

Introduction to the K-GMT Science Program

Yang Soung-Chul

@Survey Science Workshop 2023. Jan 16 - 18



INTERNATIONAL
GEMINI
OBSERVATORY



NRC-CMRC



Ministerio de Ciencia,
Tecnología e Innovación
Argentina



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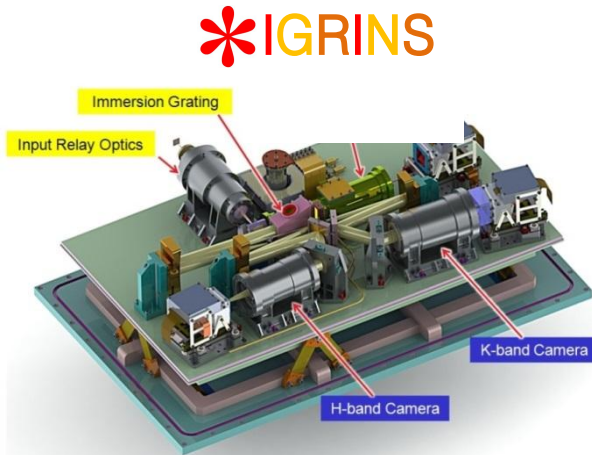
[2] Statistics You might find interest

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Introducing K-GMT Science Program

- Provides Korean community with access to large telescope/observing facilities
 - Phase I: 2009~2013
 - Phase II: 2014~ (**Open time to Korean community**)
 - **Gemini: 2015~2018 (PV), 2019~ (Full Queue)**
 - **MMT: 2014~2021 (Classical, Queue)**
 - **IGRINS: @Gemini-South(2018A, 2020-2023)**
[@McD/DCT(2014~2017), @DCT (2016-17, 2018B~2019A)]



Short History of the K-GMT Science Program

The Beginning (< 2015)

- Gemini와 MMT를 본격적으로 관측연구에 활용하기 시작한 것은 2014년 후반 및 2015년 초반으로 거슬러 올라감

The Limited-Term Partnership (2015-2018)

- **2015.4.** 한국천문학회 광학분과위원회 산하에 20여명의 한국천문학회원으로 구성된 ‘중대형망원경위원회’출범. 중대형망원경의 중요성과 중장기 활용 전략을 논의



중대형망원경위원회
보고서
2016. 4. 발간

Short History of the K-GMT Science Program

The Limited-Term Partnership (2015-2018)

- 이 기간동안에는 Gemini의 일반 Q-mode 관측일정 안에서 부분적으로 운영하는 “**Priority Visiting Observing**” 방식으로 사업단 Staff들과 PI들이 직접 싸이트에 방문하여 관측을 수행함



- Gemini의 다른 파트너 국가들이 운영하고 있는 **NGO (National Gemini Office)** 구축을 위하여, 관측일정에 맞추어 현지에서 **NGO training** 수행

Short History of the K-GMT Science Program

The Regular Partnership (2019-Current)

- 2018. 7. 개최된 샌프란시스코 Gemini Science Meeting에서 Gemini 공식파트너 협정을 체결



Gemini Board Chair Rene Walterbos (left) and KASI President Hyung Mok Lee sign the agreement making Korea a full participant in Gemini.

Short History of the K-GMT Science Program

Purchasing
Observing

Full-International
Partnership with
5% share of
Gemini



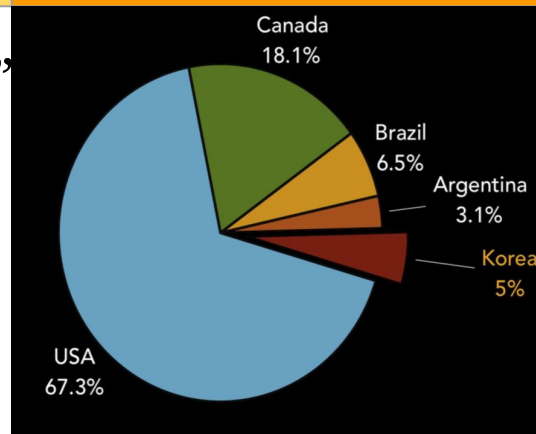
< 2015

**2015A -
2018B**

**2019A -
2021A**

**2021B &
beyond**

“Limited-Term”
Partnership to
Gemini, MMT



7% share of Gemini
Partnership
(~ 150 hr/semester)

Expanding share?

New Routes of Gemini Proposals from 2019A

The Regular Partnership (2019-Current)

Opening up new routes of Gemini observations

- **Joint Proposal**
Korean Gemini users can submit Joint Proposal by collaborating with the PIs of other Gemini international partners.
- **Subaru Time Exchange Program**
A minimum of **5 nights per semester** available for all partners
- **Poor Weather Program**
Poor weather programs will be placed in Band 4, and **neither the PI nor partner country will be charged for any time used**. Proposals can be submitted at the time of regular Call for Proposal or any time during semester.
- **Fast Turnaround (FT) Program**
FT runs by monthly-based submission and assessment. The total FT time per partner may **not exceed 10%** of the total partner's time for a given semester for now. **From 2022B Korea runs 10 hr (5h GN + 5h GS fixed) FT time.**

Currently Available Gemini Instruments

Gemini North

VISIBLE	NEAR-IR	MID-IR	OTHER FACILITIES
Facility Instruments			
GMOS (multi-object, long-slit and IFU spectrograph and imager) Instrument Fact Sheet	NIRI (1-5 μ m imager) Instrument Fact Sheet	3 cameras with 3 FOVs (22" - 120" box)	GCAL (facility calibration unit)
0.36-1.03 μ m R 210 ~ 8,808 5.5x5.5 arcmin ² imaging 35 arcsec ² (IFU) R 0.2"	NIFS (1.0-2.5 μ m integral field spectrograph) Instrument Fact Sheet	R - 5000; 3"x3"	ALTAIR (facility natural/laser guide star AO system)
	GNIRS (1-5 μ m long-slit and 0.9-2.5 μ m cross-dispersed spectrograph; formerly at Gemini South) Instrument Fact Sheet	R - 1200 ~ 18000 AO-assisted IFU will be available	
Visiting Instruments			
GRACES (0.4-1.0 μ m high resolution spectrograph)	R - 40k, 60k		
'Alopeke (diffraction-limited optical imager)	Speckle imaging 6.7" FOV Wide Field mode 60" FOV		
POLISH2 (optical polarimeter)			
MAROON-X (high-resolution spectrograph)	R - 8000, 1 m/s RV precision		

