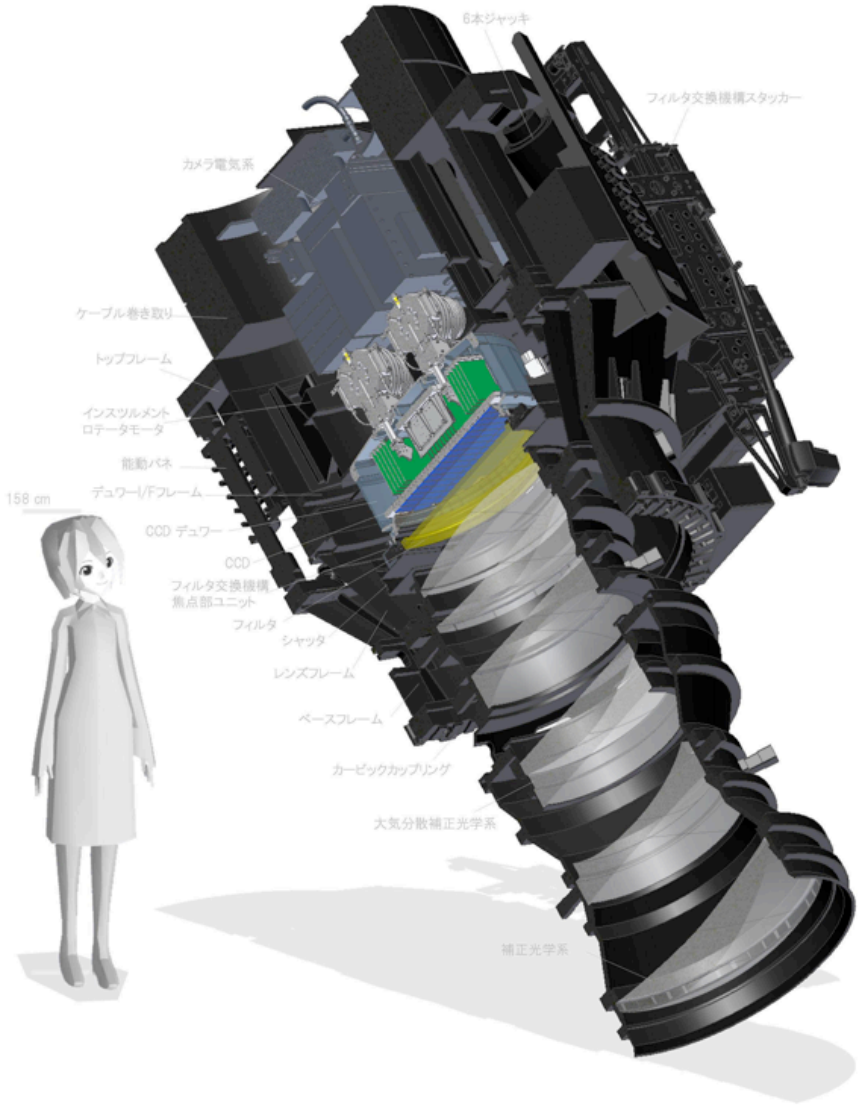
