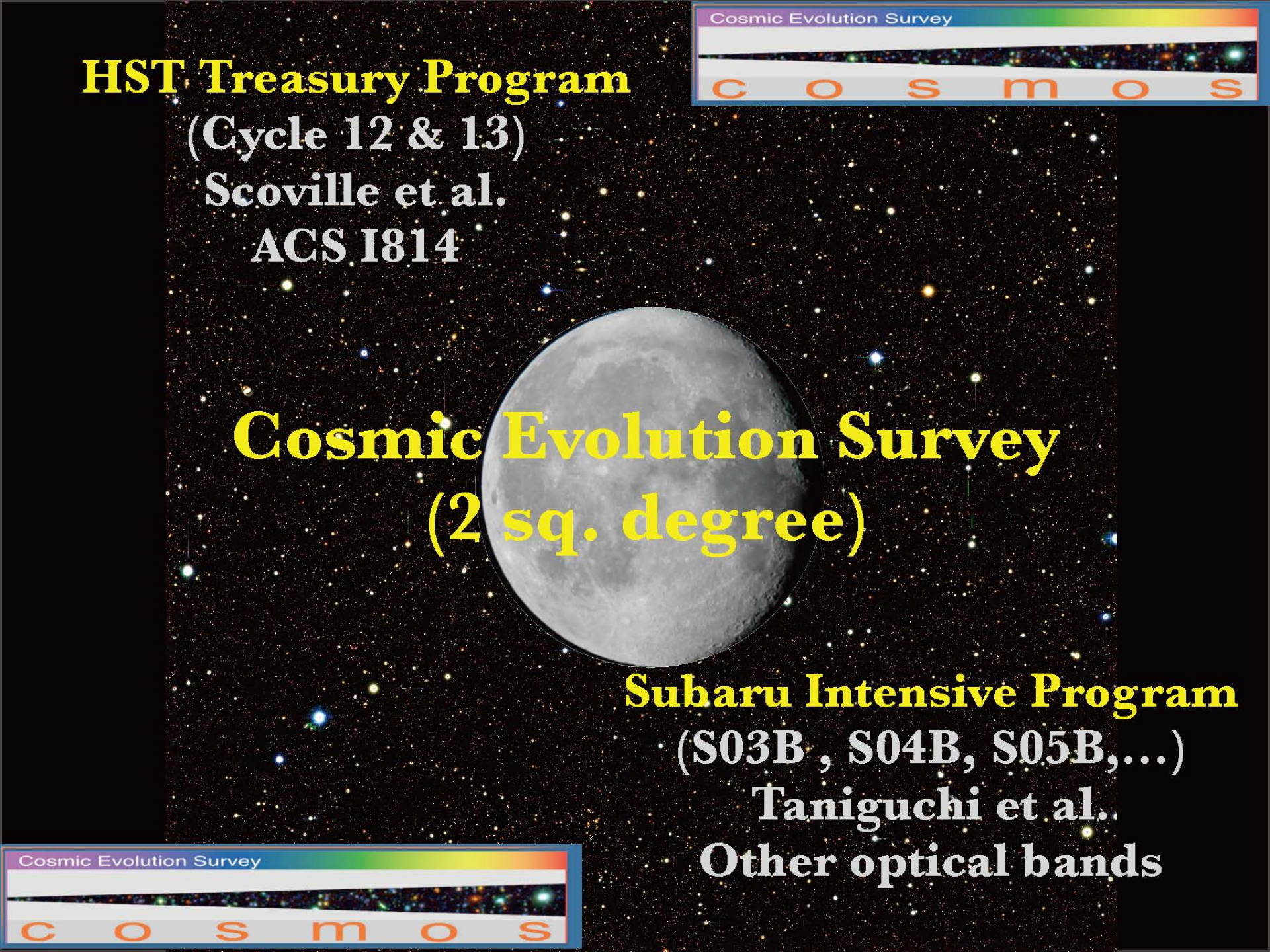
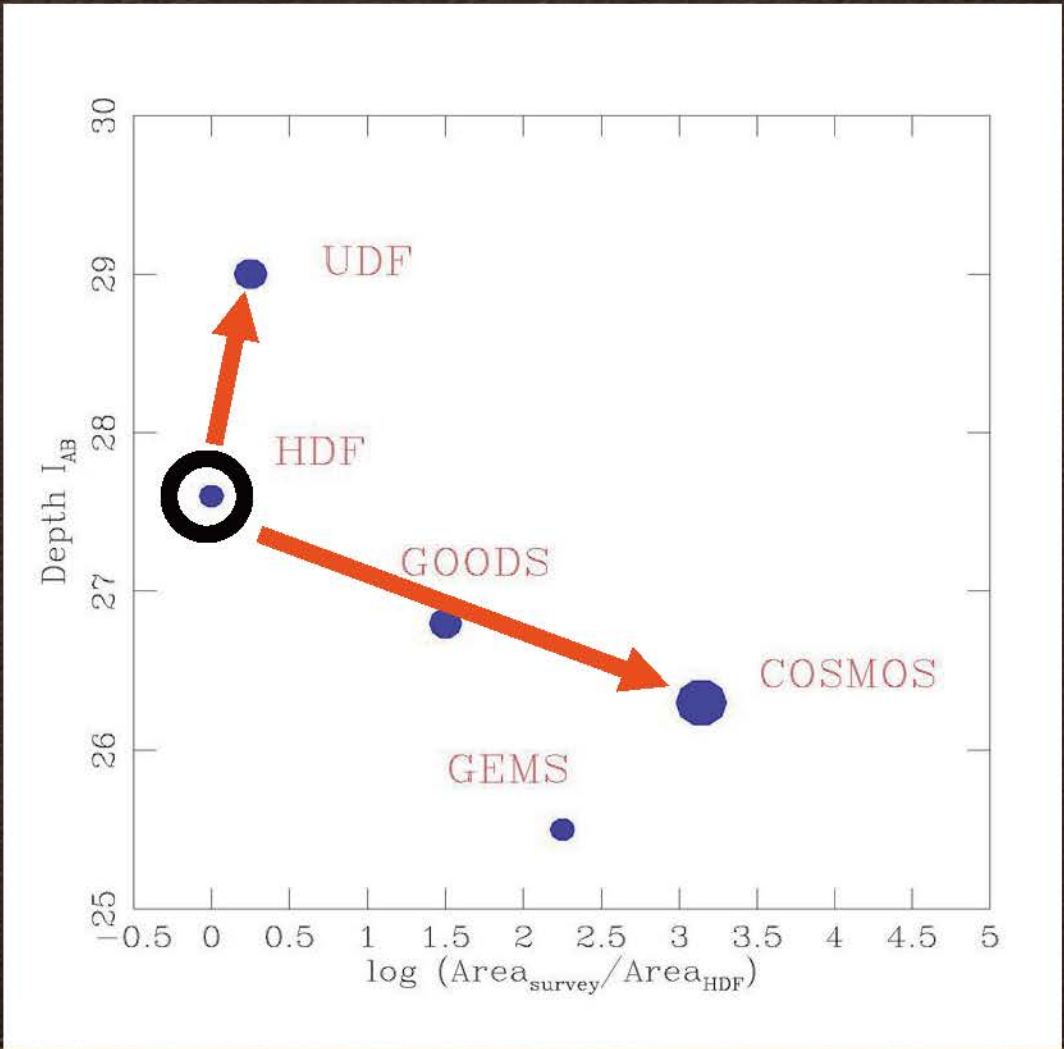

Cosmic Evolution Survey
c o s m o s
HST Treasury Program
(Cycle 12 & 13)
Scoville et al.
ACS I814
Cosmic Evolution Survey
(2 sq. degree)
Subaru Intensive Program
(S03B , S04B, S05B,…)
Taniguchi et al.
Other optical bands
Cosmic Evolution Survey
c o s m o s

Nick Scoville@CALTECH
COSMOS REAL SURVEY
Twilight Flat
FocusAG
SA95
SDSS1
COSMOS
すばる望遠鏡リモート観測室にて