For more info on these or other Visiting Instruments, contact gemini-vip@gemini.edu

Currently Available Gemini Instruments

Gemini South










VISIBLE	NEAR-IR	MID-IR	OTHER FACILITIES
Facility Instruments			
GMOS (multi-object, long-slit and IFU spectrograph and imager) Instrument Fact Sheet			GCAL (facility calibration unit)
	GSAOI (high-resolution imager for use with Multi-Conjugate Adaptive Optics system "GeMS") Instrument Fact Sheet	85" box FOV	GeMS (Multi-conjugate adaptive optics system)
	FLAMINGOS-2 (multi-object and long-slit spectrograph, wide field imager) Instrument Fact Sheet	6' circle FOV R 1000 - 3000	
Visiting Instruments			
Zorro (diffraction-limited optical imager)	IGRINS (external link)(high-resolution spectrograph)		
For more info on these or other Visiting Instruments, contact gemini-vip@gemini.edu			

Survey Sciences done with Gemini Instruments

THE ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES

OPEN ACCESS

BASS. XXIV. The BASS DR2 Spectroscopic Line Measurements and AGN Demographics

Kyuseok Oh^{27,1,2} , Michael J. Koss^{3,4} , Yoshihiro Ueda² , Daniel Stern⁵ , Claudio Ricci^{6,7} ,
Benny Trakhtenbrot⁸ , Meredith C. Powell⁹ , Jakob S. den Brok^{10,11} , Isabella Lamperti¹² ,
Richard Mushotzky¹³  [+ Show full author list](#)

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[The Astrophysical Journal Supplement Series](#), [Volume 261](#), [Number 1](#)

[The BAT AGN Spectroscopic Survey Data Release 2](#)

Citation Kyuseok Oh et al 2022 *ApJS* 261 4

DOI 10.3847/1538-4365/ac5b68

Survey Sciences done with Gemini Instruments

BASS project

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Trakhtenbrot, Benny (Tel Aviv University)  


Dr. Trakhtenbrot is interested in the cosmic growth of super-massive black holes, the radiation that emerges from this process, and how these may be related to the host galaxies. As part of the BASS core team, Dr. Trakhtenbrot contributed to optical spectral analysis, and particularly black hole mass and accretion rate measurements, as well as general project oversight.



Oh, Kyuseok (Korea Astronomy and Space Science Institute)  

Dr. Oh's research interests lie in the field of galaxy formation and evolution, with a particular focus on the active galactic nuclei with supermassive black holes using ground optical telescopes as well as space based high-energy X-ray instruments. As a core member of the BASS project, Dr. Oh analysed acquired optical spectral data, proposed successful optical spectroscopic proposals, and performed follow-up spectral line measurements. More optical data analysis for measuring black hole mass, Eddington accretion rate and emission line statistics is currently in progress.