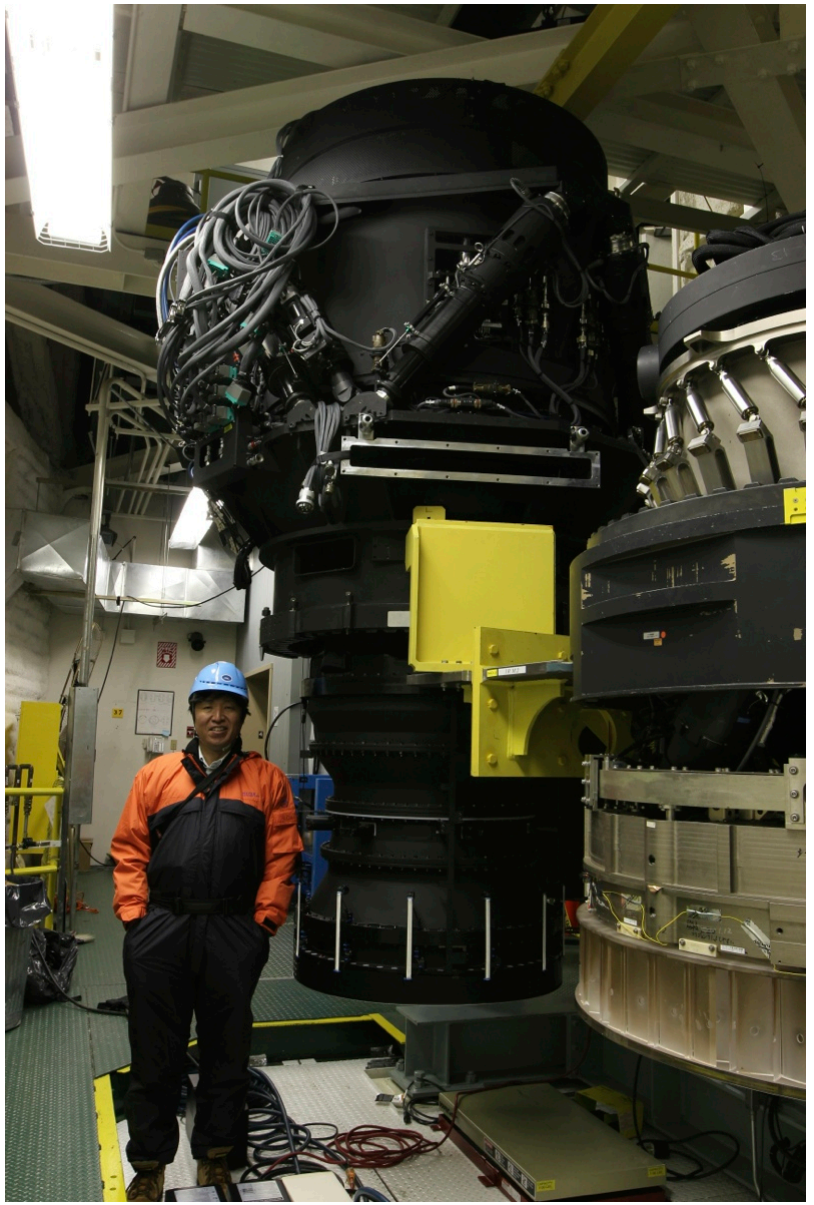
# Hyper Suprime-Cam

