

Subaru UM FY2019 (2019/11/17, Waikoloa, Hawaii)

# SAC REPORT FY2019

TADAYUKI KODAMA (SAC CHAIR; TOHOKU UNIV.)

# Subaru Science Advisory Committee (SAC)

Term: 1<sup>st</sup> Sep 2018 ~ 31<sup>st</sup> Aug 2020

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## OBSERVERS

**YOSHIDA**, Michitoshi (Director)

**TAKAMI**, Michihiro (Vice-director)

**KANBE**, Eiji (Hilo office)

**YAMASHITA**, Takuya (Head of Mitaka office)

**AOKI**, Wako (Mitaka office)

**SANDERS**, David (Univ. of Hawaii)

**SEKIGUCHI**, Kazuhiro (NAOJ)



## Recent major discussion items

1. IRD-SSP review
2. Additional night allocation to HSC-SSP
3. Instrument decommission plan
4. Subaru+TMT science book
5. International partnership
6. Time exchange program (new)
7. Accelerated operation of PFS-SSP
8. Participation in LSST
9. SWIMS science operation at Subaru

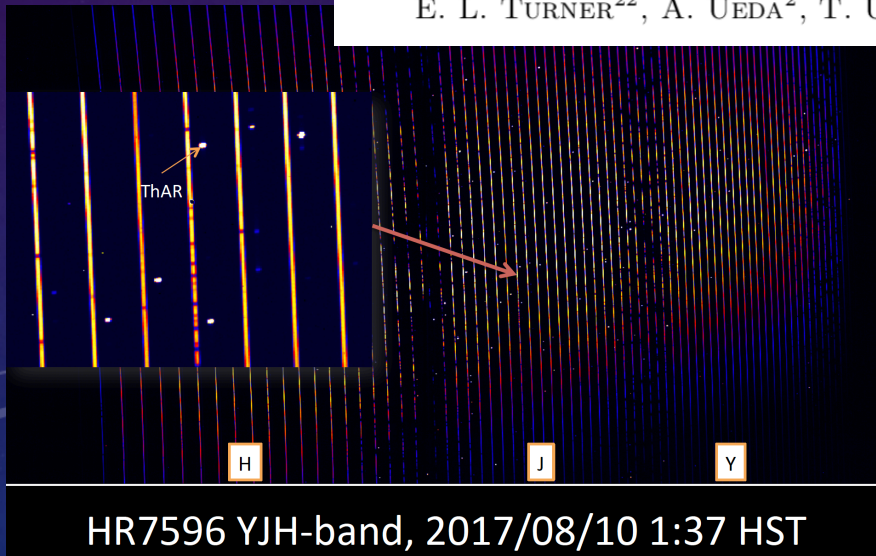
# 1. IRD-SSP review

## Search for Planets like Earth around Late-M Dwarfs: Precise Radial Velocity Survey with IRD

PI: Bun'ei Sato (Tokyo Institute of Technology)

Co-PI: Nagayoshi Ohashi (NAOJ, Subaru)