# From HDF to UDF
# From GOODS to COSMOS



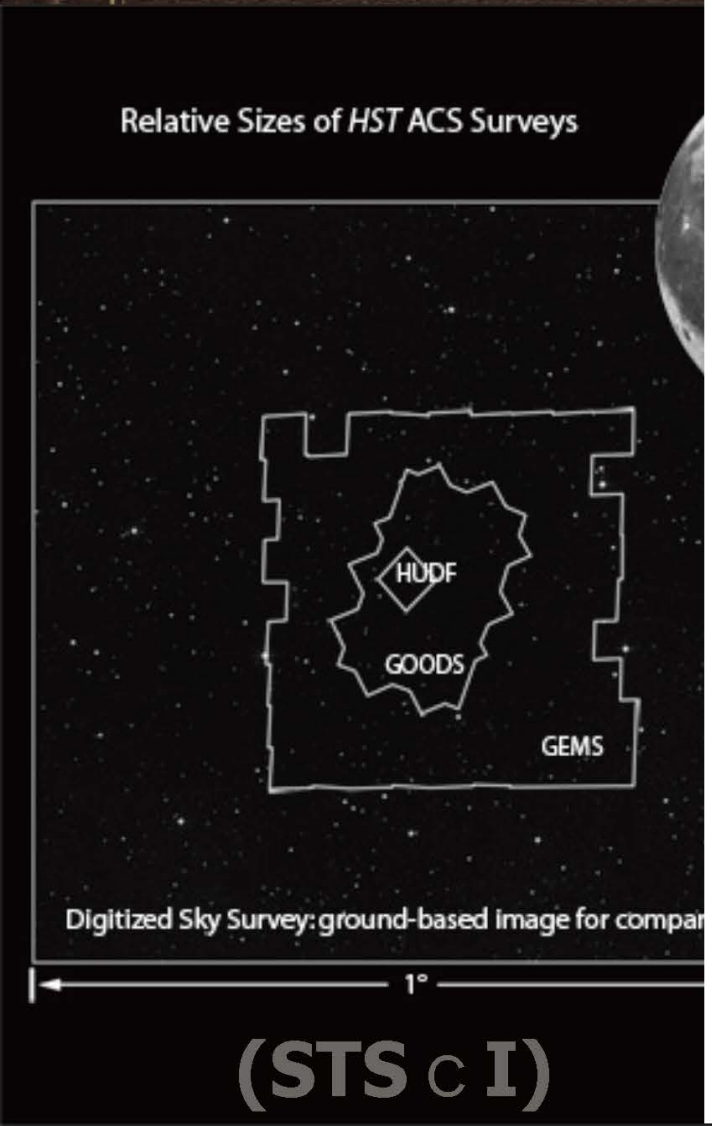
# Key Issues & Key Words

*Extragalactic Astronomy*

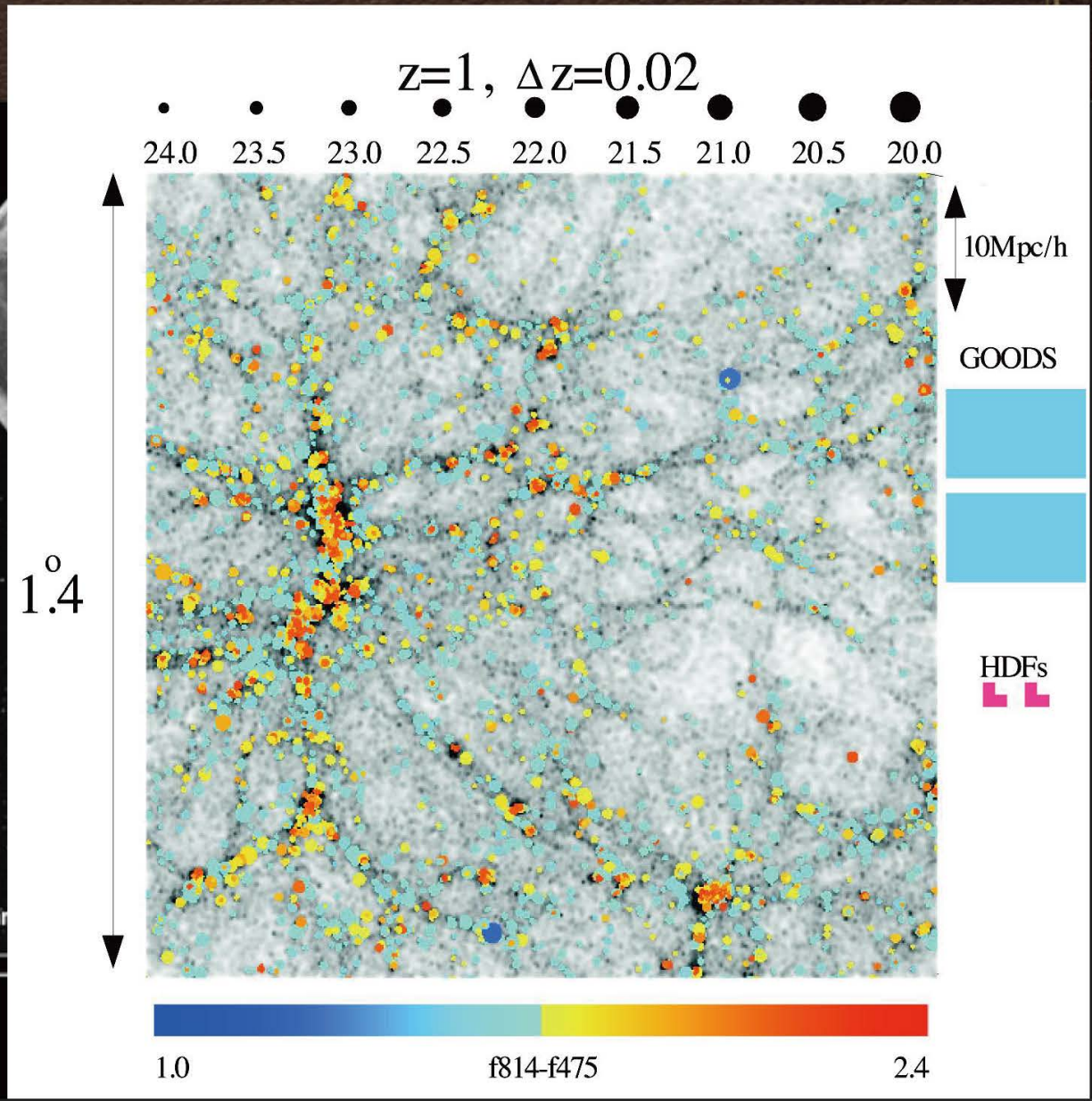
*Observational Cosmology*

*Evolution of Galaxies, AGNs, & DM*
*as a function of*
*Large Scale Structure Evolution*

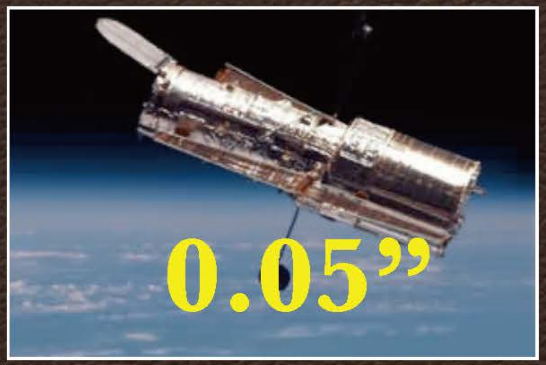
# How wide ?