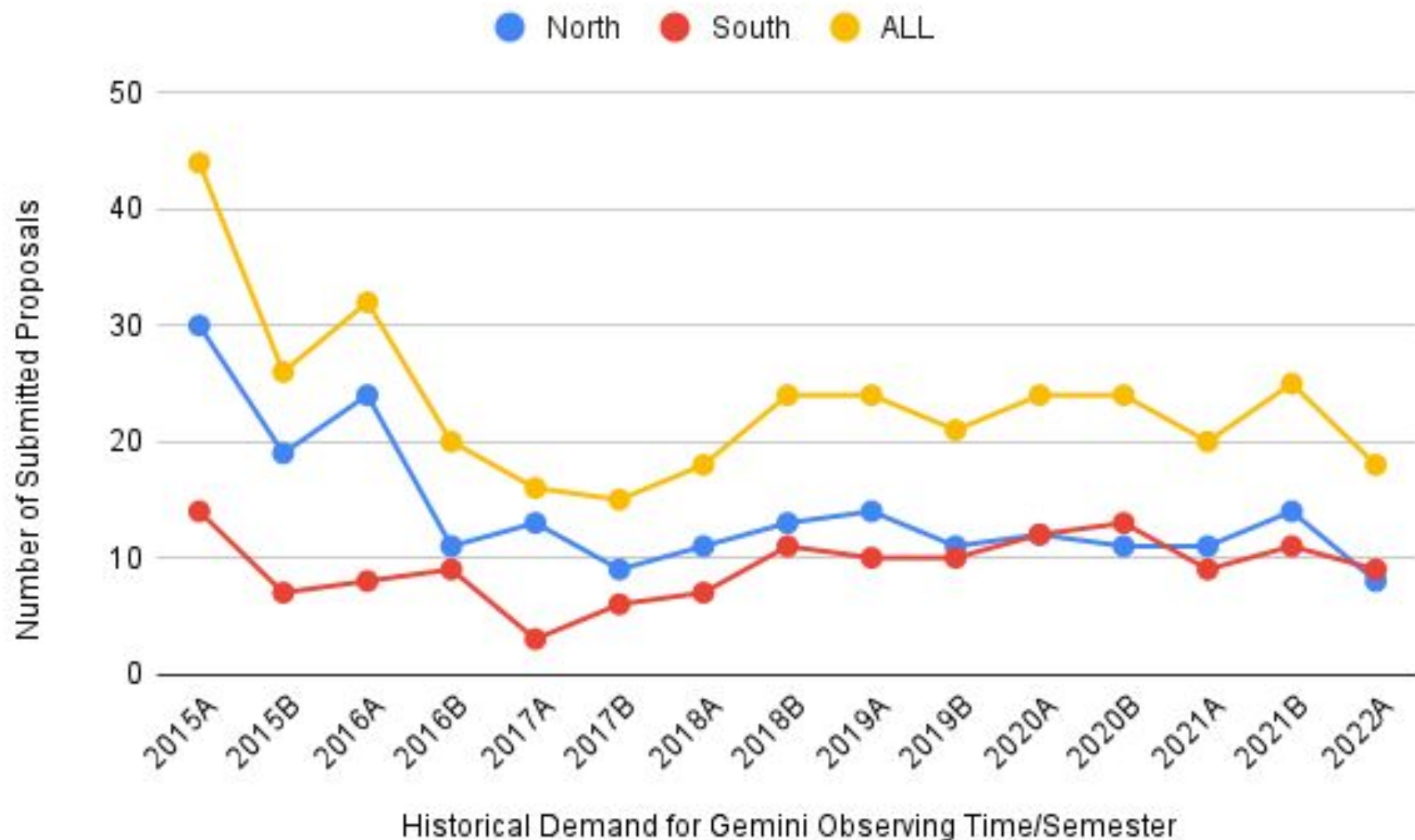


Urry, Meg (Yale University) 

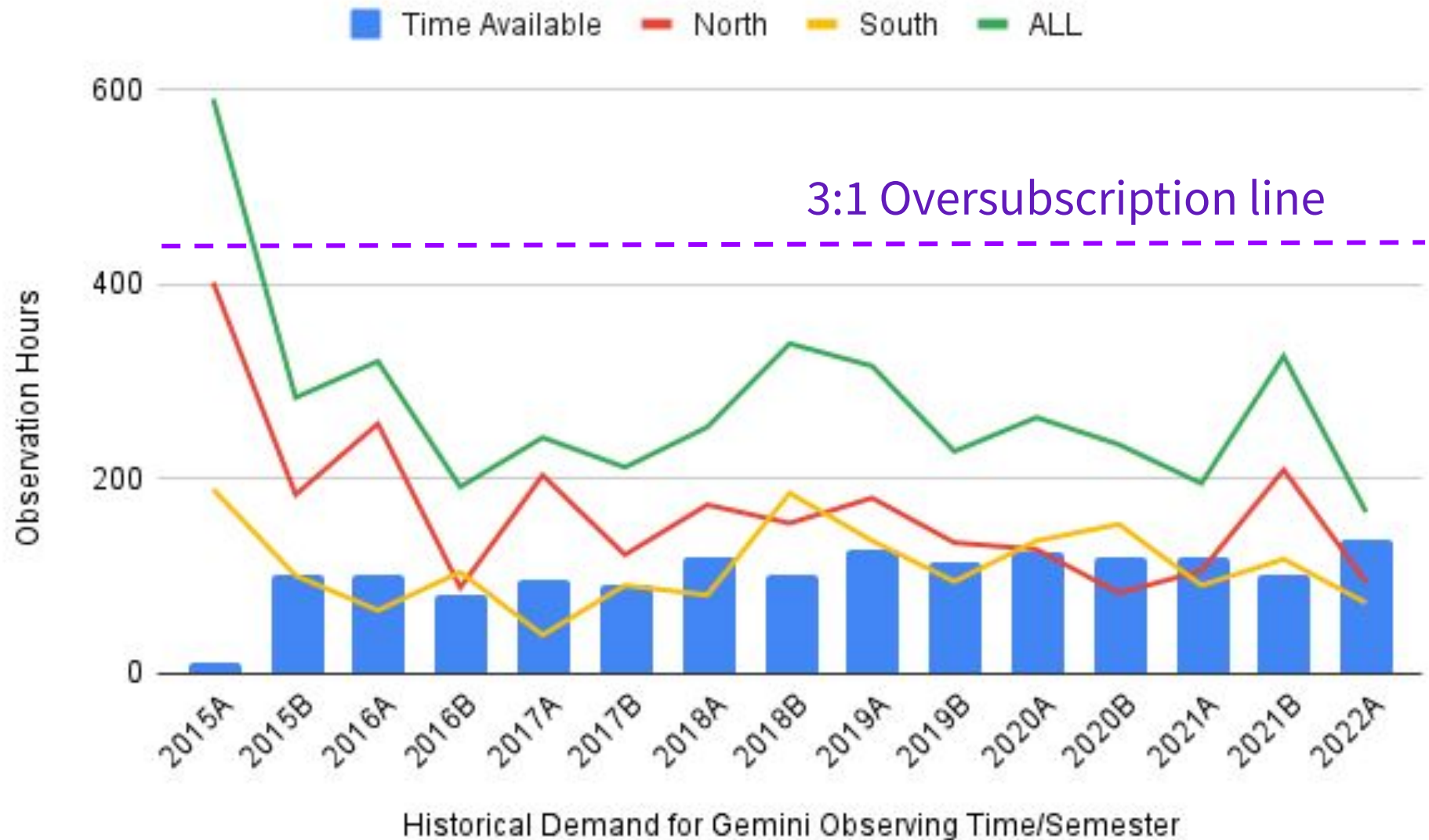
Meg Urry is Director of the Yale Center for Astronomy and Astrophysics and served as Chair of the Yale Physics Department from 2007 to 2013. She is currently Past President of the American Astronomical Society (the last in a 4-year term). Her scientific research focuses on active galaxies, which host accreting supermassive black holes in their centers; she has published over 270 refereed research articles on supermassive black holes and galaxies and was identified as a "Highly Cited Author" by Thomson Reuters.