## 現状報告

# Hyper Suprime-Cam



# Engineering First Light

- 2012/08/28 ~
  - Auto Guider, Pointing Analysis System, Mirror Analysis Systemのsoftware/hardwareの機能確認
- ほぼOK。次は性能の確認
- Filter Exchange Unitは所定の試験回数をこなす時間が足りず、安全をみて搭載を見送った

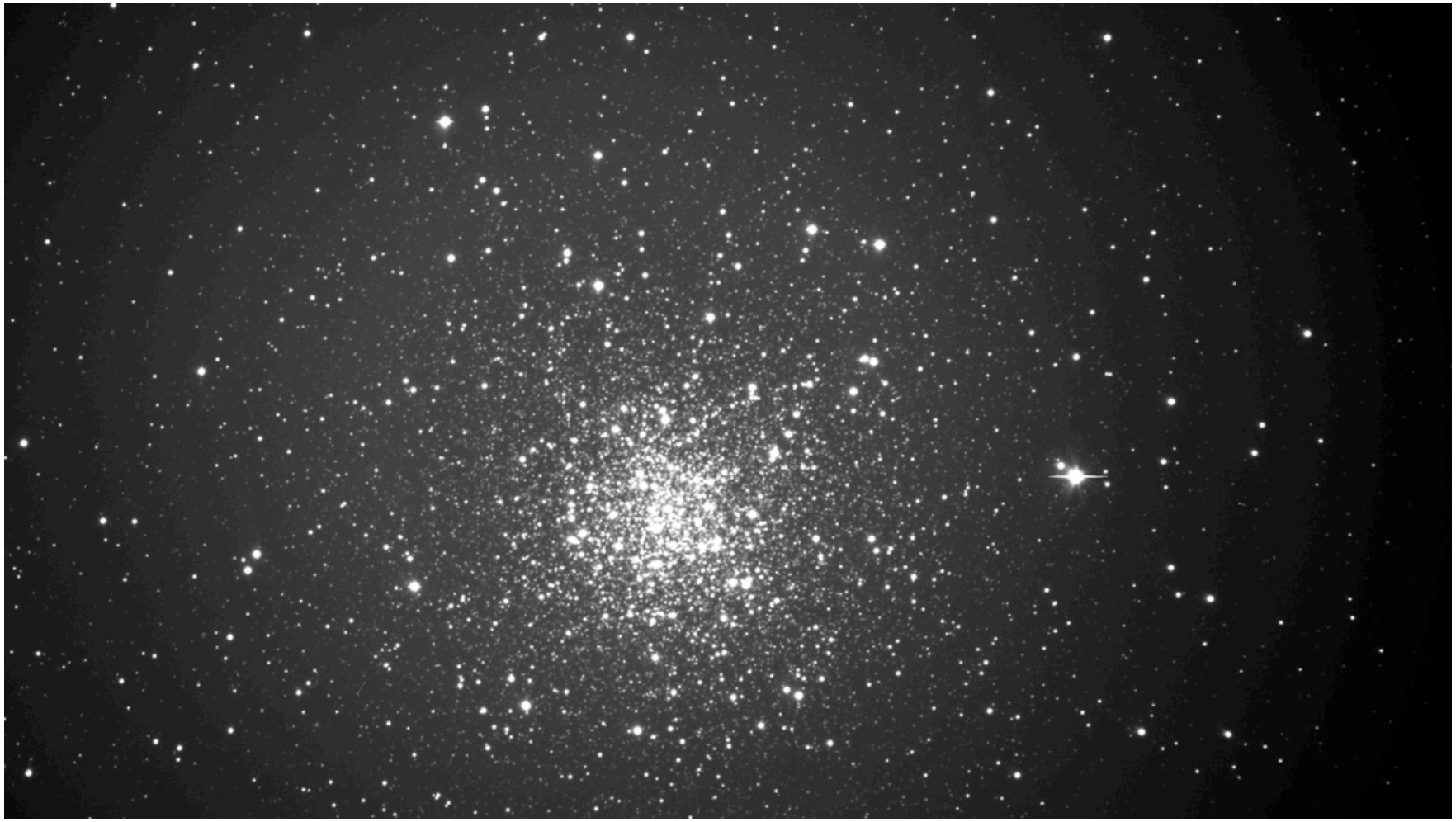
# Hyper Suprime-Cam

今後の試験観測の予定

1/24 - 2/4
3/11 - 3/21
5/16 - 5/20
6/6 - 6/13

# Main Camera Image

M56 10 sec r-band ~0''.58 FWHM