(STS c I)



# Multi-λ Strategy w/ Great Observatories



# Suprime-Cam Observations from S03B to S06B

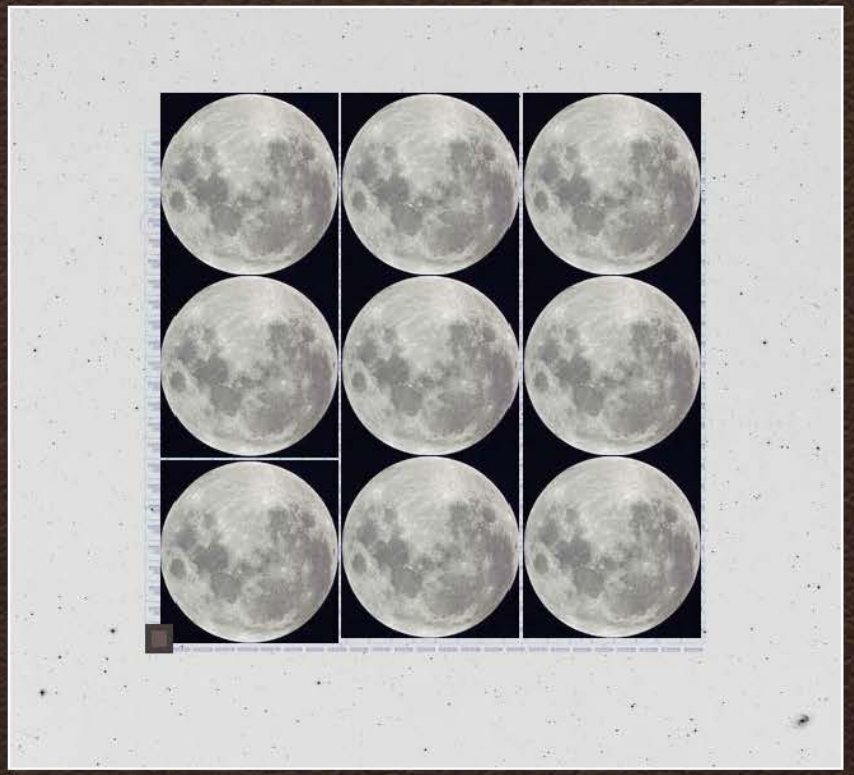
S03B-239(IP): broad band (Taniguchi+)
S04A-080 : NB816 (Taniguchi+)
S04B-142(IP): COSMOS-21 (Taniguchi+)
S05B-013(IP): COSMOS-21 (Taniguchi+)
S06B-026 : COSMOS-21 (Taniguchi+)

# The COSMOS 2 square degree Field

α(J2000) = 10:00:28.6; δ(J2000) = + 02:12:21

N

E



HST/ACS

$1.4^{0}$

# The COSMOS 2 square degree Field

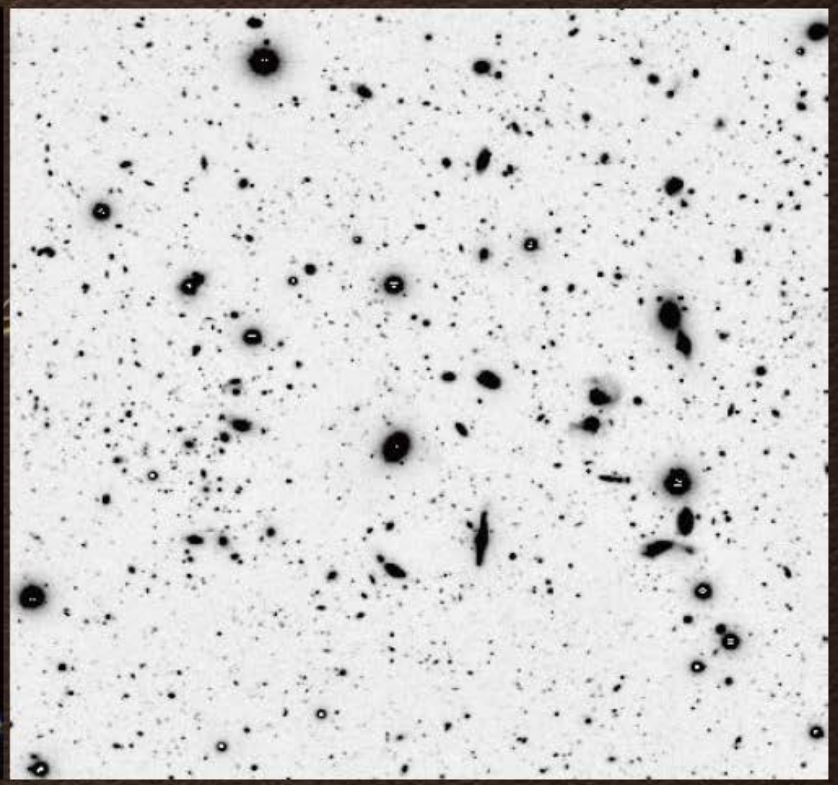
α(J2000) = 10:00:28.6; δ(J2000) = + 02:12:21

N

E

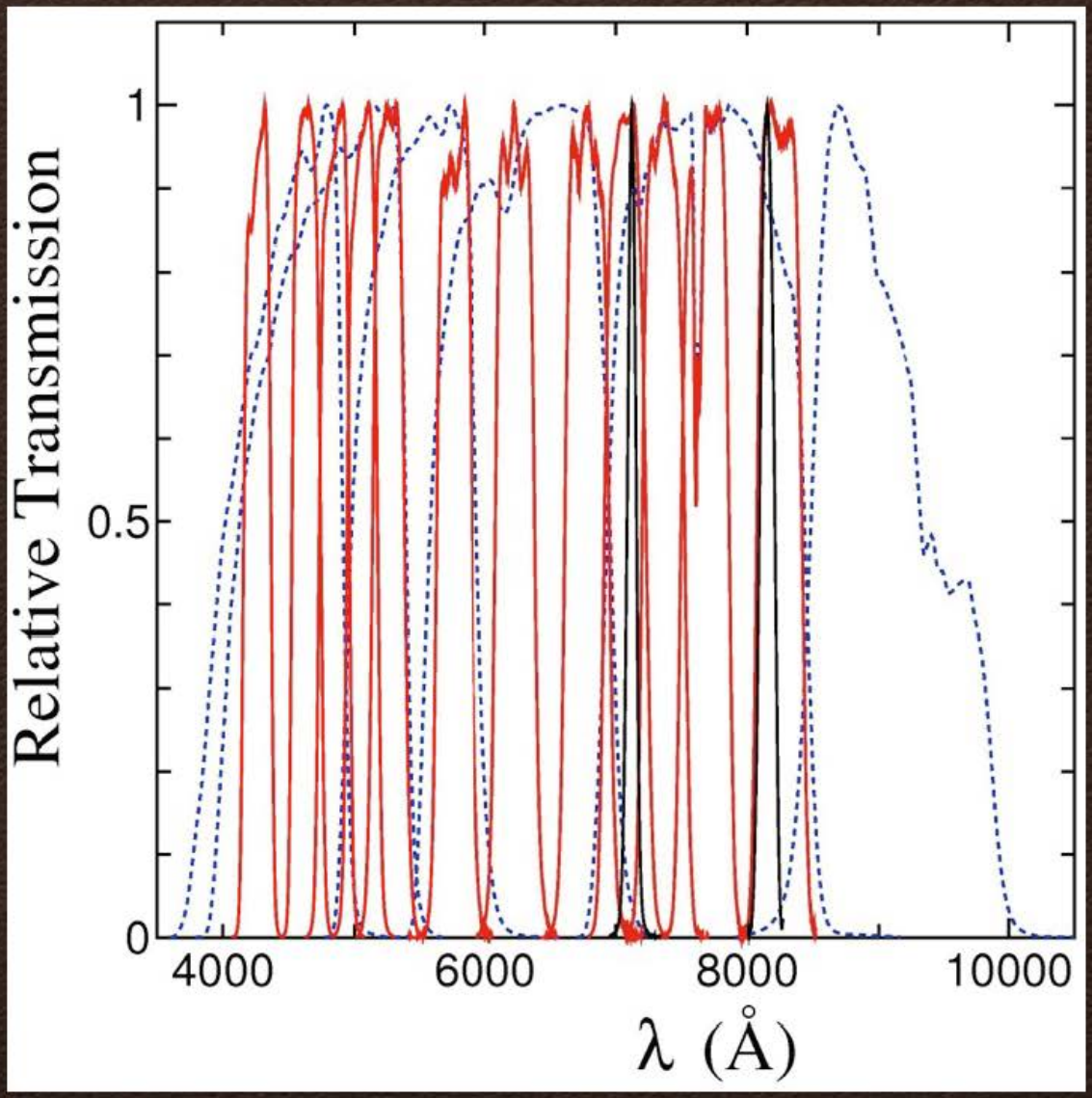
$1.4^0$

# ACS vs. Suprime-cam (central 2’ x 2’)



ACS I814+g’ Suprime-Cam i ’