E. AKIYAMA<sup>1</sup>, W. AOKI<sup>2</sup>, C. BEICHMAN<sup>3</sup>, T. BRANDT<sup>4</sup>, G. CATALDI<sup>5</sup>, C. CLERGEON<sup>5</sup>, T. CURRIE<sup>5</sup>, R. DONG<sup>6</sup>, Y. FUJII<sup>7,8</sup>,  
H. FUJIWARA<sup>5</sup>, A. FUKUI<sup>2</sup>, H. GENDA<sup>7,8</sup>, T. GROFF<sup>9</sup>, O. GUYON<sup>5,10,11</sup>, D. HALL<sup>31</sup>, H. HARAKAWA<sup>2</sup>, J. HASHIMOTO<sup>2,11</sup>,  
Y. HAYANO<sup>2</sup>, M. HAYASHI<sup>2</sup>, K. G. HELMINIAK<sup>12</sup>, T. HENNING<sup>13</sup>, T. HIRANO<sup>8</sup>, K. HODAPP<sup>31</sup>, Y. HORI<sup>2,11</sup>, Y. IKEDA<sup>14</sup>,  
S. INUTSUKA<sup>24</sup>, H. T. ISHIKAWA<sup>21</sup>, M. ISHIZUKA<sup>15</sup>, H. IZUMIURA<sup>2</sup>, S. JACOBSON<sup>31</sup>, M. JANSON<sup>17</sup>, N. JOVANOVIC<sup>23</sup>,  
E. KAMBE<sup>2</sup>, H. KAWAHARA<sup>15</sup>, T. KODAMA<sup>15</sup>, Y. KOIZUMI<sup>8</sup>, E. KOKUBO<sup>2</sup>, M. KONISHI<sup>2,11</sup>, T. KOTANI<sup>2,11</sup>, T. KUDO<sup>2</sup>,  
T. KUROKAWA<sup>2,11</sup>, N. KUSAKABE<sup>2,11</sup>, M. KUZUHARA<sup>2,11</sup>, J. KWON<sup>16</sup>, C. LEE<sup>5</sup>, J. LIVINGSTON<sup>15</sup>, M. MACHIDA<sup>28</sup>,  
T. MATSUO<sup>27</sup>, D. MAWET<sup>23</sup>, M. McELWAIN<sup>9</sup>, V. MEADOWS<sup>29</sup>, E. MIEDA<sup>5</sup>, T. MIZUKI<sup>16</sup>, J. MORINO<sup>2</sup>, T. NAGATA<sup>20</sup>,  
T. NAKAGAWA<sup>16</sup>, T. NAKAJIMA<sup>2,11</sup>, N. NARITA<sup>15</sup>, J. NISHIKAWA<sup>2,11,21</sup>, S. NISHIYAMA<sup>18</sup>, H. NOMURA<sup>8</sup>, M. OGIHARA<sup>2</sup>,  
D. OH<sup>25</sup>, M. OMIYA<sup>2,11</sup>, S. OSHINO<sup>2</sup>, T. PYO<sup>5</sup>, E. SERABYN<sup>3</sup>, M. SITKO<sup>19</sup>, H. SUTO<sup>2,11</sup>, R. SUZUKI<sup>2</sup>, Y. TAKAGI<sup>5</sup>,  
H. TAKAMI<sup>2</sup>, T. TAKARADA<sup>8</sup>, N. TAKATO<sup>2</sup>, M. TAMURA<sup>2,11,15</sup>, Y. TANAKA<sup>30</sup>, H. TERADA<sup>2</sup>, R. A. TORRES<sup>17</sup>,  
E. L. TURNER<sup>22</sup>, A. UEDA<sup>2</sup>, T. USUDA<sup>2</sup>, T. UYAMA<sup>15</sup>, S. VIEVARD<sup>5</sup>, J. WANG<sup>23</sup>, J. WISNIEWSKI<sup>26</sup>, AND Y. YANG<sup>21</sup>



-70 nights over 2 years (19A-20B) out of requested 175n have been approved on condition that the performance (radial velocity measurement accuracy) is kept sufficient.

-Remaining 105 nights allocation will be considered at the interim review at TAC+SAC in July 2020.



## 2. Additional 30 nights for HSC-SSP

Weather factor has been worse than expected by ~15%

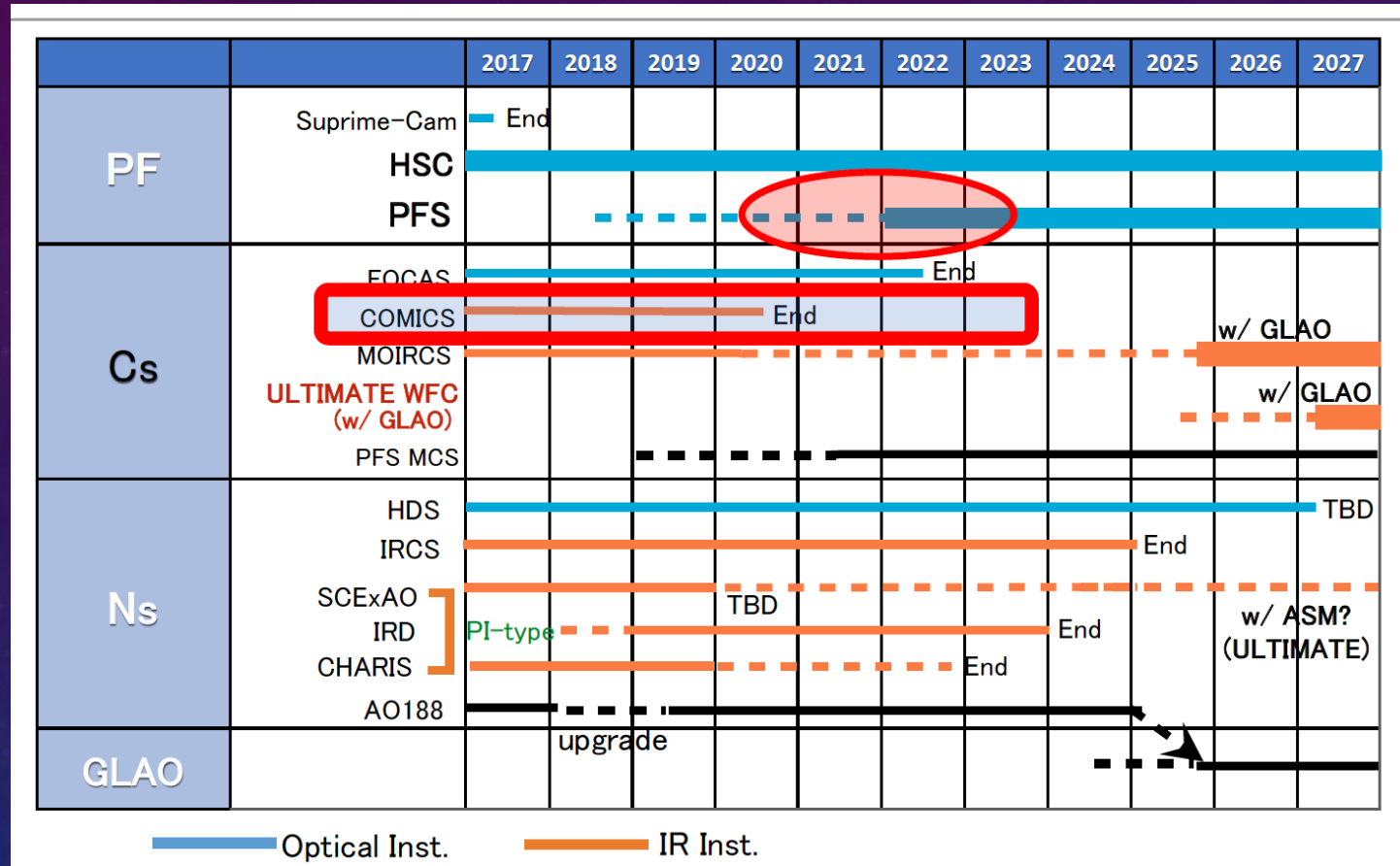
Completion fraction: D/UD=80%, W=72% (300nights)