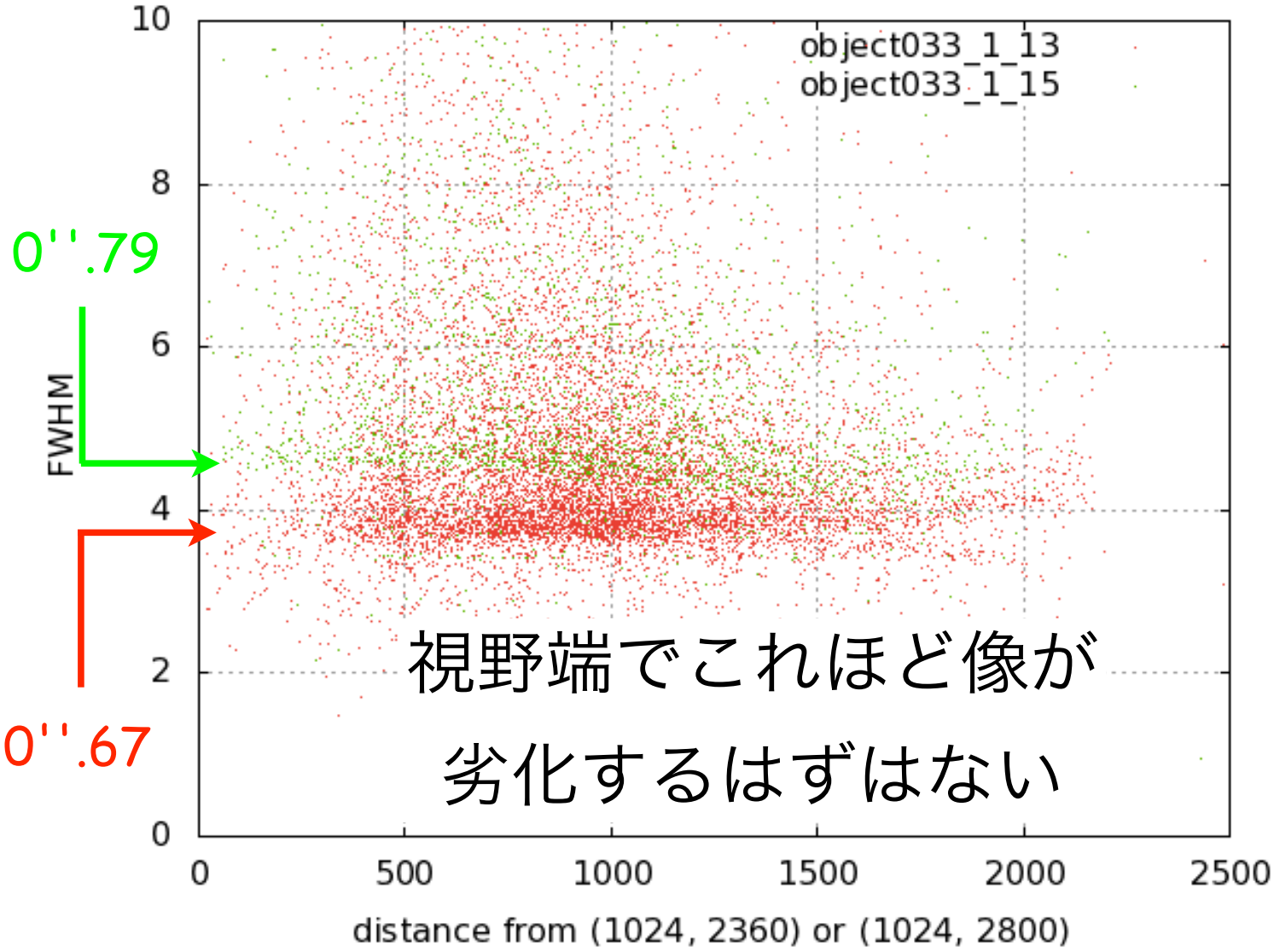
~ 2000 pix

~ 4000 pix (10 arcmin)

# Jan2013 Engineering Plan

| | | |
|---|---|---|
| 24 | PA, Open Track, ADC link | M |
| 25-26 | SH Coordinate Check | M |
| 27-28 | PM Control using SH | M |
| 29-30 | HSC SC AG Function Test | MK |
| 1/31 | Spare | K |
| 2/1-4 | (WFC+Camera) Tilt& misc Measurement | K |

# Main Camera Image Analysis




Field Angle

green: 43'

red: 19 '

