



Subaru Telescope as a world hub for the future space/ground-based NIR wide-field survey science

※ 外国機関向け説明資料

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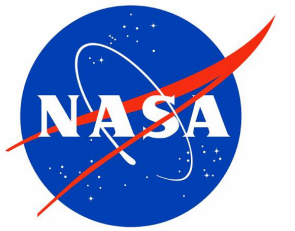
What is the “core-to-core program”?

- In short, JSPS supports activity to establish a “hub” for long-term international collaboration.
- According to JSPS, *“The program is designed to create world-class research hubs in research fields considered to be cutting-edge and internationally important in Japan. These multilateral hubs are built and operated through sustainable collaborative relations established among research/education institutions in Japan and countries around the world. While advancing research in the fields of the core research hubs, the Core-to-Core Program also concentrates on fostering the next generations of trailblazing young researchers. Core institutions in Japan and in its counterpart countries conduct collaborations. They take the form of joint research projects, seminars, and researcher exchanges, which are organized and carried out effectively under the program. Core institutions are expected to continue operating as a research hub after funding under this program has ended.”*
 - Please see <https://www.jsps.go.jp/english/e-c2c/index.html>
- \$0.16M x 5 years support from JSPS, mainly for travel costs for **Japanese researchers** to visit/stay in the partner countries.
 - Please note that JSPS will support travel costs only for Japanese researchers - JSPS assumes the partner countries have similar amount of budget (“matching fund”) which can be used for collaboration with Japanese researchers.
- The next deadline (for FY2021-FY2025) is September 17th.
 - The selection results will be notified to the PI in early next year.

Our application concept:

- In 2010s, Subaru Telescope played a leading role in the optical wide-field survey science with HSC.
- In 2020s, it is obvious that wide-field survey will be extended to NIR with flagship missions of **ESA** (**Euclid**, 2022-) and **NASA** (**Nancy Grace Roman Telescope**, 2025-) - both of which will deliver unprecedentedly deep and wide data at $\lambda=1-2\mu\text{m}$.
- At Subaru, in addition to PFS which will soon be commissioned, we are developing the wide-field GLAO system in collaboration with **Australia** and **Taiwan** (“**ULTIMATE-Subaru**”; 2026-), and ULTIMATE will dramatically improve the NIR capabilities particularly in K-band ($\lambda>2\mu\text{m}$).
- In the year of 2020 (this year), we officially agreed with NASA to provide 100 nights of Subaru time to perform “Roman-Subaru” synergistic observations as a collaboration between NASA-Subaru scientists. Also, 40-nights HSC intensive program is approved (with HSC) as from 2020B semester to perform “Euclid-Subaru” synergy.
- We, Subaru Telescope, are therefore standing at a very important position in 2020. To promote close collaboration and communication between Japan and the partner countries listed above, we propose a “core-to-core” program to establish a new research hub at Subaru/NAOJ to lead the NIR wide-field survey astronomy in 2020s and beyond (see next page).

Note: it's not an easy application at all - oversubscription rate of $\sim 10x$ every year.



Euclid (2022-)

France +

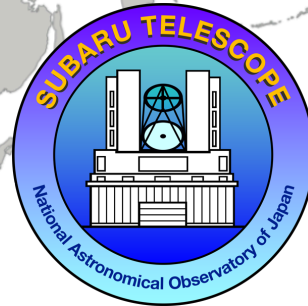
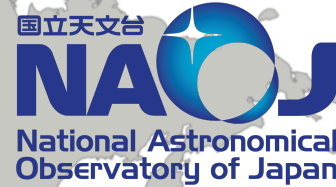
Synergy survey + collaboration in science

Synergy survey + collaboration in science



Roman (2025-)

USA



ULTIMATE Subaru

Collaboration in WFI development and science

Collaboration in GLAO development and science



Taiwan



Australian National University



Australia

Please note that we need to pretend as if Japan plays really a leading role in this activity - because this is an application to Japanese government.

Important note for “partner countries”

1. First of all, application form is submitted to JSPS only in Japan side - so please be relaxed, you don't need to prepare/submit any formal proposals in your country.
2. The only thing we need to ask you before the deadline (Sep 17th) is to prepare a list of member scientists (N~5-15) who can join this activity from your country.
 - Scientists nominated here are expected to come to Japan or Hawaii several times during the 5-yr period of core-to-core program (i.e. between April 2021- March 2026).
3. Regarding the “matching fund”: please be relaxed - you don't need to get new funding if you (or your institutes) have budget which can be used for travel from your country to Japan/Hawaii.
 - Roughly speaking, please assume \$3K(USD)/yr per person as a matching fund.
 - Note that JSPS requires at least a few scientists will come to Japan/Hawaii from your country every year using your budget.
4. If the application is approved by JSPS, we will ask you to write an official letter stating that you have already secured reasonable amount of money which can be used for the member scientists in your country to travel to Japan/Hawaii related to wide-field NIR science/instrumentation.