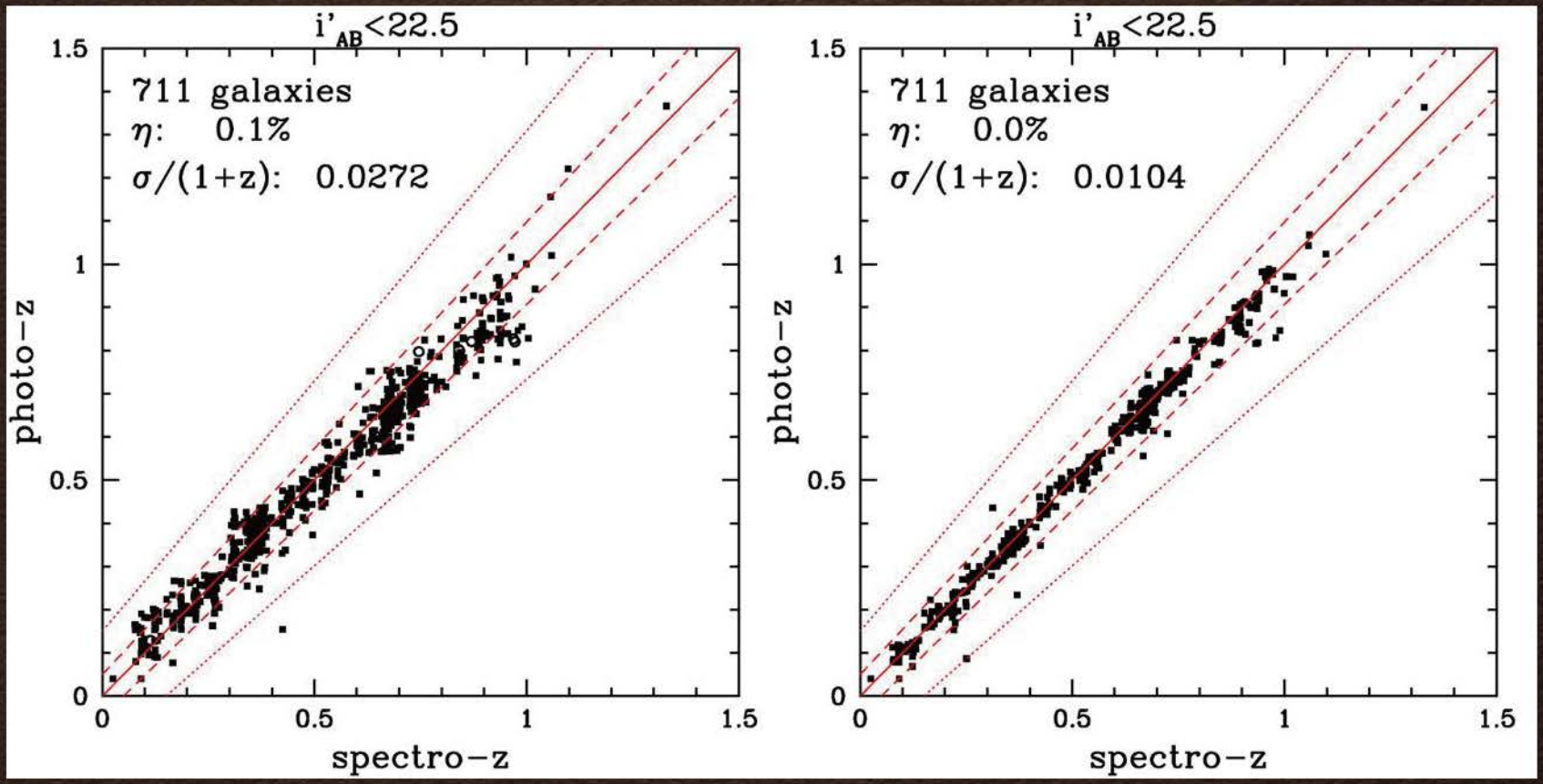
# COSMOS-20



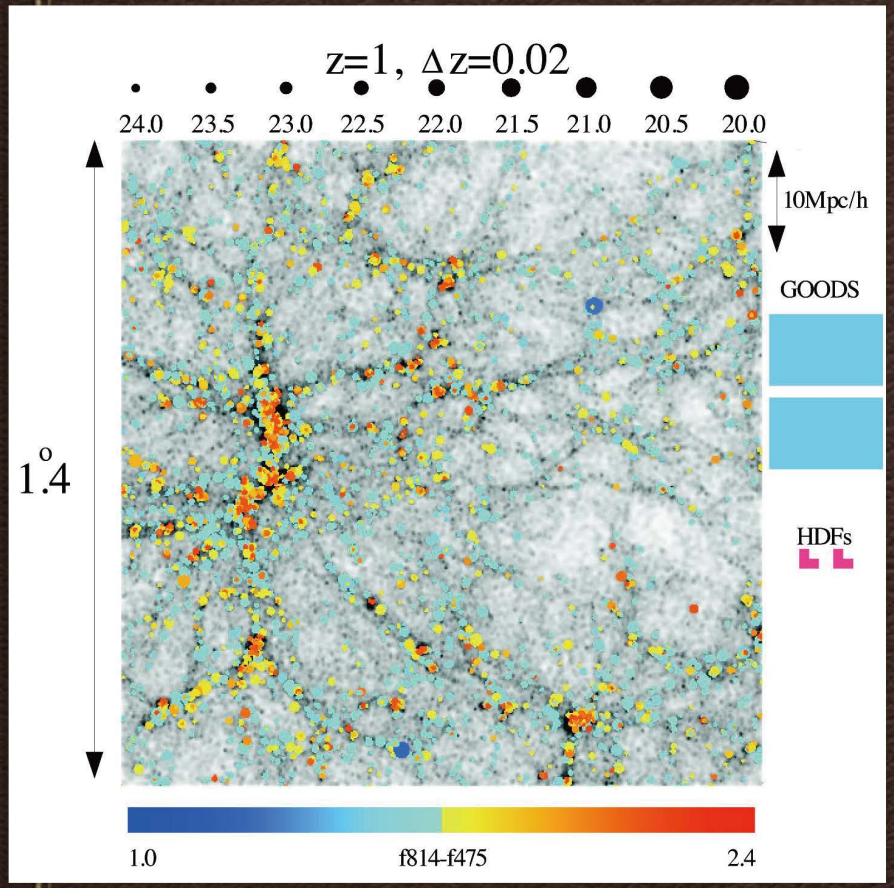
# Spec-z vs Photo-z

## without IA

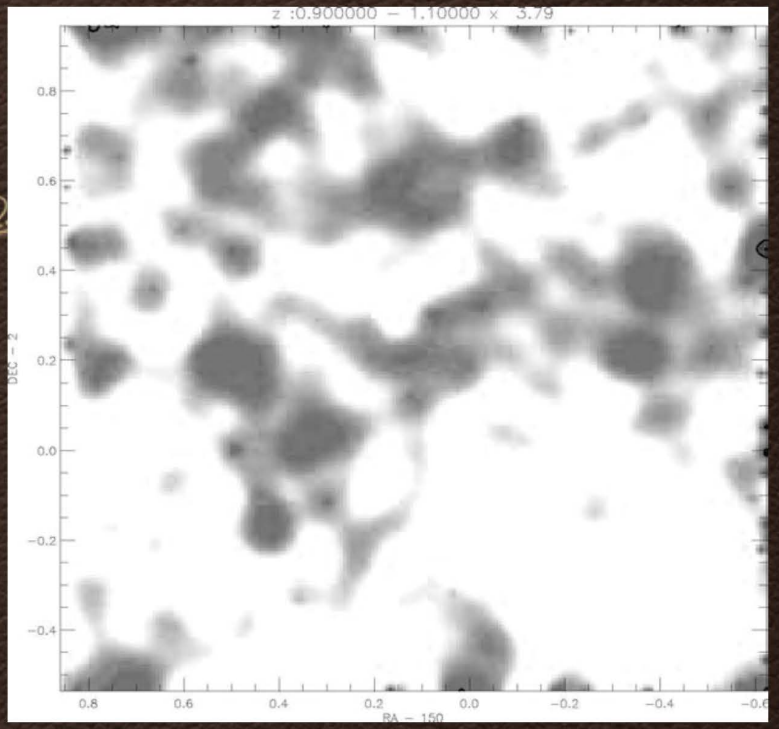
## with IA



# Probe LSS Evolution Accurately !



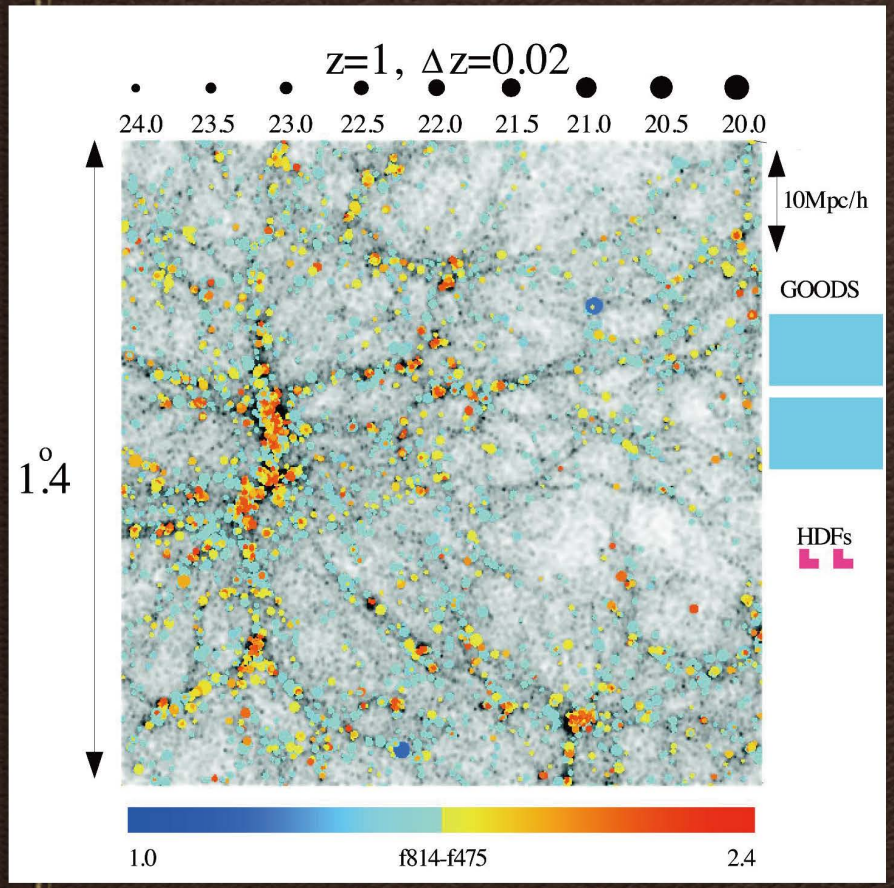

$z$ = 0.9 - 1.0



ΛCDM (Frenck et al.)

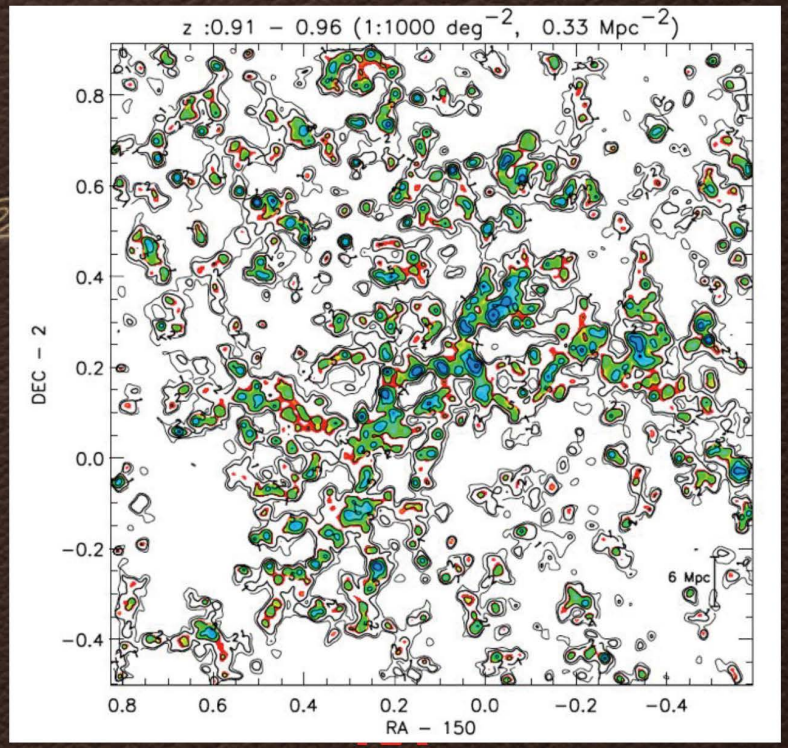
COSMOS

# Probe LSS Evolution Accurately !




ΛCDM (Frenck et al.)

