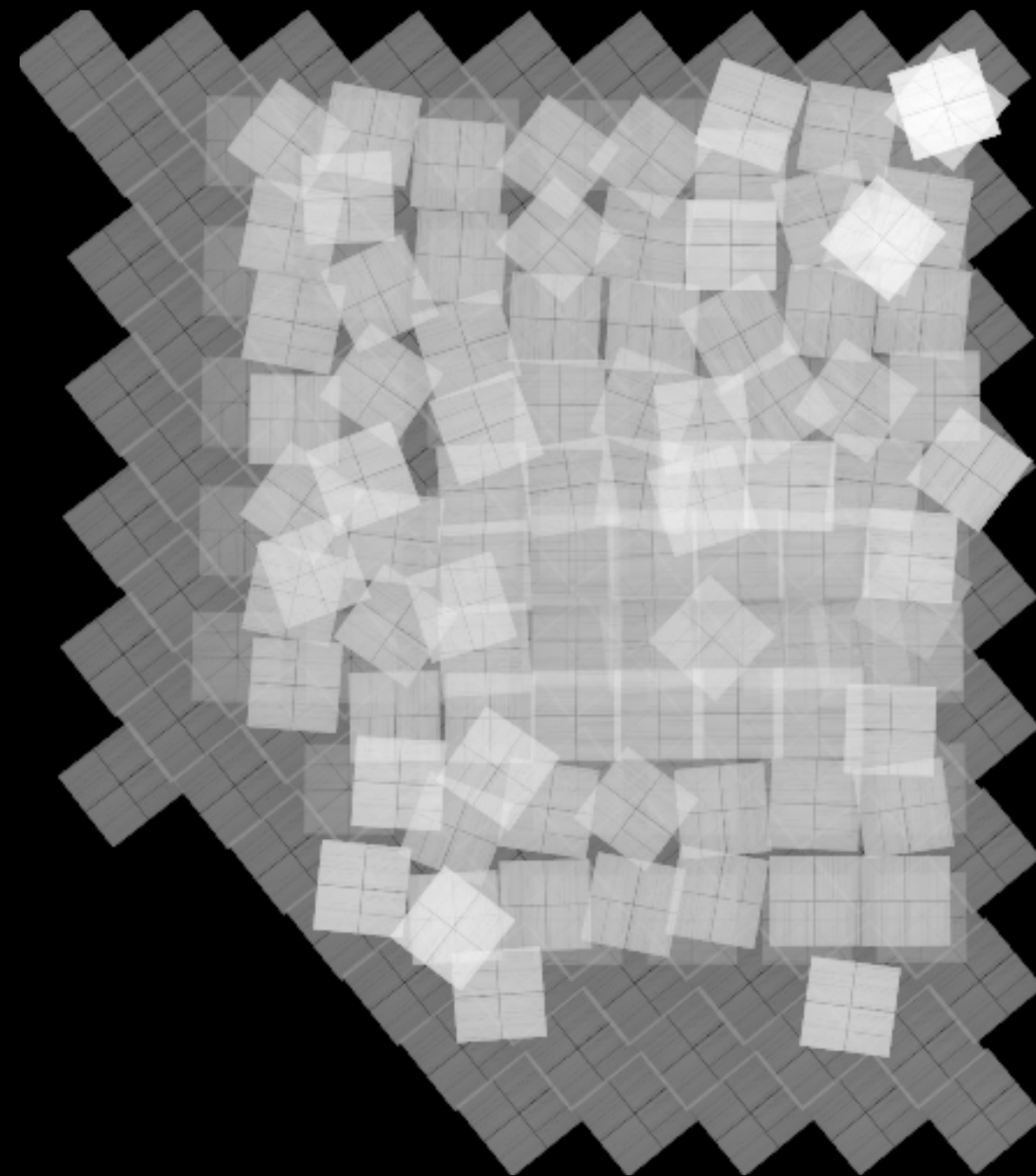


- HIGHER REDSHIFT
- FAINTER, OBSCURED SOURCES

- LARGE SCALE STRUCTURE
- CLUSTERING
- RARE, LUMINOUS SOURCES

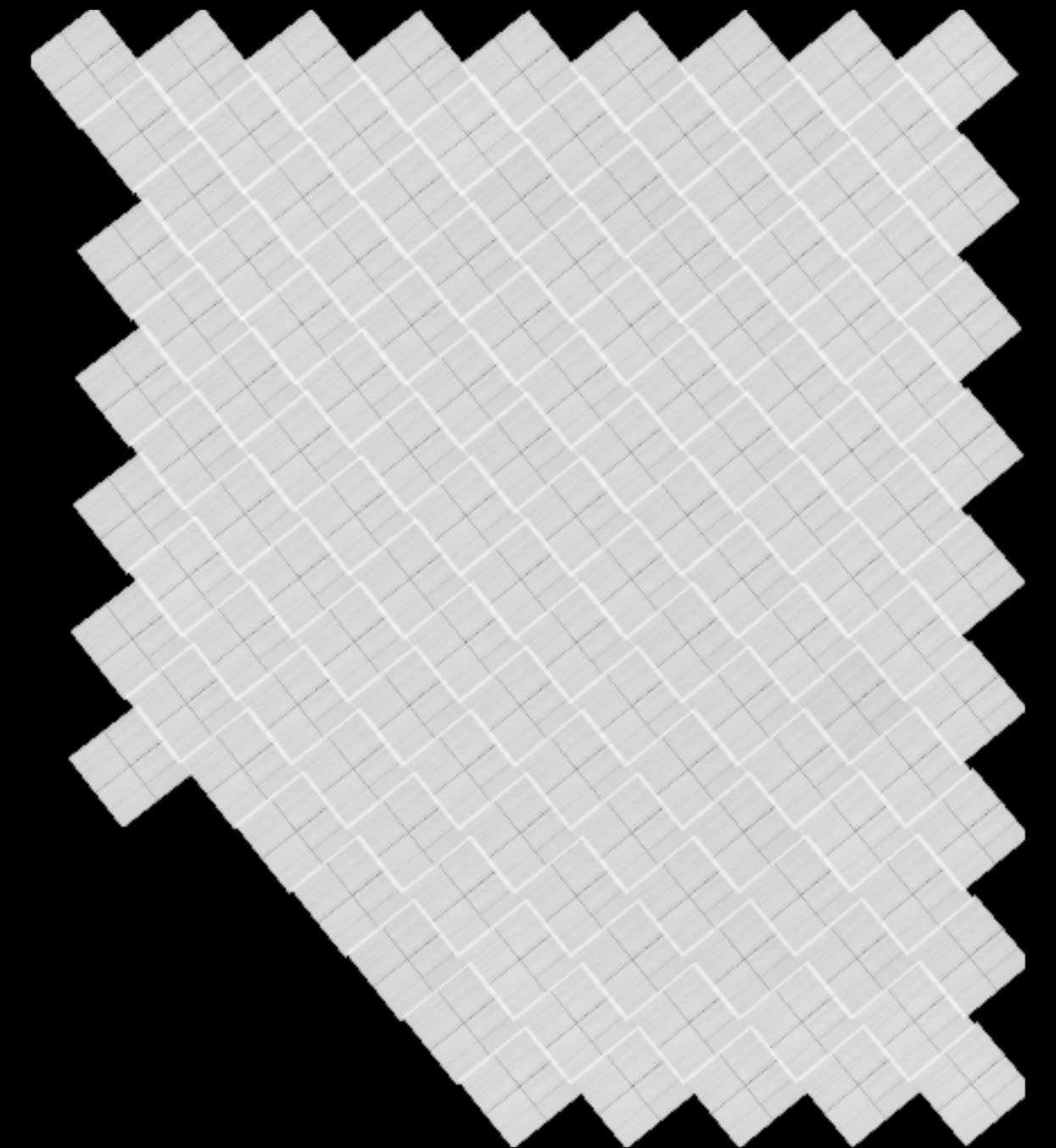
281 CHANDRA
OBSERVATIONS
5-100 KS EACH

3.4 Ms

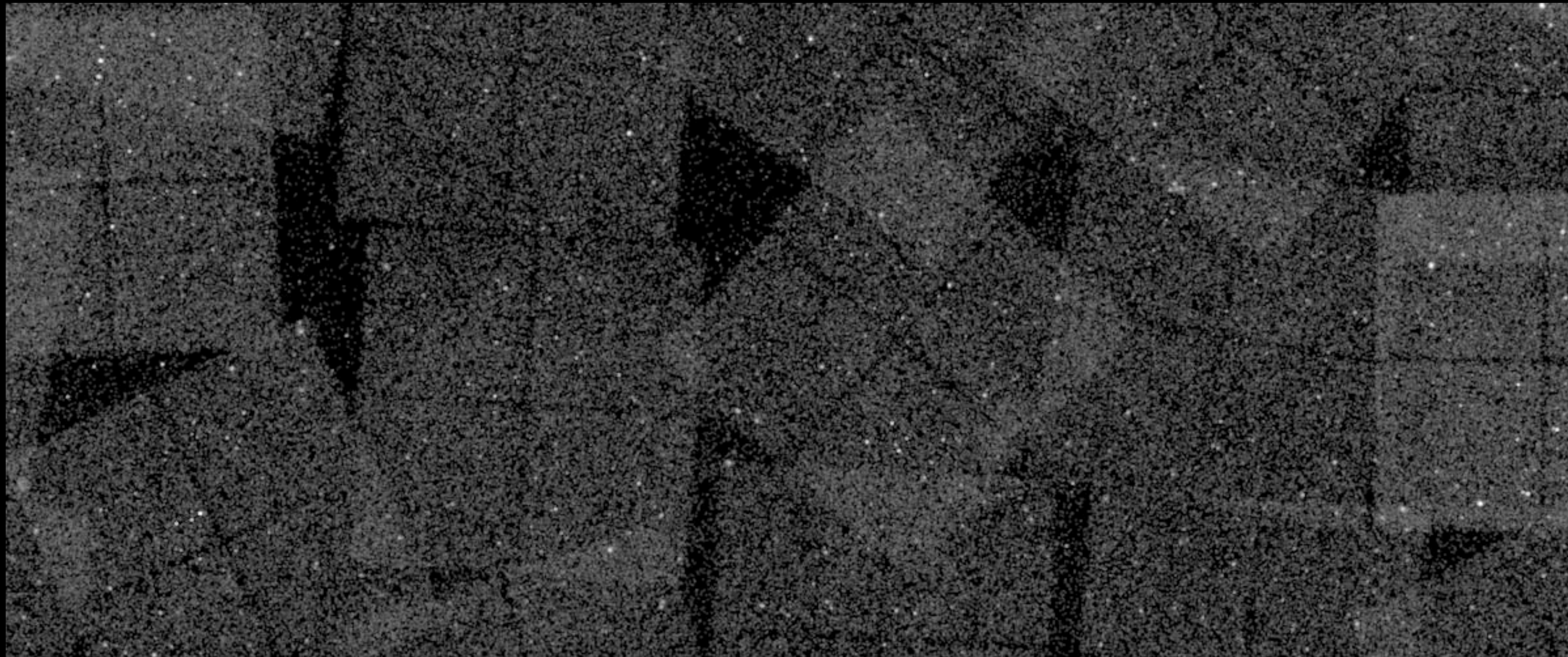


126 CHANDRA
OBSERVATIONS
5 KS EACH
(MURRAY ET AL. 2005)

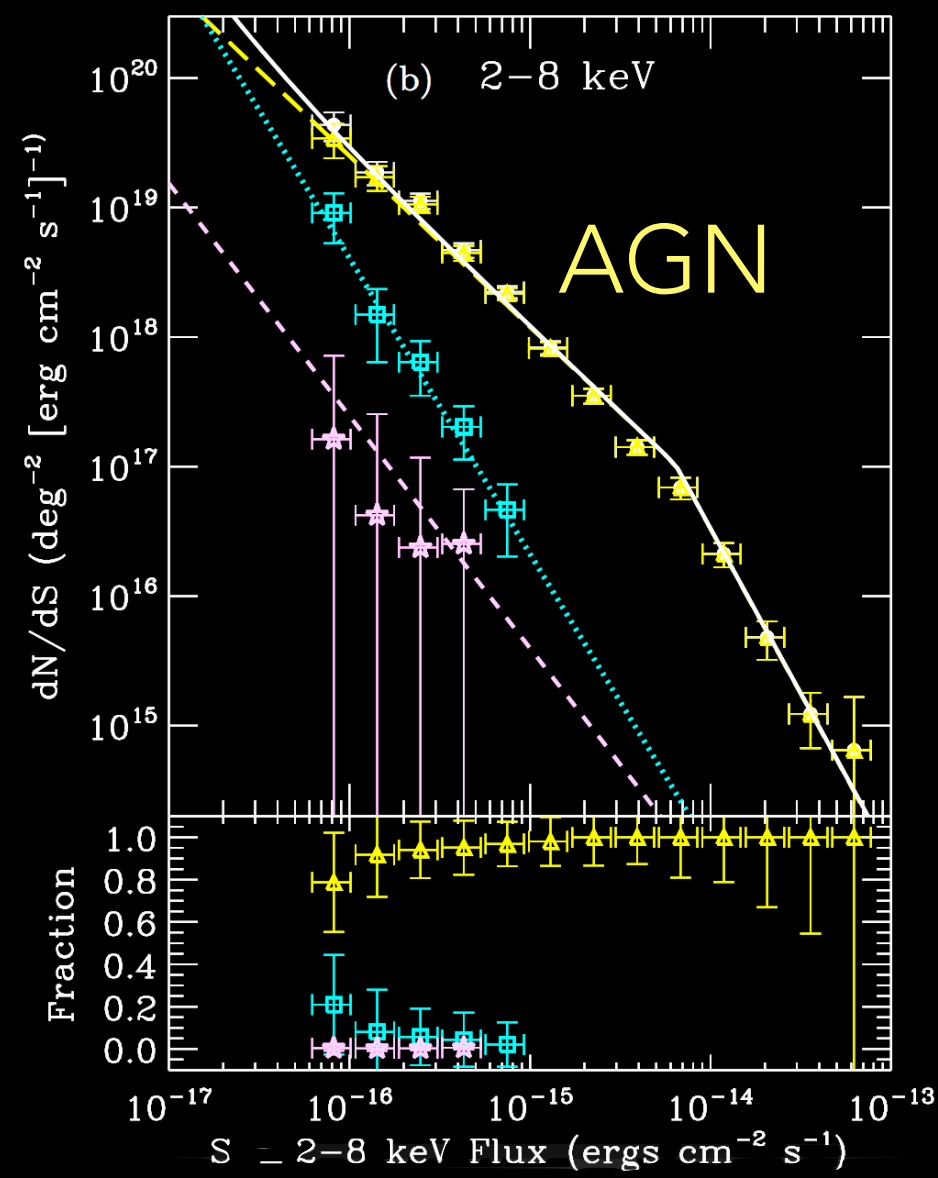
0.6 Ms



RICHNESS OF SOURCES!