K-GMT Science Program Status

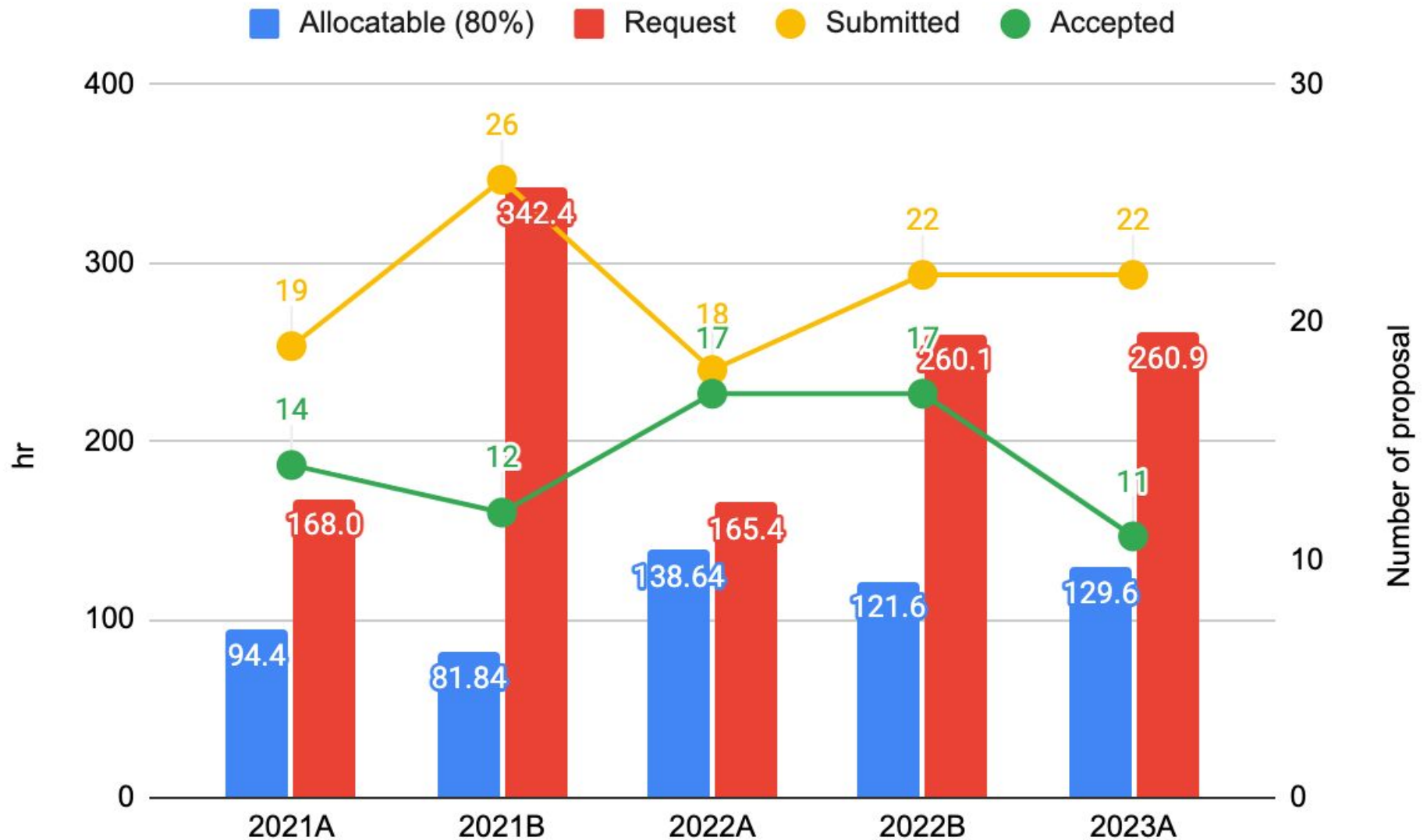
Historical Demand for Gemini Observing Time



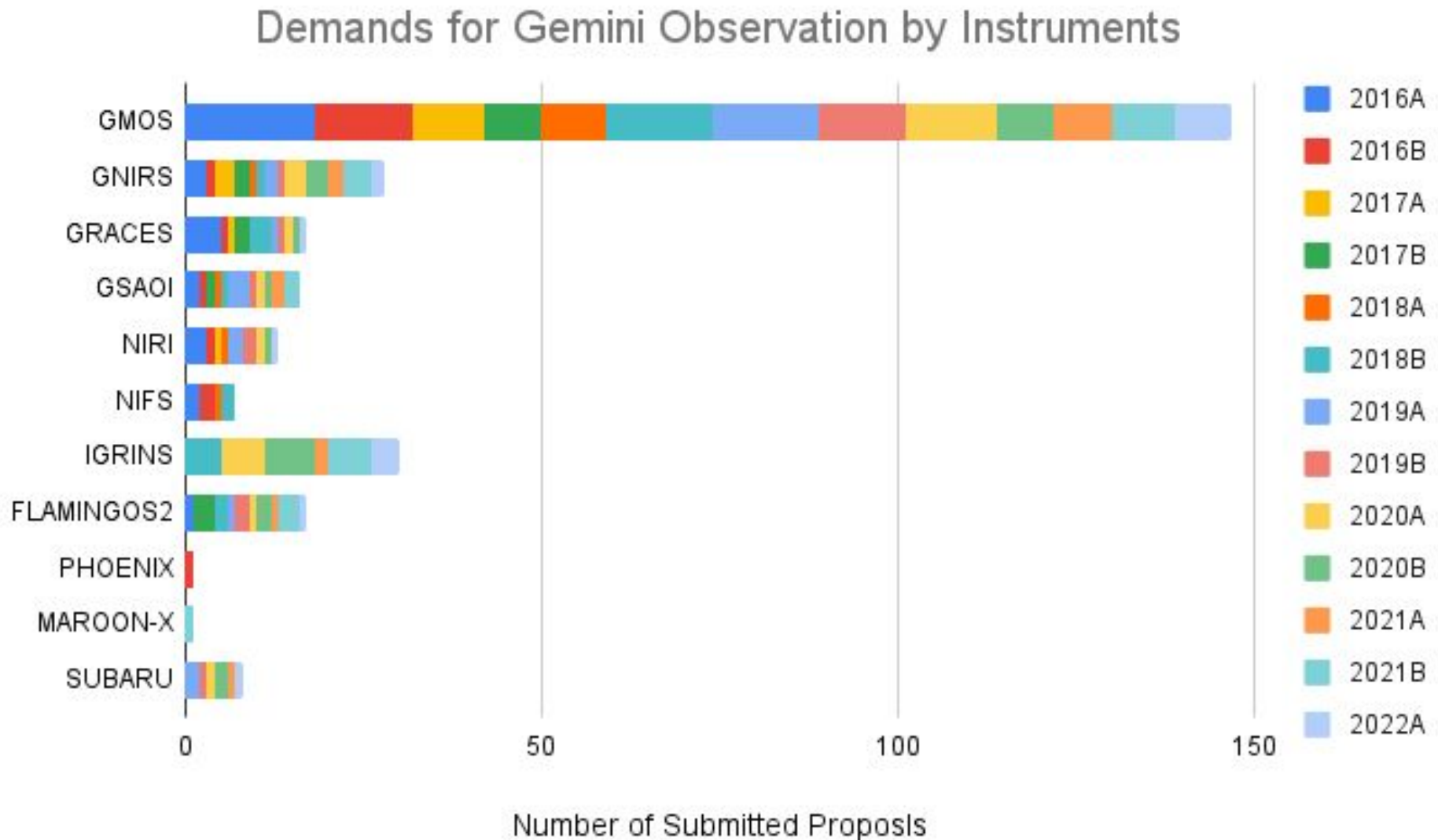
Historical Demand for Gemini Observing Time