# 戦略枠プロポーザル

**Wide-field imaging with Hyper Suprime-Cam:**
**Cosmology and Galaxy Evolution**

*A Strategic Survey Proposal for the Subaru Telescope*


**PI: Satoshi Miyazaki (NAOJ)**
**Co-PI: Ikuru Iwata (NAOJ)**

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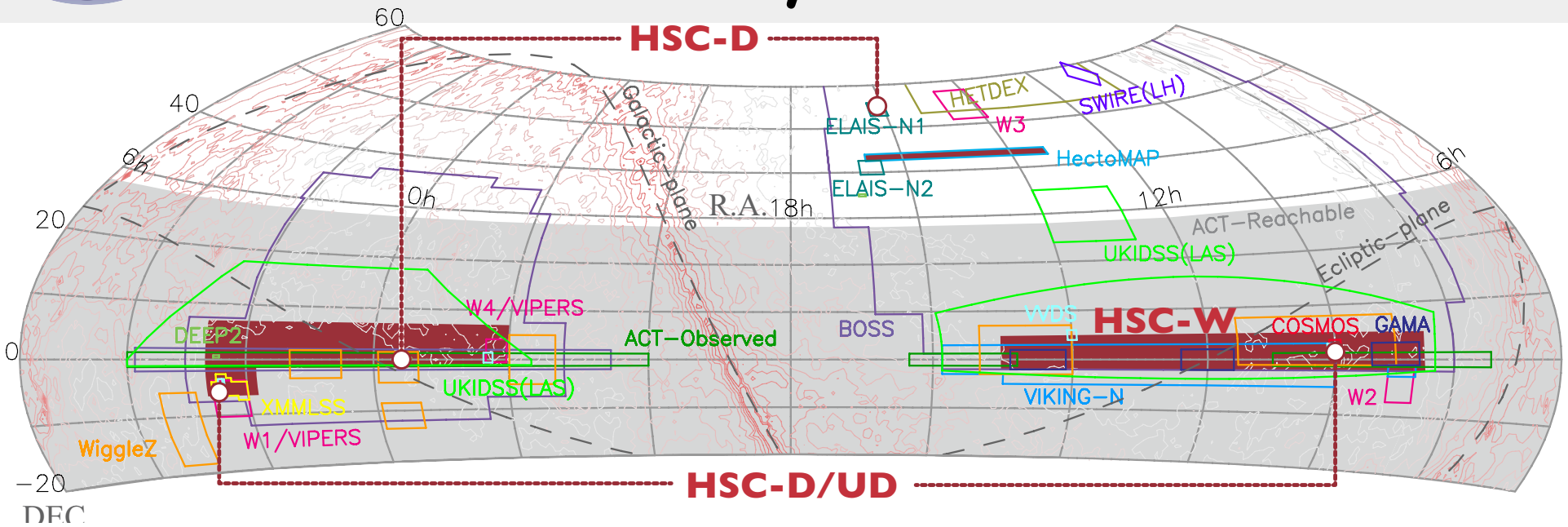
- WLを使いDEを前人未踏の精度で計測

-日本がリードしてきた初期銀河宇宙研究を発展

# Survey Field




| | | |
|---|---|---|
| Wide | 1500 deg$^2$ | 10 times wider, 1 mag |
| Deep | 28 deg$^2$ | deeper, 20 % shaper |
| UDeep | 4 deg$^2$ | than CFHLS-Wide |

大規模サーベイ、解析遂行にはcommunity effortの結集が必要。Wのみ、D/UDのみでは実行不可能。

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NATURE | NEWS

## Cameras to focus on dark energy

**A pair of detectors that measure minute distortions in images of distant galaxies will probe the riddle of cosmic acceleration.**

Eric Hand

12 September 2012

Even the best pictures of a distant galaxy are a bit lopsided. But this is an attribute, not a bug. Because mass distorts space-time, light coming from distant galaxies is bent as it passes through intervening shoals of invisible matter, leaving the images of these distant objects minutely sheared and stretched.

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   *Nature* | 16 October 2012
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   *Nature* | 16 October 2012

Nature 489, 190-191
(13 September 2012)

"One of the new efforts will use the Hyper Suprime-Cam (HSC), which achieved first light on 28 August on the 8.2-metre Subaru telescope in Hawaii. By 2018, it aims to have imaged 10 million galaxies over a 1,500-square-degree-swathe of the sky ... A rival project DES ..."

