

Current Status and Future Plans of SMOKA

<https://smoka.nao.ac.jp/index.jsp>

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What is SMOKA?

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- An archive system for astronomical data taken by Japanese optical and infrared telescopes
- 34 instruments, 313 TB (as of 2021-01-12)
 - **Subaru:** Suprime-Cam, FOCAS, HDS, OHS/CISCO, IRCS, CIAO, COMICS, CAC, MIRTOS, MOIRCS, Kyoto-3DII, HiCIAO, FMOS, HSC, CHARIS, IRD, SWIMS, MIMIZUKU, **VAMPIRES (new)**
 - **OA0 188 cm:** ISLE, KOOLS, HIDES, OASIS, SNG, MuSCAT
 - **Kiso Schmidt:** 1kCCD, 2kCCD, KWFC
 - **MITSuME:** MTA, MTO
 - **Kanata:** HOWPol, HONIR
 - **Nayuta:** NIC
 - **Seimei:** KOOLS-IFU

[Digitized photographic plates data](#),
and [Tomo-e Gozen data \(new\)](#)
from Kiso Schmidt, and
[sky monitor imaging data](#) are
also available in other systems.

1. New Research Discoveries

- Other ideas and aims, other objects in the field of view, other analyses, combination of time series data or multiwavelength data

2. Verification of Results

- Reproducibility is the basis of science
- The verification is more important for epoch-making results

3. Promotion of research and education

- Research schedule planning, software development, Data analysis training, etc.

Raw data are mainly available for these aims.

- Not just placing copies of the observational data on a server and releasing them
- Release of observational data past the observer occupancy terms
 - Check observational data and place them in the public area
 - Fix wrong FITS headers
 - Create a file of finding aid information (Quick Look image, thumbnail)

Search Mode

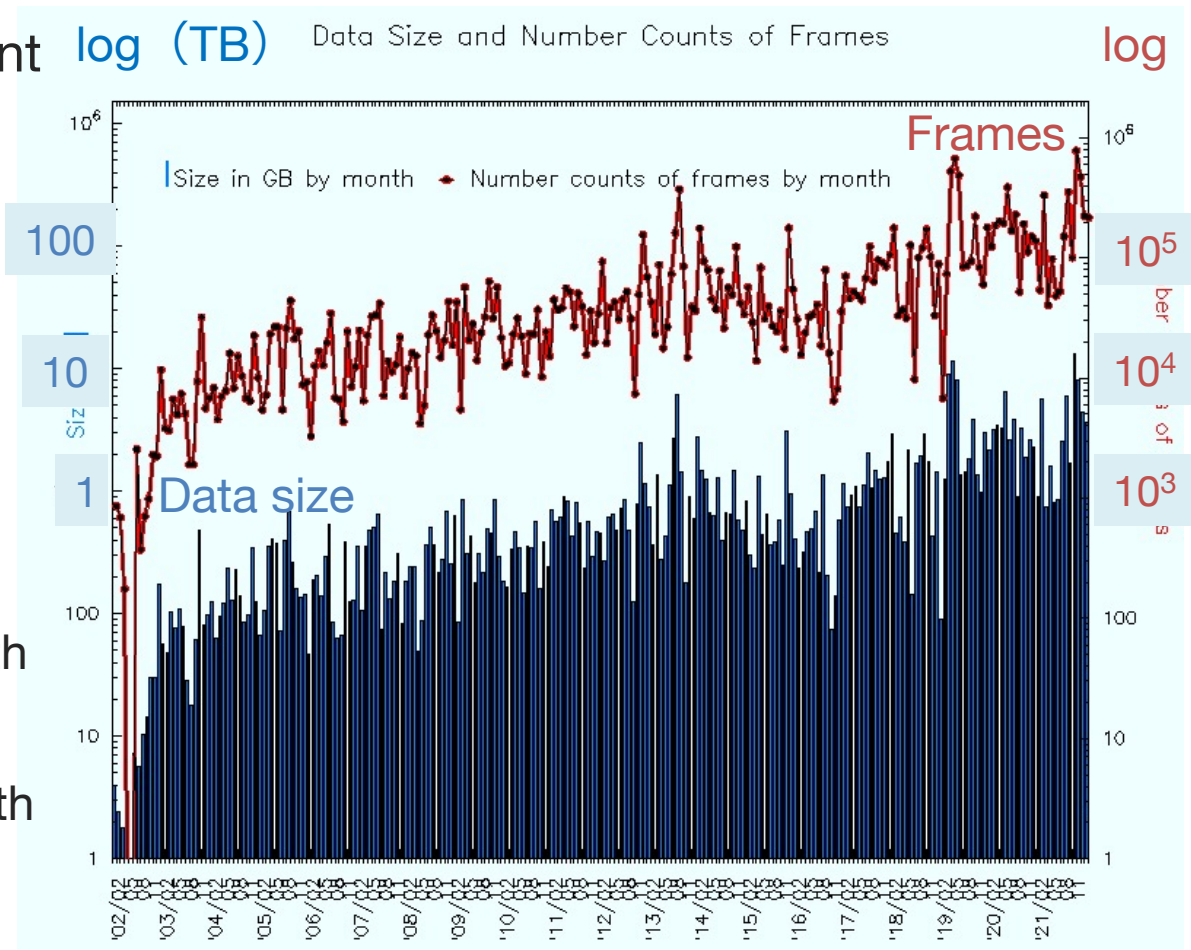
- Simple Search (**object name**)
- Advanced Search (**RADEC, observation mode, etc.**)
- Suprime-Cam Search (**quality, e.g., seeing size**)
- HSC Search (**quality**)
- Pinpoint Search
- Calendar Search
- All Keywords Search