Historical Demand for Gemini Observing Time

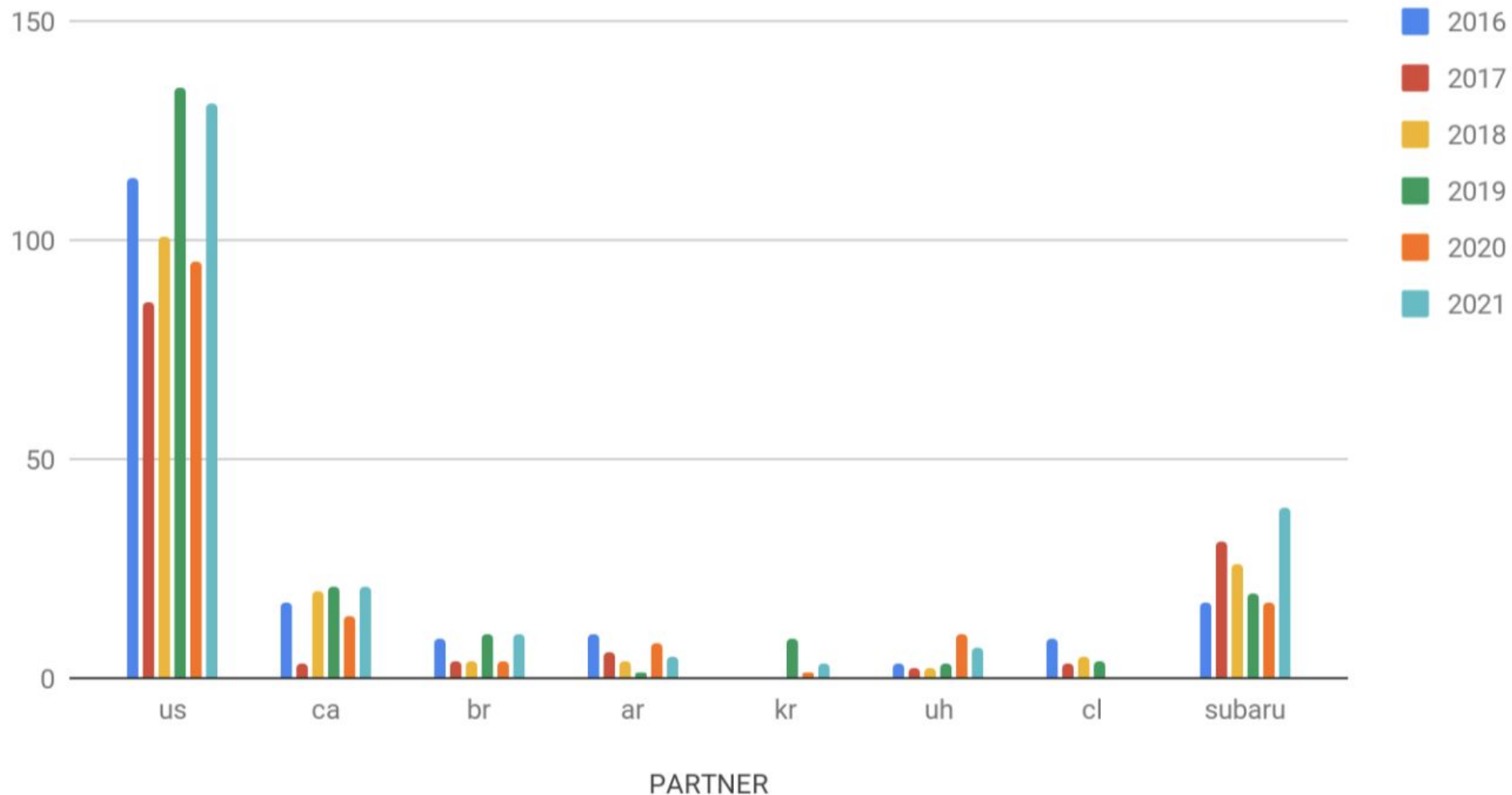


Historical Demand for Gemini Observing Time



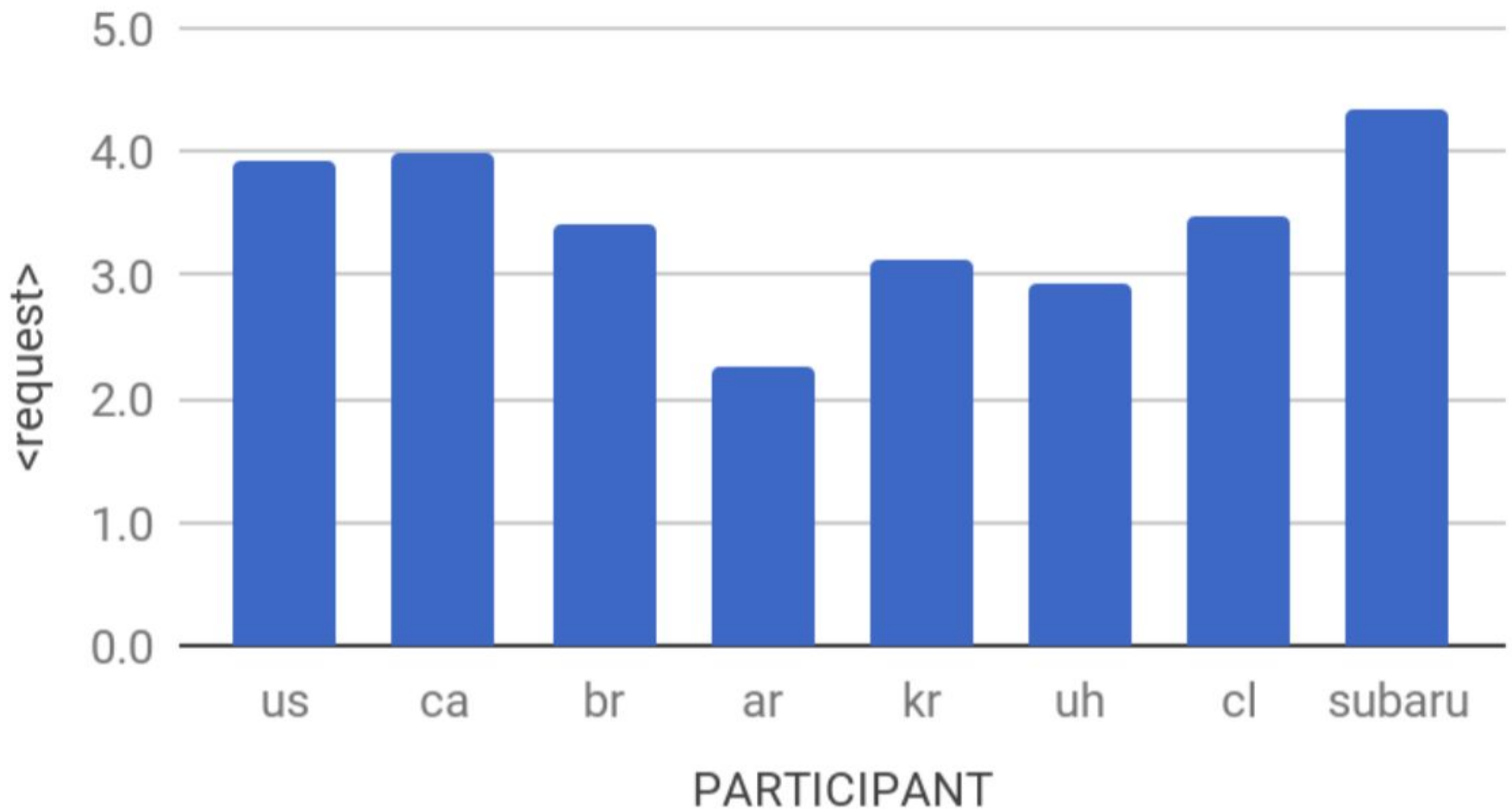
Historical Demand for Fast Turnaround Time

N(proposals) per Participant



Historical Demand for Fast Turnaround Time

Average requested time (all time)