# 戦略枠プロポーザル

第1段階審査　合格

第2段階審査

開かれた(研究)組織作り

ハワイ観測所における体制作り

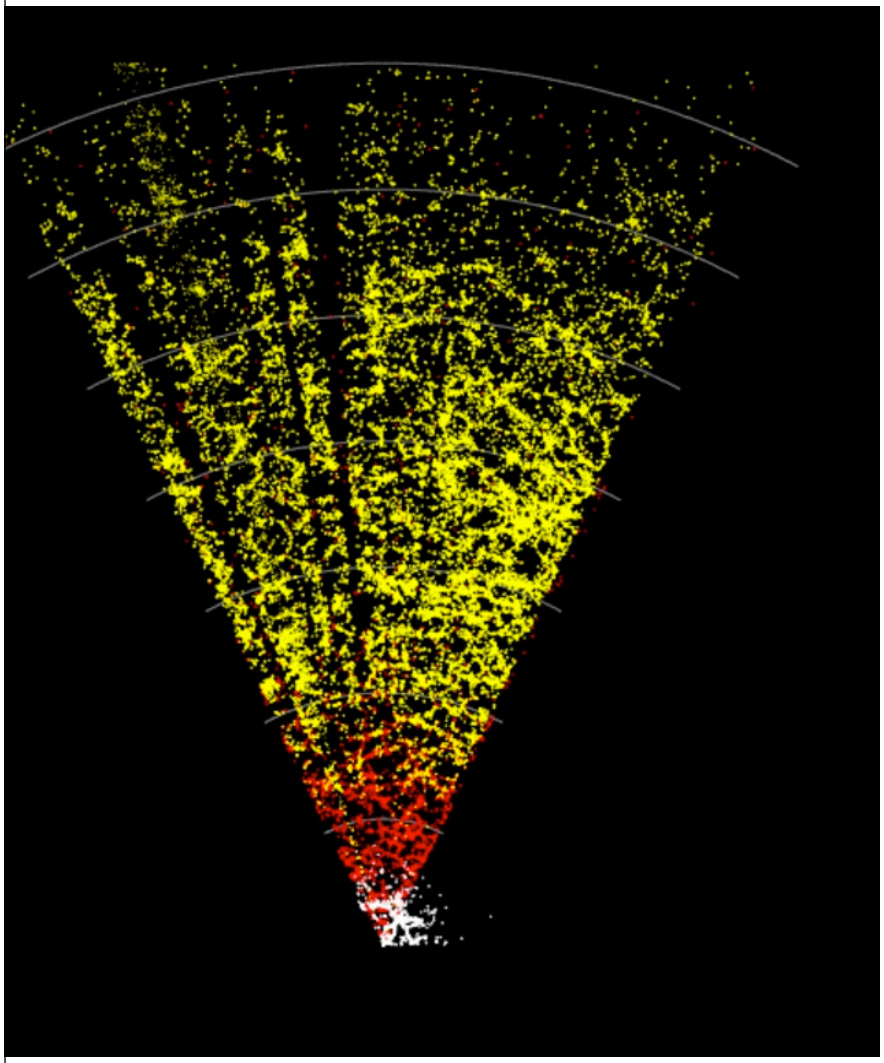
第3段階審査　3月にヒアリング

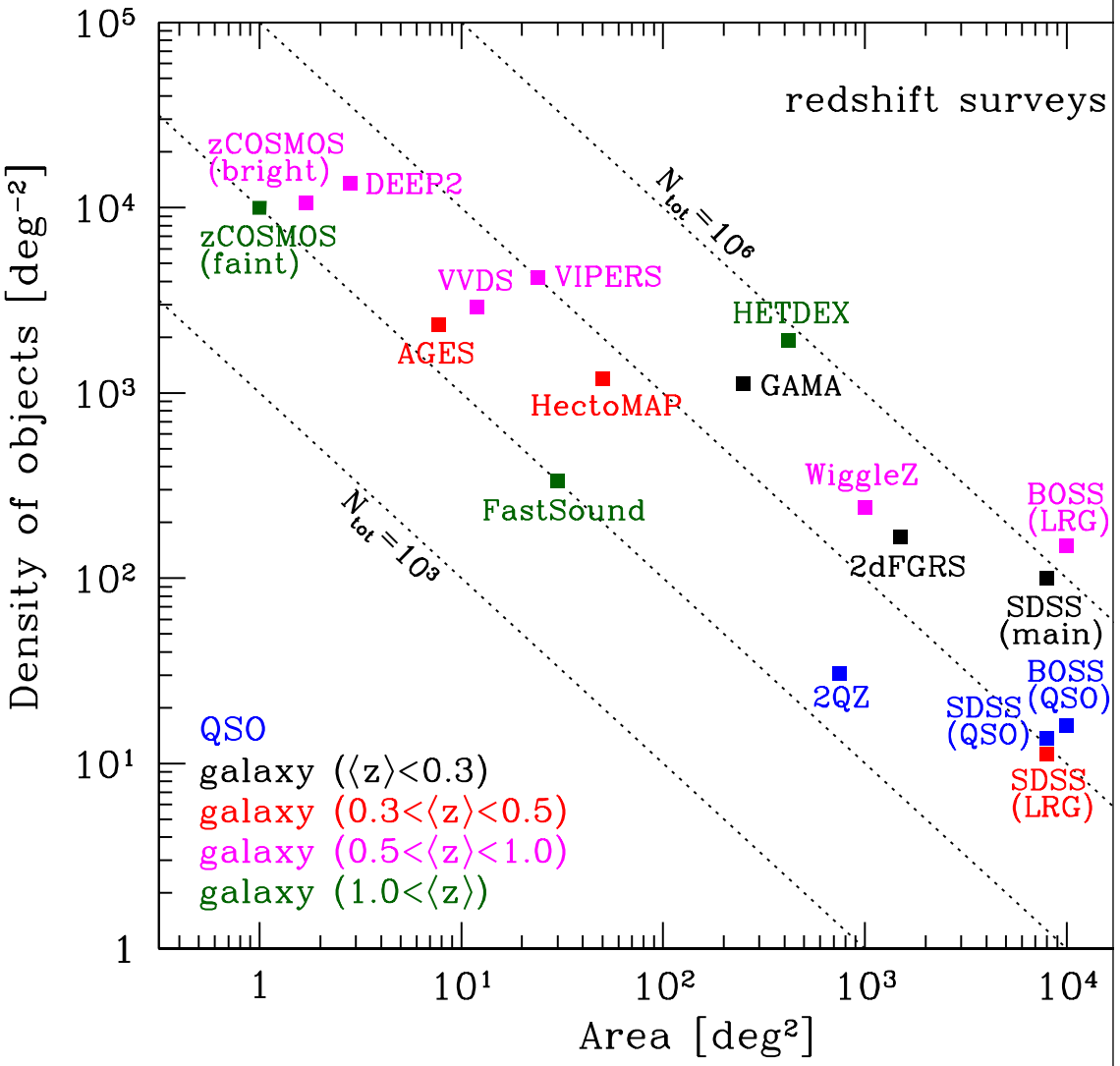
第4段階審査　最終提案書

# 他プロジェクトとの協力

- Spitzer COSMOS survey (Peter Capak)
  - Ultra Deep COSMOSデータ(BBのみ?)とSpitzerデータとの交換
- HectoMAP (Margaret Geller)
  - Wide (50平方度のみ)のDark Matter Halo Catalogと分光データの交換(r < 21.3 dense)
- U-band
  - Palomar ? CFHT ? DECam ? 本当に必要 ?

# HectoMAP






白 CfA 赤Sloan 黄HectoMAP

# University of Hawaii ?

- Meeting with JT & RJW on 2012/12
- SCの時のように組織だったsurvey計画はまだない
- 様子見だが、データが出始めると本気で考え始めるだろう
- DirectorがCOSMOS Fieldのデータを HSCで取らないかと言ってきている
- UH時間でより深く撮ってもらい、shareする？
- 2013/10までに協力関係を整理したい

# HSC Data Release Plan (draft)

- Raw data automatically release for public in 18 mo.
- Reduced image and Catalog release within the HSC collaboration
  - 1 st release 18 mo. from the beginning of the survey: every 12 mo. from the 2 nd
  - 18 mo. after the survey completion open globally
- Part of the catalog items release globally from the beginning ? (Position & BB mag ...)

# Data Amount

- Basic Photometric Catalog
  - Single Filter:474 Byte, Combined 1820 Byte
  - (474x5 + 1820) ~ 4kByte/object
  - ~ 50x60x60x1400 ~ 252M object
  - ~ 1TByte total
- + Weak Lensing Catalog  a few TByte
- Stacked Image
  - 6e11 pixels (1400 deg^2)
  - 6e11 x 4 byte x 5 color ~ 10 TByte

Image will be divided into sky patch

Distribution media: Hard Drive

# Software Tools

- Local Database Browser
- Software Libraries to allow a combined access to catalog and stacked image for further independent analysis
- Users who want to manipulate raw images are encouraged to work closely with the HSC project's data analysis team

# On Line Access

- Data and the software distributed through SMOKA channel
- Development of the data browsing and retrieval tools are shared by SMOKA group
- In early phase of the survey, on line distribution might be enough.

