



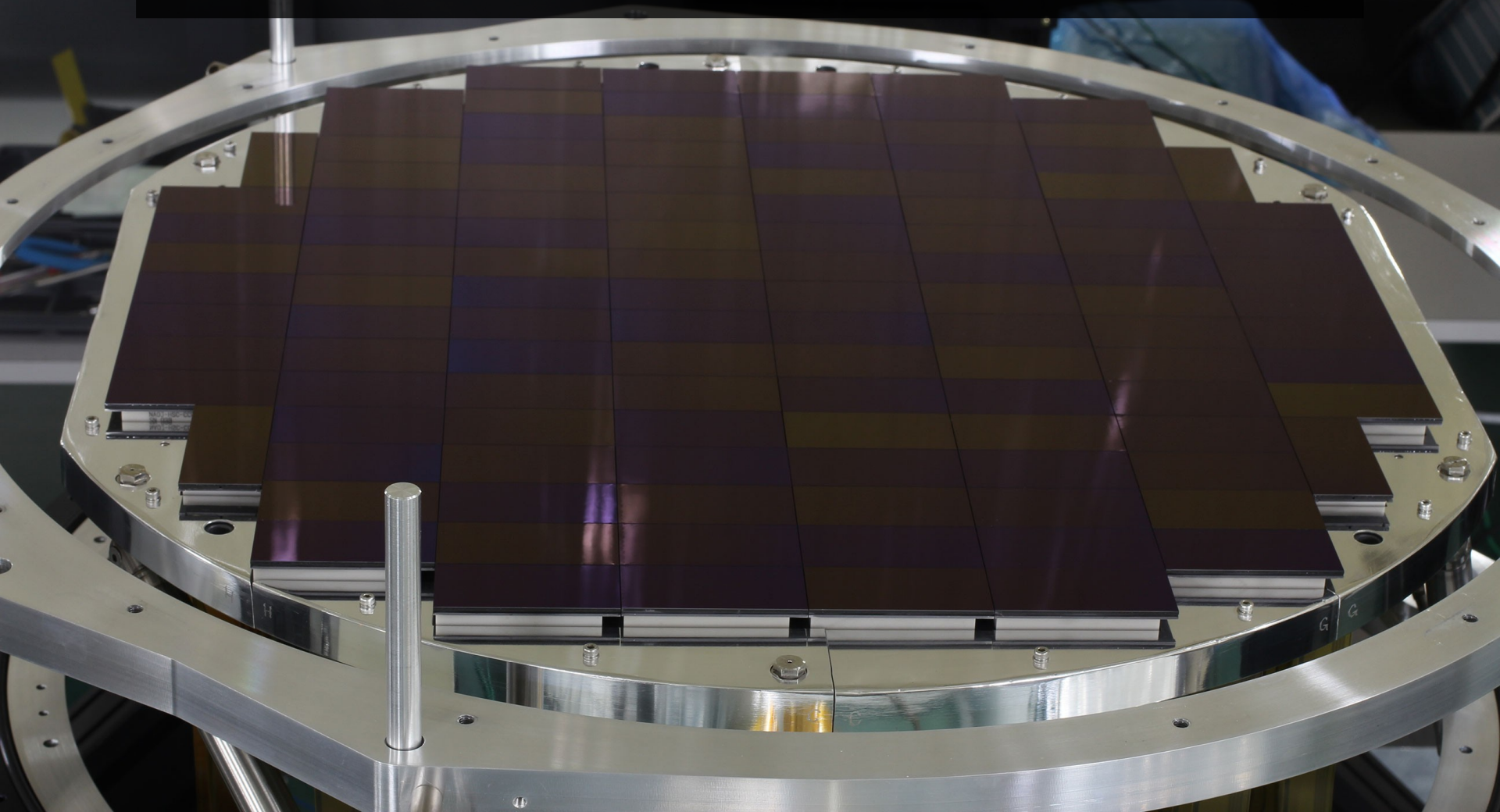
HSC-SSP + HSCLA (+GC)

Masayuki Tanaka (NAOJ)



Hyper Suprime-Cam (HSC)は
主焦点に設置されたすばる
望遠鏡のメインの観測装置。
広い視野を持つ、可視光の
カメラである。

カメラの中には高感度のCCD(電荷結合素子)が116枚敷き詰められていて、そのうち104枚が科学観測に使われる。



Hyper Suprime-Cam



ハッブル宇宙望遠鏡
「広視野カメラ3」

Hyper Suprime-Cam Subaru Strategic Program (HSC-SSP)



すばる戦略枠プログラム (Subaru Strategic Program; SSP)
世界に誇る装置でタイムリーに大量の観測時間(330晩)を投入
することで大きな科学成果を狙ったAll-Japanプログラム。



Recording

			Sogo Mineo (NAOJ)	
				okura
Daichi Hiramatsu	komiyama	Kimihiko Nakajima	Yu-Yen Chang	Yuichi Harikane

HSC Subaru Strategic Program: International collaboration of all Japan, Princeton, and Taiwan.

Over 200 scientists are involved in this large observing program with 330 nights. The observation started in March 2014 and completed in January 2021.