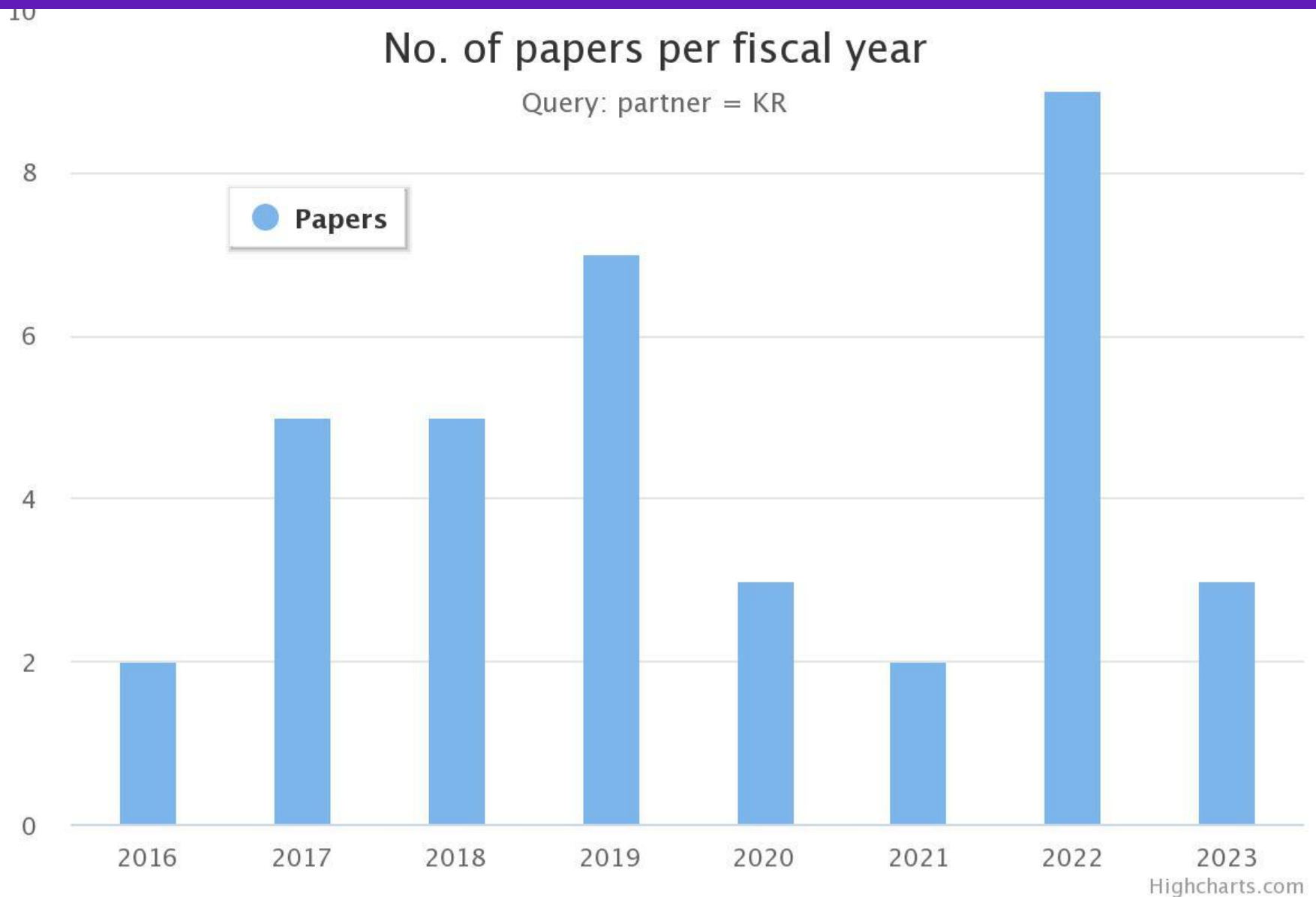


Historical Demand for Fast Turnaround Time

Table 1 - awarded hours and percent of annual total, per participant, since 2016.

	award	award	award	award	award	award	%	%	%	%	%	%
PART NER	2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021
us	242	235	230	248	141	258	72%	76%	67%	67%	70%	66%
