

Current Status of SWIMS-IFU

- A new near-IR IFU for Subaru -

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【Collaborator】

SWIMS development Team (PI: K. Motohara)

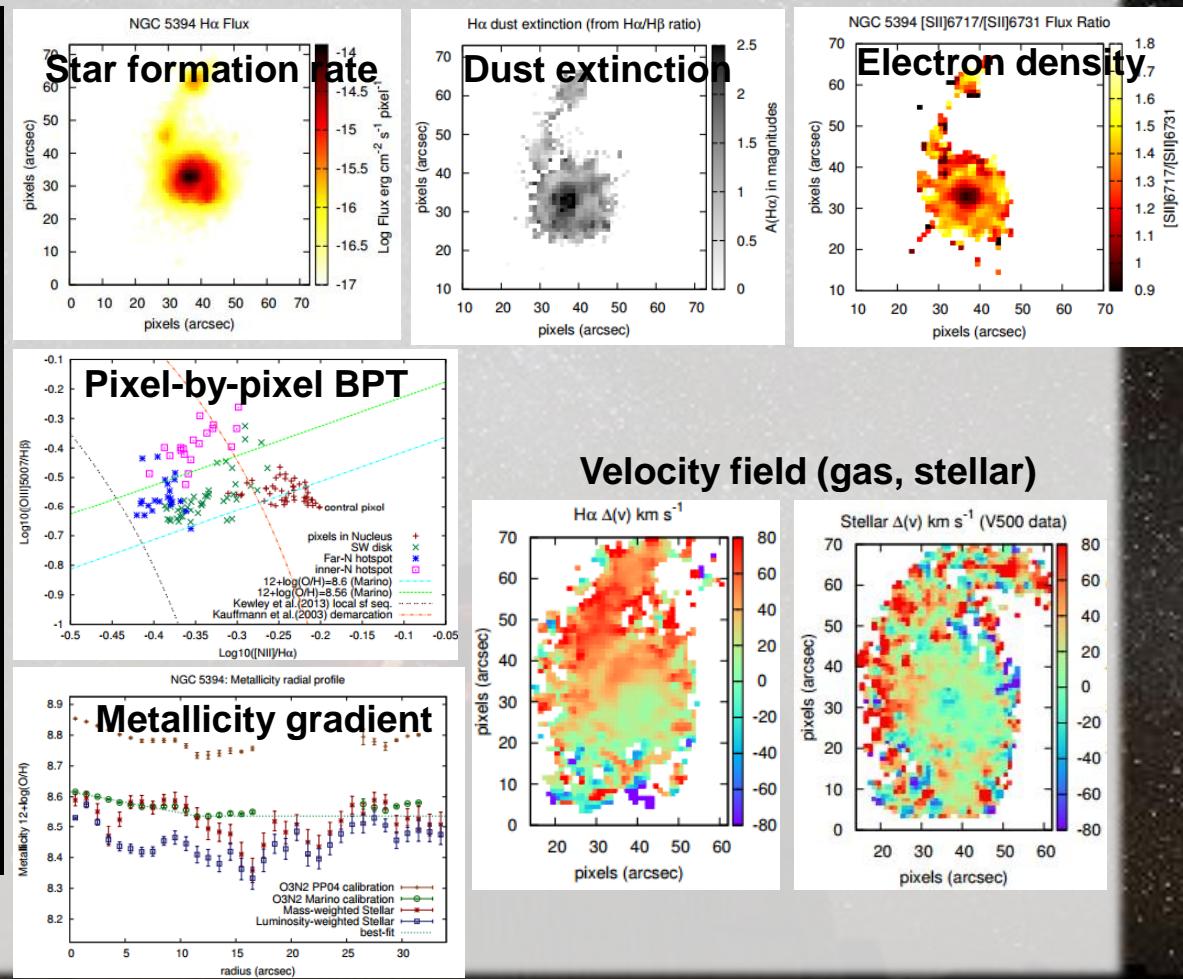
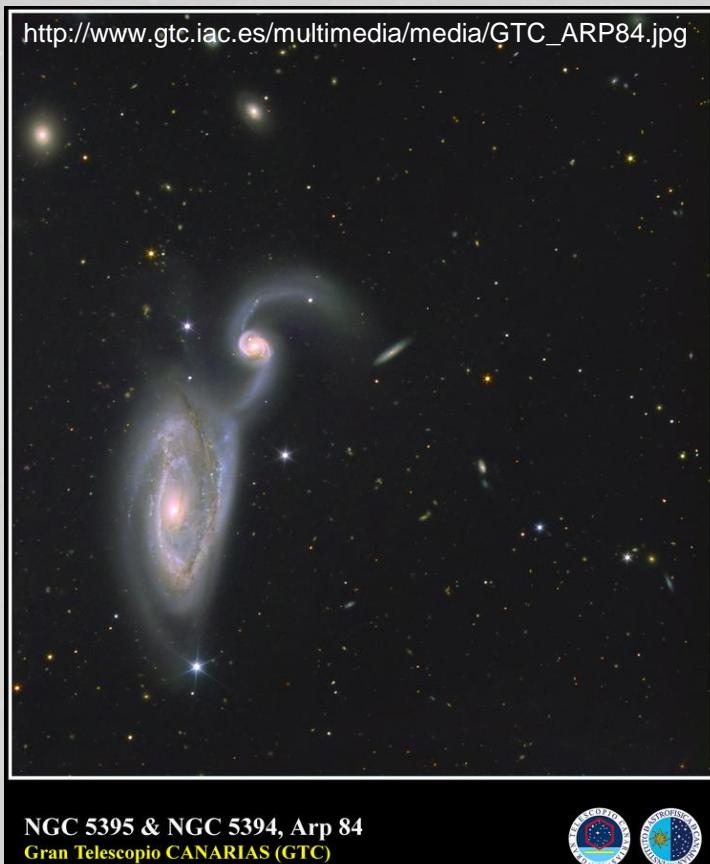
S. Ozaki (NAOJ), Y. Yamagata (RIKEN)