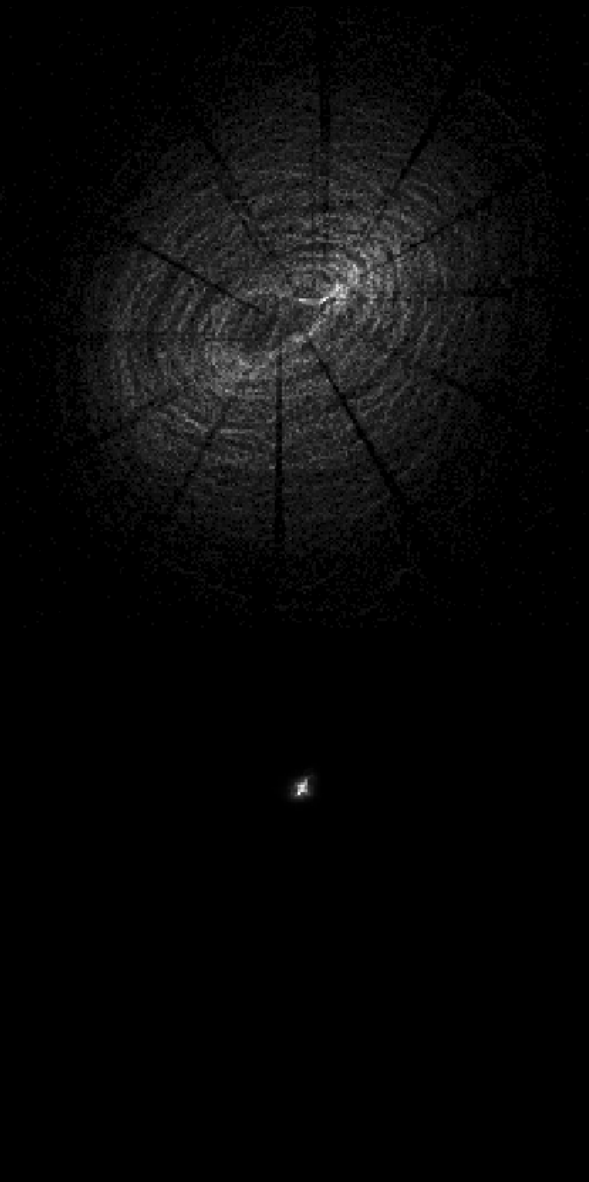


CALIBRATING THE THRESHOLDS: SIMULATIONS



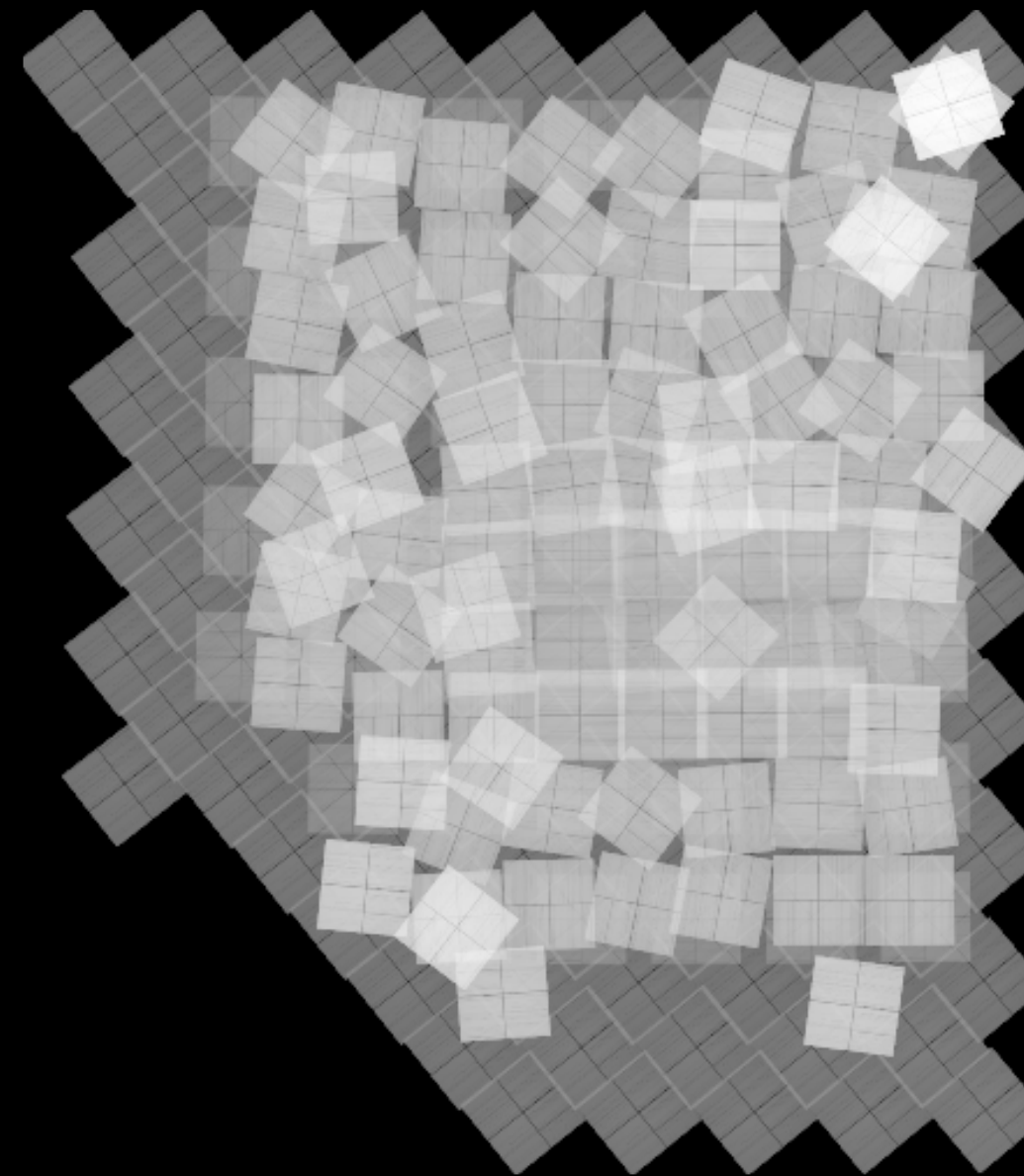
dN/dS

+



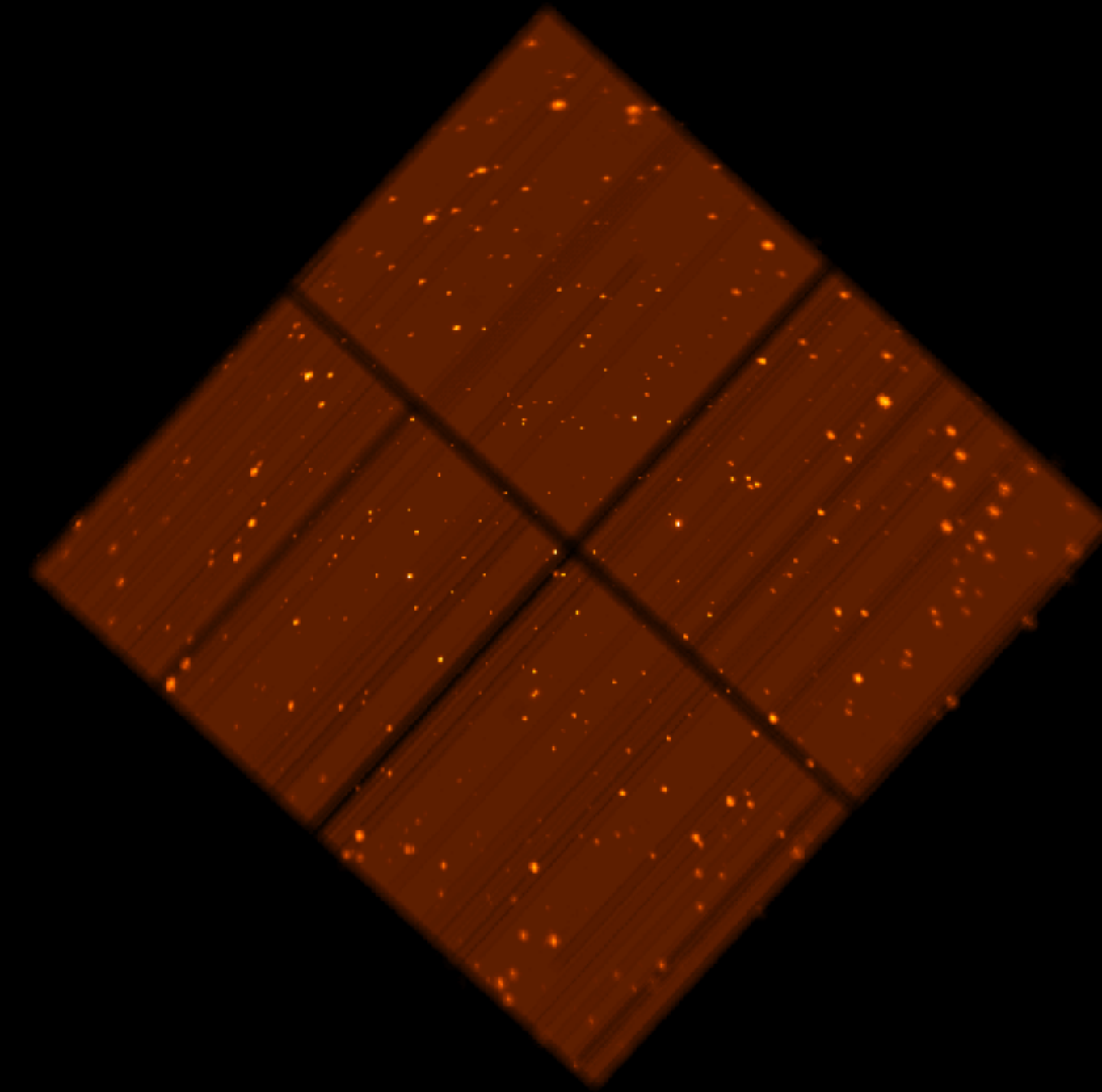