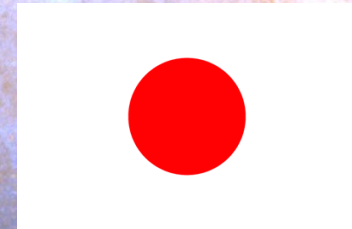
<https://hsc.mtk.nao.ac.jp/>

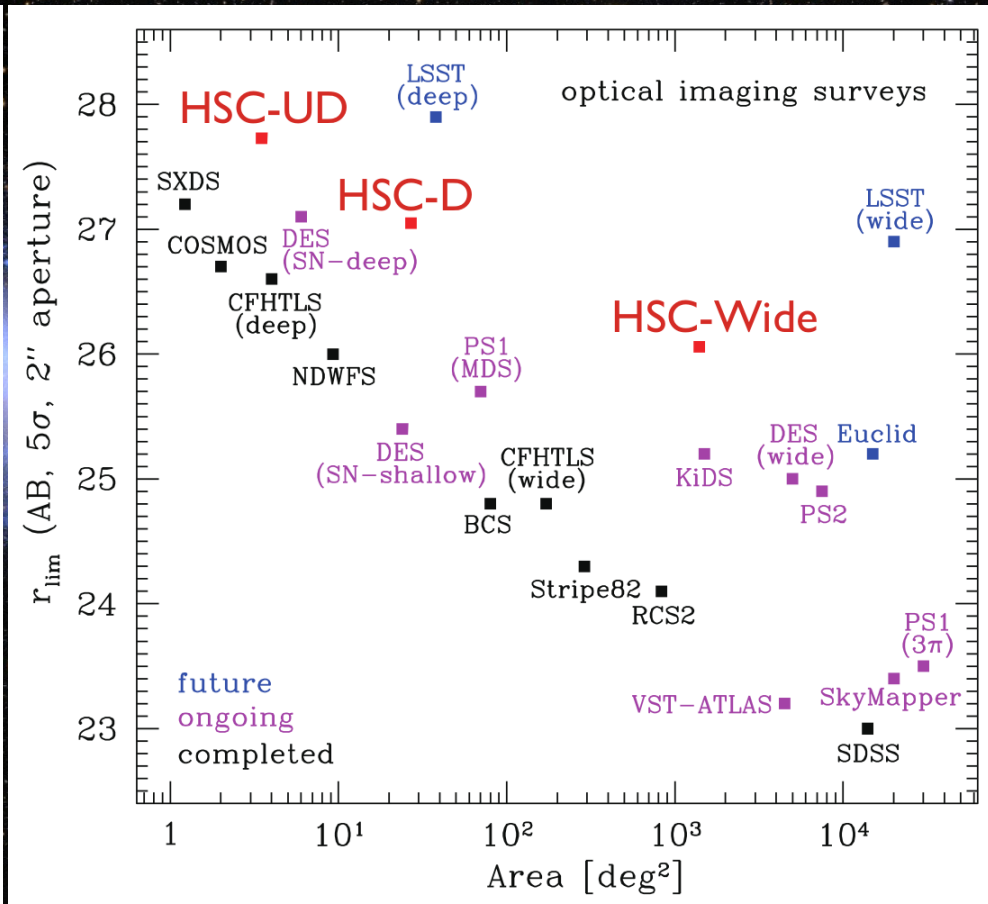
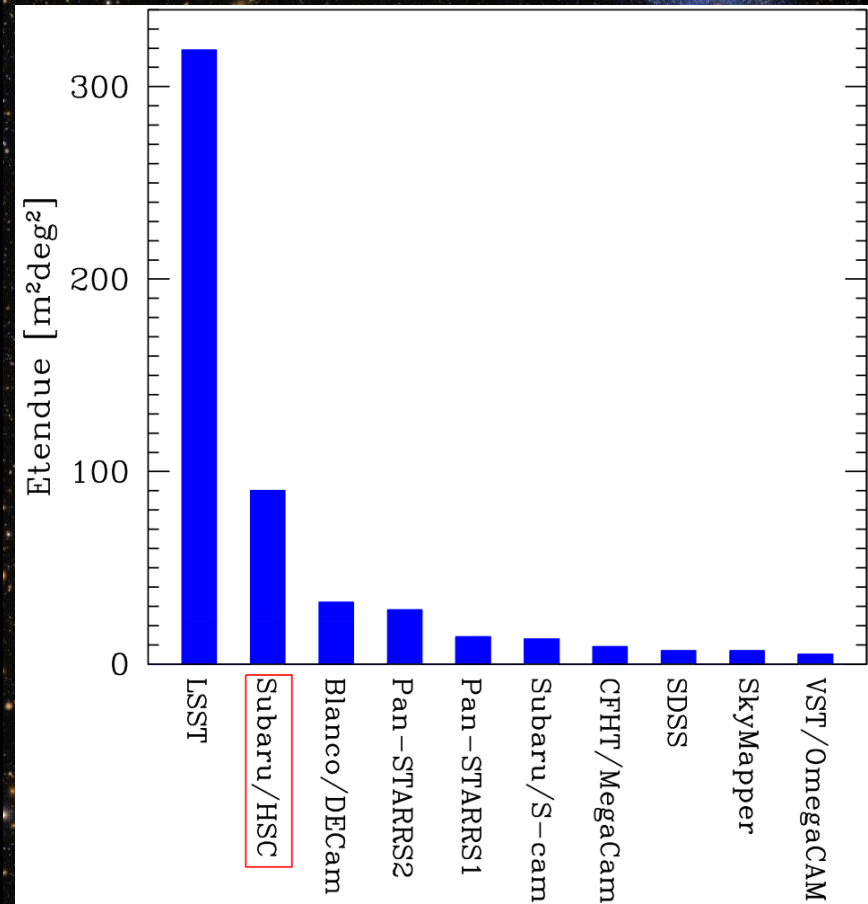
SSP proposal

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)

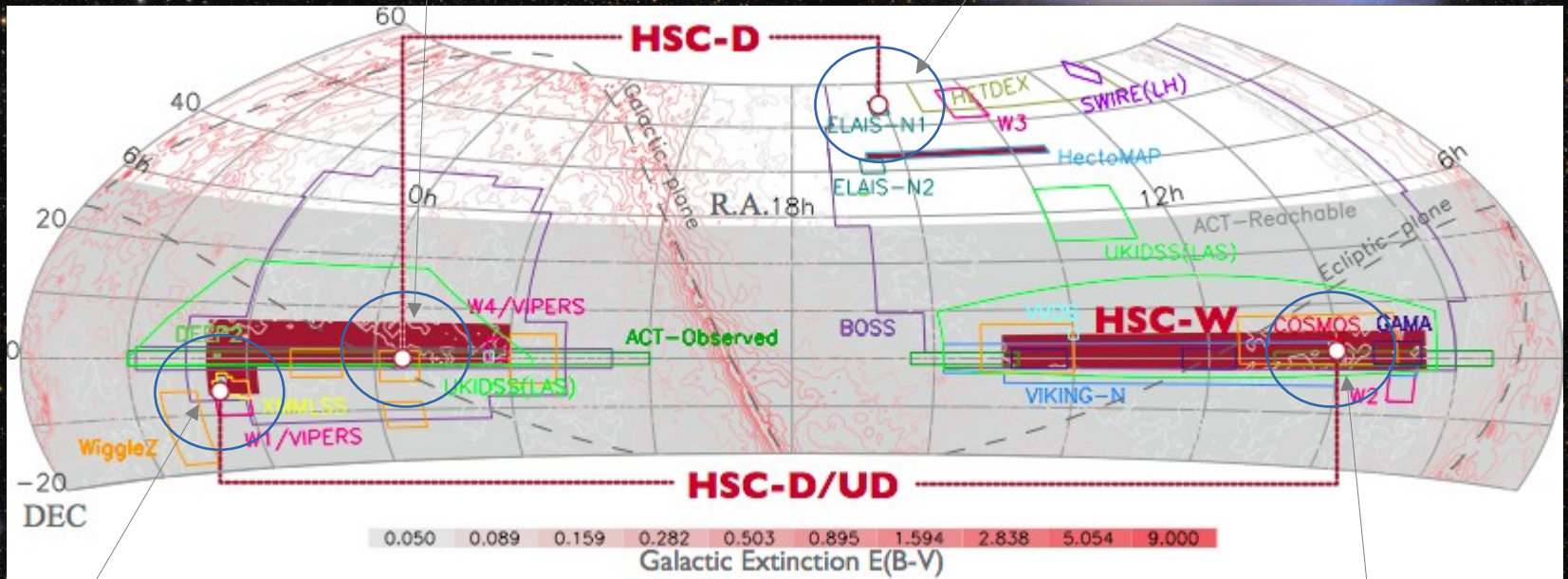
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DEEP2-F3 (D)