S. Morita (Tokyo Denki Univ.)



Why do we need IFS observations ?

- IFS technique provides **spatially resolved physical information**.



N. Roche et al., 2015 (MNRAS)



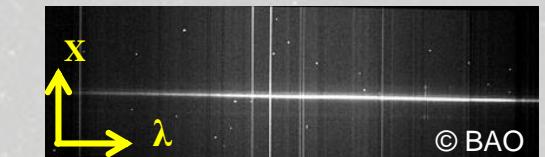
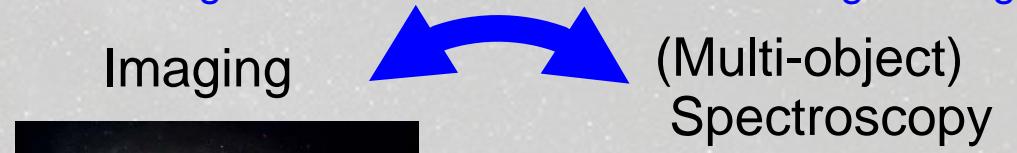
Concept of SWIMS-IFU

► Original design of SWIMS

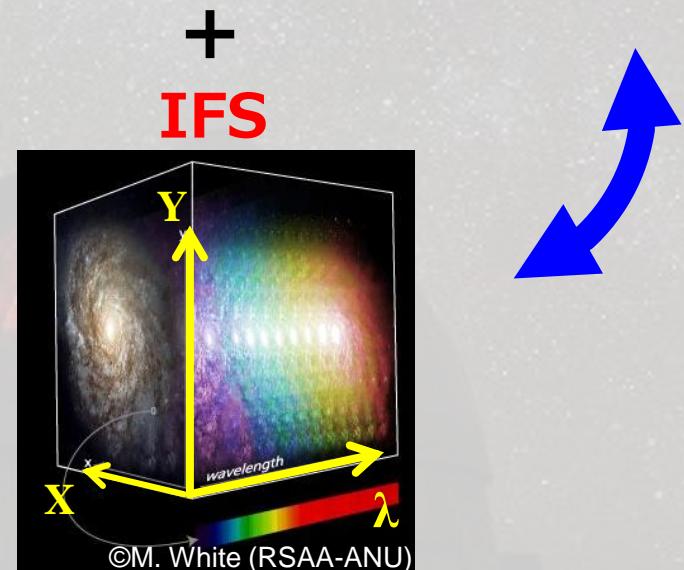
We can change each observational mode during one night.