D/UD>80%, W>80% (300 + **30nights**)

- This request was discussed at UM2018 and has been approved by SAC
- Completion of HSC-SSP will be extended to S20B (or S21A?).

### 3. Instrument Decommission Plan To reduce the operation cost



COMICS → 2020  
FOCAS → 2022

This will be discussed on Wednesday (17:30-18:30 on Nov 20)



## 4. Subaru + TMT Science Book Due by the end of 2019

Tentative front page



Aim: To brainstorm unique science using both Subaru and TMT, and to discuss our future directions, design our scientific and instrumentation plan.

Can be read by the scientists in other fields in upper level governmental committees.

Many scientists (>30) from the community are contributing the book as authors/editors

Editorial office: TMT-J project office

Currently Japanese only, but English summary is planned.



## 5. Subaru International Partnership

- Subaru international partnership framework has been intensively discussed in Hawaii observatory, EAO working group, SAC, and the NAOJ top management. It has also been reported and discussed at previous Subaru UMs and community questionnaire.
- As a result, we have abandoned the shared time concept, and instead we devised the **multi-partner program** (MMP), similar to ALMA LP, where multiple partners put their allocated time (PGT) together to conduct a relatively large program in collaboration.
- The framework has been finalized at the NAOJ top management and a document which describes it in detail has been issued (2019.9.5).
- We are currently discussing/negotiating with the following partner candidates: China, India, Canada, and Dawn-ORIGINS team.



# International Partnership Negotiations

**China:** Positive negotiation with NAOC is underway.

2 nights have been already allocated to Chinese proposals in S19B from DDT.

**India:** Positive discussion/negotiation is underway.

India-Japan Science workshop will be held on Dec. 18 –20 @Tata Institute of Fundamental Research (TIFR), Mumbai, India

**Canada:** Positive discussion is underway.

Co-held a Canada-Subaru session in “Wide-field Astronomy in Canada” (Oct 11-12, 2018).

Positively proposed in the Canadian Long-Range Plan.

**Dawn:** Negotiations with the PFS-SSP team is underway. See Sune Toft’s talk.

## MULTI-PARTNER PROGRAM (MPP)

New framework

- MPP is a science program that multiple Partners/Associates ( $\geq 2$ ) participate in with PI/Co-PI's.
- The number of nights are taken from each Partner/Associate's PGT in proportional to the number of PI/Co-PI's.
- Partners/Associates that participate in a MPP must have enough PGT and a contract of partnership until the completion of the MPP.
- In order to promote collaborations among Partners/Associates, up to 5 nights per semester may be reserved from the open-use time to assign buffer nights to some highly ranked MPP's in case of loss of their telescope times due to bad weather, etc. (SAC recommendation)



# TWO CATEGORIES OF PARTNERSHIP

New framework

- **Subaru Partner (SP):** Modified and approved by NAOJ director general based on the SAC proposal (2019.9.5)
  - Access to **Normal, Intensive, Large Programs, and future SSP (after PFS).**
  - Can apply for **Multi-Partner Program (including Large Program)**
  - **Participation in decision-making process (TAC and SAC)**
  - **More than 2 M USD in-cash contribution per year**
  - **Additional in-kind contributions** may be accepted up to **25%** of their cash contribution
  - **Term  $\geq$  3yrs**
- **Subaru Associate (SA):**
  - Access to **Normal and Intensive Programs**
  - Can apply for **Multi-Partner Program (excluding Large Program)**
  - **Observer participation in the TAC.**
  - **More than 400 K USD in-cash contribution per year**
  - **In-kind contributions may *not* be accepted**
  - **Term  $\geq$  2yrs**

\*Unit can be any of a country, a multi-country organization, an institute, or a multi-institute consortium.