PSF

+



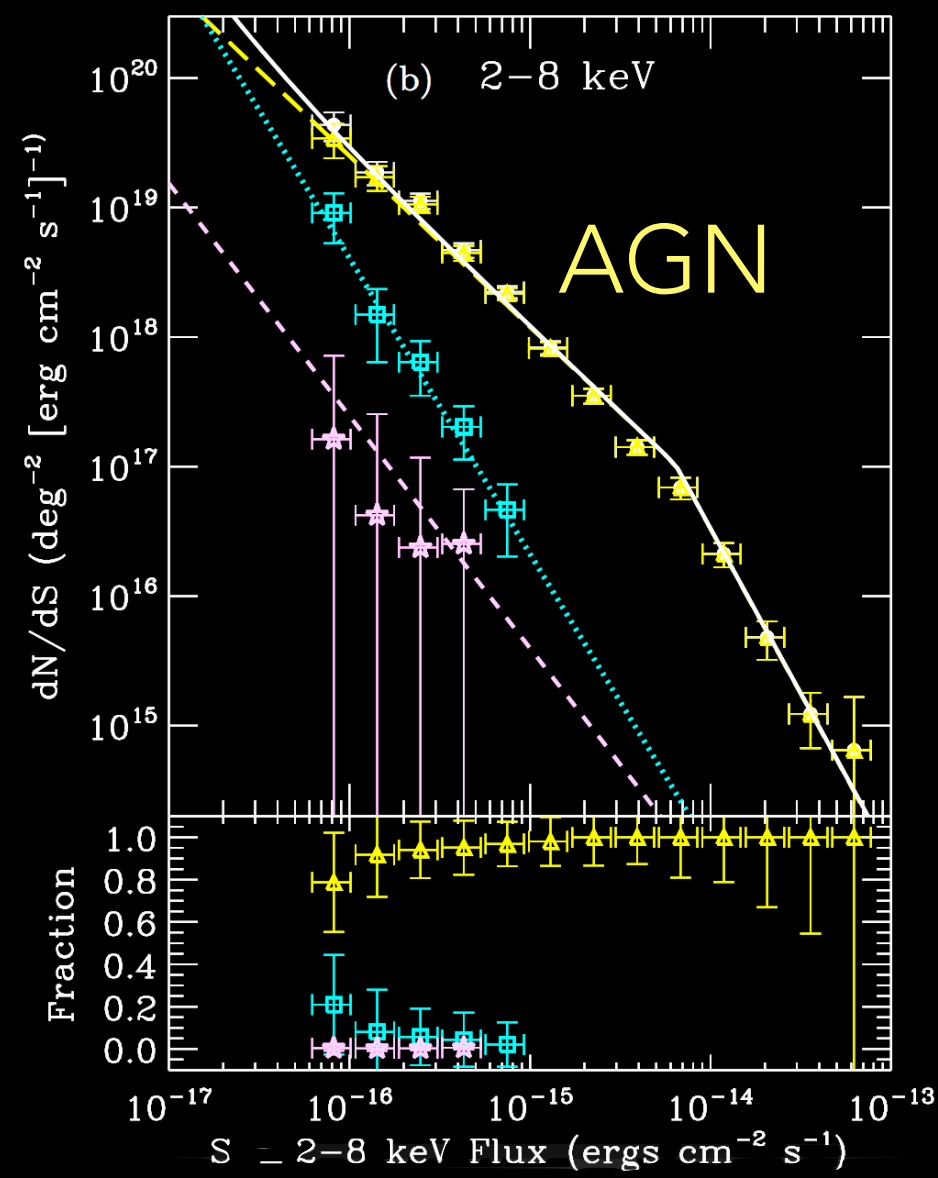
Bkg/Exp map

=

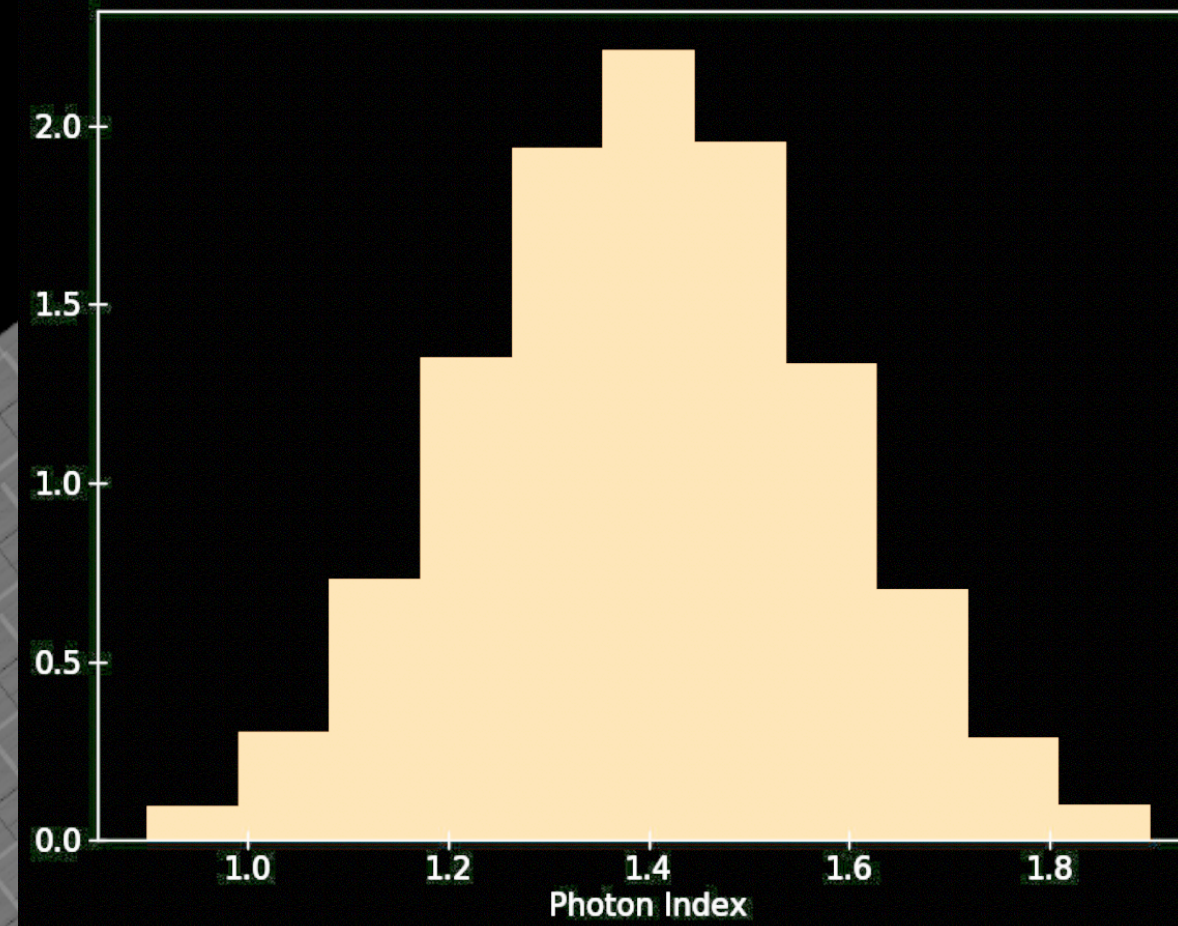
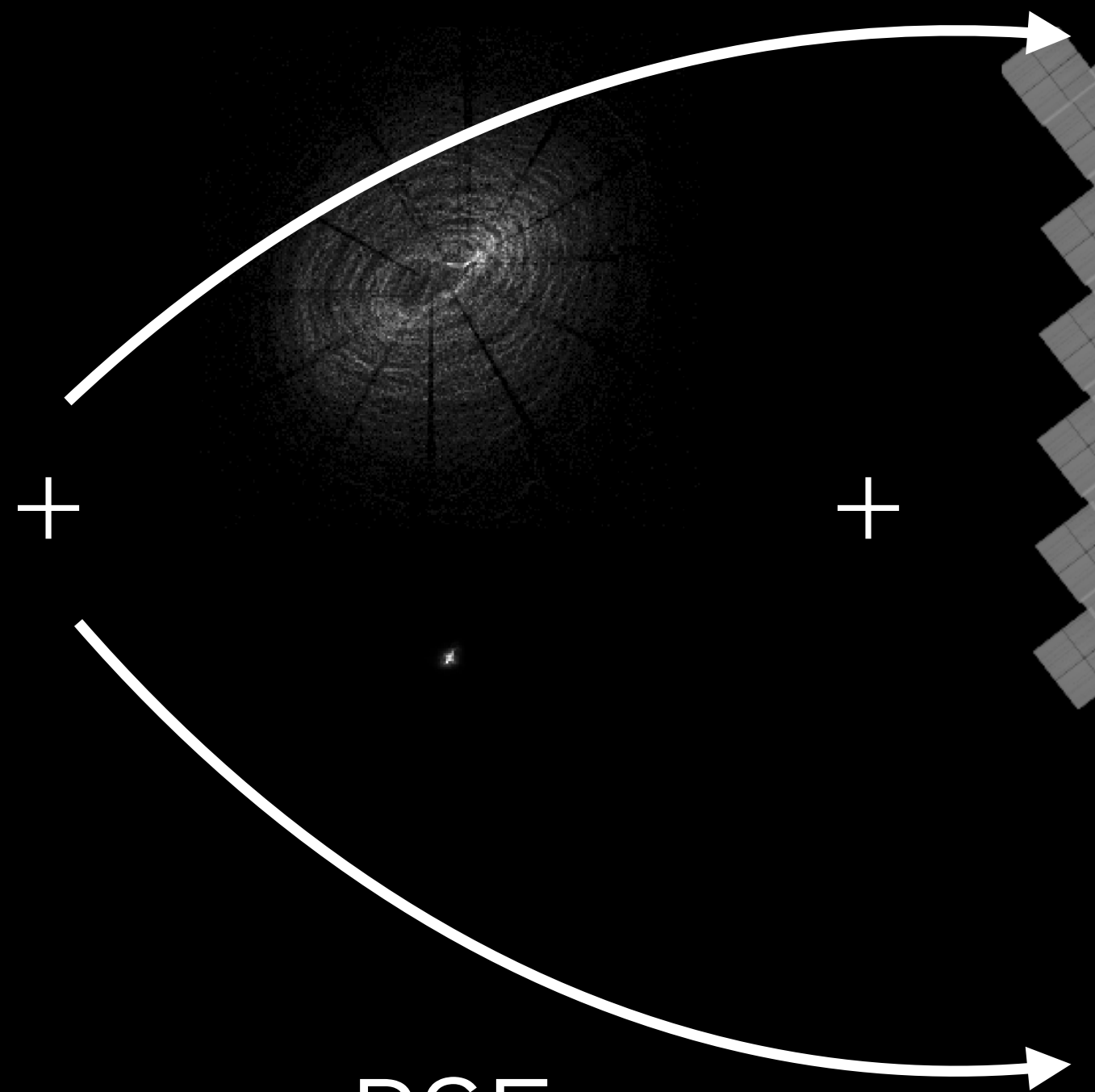