SWIMS main dewar



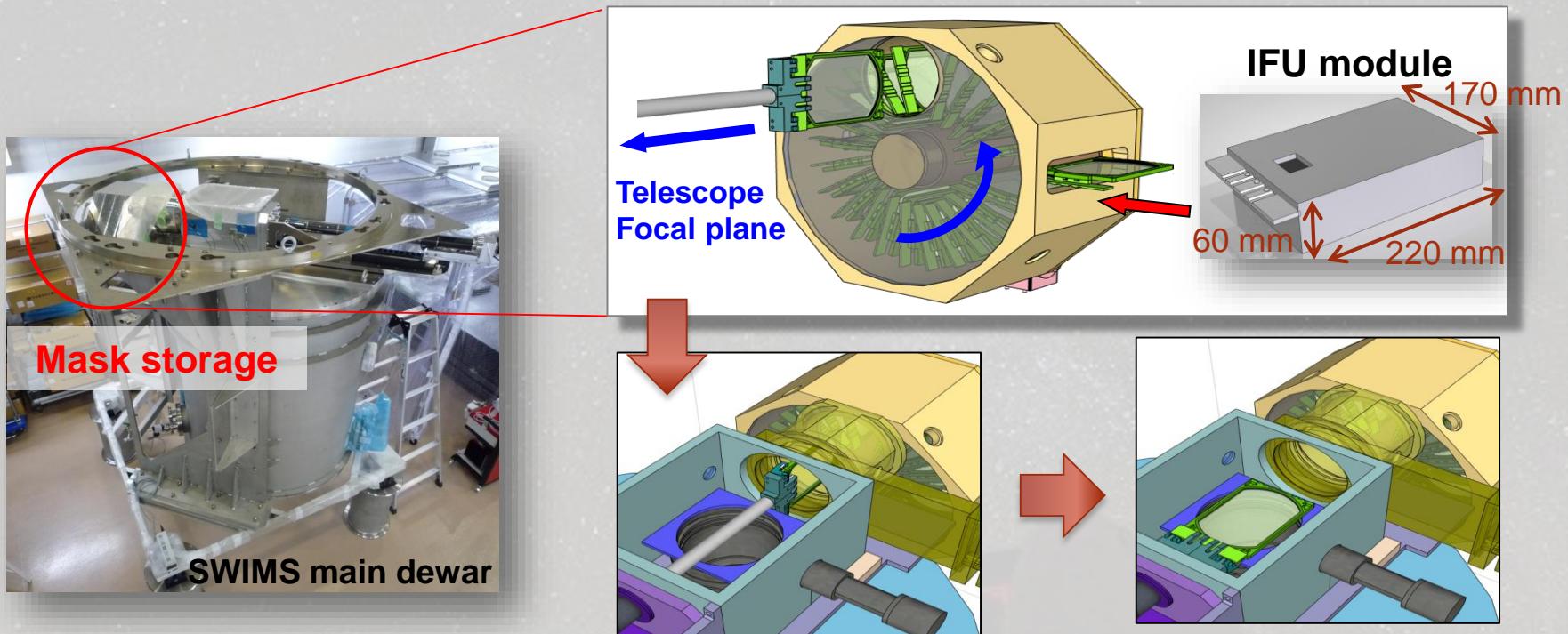
► Current design is ...