ca	24	2	57	48	16	34	7%	1%	17%	13%	8%	9%
br	9	12	10	5	6	11	3%	4%	3%	1%	3%	3%
ar	7	4	7	1	0	3	2%	1%	2%	0%	0%	1%
kr	0	0	0	8	2	8	0%	0%	0%	2%	1%	2%
uh	7	0	2	15	8	12	2%	0%	0%	4%	4%	3%
cl	16	2	9	0	0	0	5%	0%	2%	0%	0%	0%
subaru	29	54	30	45	27	63	9%	18%	9%	12%	14%	16%

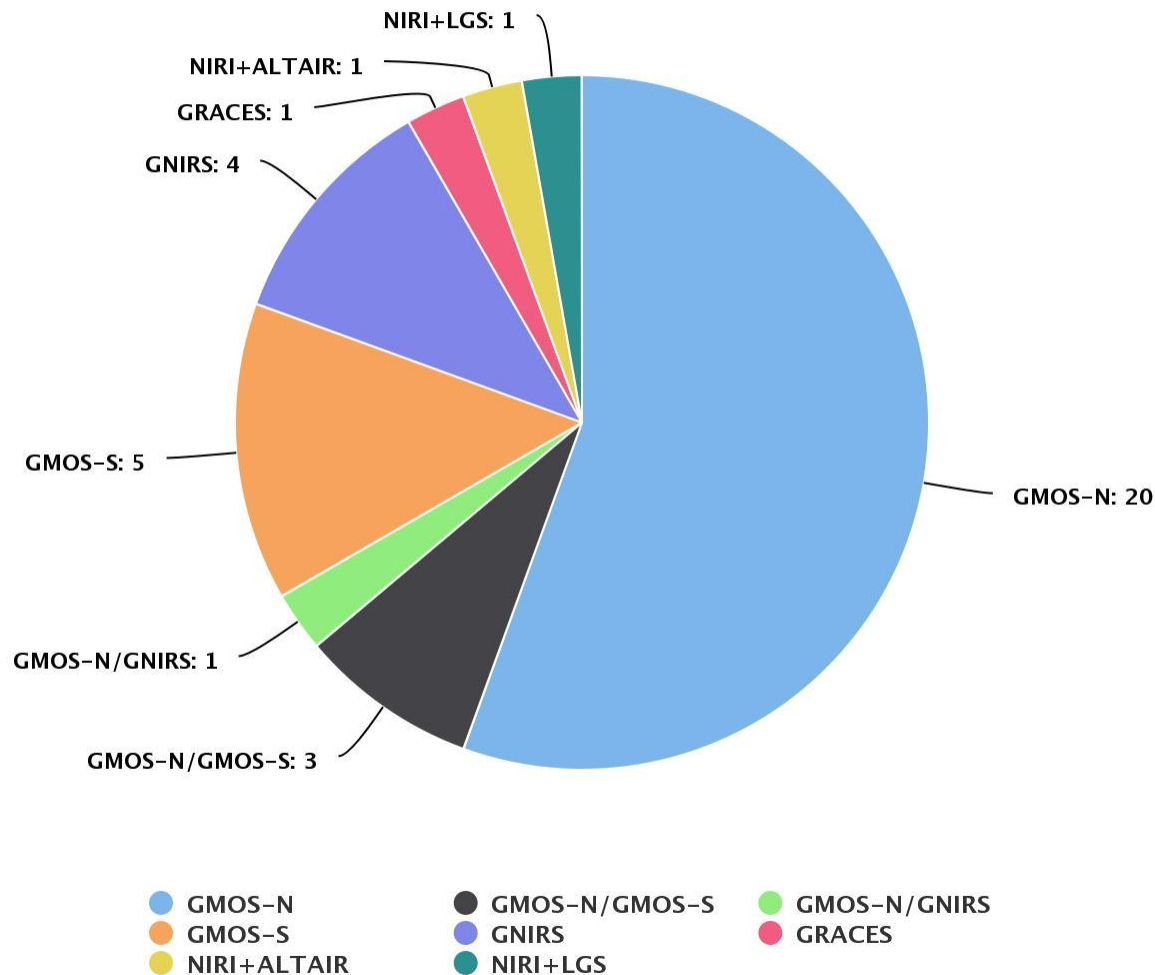
Scientific Results from the Gemini Observations