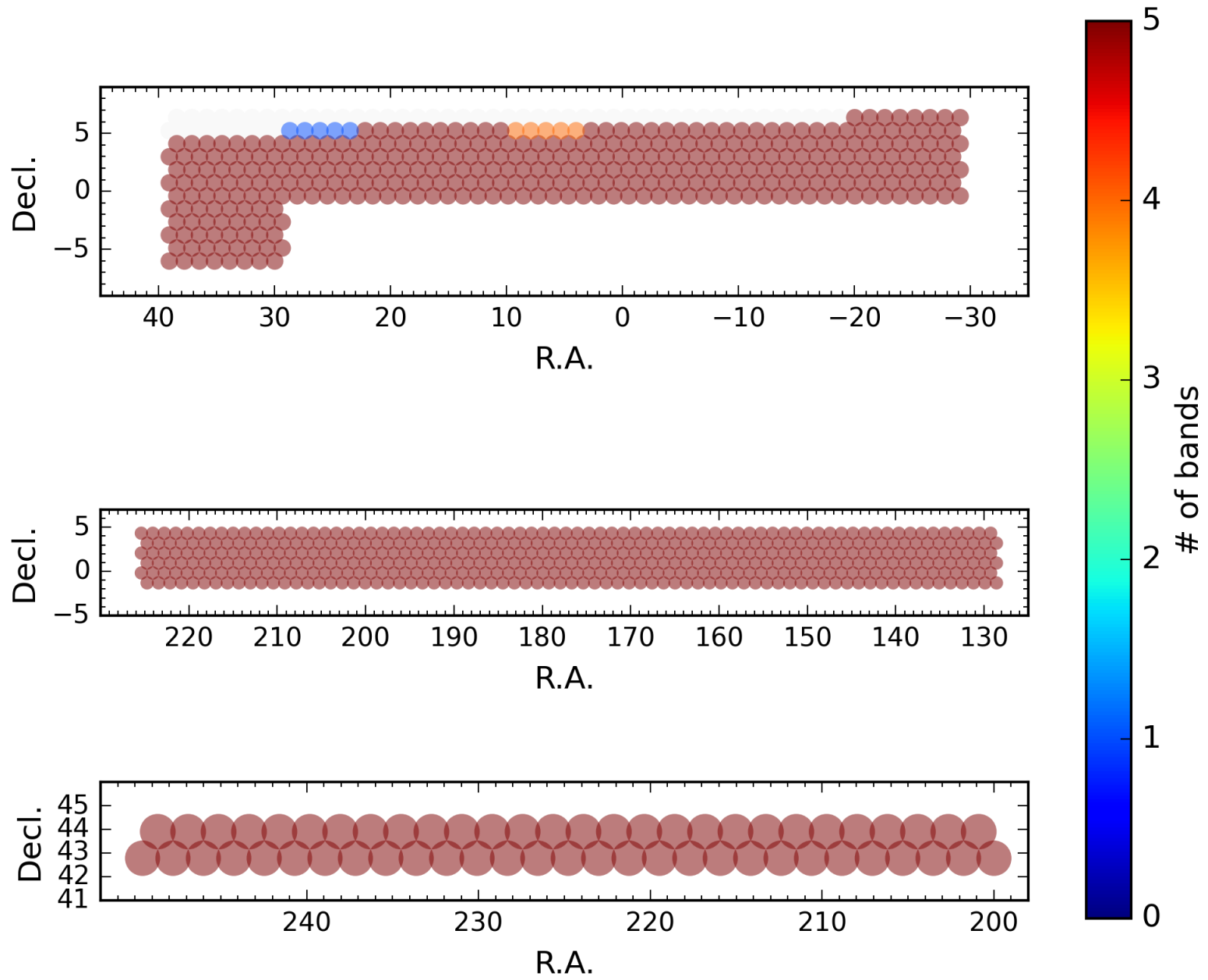
ELIAS-N1 (D)

