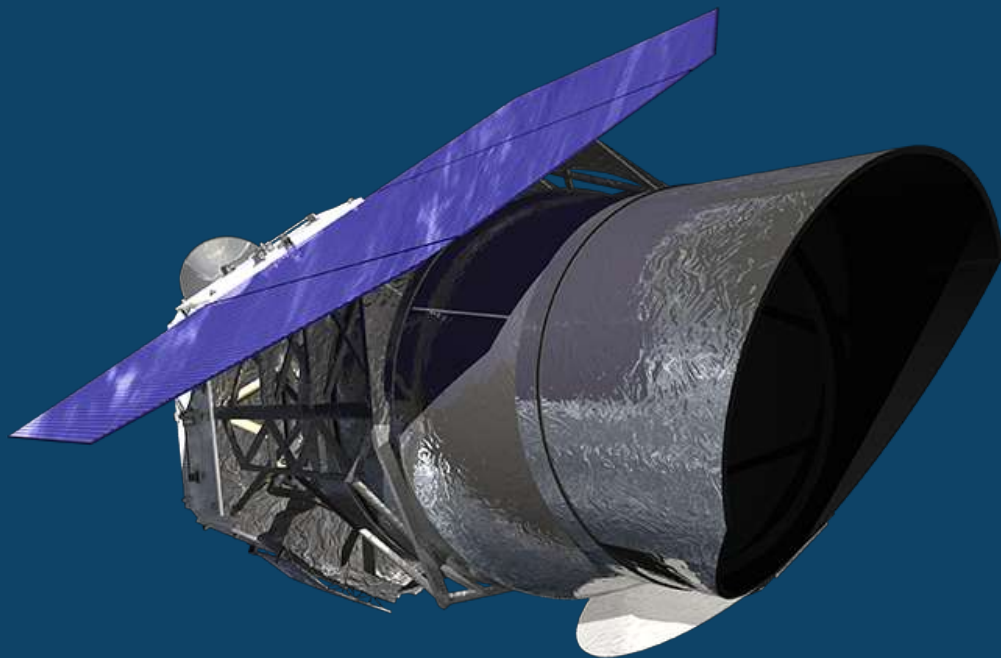


WFIRST-Subaru synergy program



Takahiro Sumi (Osaka U), Toru Yamada (ISAS)
Yusei Koyama (Subaru), **WFIRST WG**

2018/1/19 Subaru UM@NAOJ

- **Overview** (Sumi)
- **Summaries of break out sessions:**
 - ML: T. Sumi
 - HL: M. Takada
 - CG: M. Tamura
 - SN: T. Moriya
 - GO: Masayuki Tanaka
- **Discussions** (Koyama):