Concept of SWIMS-IFU

- ▶ Easy and quick switching of observation modes



- ▶ Compact and lightweight IFU module like a “slit mask”
 - Size : < 170 mm x 220 mm x 60 mm (corresponding to 2 slit masks)
 - Weight : < 900 g



Specifications

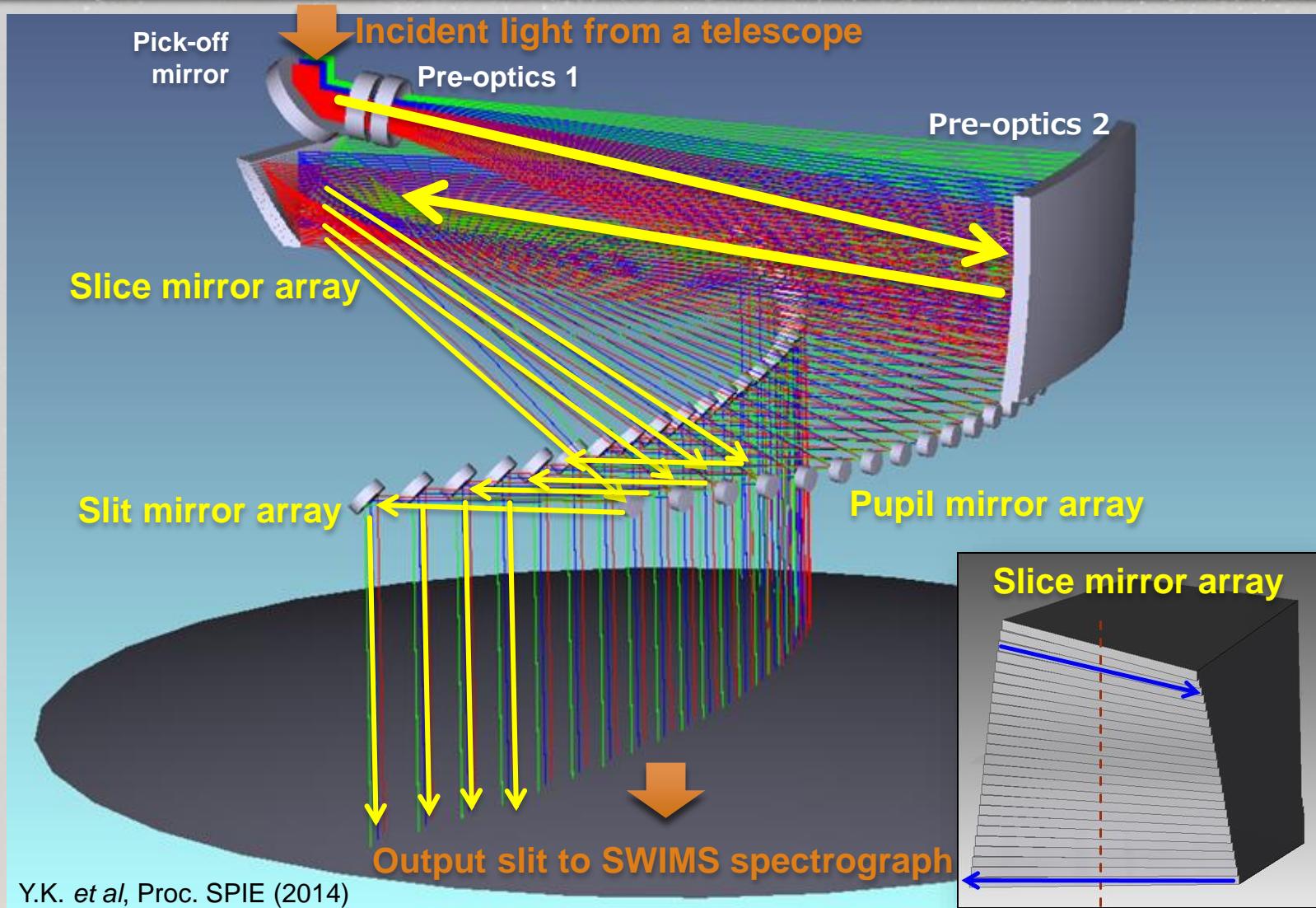
► Comparison with other near-infrared IFUs