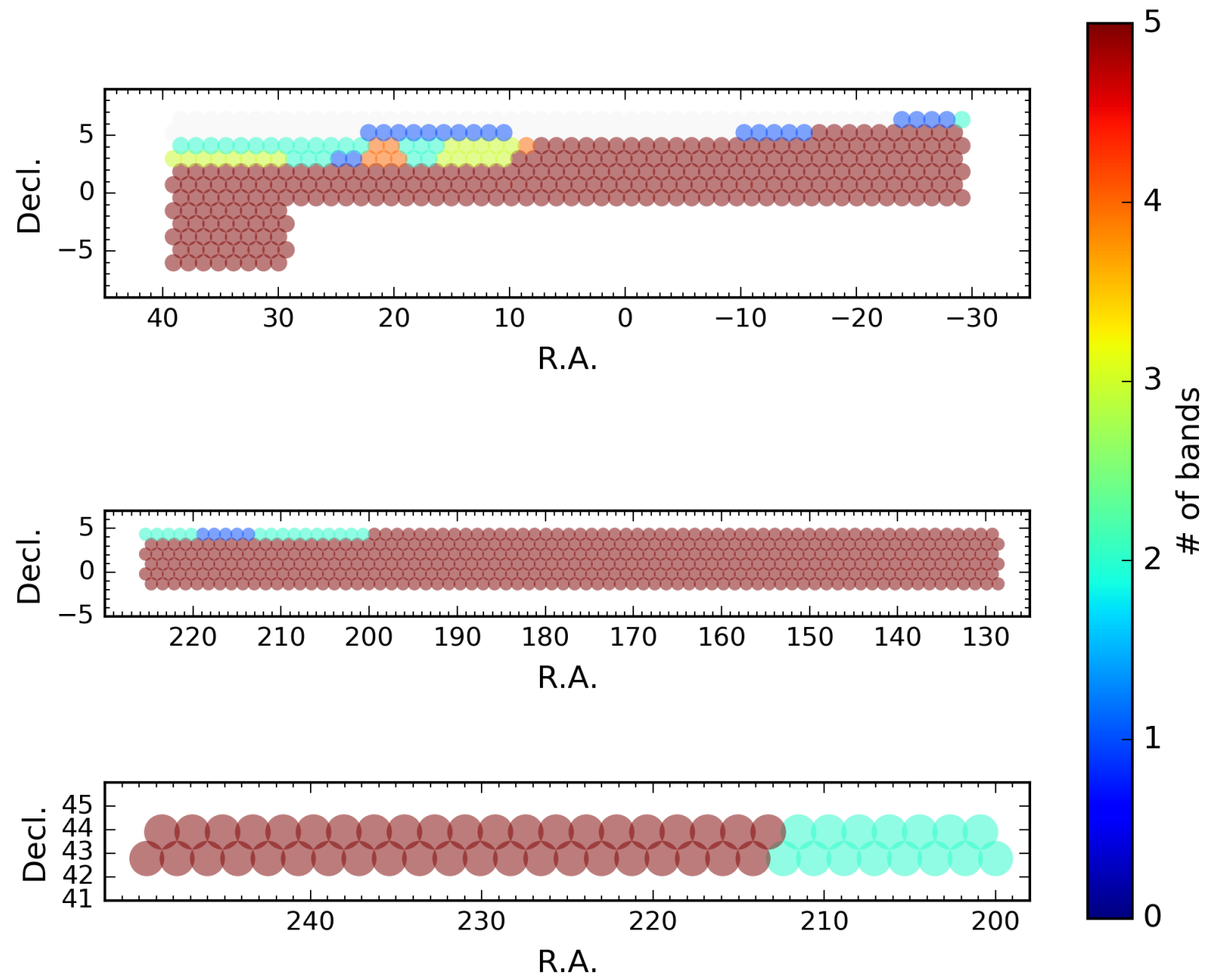


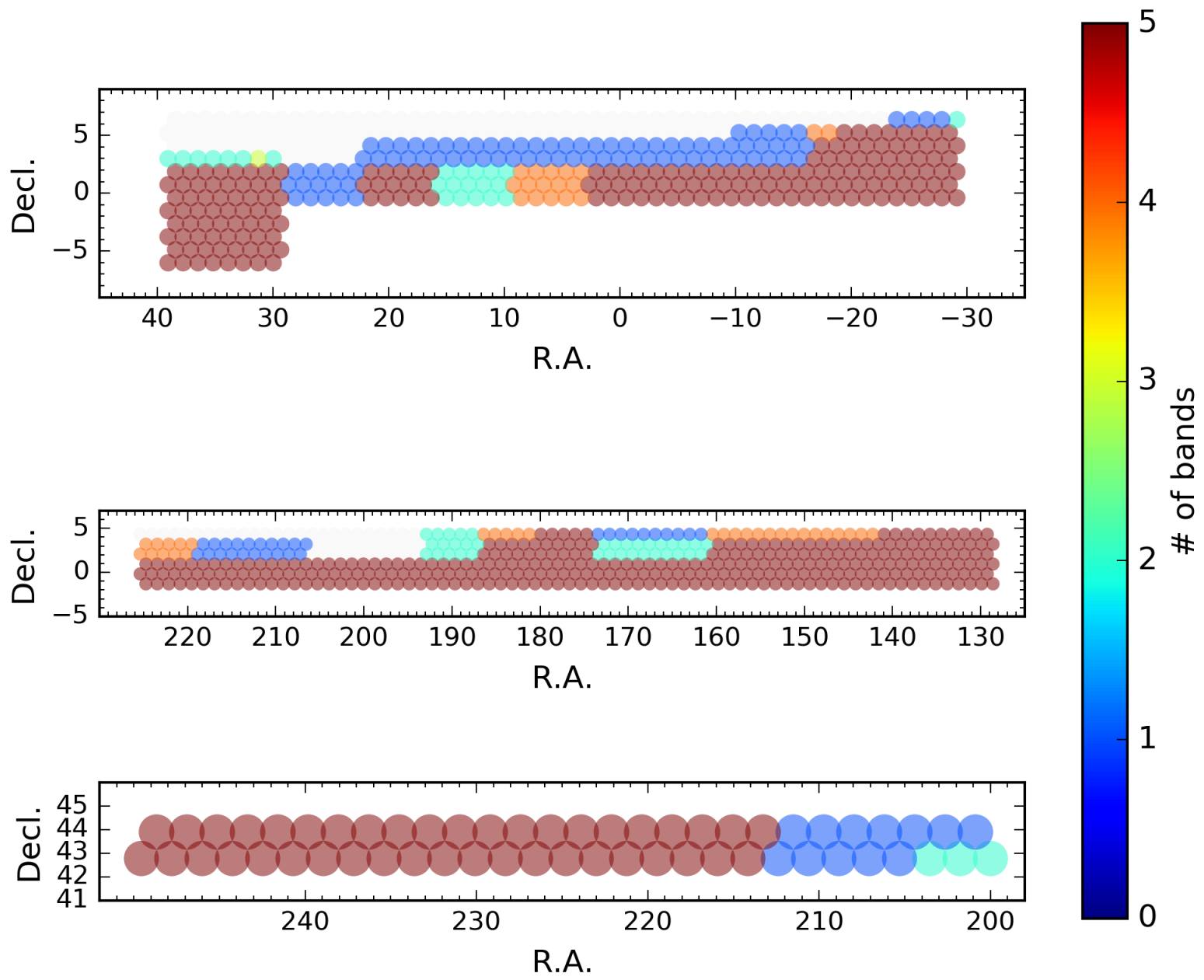
SXDS (UD)
XMMLSS (D)

- ◆ Full overlap with SDSS
- ◆ Low dust extinction
- ◆ Wide R.A. range
- ◆ Overlap with other NIR, spec, etc surveys.

COSMOS (UD)
E-COSMOS (D)









Deep

g~1hour
r~1hour
i~1.5hours
z~2.5hours
y~1.5hours
NB387~1.5hours
NB816~2hours
NB921~3hours

UltraDeep

g~5hours
r~5hours
i~10hours
z~10hours
y~10hours
NB816~7hours
NB921~8hours
NB1010~10hour

SSP Color

Mixer: SDSS_TRUE_COLOR

	g	r	i	z	y	387	816	921
r	●	●	●	●	●	●	●	●
g	●	●	●	●	●	●	●	●
b	●	●	●	●	●	●	●	●

β

b_0

A

bias

- **Image Products**
 - direct file access
 - file search tool
 - image cutout tool
 - PSF picker
 - hscMap
- **Catalog Products**
 - direct file access
 - database search

SSP は CLAUDS (u-band survey) と DUNES² (JHK survey) と協調して Deep/UltraDeep 領域を観測しました。u2k と呼ばれる多色カタログも内部公開されています。



SSP internal のデータでサイエンスをする場合は登録が必要です。
日本人であればどなたでも参加できます。

Collaboratio policy 等に従っていただく必要がありますが、
一通りの document が team wiki にありますので、
登録後にご一読ください。

サイエンスは各 working group を中心に行っています。
メーリングリストに登録すると telecon の情報など流れて
来ると思います。

が、サーベイも終盤でして、最近はどの ML もとても静かです....。

We peer deep into the Universe to unveil the nature of dark matter and dark energy.

Public Data Release 3

Welcome to the [Hyper Suprime-Cam](#) Subaru Strategic Program Data Release Site!

The third public release of HSC-SSP occurred on 31 August 2021. The release includes over 600 square degrees of deep multi-color data served through dedicated databases and user interfaces. The figures below show the area covered in this release and the table gives an overview of the data in the three survey layers, Wide, Deep, and UltraDeep. Refer to [our survey website](#) for details of the survey design. Also, read [the data release paper](#) for details of this release.

[Public Data Release 3 paper](#)

NOTICE: Scheduled downtime

Our system will be down for maintenance for 11-14 Nov 2022 JST. All our services will be unavailable for this time period.