Simulated
observation

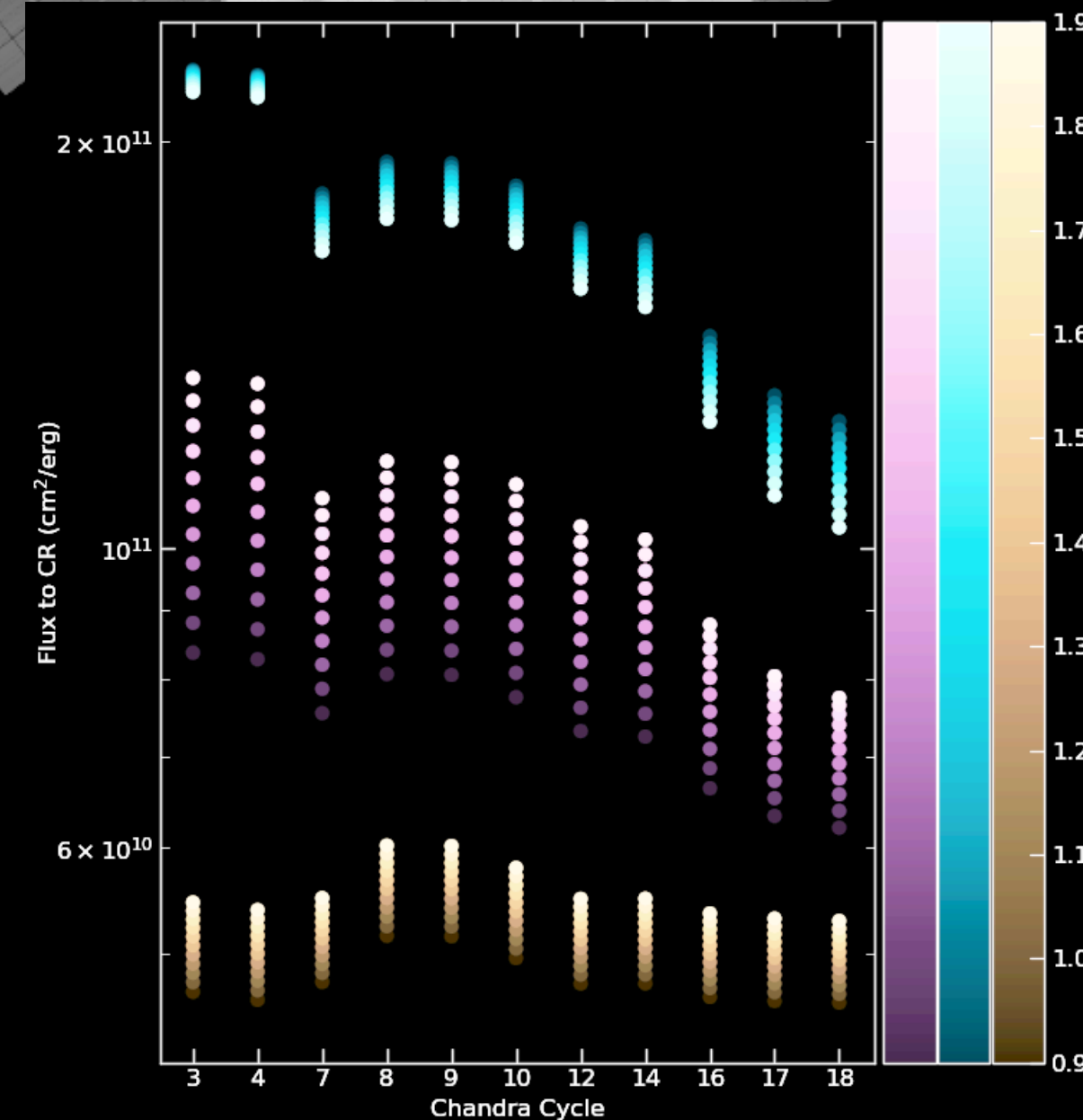
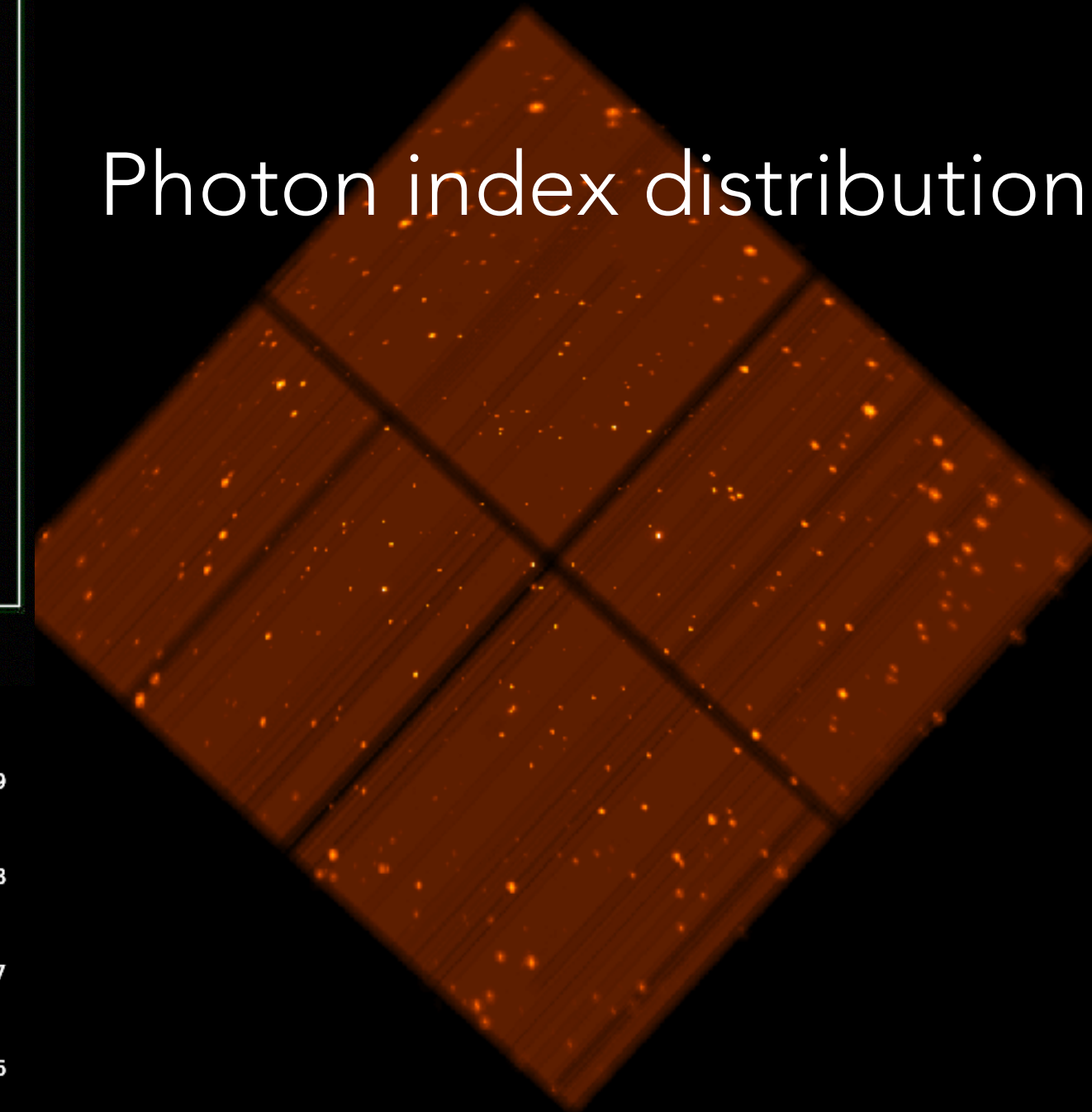
CALIBRATING THE THRESHOLDS: SIMULATIONS