Telescope	Subaru	TAO 6.5m	VLT	Gemini	Keck
IFU	SWIMS-IFU		SINFONI	NIFS	OSIRIS
Method	Image slicer		Image slicer	Image slicer	Lenslet array
λ (μm)	0.9 - 1.4 (blue) 1.4 - 2.5 (red)		1.1 - 2.45	0.94 - 2.4	1.0 - 2.4
$\lambda / \Delta\lambda$	900 - 1400 (blue) 700 - 1200 (red)		~ 3000	~ 5000	~4000
sampling	0.4" (13 slice)	0.5" (26 slice)	0.025" - 0.250" (32slice)	0.103" (29 slice)	0.02" - 0.1"
FoV (arcsec ²)	14.0 x 5.2	18.4 x 13.7	0.8" x 0.8" - 8" x 8"	3.0" x 3.0"	0.3" x 1.3" - 3.2" x 6.4"

- simultaneous wavelength coverage (0.9-2.5 μm) and wide FoV (> 250 arcsec² @TAO)
- coarser spatial sampling optimized for seeing-limited observations.
→ more sensitive for extended sources



Optical design

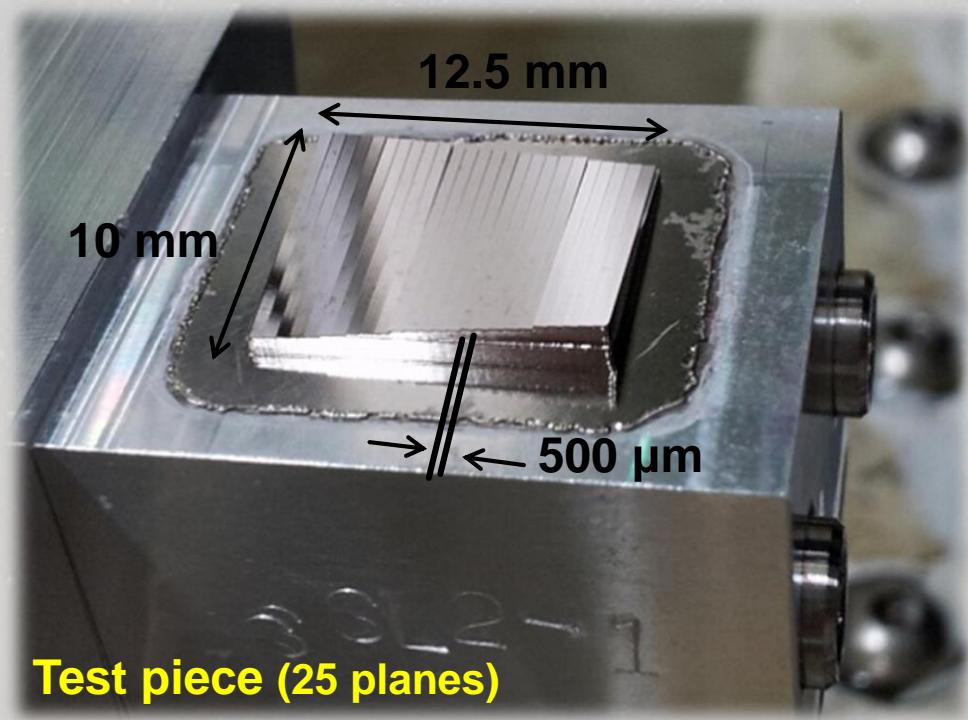


Mirror fabrications



► Fabrication of slice mirror arrays

* collaborated with RIKEN Center for Advanced Photonics





Summary and Future prospects

► SWIMS-IFU

- Wide FoV ($>250 \text{ arcsec}^2$ @ TAO)
- Wide wavelength coverage (simultaneously $\lambda = 0.9\text{-}2.5 \mu\text{m}$)
- Efficient IFS observation (seeing-limited)