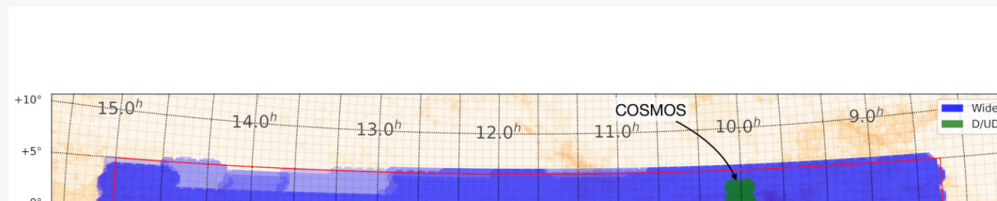
NEW: PDR3 incremental release 3

We have reprocessed several problematic tracts in the D/UD layer, and the deeper data are available. See [this page](#) for details. Also, long-awaited photo-z's for PDR3 are now available as summarized in [this page](#). Furthermore, heavyFootprints (deblended images) are no longer withheld from our data products. These new releases are a significant addition to PDR3; we hope you will find them useful!

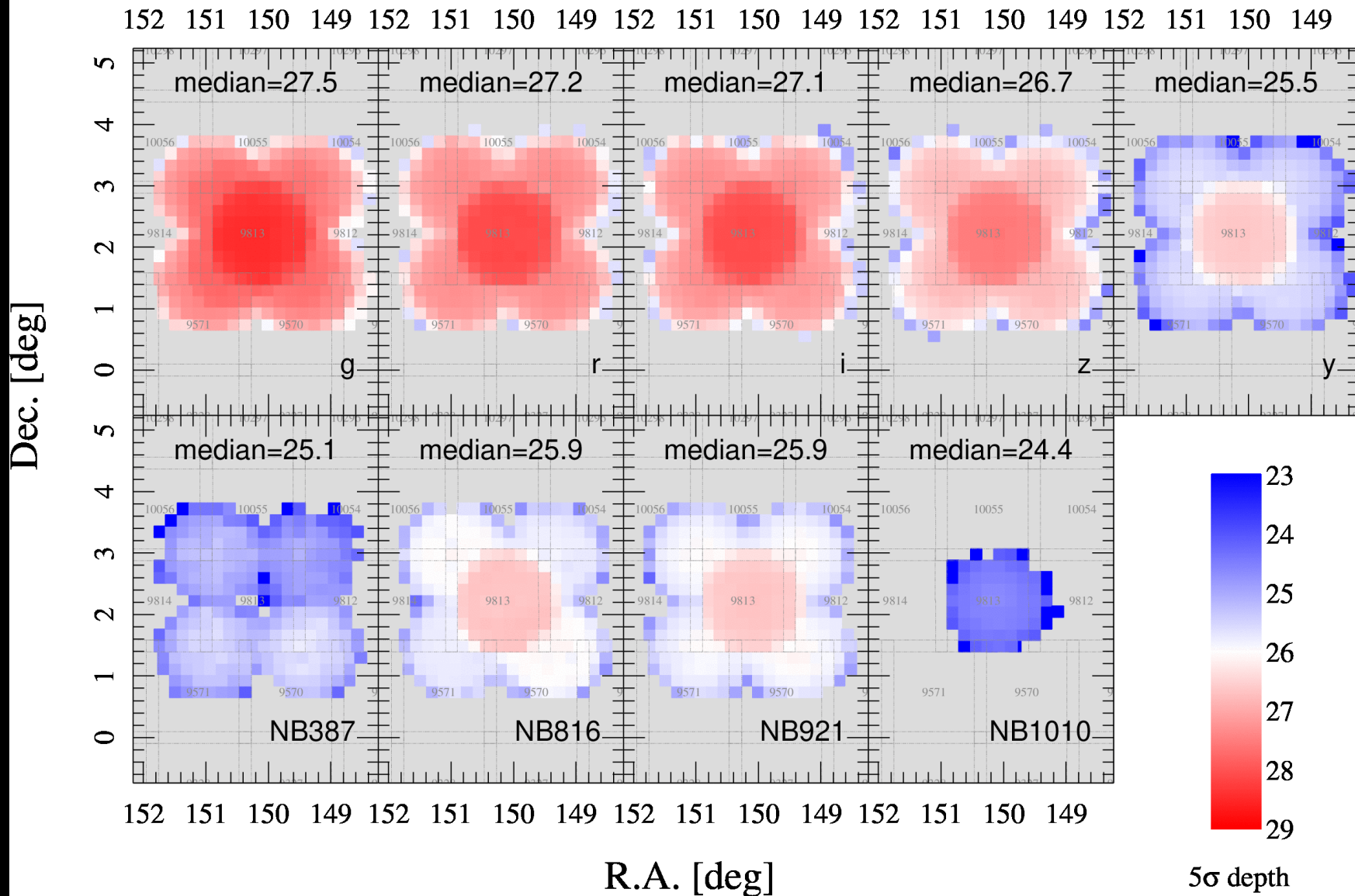
NEW: HSC Legacy Archive 2016

This side offers processed data from HSC-SSP, a large observing program conducted at the Subaru Telescope. While 1/3 of the observing time was used for SSP, the remainder has been used for PI programs. The observatory processed public raw data from PI programs conducted through 2016 and the science-ready data is available at the HSC Legacy Archive (HSCLA). Check out the website here.

[Go to HSCLA!](#)