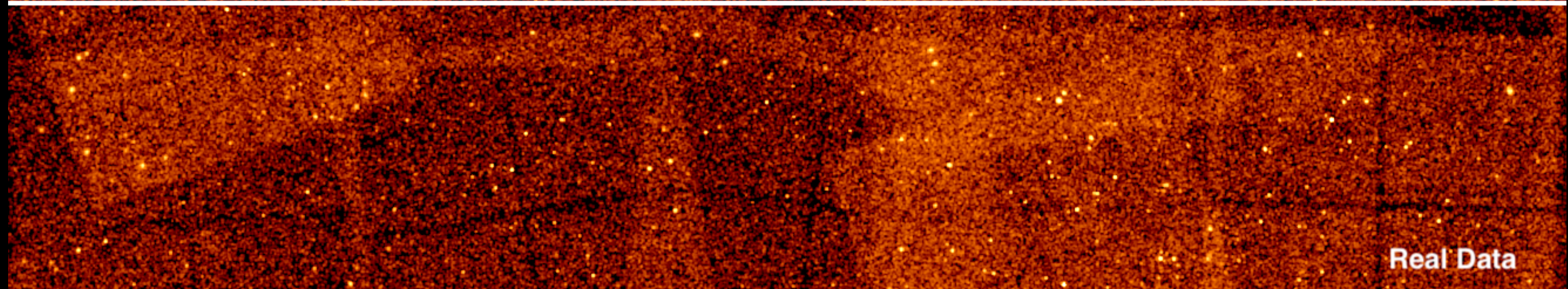
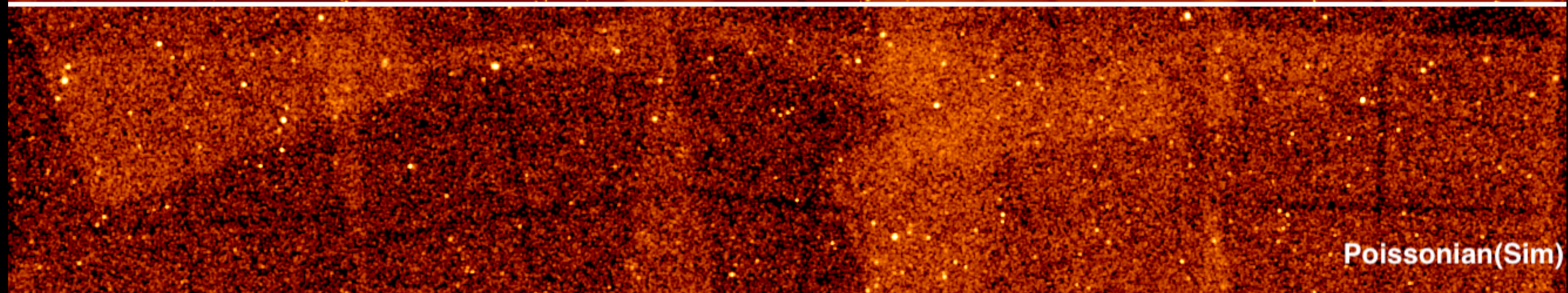
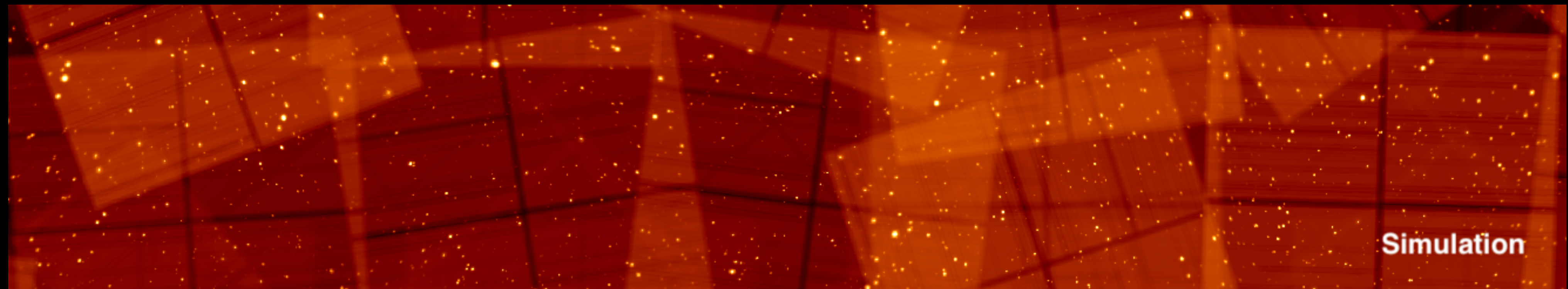
dN/dS