$z = 0.91 - 0.96$

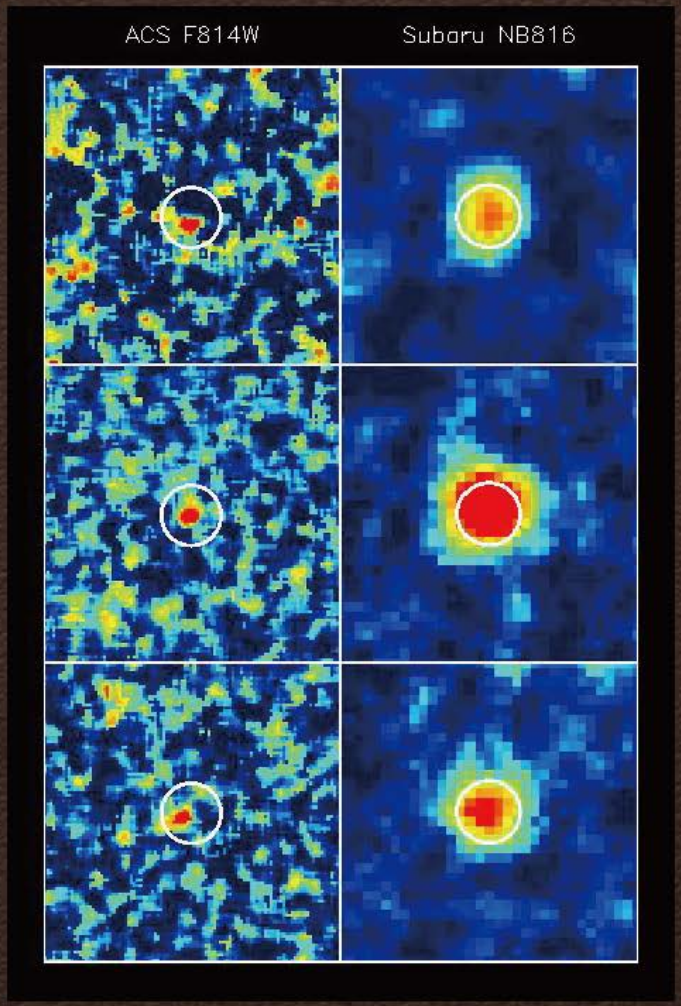



Cosmos-20

# 3D Dark Matter Map in the Universe provides evidence for CDM-driven Galaxy Formation

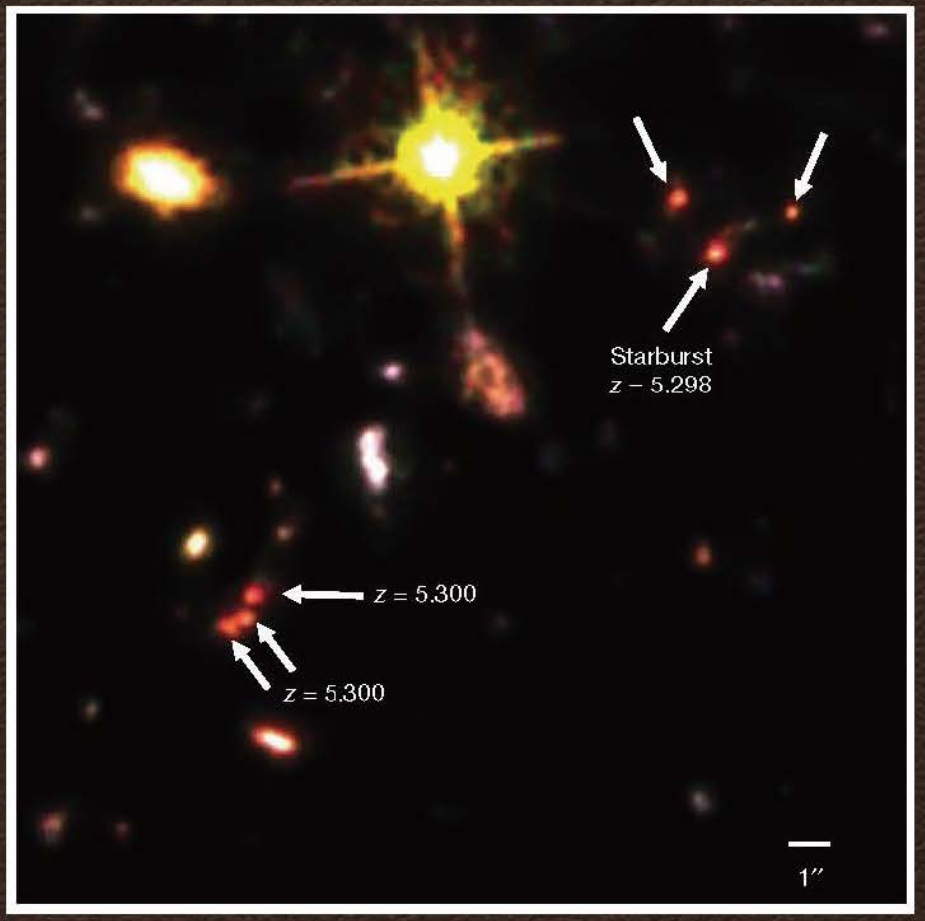
*(Massey+07, Nature, 455, 286)*

# High-$z$ LAEs are compact (~1 kpc)



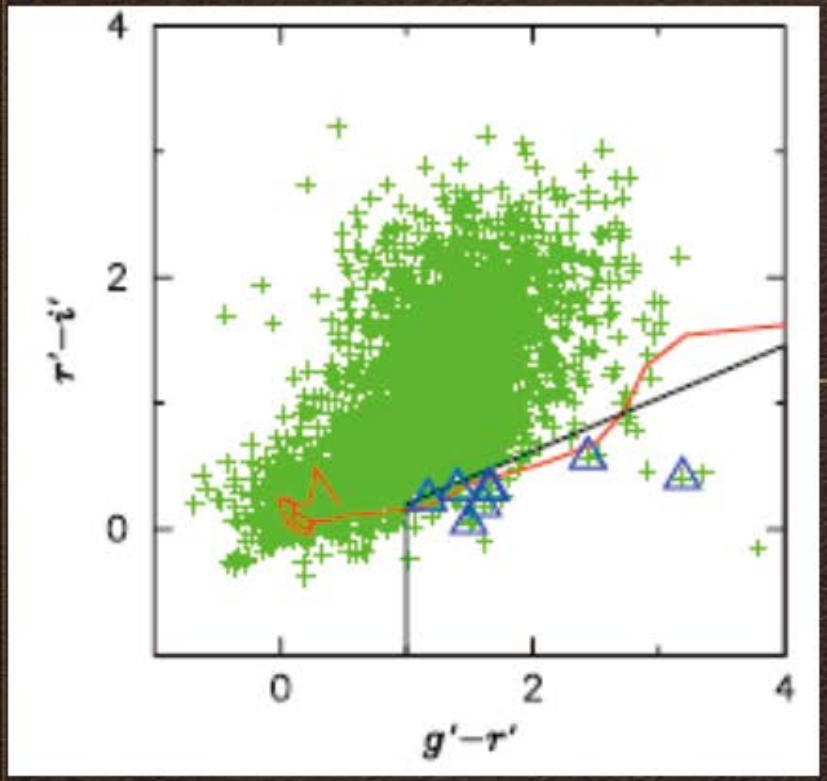

*(Taniguchi+09, ApJ, 701, 915)*

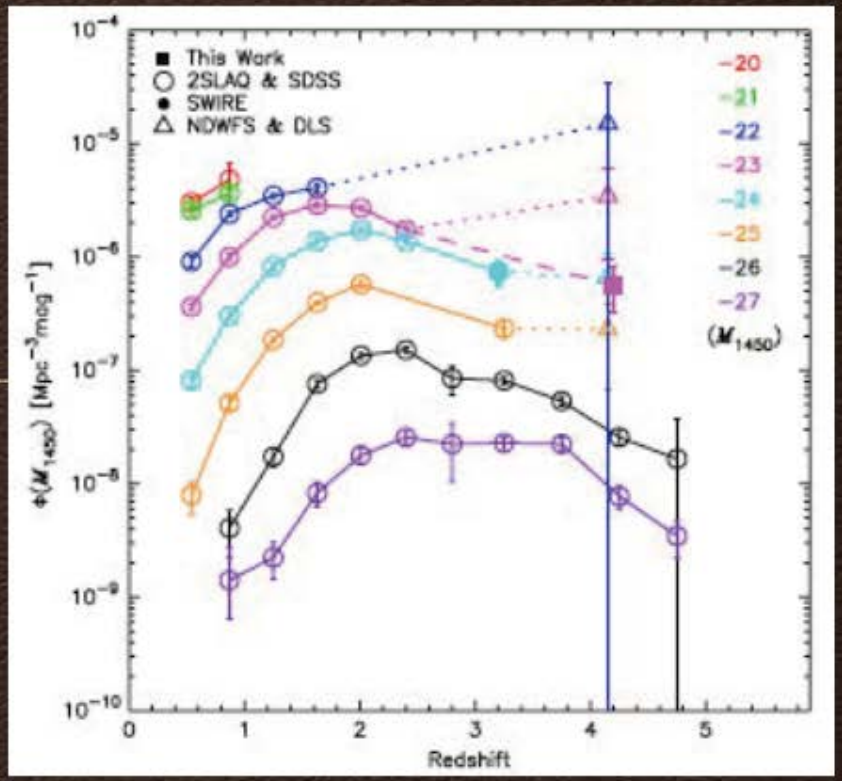
# High-$z$ Proto Cluster @ $z$ =5.3




*(Capak+11, Nature, 470, 233)*

# High-$z$ Low-Luminosity Quasars Evidence for Downsizing




*(Ikeda+11, ApJ, 728, L25;*
*see also Ikeda+12, ApJ, 756, 1600*

# COSMOS is going on

*SPLASH (Spitzer Large Area Survey with Hyper-Suprime-Cam) has been accepted TODAY !*