► Current status

- Optical design → completed *slight modification may be applied
- Fabrications → in progress

► Progress schedule

- 2015.12
Fabrications
(mirror arrays & structures)

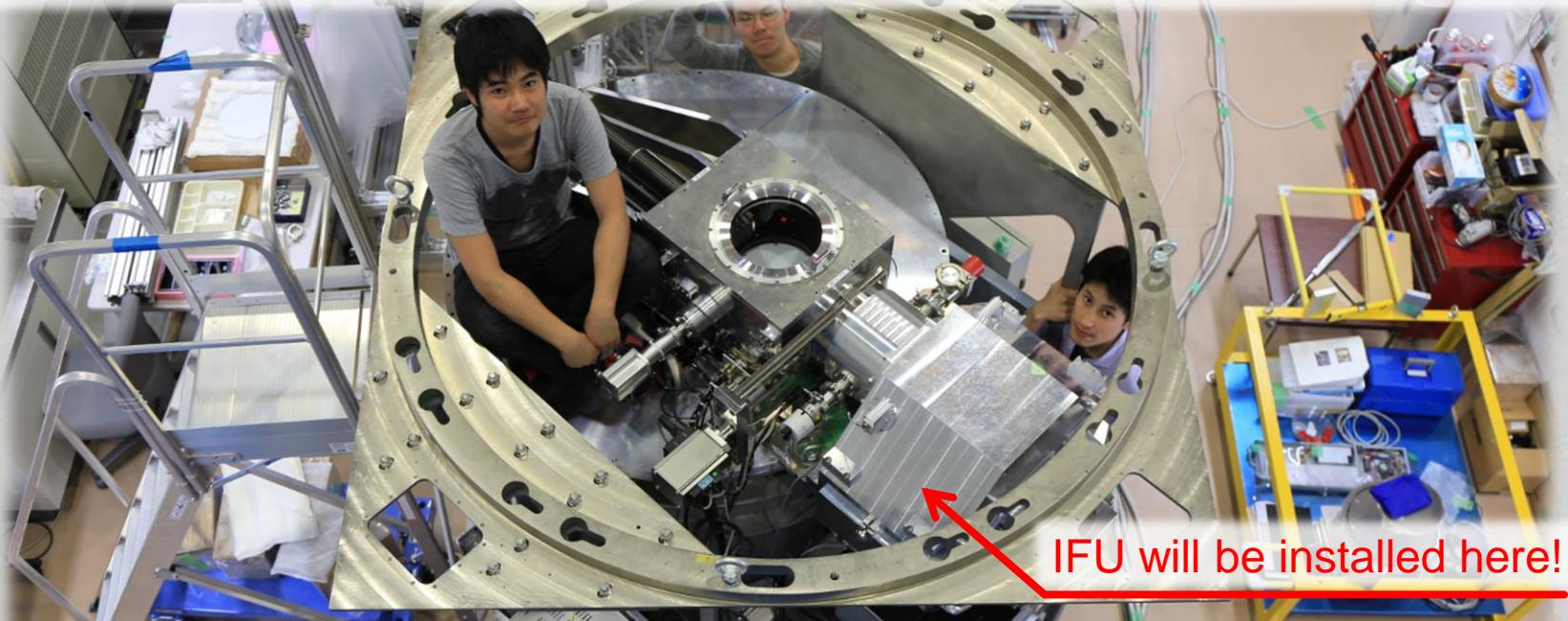
2016.1-2
Assembly and
performance evaluation
@ Mitaka

2016.4 -
Transportation to Hilo
and First light at Subaru



Thank you for your kind attention

We are looking forward to collaborating with you...!



IFU will be installed here!



by SWIMS development Team