Photon index distribution

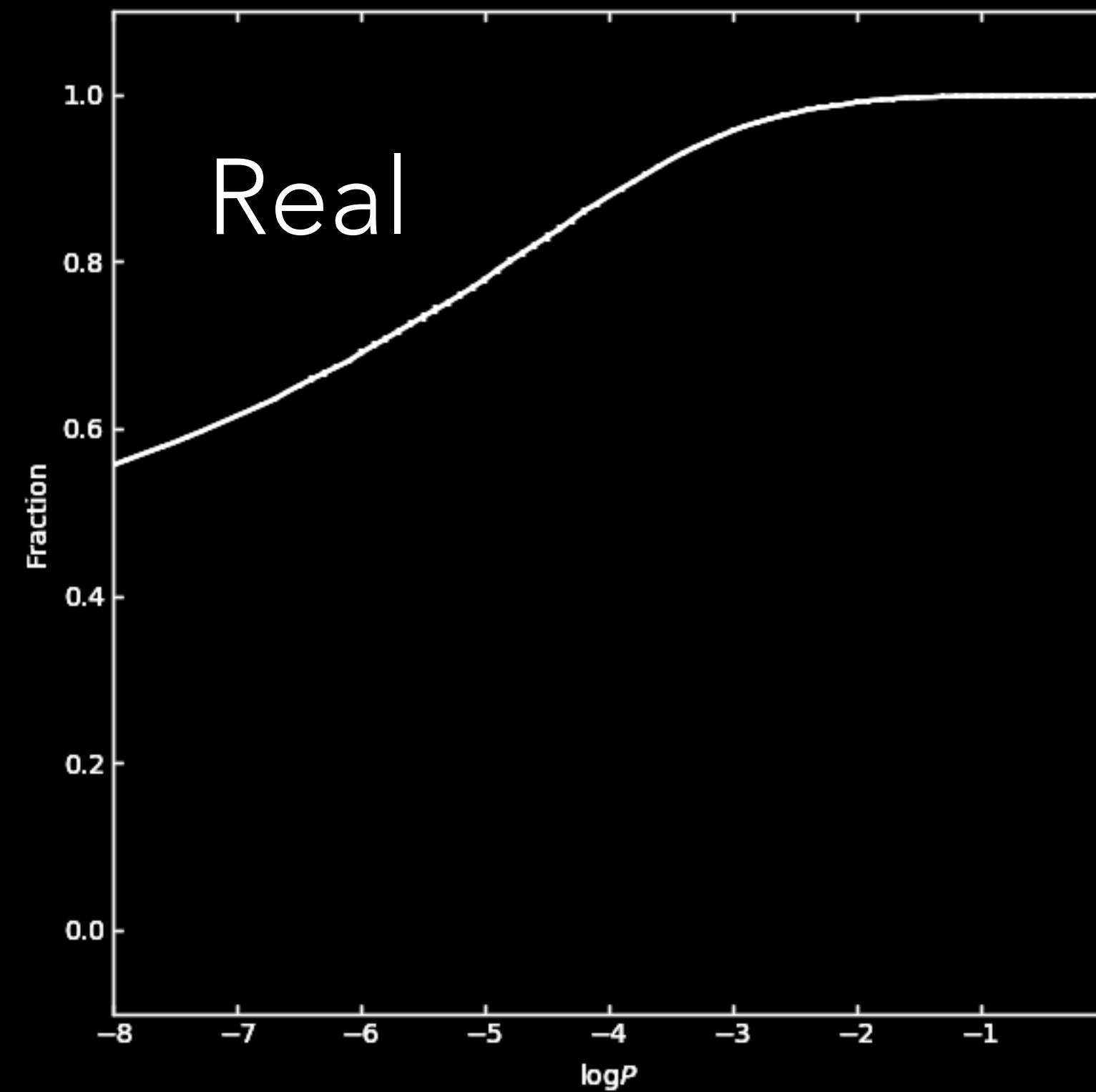


CALIBRATING THE THRESHOLDS: SIMULATIONS



CALIBRATING THE THRESHOLDS: SIMULATIONS

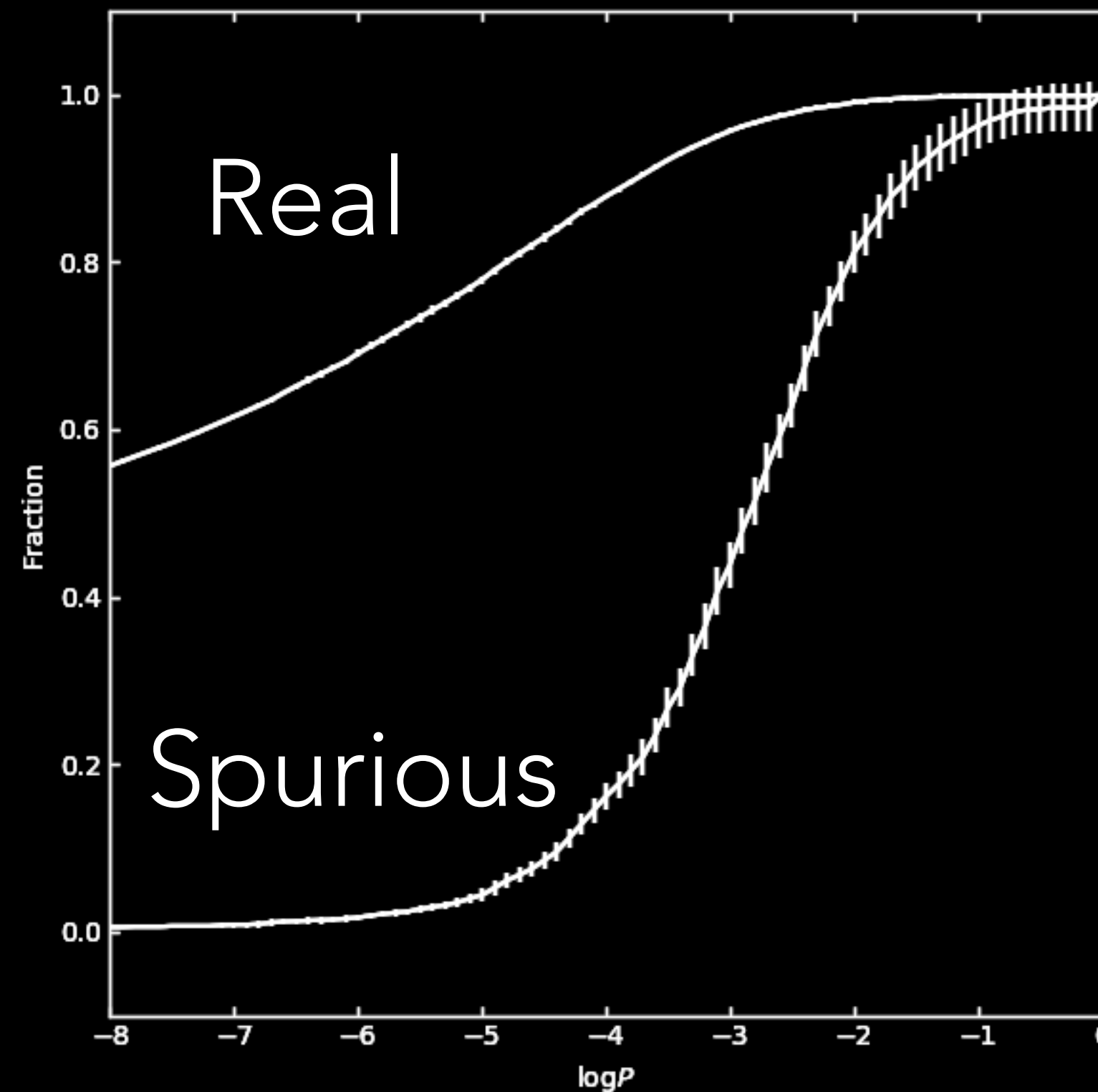
$$P(C, B) = B^C \frac{e^{-B}}{C!}$$



Real = detected and matched

CALIBRATING THE THRESHOLDS: SIMULATIONS

$$P(C, B) = B^C \frac{e^{-B}}{C!}$$

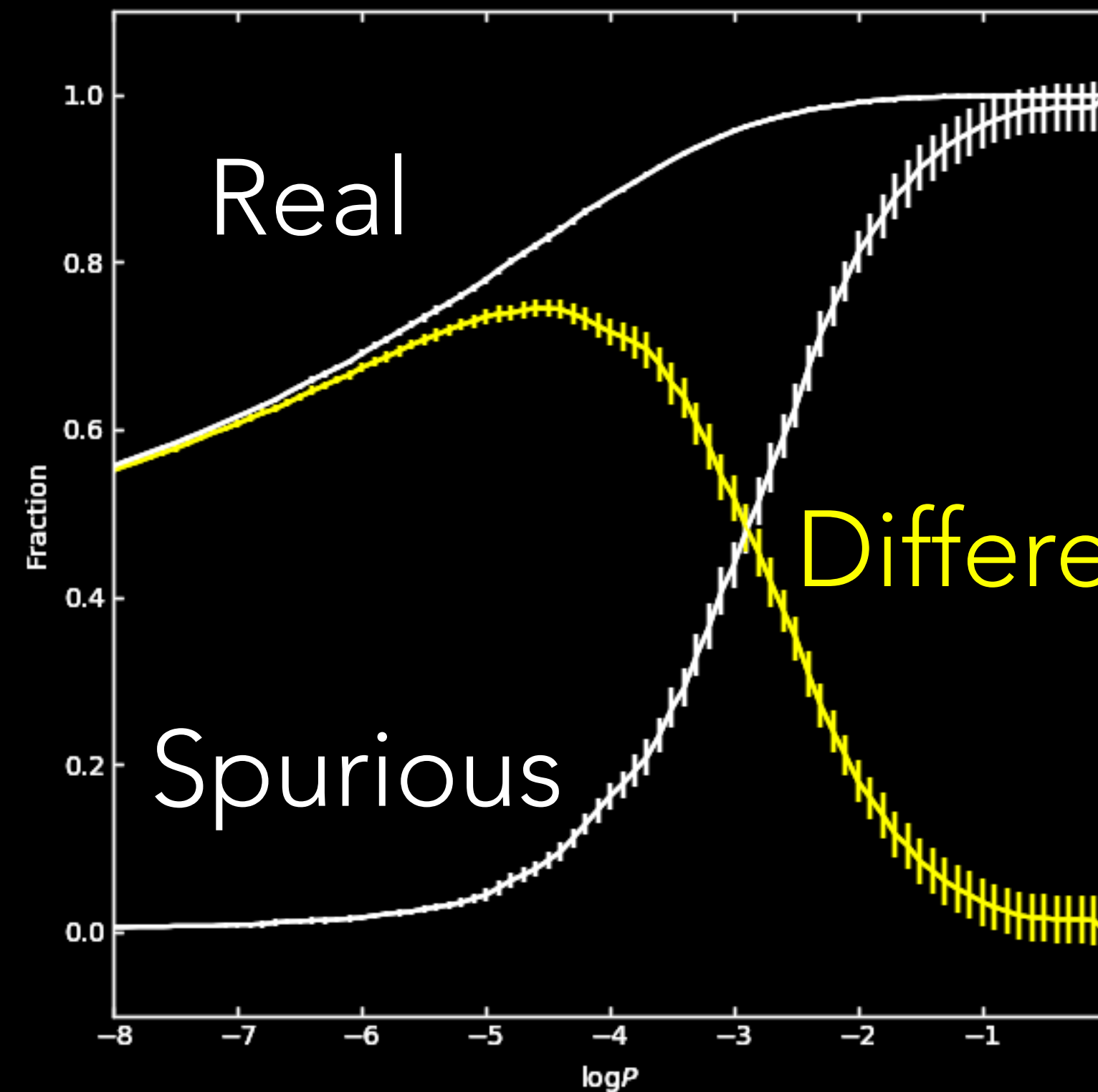


Real = detected and matched

Spurious = detected and not matched