# Open Use Support

- Contributing to the observatory's effort
- Provide stacked images and crude catalog made on the fly (during the observing run)
- Release data analysis software package (subset of HSC pipeline) and provide the user supports

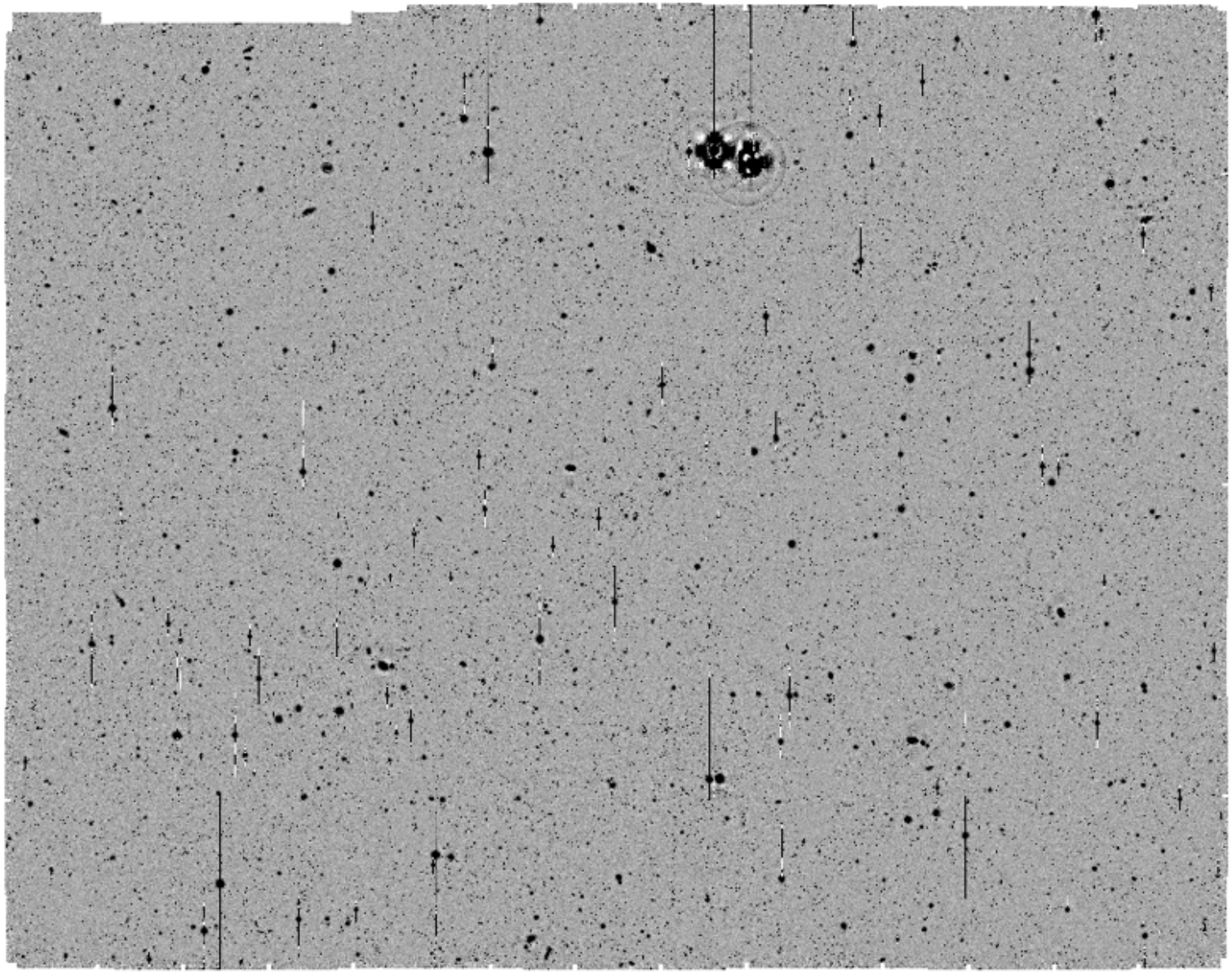
Current estimates of times to generate a mosaic-stacked image:

- Single $3,500 PC (Linux)
- 0.5 h exposure (Rc 4 visits)

~ 2 hour

Real Time X 4

# Mosaic-Stacked Image



# Schedule

- 2012/08 First Light
- ~ 2013/07 Commissioning Run
- (2013/08~ Legacy Survey (5 yr) and Open Use)