SUBARUPRIMEFOCUSSPECTROGRAPH

Naoyuki Tamura (Kavli IPMU, The Univ of Tokyo) & PFS collaboration

PFS (Prime Focus Spectrograph), a next generation facility instrument on Subaru Telescope, is a very wide-field, massively multiplexed, and optical & near-infrared spectrograph. The instrument has been developed by the international team at the initiative of Kavli IPMU. The project is coming into the construction phase aiming at system integration & commissioning in 2017-2018 and science operation in 2019, with three key science areas: Cosmology, galaxy/AGN evolution, & Galactic archaeology.



<u>PFS – Fast facts</u> Wide field: ~1.3 deg diameter (Hexagonal)

Quick fiber reconfiguration: ~60 sec (TBC)

Positioner pitch: 8mm (~88 arcsec), with patrol areas overlapped between adjacent ones.

Optical-NIR coverage: 380-1260nm at once.

Highly multiplexed: 2400 fibers,

Fiber diameter: ~1.1 arcsec

HSC & PFS for "SuMIRe"

Kavli IPMU is leading the project "SuMIRe" (Subaru Measurement of Images and Redshfits), of which two wheels are PFS & Hyper Suprime Cam (HSC, a very wide-field CCD imager) on Subaru.

PFS will share the prime focus housing unit "POpt2" and Wide-Field Correcton "WFC" with HSC.





Wide-Field Corrector "WFC" with HSC.





<u>Prime Focus Instrument "PFI" (</u>JPL/CIT, ASIAA, LNA)

		Blue	Red		NID		CALLS ST PA				
		Diue	LR	MR	INIK			C.	actroaran	h Custom	"C
Cov	erage	380-	630-970	710-	940-1260			<u>- 2</u>	(LANA DI		<u></u>
(nm Res) olving	650		885			D		(LAIVI, PC	J, JHU, LI	NAJ
pow	/er	~2300	~3000	~5000	~4300			• 4 i	identical units	→ 2400 sp	ectra total.
			<u>Throu</u>	<u>ighput model</u>		// 16/		Lo or	n the TUE-IR flo	or in the do	n room me.
20 780			Vr								1 2 1
											14
, L.	 600	800 1000 1200						E E E E	enterer A Detaster		
		Wavelength [rrm]						Cetrudy Schere	1996 I Constante 1999 1982	100 - S	
[1-(o	s/N	per pix for a 22.5	mag (AB) source				7-112	Converse 1	Datentes Schendt		
Preid center, Zentin Justance = 0 deg									Magn.mirer		
1) 1-	1	ri l'Alimia,					a Dive	Margin er	inor 💦	X	UD
(xiq)]							Tell 1				
20 0 4000 6000 8000 10 ⁴ 1.2×10 ⁴							<u>Expected timeline</u>				
τ.		Wavelengtl	h [A]	Entranciscom.			"SM-N": Nth Spectrog	raph Module			
Fiber System (LNA)					<u>Ivier</u>	(ASIAA)	"MCS": Metrology Ca "PFI": Prime Focus Ins	mera System trument	Subsystem DEL & A	IT at Subaru	
				cable C		(ASIAA)	"CAB": Fiber Cable on	Telescope	SM-1, 2 AIT	DEL SM-3, 4	
 The 	ree parts: escope ("	PFI ("Cable C B"), SpS ("A")	") Chines	RO	• Take ima	ges of back-lit fibers	MCS CDR PFI	DEL SM-:	^{1, 2} CAB PFI	SM-3, 4 Al	г
• Two connectors: "C-B" & "B-A".				on the prime focus <i>all at once.</i>					ļļ		
U) fiver (IR side _ cable A			A CAL		as an instrument at cs.	2015	2016	2017	2018	2019	
A											
							Constructio	n, subsystem int	egration & test		Science
									System	integration	operation
										On-sk commissio	y Joning