CALIBRATING THE THRESHOLDS: SIMULATIONS

$$P(C, B) = B^C \frac{e^{-B}}{C!}$$



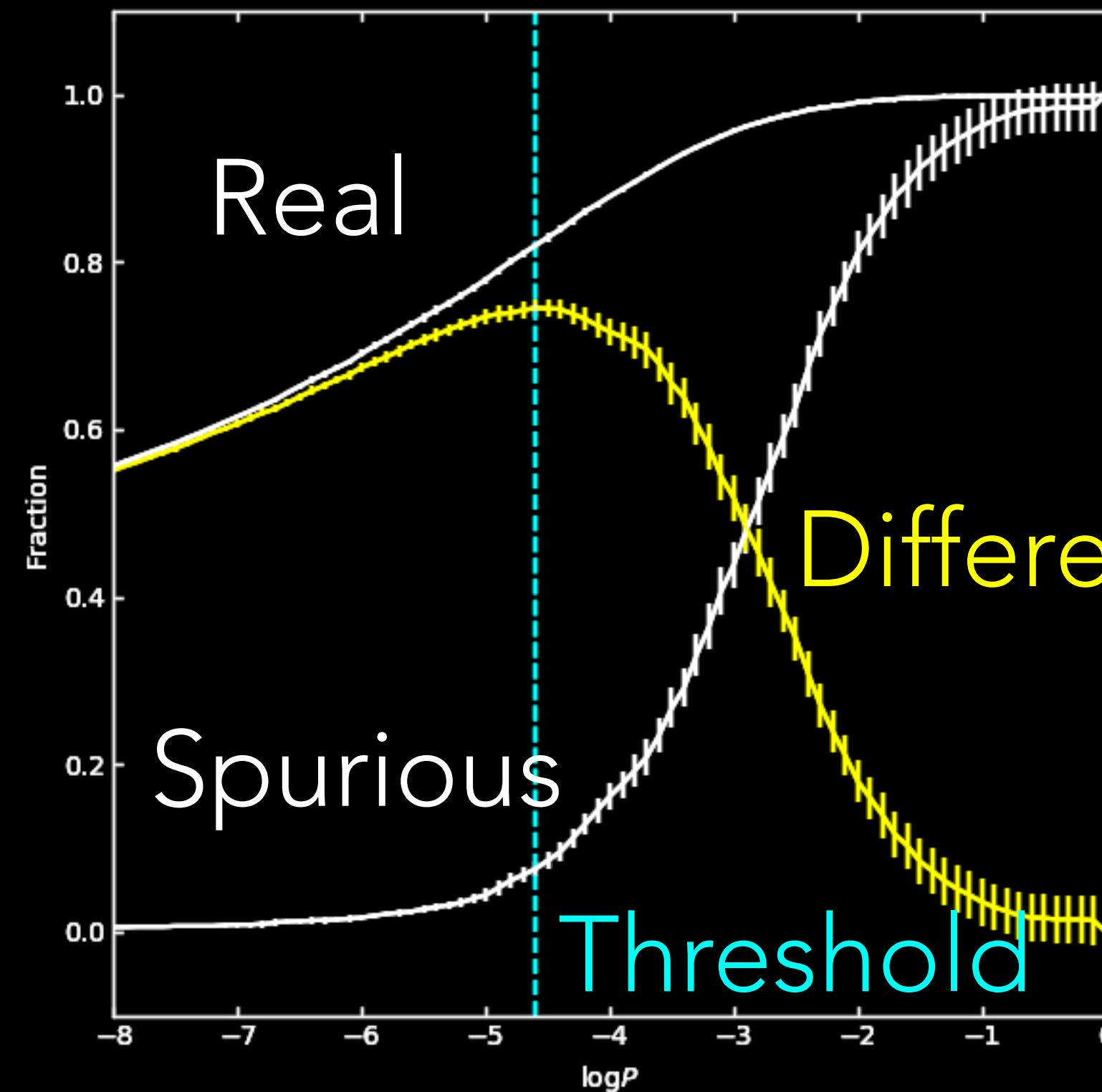
Real = detected and matched

Spurious = detected and not matched

Difference

CALIBRATING THE THRESHOLDS: SIMULATIONS

$$P(C, B) = B^C \frac{e^{-B}}{C!}$$



Real = detected and matched

Spurious = detected and not matched

Difference

Threshold

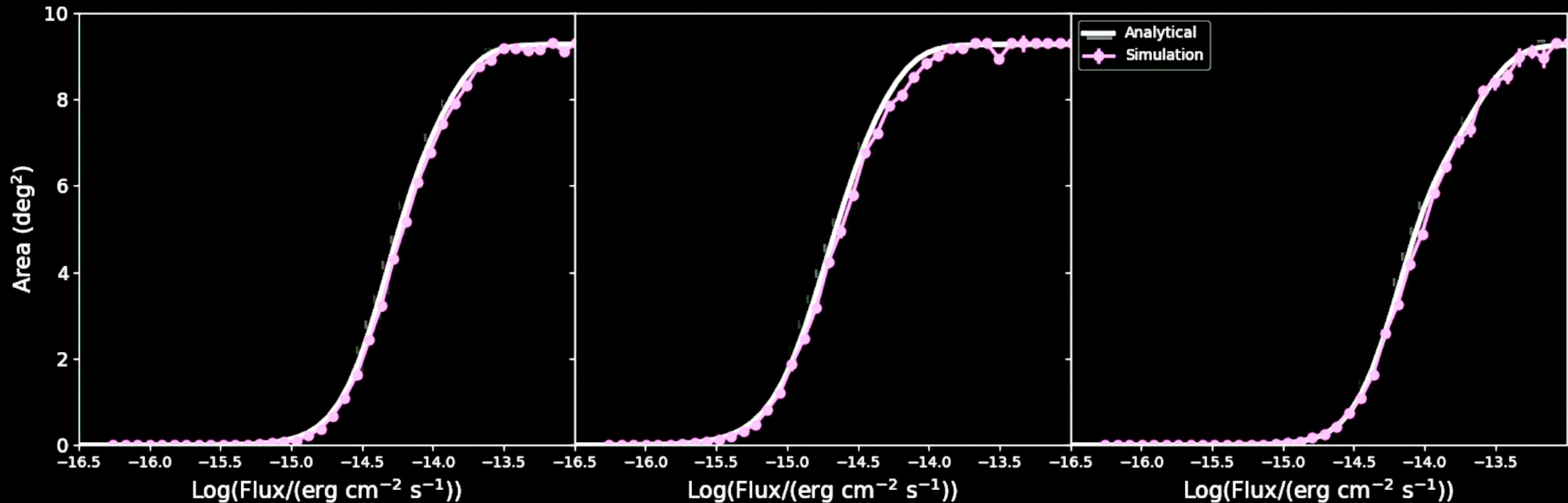