Scientific Results from the Gemini Observations

No. of papers per instrument

Query: partner = KR



Korea Gemini Office (KGO) Activities

Main Goals of KGO are

- Supporting Korean Gemini Users in the phases of the Gemini observing cycle, from proposal preparation through obtaining scientific data
- Promoting scientific activities and communication between Korean Gemini Users (e.g. K-GMT Summer School / Gemini Users Meeting... etc)
- Being a point of contact of Korean Gemini User Community to the Gemini International Operation



Korea Gemini Office (KGO) Activities

Main Activities of KGO:

- Managing Call for Proposals
 - Participating TAC
 - Phase I support - Technical Assessment
 - Phase II support - Observing Tool Preparation
 - User support in general
- Biweekly NGO meeting with International Partners
- OpsWG meeting between International Partners
(2 times/yr)
- Organizing Users' Meeting & Summer School
- Developing Gemini Science Cases

Korea Gemini Office (KGO) Activities

Current Members



Soung-Chul Yang
KGO Head
Users Meeting/School
Phase I/II Support



Ji Yeon Seok

Maternity leave



Jae-Joon Lee
TAC Management



Eunchong Kim
NGO meeting
CfP support
Phase I/II Support



Ho-Gyu Lee

CfP support
Phase I/II Support



Sanghyun Chun

CfP support
Phase I/II Support

Looking Back in 2022 - Gemini Science Meeting



Looking Back in 2022 - Gemini Users' Meeting



Hot Topics in Discussion

1. Korean Large & Long program 도입추진

****Gemini & Survey Science Synergy?**

2. Band 3 LoI program 유지

3. DARP 도입추진

Hot Topics in Discussion

Korean LLP for Gemini & Survey Science Synergy? Examples?

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The BAT AGN Spectroscopic Survey

An all-sky study of the brightest and most powerful
hard X-ray detected AGN



Hot Topics in Discussion

Korean LLP for Gemini & Survey Science Synergy? Examples?

Swift-BAT

The Burst Alert Telescope (BAT) instrument on the Swift satellite has surveyed the sky to unprecedented depth, increasing the all sky hard X-ray sensitivity by a factor of more than 20 compared to previous satellites.

The goal of the BAT AGN Spectroscopic Survey (BASS) is to complete the first large (>1000) survey of hard X-ray selected AGN with optical spectroscopy.



This work will place constraints on the growth and structure around nearby black holes and provide a baseline for future European X-ray missions, such as ATHENA, that will perform deeper observations of more distant AGN.



Hot Topics in Discussion



Korean LLP for Gemini & Survey Science Synergy? Examples?



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DOI 10.3847/1538-4365/ac5b68

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 Citations 14

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Hot Topics in Discussion

Korean LLP for Gemini & Survey Science Synergy? Examples?

Categorizing Clouds : Analyzing Association of the SPLICES Targets in the Taurus Star-forming Region*

SOUNG-CHUL YANG ¹

¹*Korea Astronomy and Space Science Institute
776 Daedeok-daero, Yuseong-gu, Daejeon 34055, Republic of Korea*

ABSTRACT

Context: About a half of the SPLICES samples (i.e. ~ 4 million sources) with NIR-MIR photometry from 2MASS, AllWISE, and IRAC point source catalogs was successfully cross-matched to the latest data release (i.e. Gaia DR3) from the Gaia team. Based on their DR3-parallax-based astrometric parameters (e.g. inferred distance distributions, RA, Dec, Proper motions, and Radial Velocity ... etc), we attempt to establish associations of the SPLICES targets with “particular molecular complexes” of our interest. This will pave a way for us to investigate the fundamental nature of the Galactic molecular cloud complexes when the SPHEREx starts to release its state-of-art data in the near future.

Korea Gemini Office (KGO) Activities

We (KGO) are very anticipating to hire a new KGO member!

붙임 1

국문공고문

한국천문연구원 박사후연구원 채용공고

21세기 우주시대를 선도하는 최고 수준의 「한국천문연구원」에서 창의적이고 미래의 변화를 주도해 나갈 진취적이고 창의적인 인재를 찾습니다.

2021. 12. 27.

한국천문연구원장

P14	대형광학망원경 사업단 (1명)	대형광학망원경 첨단 기술 활용 연구 및 운영 지원	○ 대형광학망원경 첨단 기술 활용 관측연구 수행 ○ 대형광학망원경 사용자 지원	1	
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Gemini Science Meeting

26–29 July 2022

Gemini Observatory invites its international user community to Seoul, Korea to share their breakthrough science results, and plan for the bright future ahead as Gemini's instrumentation suite and adaptive optics capabilities undergo a major revitalization. Hosted by the partnership's newest member, we hope that the much anticipated 2022 Science Meeting (postponed since 2020 due to the pandemic) will allow the partnership to gather in-person once more.

#geminiobs22 will feature invited and contributed talks, poster sessions, news on current instrumentation projects, updates on operations developments, fabulous dining, and lively discussion of Gemini's strategic plans for the coming decade. Note that both in-person/hybrid and virtual-only meeting plans will be developed simultaneously to enable participants and organizers to quickly adapt to changing circumstances.

Upcoming Events

- 2023A Semester Begins from Feb 1 (to July 31)
- OpsWG Meeting scheduled on Feb 15
- 2023B Call for Proposal will be announced soon (March 1st)
- 2023 제 10차 K-GMT 여름 학교 (late July or early Aug)

We call for your active participation in K-GMT Science Program!

Thank You!