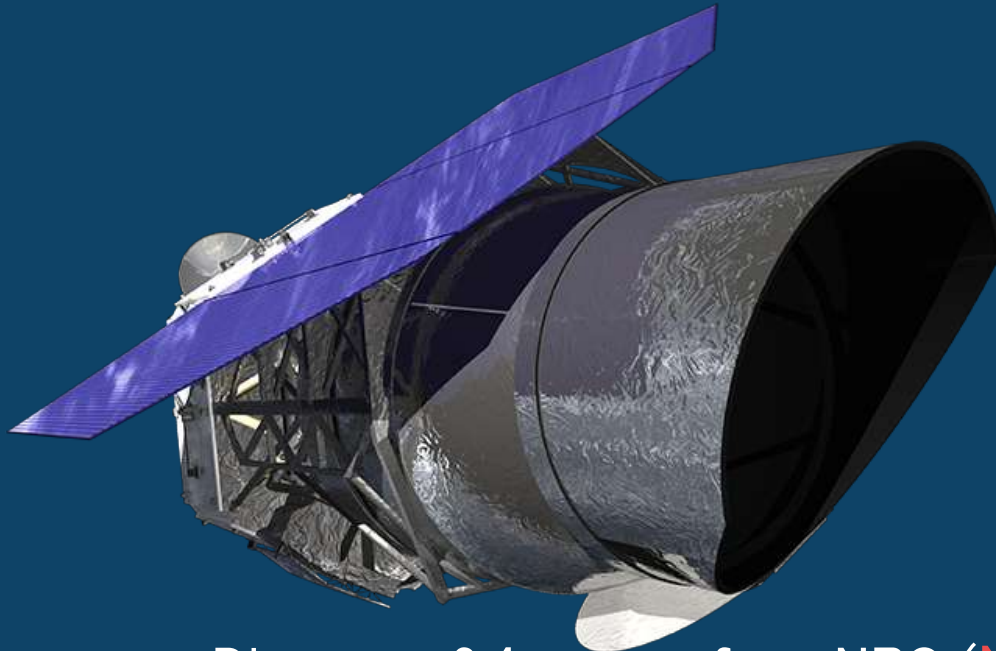
WFIRST



(Wide Field Infra Red Survey Telescope)

Recommended by Decadal survey astro2010
NASA's flagship mission following HST, JWST

Launch in 2025



- Dark Energy
- Exoplanet Microlensing
- Exoplanet Coronagraph
- Guest Observing Prog.

Diameter: 2.4m given from NRO ([National Reconnaissance Office](#))

$\lambda < 2 \mu\text{m}$

FOV: 0.281 deg.²

Channel field layout for AFTA-WFIRST wide field instrument

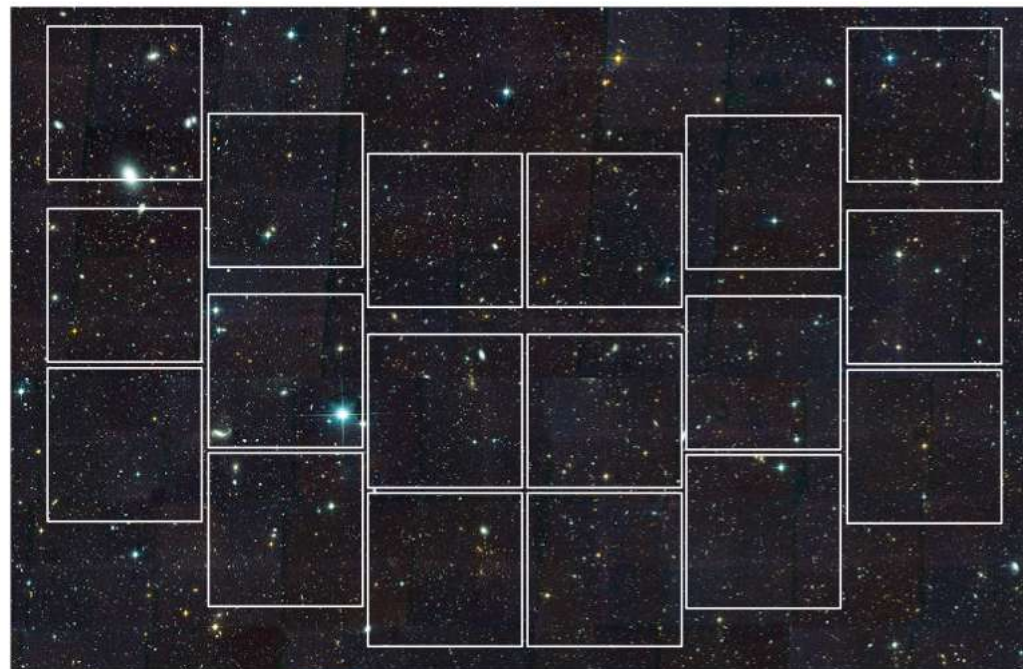
0.788° wide
0.427° high

X gaps 2.5mm
Y gaps 8.564mm



Moon (average size seen from Earth)

4k x 4k pixel H4RG-10 18 detectors
0.11 arcsec/pixel 0.28 deg²



HST/ACS



HST/WFC3



JWST/NIRCAM

~90 × bigger than HST–ACS FOV,

~200 × bigger than IR channel of WFC3

Each square is a H4RG-10
4k x 4k, 10 micron pitch
288 Mpixels total

Slitless spectroscopy with grism in filter wheel
R_θ ~ 100 arcsec/micron

Japanese Contribution “Package” for WFIRST

■ JAXA WFIRST WG (PI: Sumi)