*1250 hours for COSMOS & SXDS*

# COSMOS Team Meeting 2013

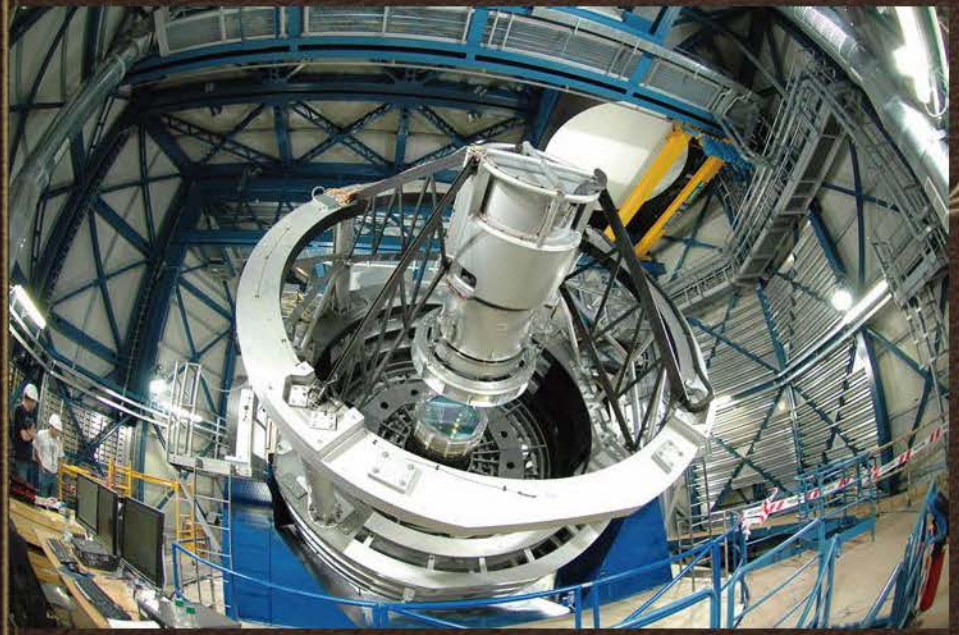
*Kyoto in May, 2013*

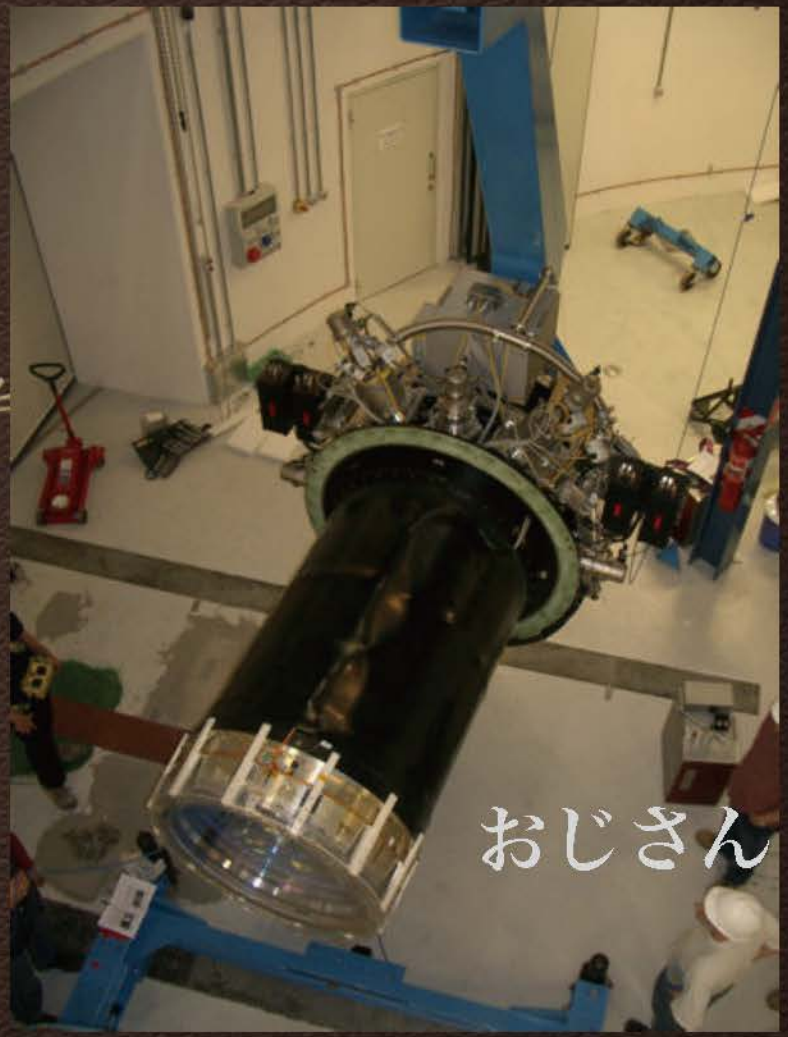
# VISTA = Visible & Infrared Survey Telescope for Astronomy