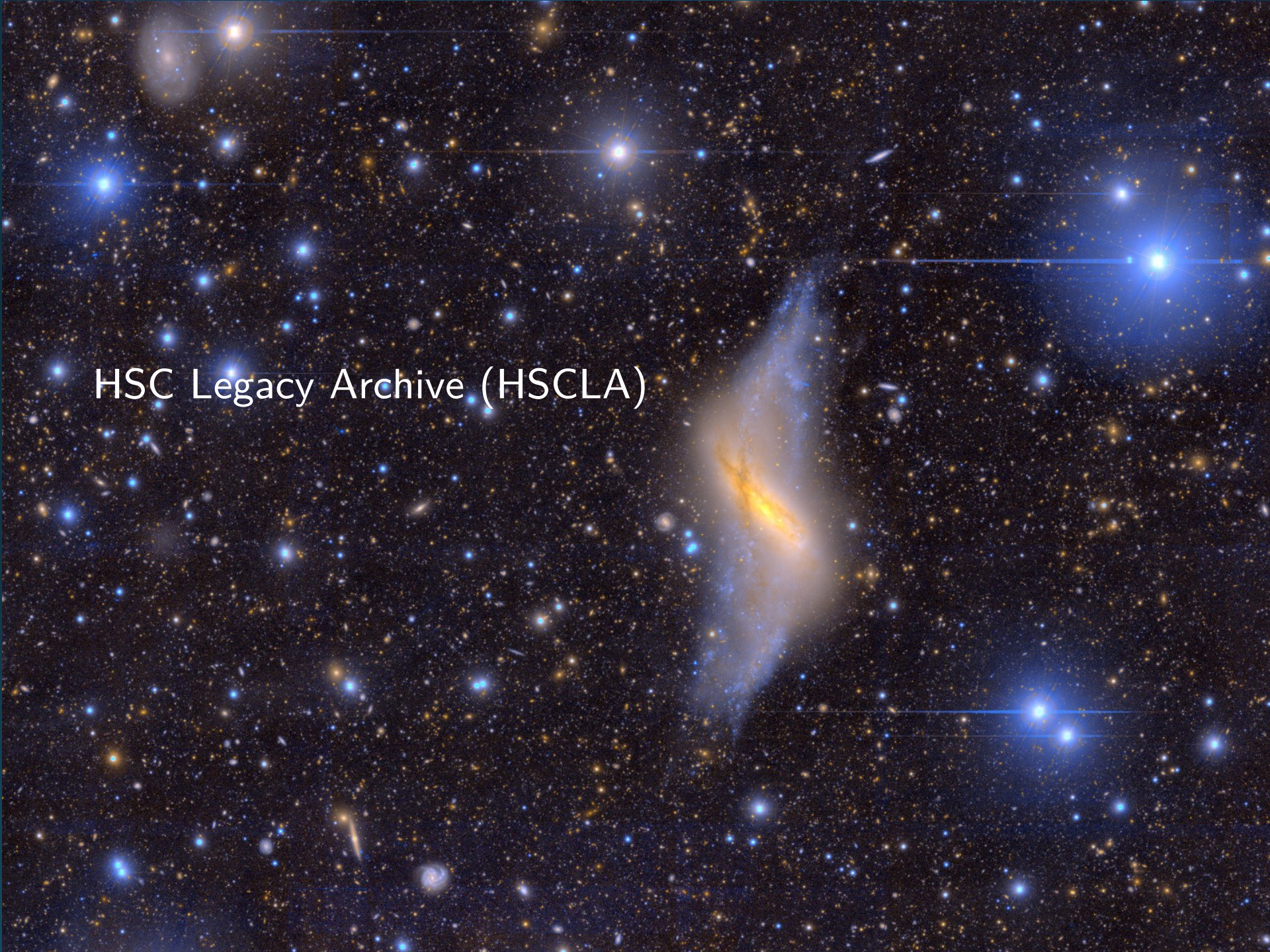
D/UD-COSMOS



A deep space photograph showing a vast field of stars. In the center, there is a large, glowing blue nebula. Several bright cyan stars are scattered across the field, each with a prominent four-pointed diffraction pattern. The background is a dense field of smaller, dimmer stars.

ここだけの話ですが...

HSC Legacy Archive (HSCLA)



- HSC観測時間の3分の1はSSP観測に割り当てられた。
- 残りは共同利用観測へ。
- 共同利用観測データの科学的価値は高いものの、処理済みデータは公開されてこなかった。
- 天文台で処理して公開しようぜ。