# HOW TO CALCULATE THE NUMBER OF NIGHTS FOR PARTNER GUARANTEED TIME

- Partner's guaranteed time (PGT) is allocated to each partner/associate based on the fraction of total contributions from each partner to the value of Subaru:

Value of Subaru: **20 M USD (~2.2 B JPY)**, considering the past 20 yrs of operations

Total available nights for science operations: S

Partner/Associate's contribution (M USD): P

$$\text{Number of PGT} = S * P / 20$$

Note: Total available nights for science operations (typically ~220-240 nights) are calculated as:

$$S = 365 - (\text{down time} + \text{UH time} + \text{open-sky time} + \text{DDT} + \text{engineering})$$

If S is 220-240 nights and P is 2 M USD, No. of PGT is 22~24 nights / yr.

If P is 0.4 M USD, No. of PGT is 4.4~4.8 nights / yr.

Those nights will be roughly evenly breakdown into dark/gray/bright nights.



## SUMMARY OF THE NEW SUBARU INTERNATIONAL PARTNERSHIP FRAMEWORK

- Subaru Partner
  - > 2 M USD /yr in-cash contribution → > 22-24 nights / yr
- Subaru Associate
  - > 400 K USD /yr in-cash contribution → > 4.4-4.8 nights / yr
- In-kind contribution can be accepted for Partners only, and is additional and <25% of their cash contribution
- We introduce “Multi-partner program” which can be organized freely among partners/associates using their own telescope times, in proportional to the # of PI/Co-PI’s.
- In order to promote MPP, up to 5 nights may be reserved to assign buffer nights to highly ranked MPP’s in case of loss of nights (SAC recommendation).  
SAC proposal. This will not be written in the agreement, but can be taken into account in actual operation.

## 6. Telescope time exchange programs (new)

- **AAT (Australia)** X : Subaru = 1:5 (night-basis)?

Good for Japanese community to get used to fiber spectroscopy, and prepare for PFS

- **LAMOST/FAST (China)** X : Subaru = 1:5 (night-basis)?

Demand for LAMOST (low-R optical spectroscopy) in Japan are limited to some small groups of people, and it may not be appropriate to exchange the telescope times with the general purpose Subaru telescope?

This will be briefly discussed in this meeting on Wednesday (17:30-18:30 on Nov 20).



## 7. Accelerated operation of PFS-SSP

SAC was consulted by NAOJ director-general (Tsuneta-san) to discuss the possibility of accelerated science operation of PFS-SSP to maximize its scientific impact, by winning the international competitions and promoting synergetic collaborations. SAC is now intensively discussing this issue by taking into account the following items:

- \*Telescope night simulation by the observatory
- \*Competitions with other projects
- \*Synergies with other projects
- \*PFS-SSP team's preferences
- \*Balance with smaller individual PFS programs and with other instruments
- \*Possibility of fiber share with other open-use PFS programs

This will be discussed on  
Wednesday (17:30-18:30 on Nov 20).

On top of these, SAC recognize that it is critical how we define overlaps between PFS-SSP and other open-use PFS programs in targets, exp times, and science.

## 8. Japan's Participation in LSST

LSST (2023-) invites **in-kind contributions from the wide community (300K USD per researcher, including associated 4 postdocs/students).**

This can also include providing Subaru telescope times (eg. PFS) to the LSST team.

Japanese community is interested, given the experiences and heritage with HSC. **Letter of Intent (LOI) will be sent jointly from NAOJ and IPMU to LSSP by Nov 22 (deadline). Complete proposal will be due later.**

Contact persons: NAOJ (Miyazaki) and IPMU (Takada).

**This will be discussed in this meeting on Wednesday (17:30-18:30 on Nov 20).**



## 9. SWIMS science operation at Subaru

SWIMS team submitted a proposal for **science operation of SWIMS on Subaru for two years** (S20B-S22A).

The review committee (including 3 SAC members) has **approve this proposal, but it will start from S21A (delayed by half a year)** in order to wait for the successful completion of detector replacement (confirmation of feasibility).

**MOIRCS may be hibernated during this epoch,** but the **MOIRCS limited/partial operation** even during the epoch, and/or **campaign-mode time allocation/operation** will be discussed at Hawaii observatory and SAC.

**This will be discussed in this meeting on Wednesday (17:30-18:30 on Nov 20).**