# VISTA

# VISTA with VLTs

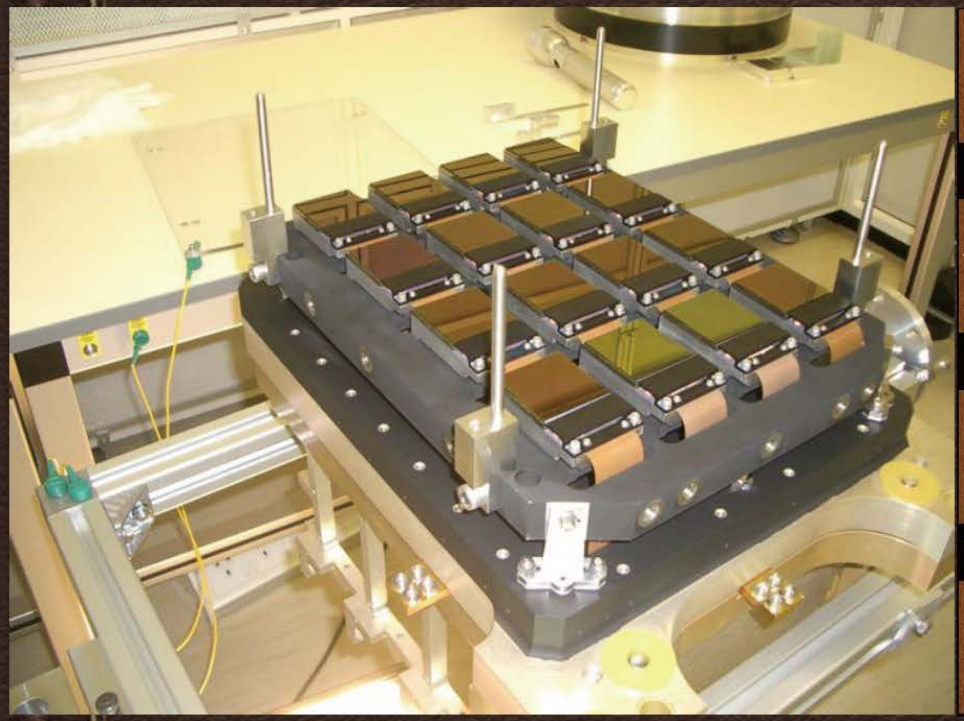
# IR Camera for VISTA

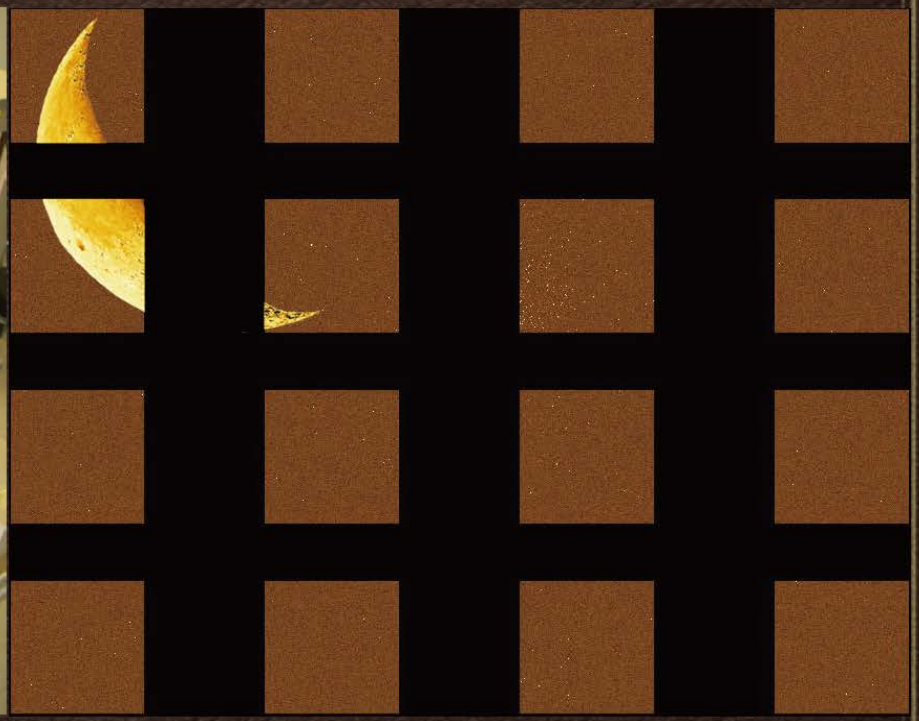




# 16× 2048x2048 pixel IR detectors

## (Raytheon VIRGO HgCdTe 0.84-2.5 micron)





## FOV = 1.5 square degree with 0.34”/pixel

# ULTRA-VISTA

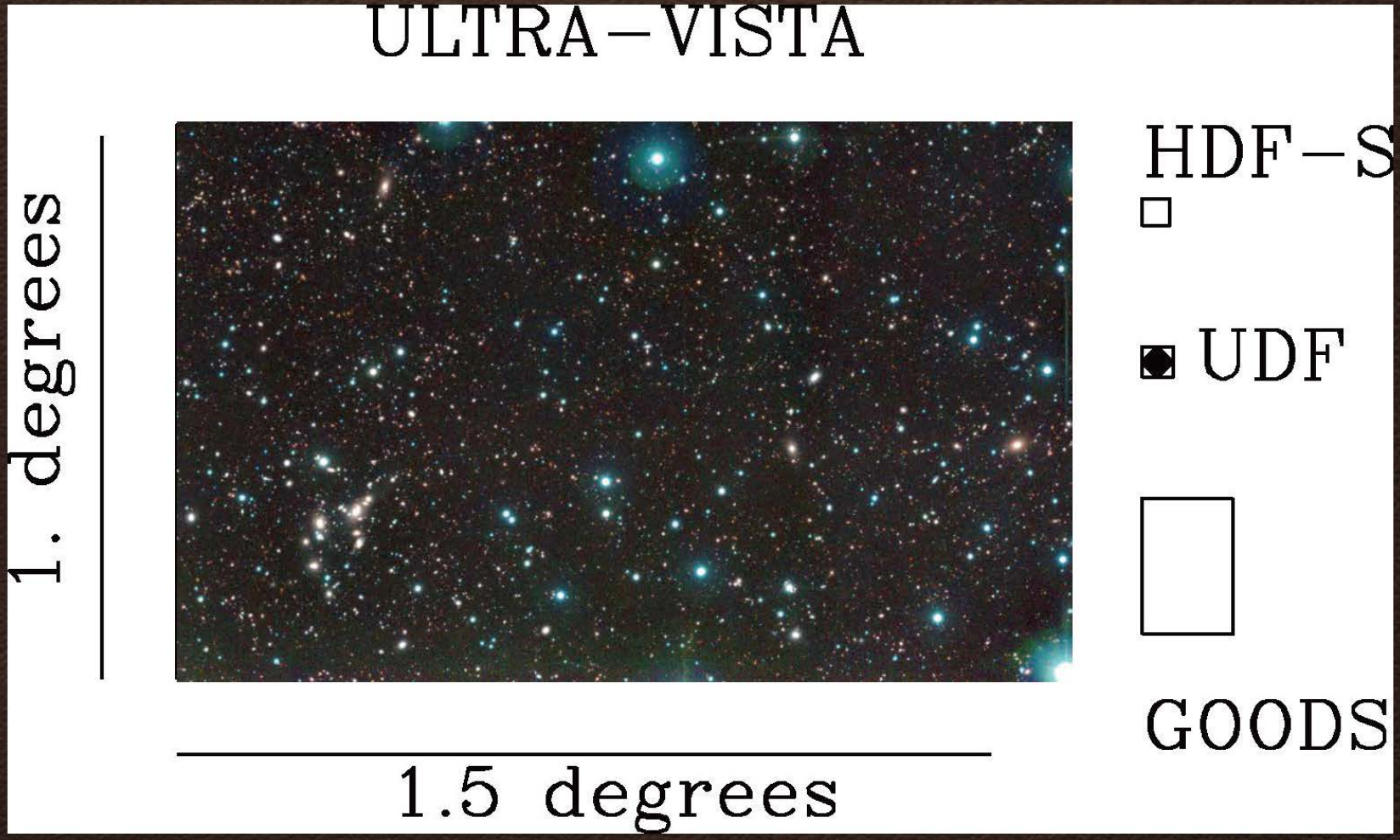
## Field : COSMOS

## Survey Mode:

**Ultra-Deep-Broad – YJHK (1408 hrs)**
**Ultra-Deep-Narrow – NB1185 (180 hrs)**
**0.73 sq. deg**

**Wider – YJHK (212 hrs)**
**1.5 sq. deg**

# ULTRA-VISTA Survey Mode



# Survey Depth (5σ AB)

## Ultra Deep

Y: 26.7
J: 26.6
H: 26.1