1. Subaru-WFIRST Synergy Survey (2025年～100nights)

1. photo-z calibration
2. Narrow band filters

2. Contribution to Coronagraph Instrument

- Polarimetry capability
- Development of Polarimetry Compensation Unit

3. Ka-band Data Downlink Station in Japan

4. Ground base microlensing data sharing (MOA) pre/concurrent Ground base microlensing obs. with new 1.8m (PRIME)



WFIRST activity & schedule

- 2010/12, first WFIRST Science Definition Team(SDT), Japan rep. Sumi
- 2013/7, WFIRST-AFTA SDT, JAXA rep. Toru Yamada (ISAS)
- 2013/8, launch 「WFIRST informal WG」
- 2014/2, WFIRST coronagraph WACO WG at JAXA
- 2015/3, SDT final report
- 2016/1, launch WFIRST WG(PI:Sumi)
- 2016/2, NASA started phase A.
- 2016/6, Toru Yamada became JAXA rep for NASA FSWG
- 2016/7 Subaru-WFIRST synergy obs. White paper
- 2017/9 proposal submitted to ISAS/JAXA.
- 2017/8~10, WIETR
- 2017/11, descope plan submitted to HQ
- 2017/2/19, NASA WFIRST
SRR(System Requirements Review),
MDR (Mission Definition Review)
- 2017/4, NASA WFIRST KDP-B(Key Decision Point)

SRR explain the flow from
objective to requirement.
MDR is reverse.

Subaru Synergistic Observations

■ Subaru Telescope Commitment

Subaru Telescope, NAOJ, **agreed to commit**
~100 nights at ~2025(*) for Subaru/WFIRST
synergistic observations.

- Support in GOPIRA symposium in October 2016
in wide opt/IR community
- Subaru Advisory Committee concluded in their
report in November 2016
- Letter of Intent sent to Director of ISAS from Director of
NAOJ Hawaii observatory.(cc: NASA HQ)
- Reported in Subaru Users' Meeting in January 2017

Subaru Synergistic Observations

- 2016/7 Subaru–WFIRST synergy obs. White paper

2017:

- 9/13 Meeting with Hawaii observatory & WG
- 10/2 Meeting with Hawaii observatory & WG
- 10/5 **First domestic meeting for synergy workshop**
(~20participants)
- 11/15 **Second domestic meeting: Science talks**
(34 participants)
- 11/27 Meeting with Hawaii observatory & WG
- 12/18-20 **WFIRST/Subaru synergy workshop**
@Mitaka(>90participants,including 16 from US)
- 1/19 **Subaru UM. Report and discussion.**
NAOJ and JAXA prepare the Letter of Commitment

WFIRST-Subaru Synergistic Observation Workshop

December 18-20, 2017
NAOJ Mitaka Campus, Tokyo, Japan

Organized by **JAXA WFIRST WG**, Hawaii observatory, **NASA WFIRST FSWG**

Participants: >90, including 16 from US, WFIRST FSWG, SIT





WFIRST-Subaru Synergistic Observation Workshop

December 18-20, 2017
NAOJ Mitaka Campus, Tokyo, Japan

Scope:

- Share the interests from Japan and US
- Share the requirements from Subaru & WFIRST
- Start considering the overall strategy
- Define the rough schedule (launching the committee, program selection process etc..)
- Define the organization (committee)

Define the organization

- Steering committee: (for example)
 - 4 from NASA WFIRST project
 - 2 from JAXA WFIRST WG
 - 1 from Subaru
 - 1 from Subaru SAC

Day 2, 13:35-16:35, breakout sessions

discussion leaders:

HL: Dan Masters

Hiro Miyatake, M. Takada

ML: David Bennett

Taka Sumi

CG: Tyler Groff

Motohide Tamura

SN: Ryan Foley

Nao Suzuki, T. Moriya

**GO: James Rhoads, Brant Robertson, Toru Yamada, M,
Tanaka**

Discussion Item:

a) List possible Scientific programs.

b) Possible feasible scenario

c) Procedure to decide the observational programs.