というのが HSC Legacy Archive (HSCLA) です。

<https://hscla.mtk.nao.ac.jp/>

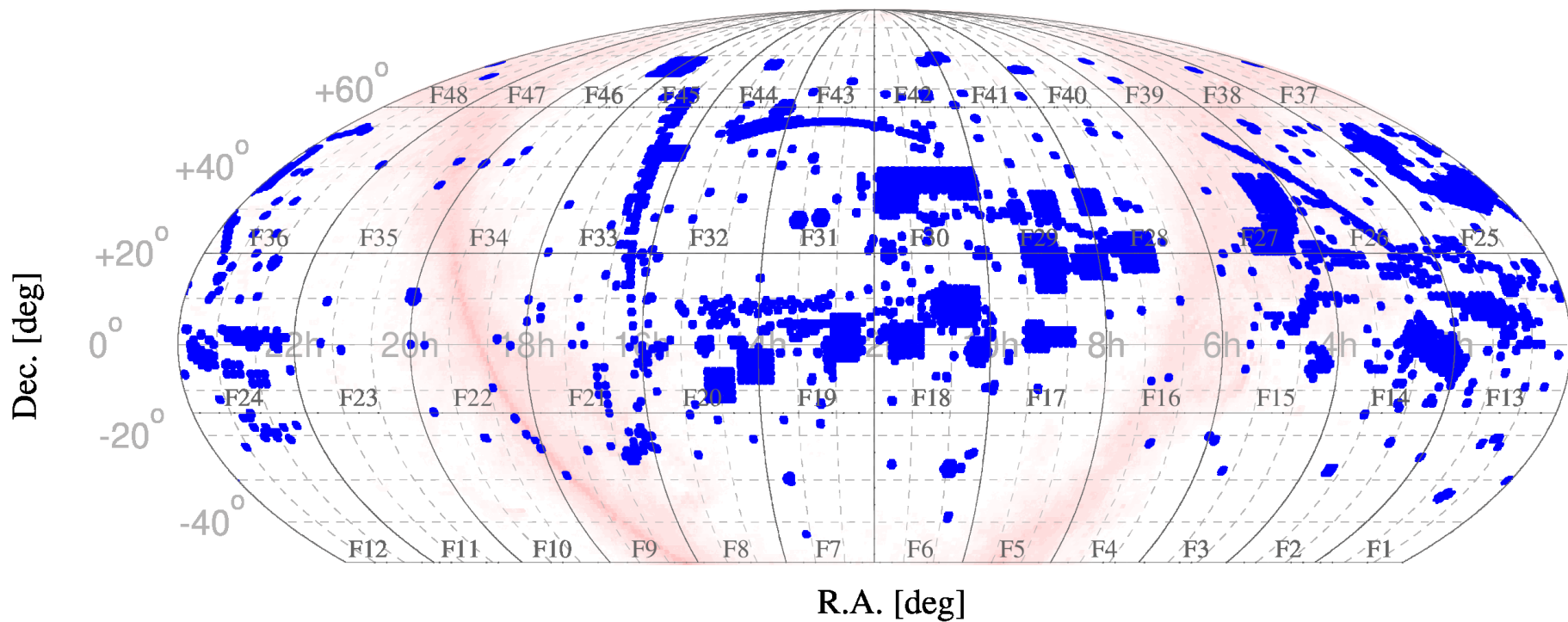
SSP では観測されない様々な天体が含まれています。



SSP では観測されない様々な天体が含まれています。

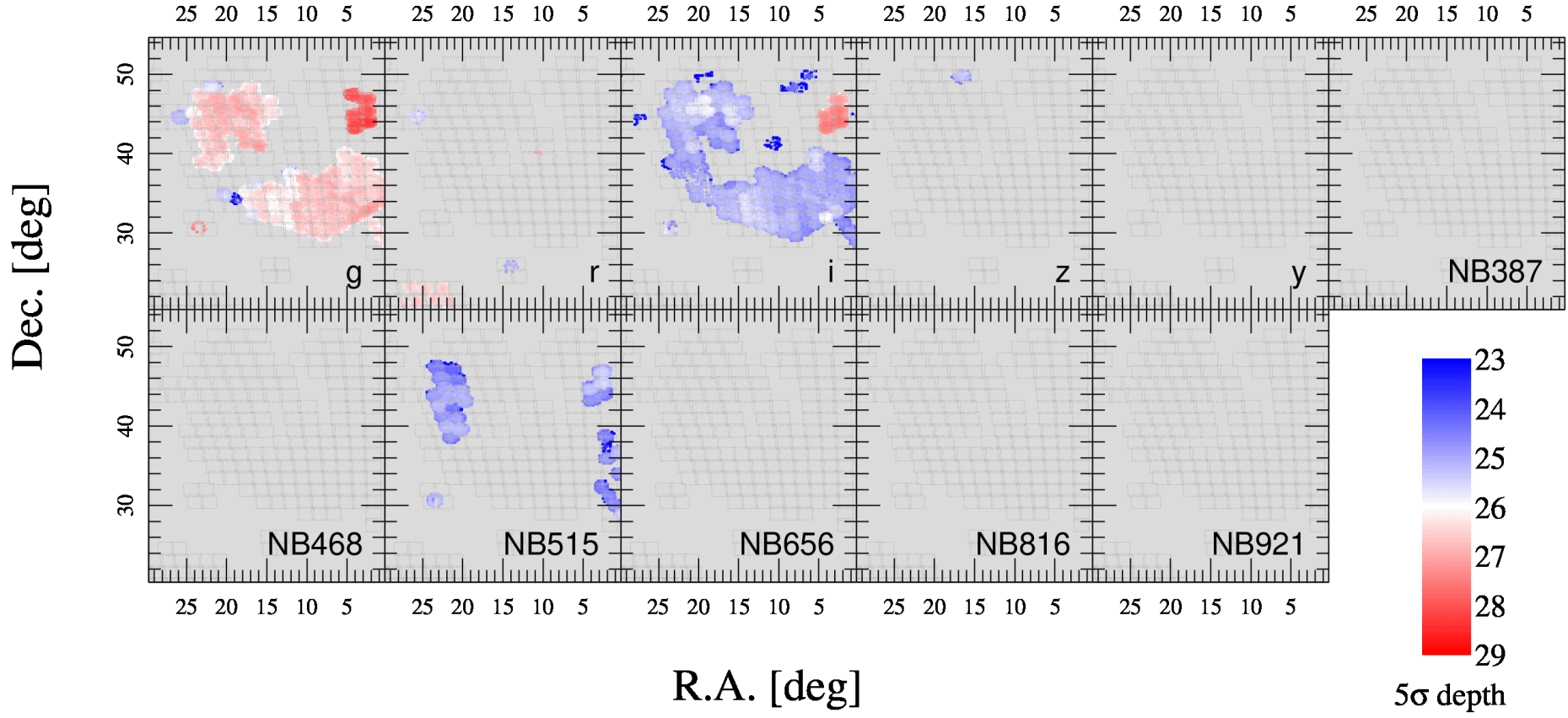



最新リリースはHSCLA2016 (2016年までの共同利用観測データが含まれる)。現在、HSCLA2020に向けて作業中。データの詳細は website の QA plots をご覧ください。



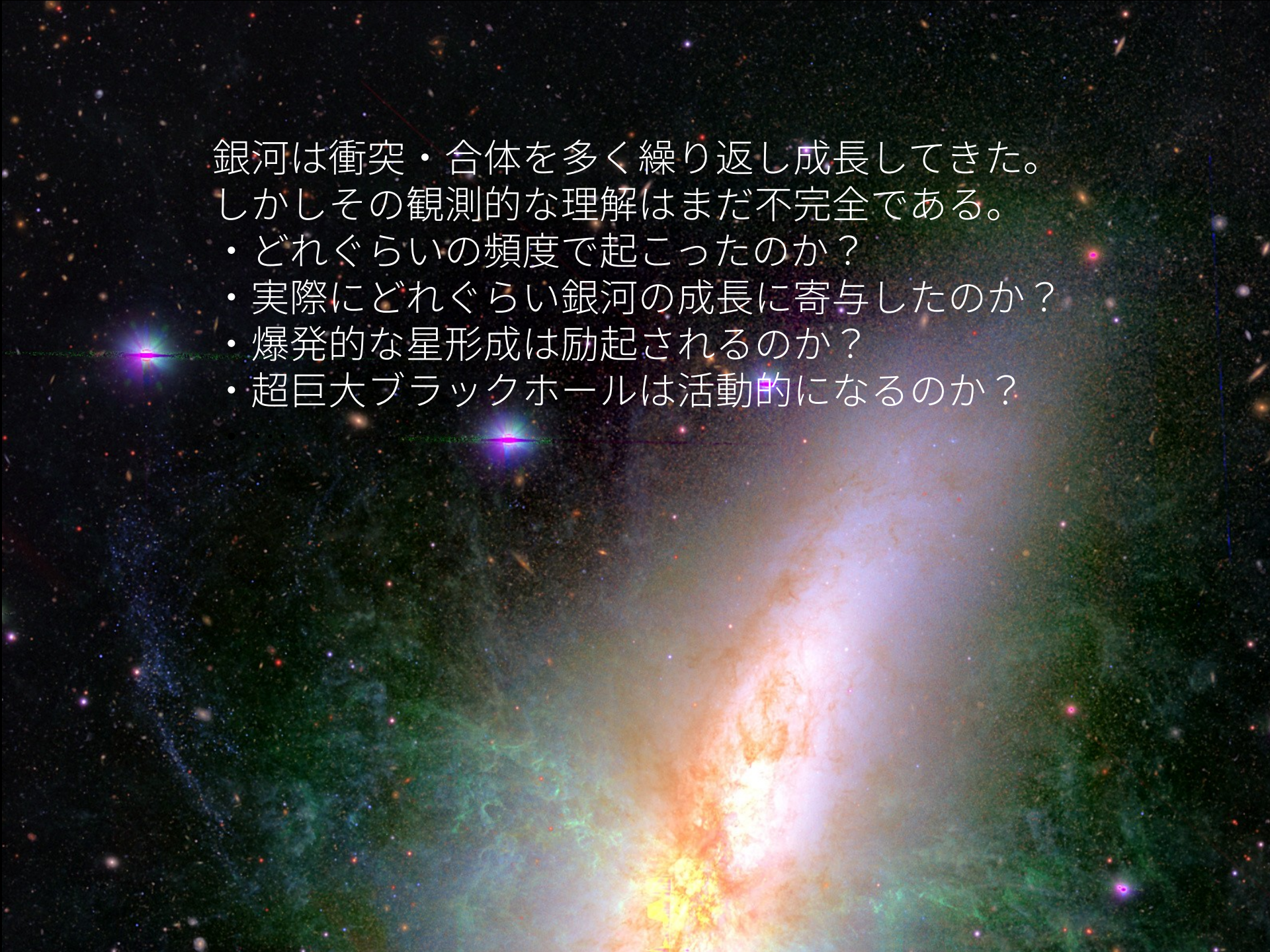
HSC-SSP と同じツールでデータを切り出すことができます。
SSPに慣れている方は、とても簡単にHSCLAデータが使える
はずです。どなたでもご利用いただけます。

F25




A deep space image featuring a variety of celestial objects. In the upper right, a bright yellow star with prominent diffraction spikes shines. Below it, a small satellite or probe is visible. The central focus is a large, detailed spiral galaxy with a bright core and blue-tinted arms. To its right, a smaller, more irregular galaxy is visible. The background is filled with numerous stars of different colors, including many bright blue ones, and smaller, fainter galaxies. The text "GALAXY CRUISE" is centered in the image.