Ks: 25.6
NB1185: 24.1

## Deep

Y: 25.7
J: 25.5
H: 25.1
Ks: 24.5

# How many objects ?

## Dropouts

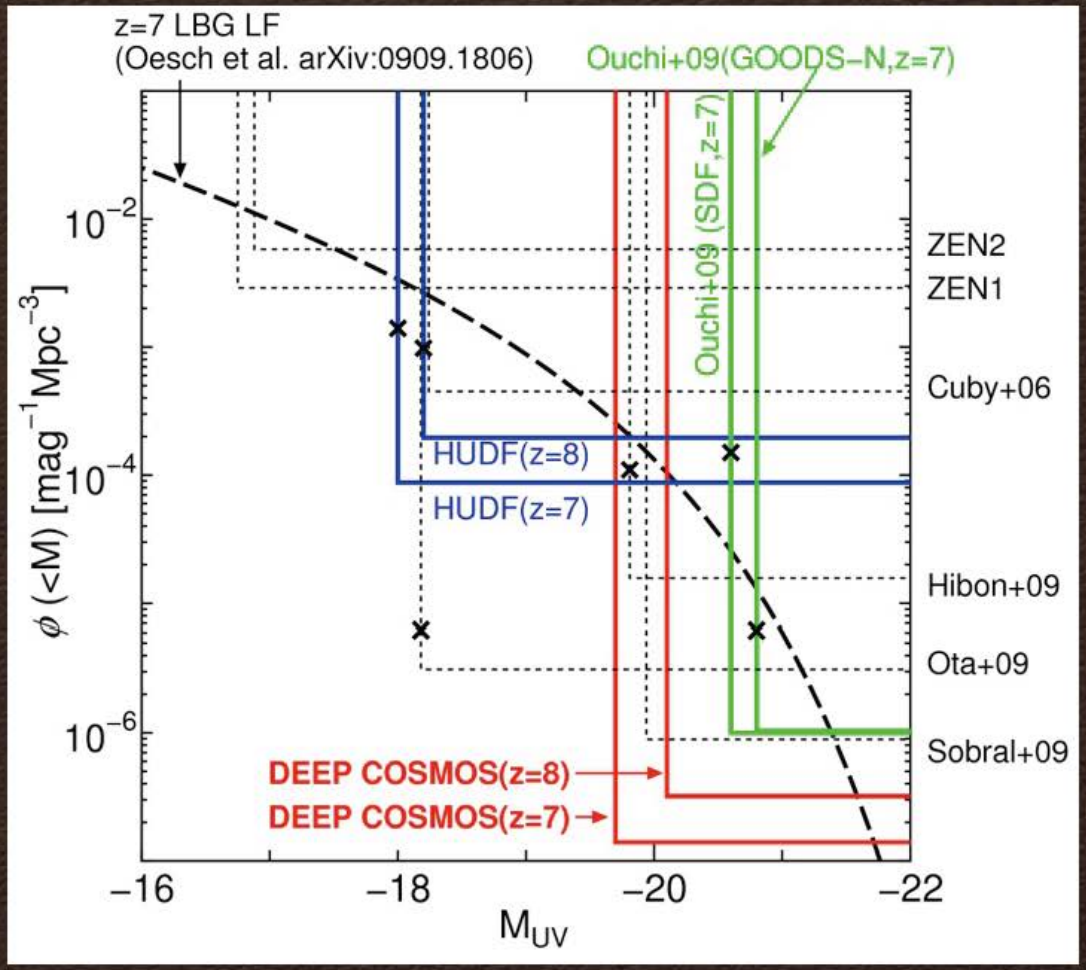
540 galaxies @ $z = 6.3$
450 galaxies @ $z = 7.5$
180 galaxies @ $z = 8.5$
6 galaxies @ $z = 10$

## NB excess

30 LAEs @ z = 8.8
6000 Hα emitters @ $z = 0.8$

McCracken+12, A&A, 544, 156
UltraVISTA: a new ultra-deep near infrared survey in COSMOS

# HSTの行方




**NIR-COSMOS with WFC3**

# サーベイの心得

ワールドトップである

中途半端は狙わない

大胆にして細心であれ

決してあきらめない

喧嘩はしてもよい

# HSCレガシーサーベイに期待する

## 驚くべきことがある

## HSCプロジェクトの歴史を見よ

## 新補正レンズの検討 by 宮崎＋

## ２００２年！！！

# ハイパーな方々に感謝！