THE X-RAY POINT SOURCE CATALOG

6843 unique X-ray point sources

2841 XBOOTES are matched (452 missing)

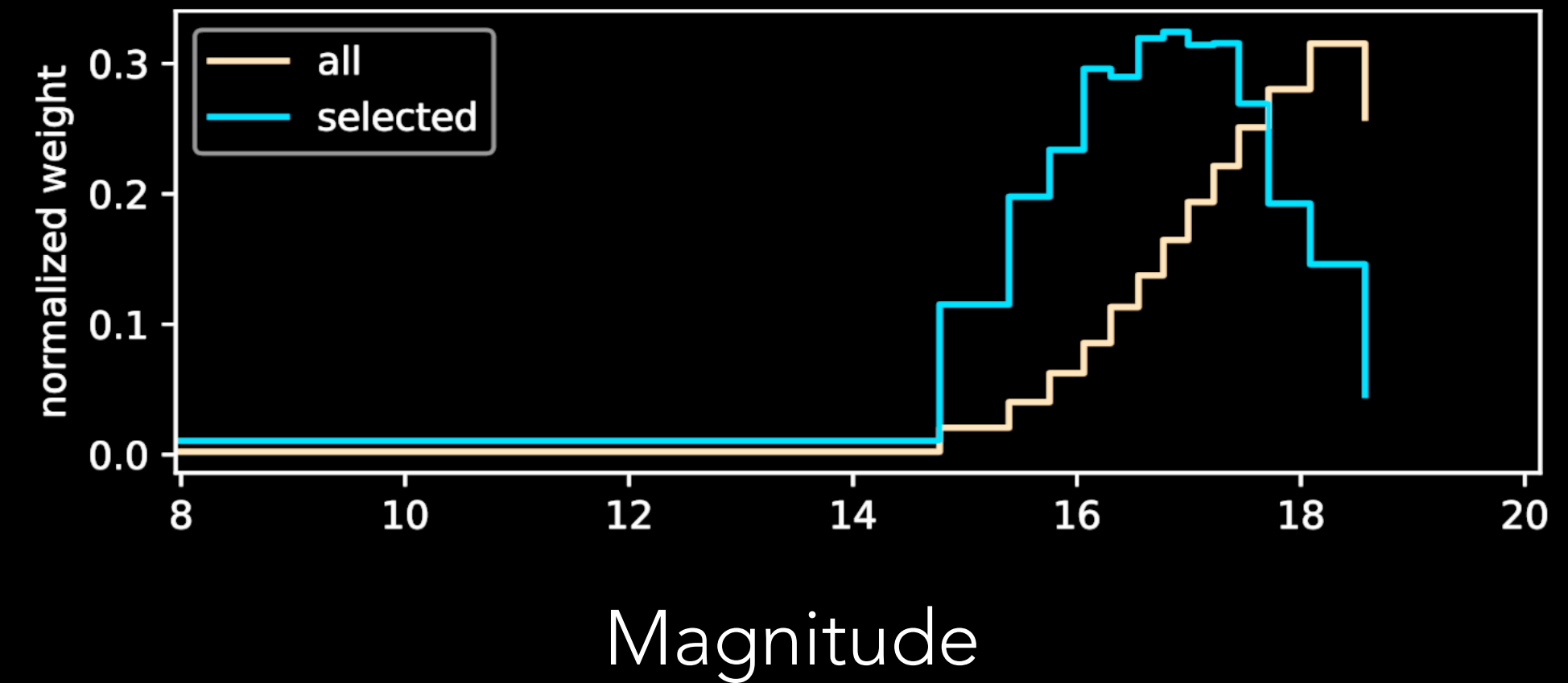
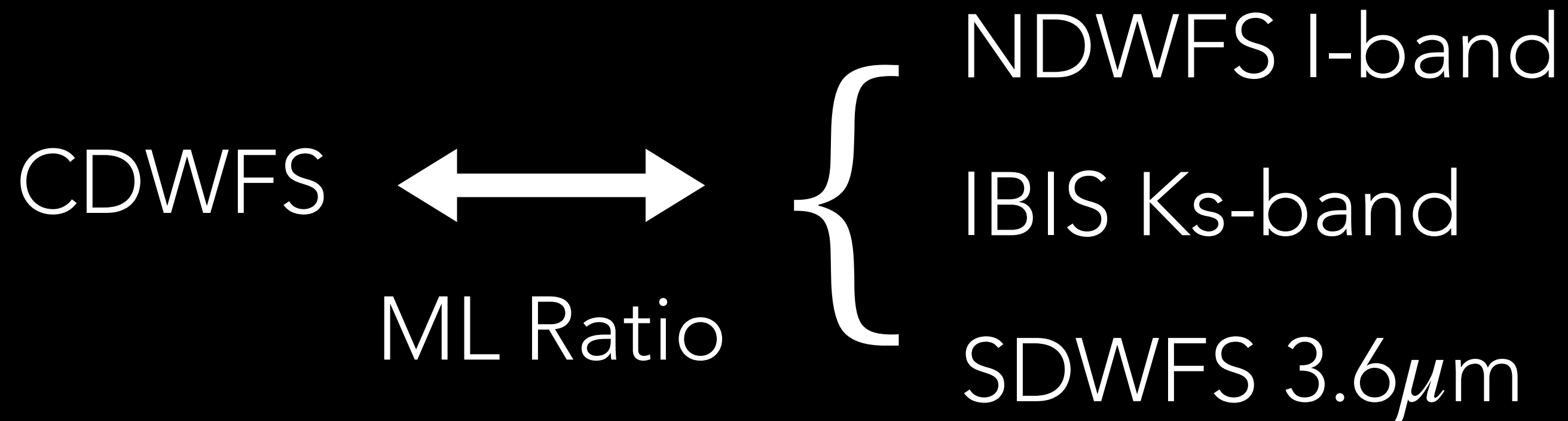
66/452 would satisfy our cuts

$$6843 + 66 = 6909$$



MULTI-WAVELENGTH COUNTERPARTS AND REDSHIFTS

NWAY (Salvato et al. 2018)



5687 optical - NIR counterparts, 4268 redshifts (2021 spec and 2247 phot)

MULTI-WAVELENGTH COUNTERPARTS AND REDSHIFTS