GALAXY CRUISE



銀河は衝突・合体を多く繰り返し成長してきた。
しかしその観測的な理解はまだ不完全である。

- ・どれぐらいの頻度で起こったのか？
- ・実際にどれぐらい銀河の成長に寄与したのか？
- ・爆発的な星形成は励起されるのか？
- ・超巨大ブラックホールは活動的になるのか？



今までの研究でよく使われてきた画像



すばる望遠鏡で撮られた画像！

Hyper Suprime-Cam

A vast field of galaxies, including spiral, elliptical, and irregular shapes, scattered across a dark cosmic background. The galaxies exhibit a wide range of colors, from bright yellow and orange to deep blue and green. The density of galaxies is high, creating a rich, multi-colored tapestry of the universe.

全部目で見るのはつらい！



天文学者



天文学者



一般市民



Ajay Verma/Reuters

国立天文台 市民天文学プロジェクト

GALAXY CRUISE

詳しい内容を知りたい



「GALAXY CRUISE」ってなに?

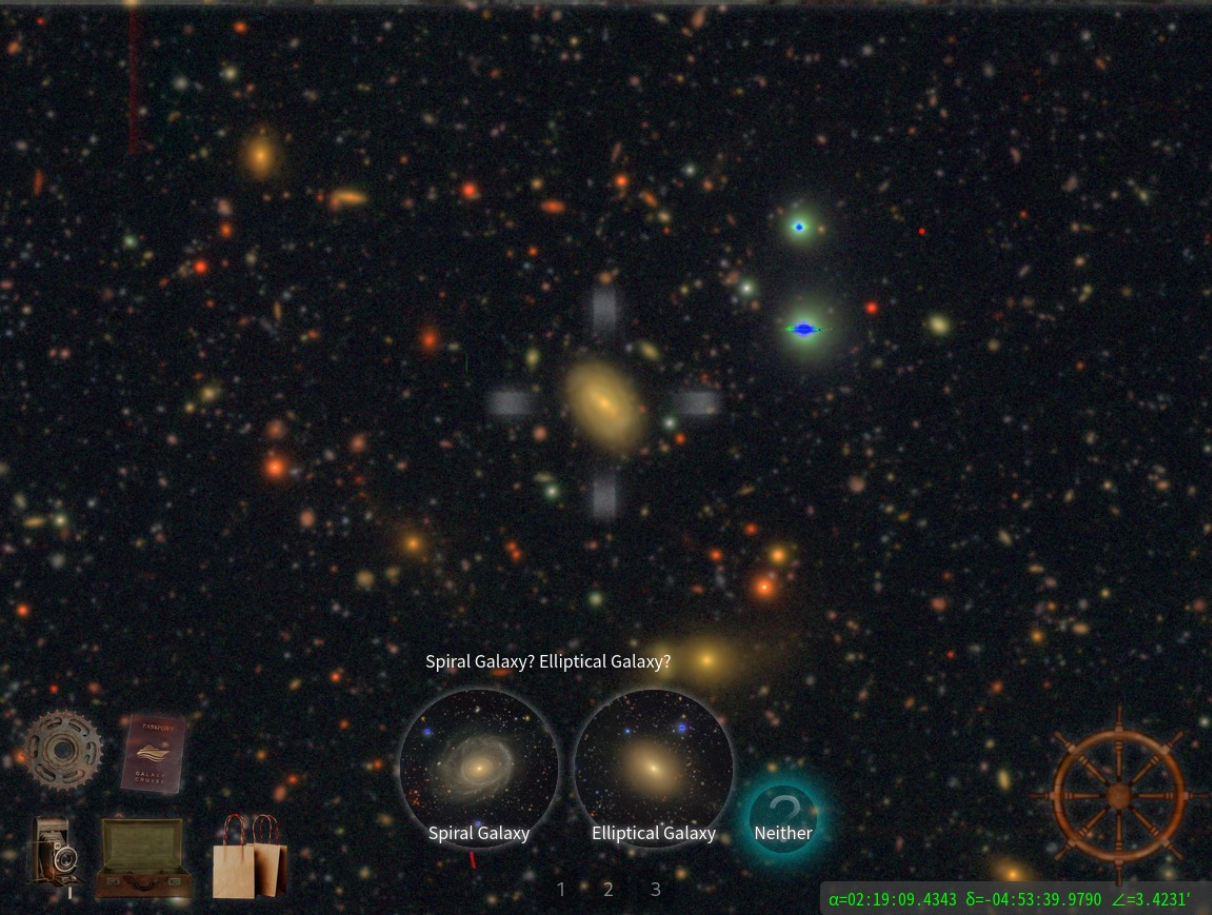
今すぐ乗組員になる



市民天文学者としてプロジェクトに参加したい



<https://galaxycruise.mtk.nao.ac.jp/>



Q1: Morphology of this object?



Elliptical



Spiral



Not sure



Q2: Interacting?



Yes



No



Not sure



If 'Yes'

Q3: Which feature(s)?



Ring



Fan



Tail



Distortion

GALAXY CRUISE: Deep Insights into Interacting Galaxies in the Local Universe*

ver. 2022 November 25

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Received ; Accepted

Abstract

We present the first results from GALAXY CRUISE, a citizen (or community) science project based on data from the Hyper Suprime-Cam Subaru Strategic Program (HSC-SSP). The current paradigm of galaxy evolution suggests that galaxies grow hierarchically via mergers, but our observational understanding of the role of mergers is still limited. The data from HSC-SSP are ideally suited to improve our understanding with improved identifications of interacting galaxies thanks to the superb depth and image quality of HSC-SSP. We have launched a community science project, GALAXY CRUISE, in 2019 and collected over 2 million independent classifications of 19,847 galaxies at $z < 0.2$. We first characterize the accuracy of the participants' classification and demonstrate that it surpasses previous studies based on shallower imaging data. We then investigate various aspects of interacting galaxies in details. We show that there is a clear sign of enhanced activities of super massive black holes in interacting galaxies compared to those in isolated galaxies. We also show that the mass growth rate inferred from our results is consistent with the observed evolution of the stellar mass function. The 2nd season of GALAXY CRUISE is currently under way and we conclude with future prospects. We make the morphological classification catalog used in this paper publicly available at the GALAXY CRUISE website.

年内に論文を投稿予定。
台内での始動から5年余。

- 楕円銀河 vs 渦巻銀河
- 衝突していて、こういったfeatureが見えるか

について統計的な分類があります。
カタログを利用したい方は田中まで。