The screenshot displays the 'Advanced Search Page' interface, organized into several sections:

- Search Conditions:** Includes an 'Object Name' field, a 'Resolver' section with radio buttons for 'SIMBAD', 'NED', and 'Don't Resolve', and a 'Resolve' button. It also features 'Coordinate System' (Equatorial/J2000), 'Field of View' (Circular/Rectangle), 'Observation Date', 'Exp Time (sec)', 'Observer', 'Frame ID', 'Exposure ID', 'Output Format' (TABLE/ASCII), and 'Frame or Shot mode' (FRAME/SHOT).
- Instruments/Filters:** A table with columns for 'Instruments', 'Observation Mode', 'Data Type', and 'Observation Category'. Below this is a 'Filter lists / Wavelength' section.
- Output Options:** Includes 'Output columns' (All/None/Reset), 'Order by' (FRAMEID/reverse), 'Maximum number of hits' (100), 'Output Equinox' (J2000), and a checkbox for 'Show SQL Query'.

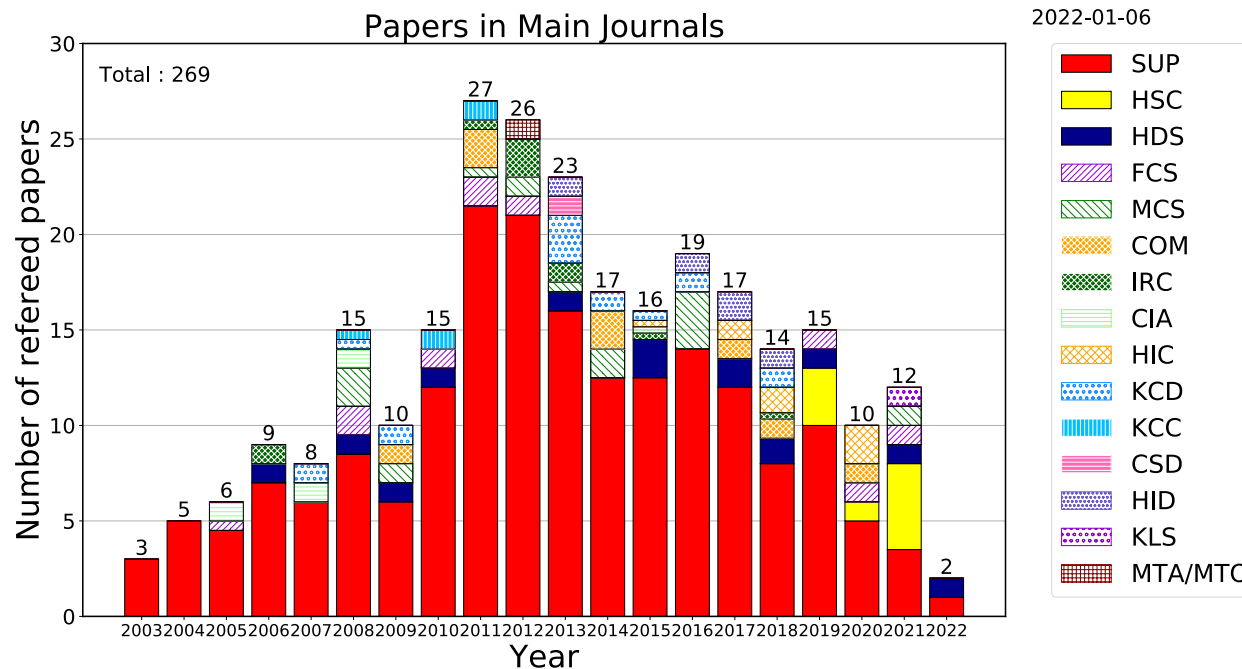
Advanced Search Page

- Number of registrant
 - ~250 people
 - Reset in every fiscal year end
- Amount of Requested data
 - Number counts
~ 10^5 – 10^6 / month
 - Data size
~1-10 TB / month

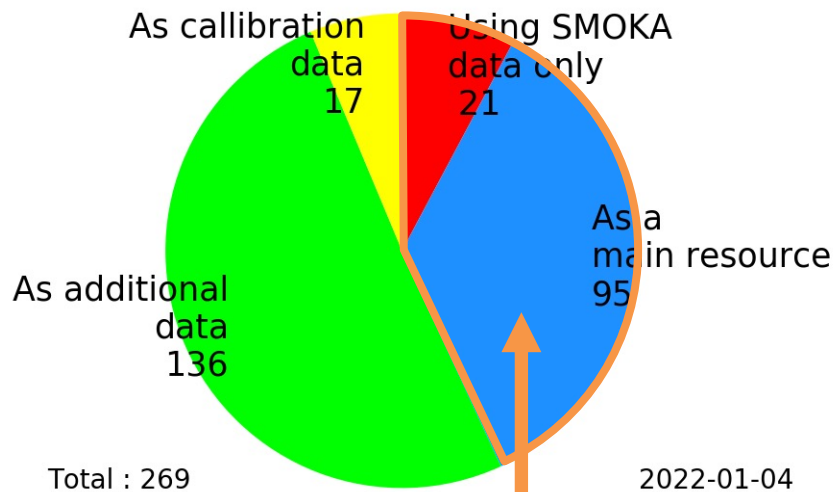


The transitions of requested data size and number counts

- Published in main journals: 269 papers (as of 2022-01-12)
 - ~14 papers / year
 - ApJ, ApJL , ApJS, A&A, PASJ, PASP, MNRAS, ICARUS, Nature, NatAs

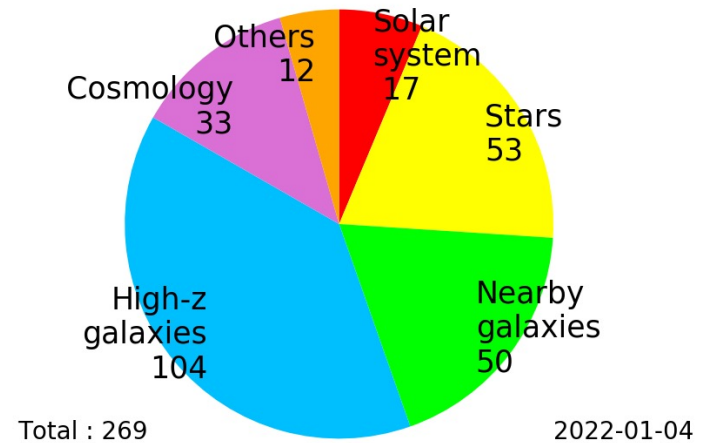


Use Cases of SMOKA Data



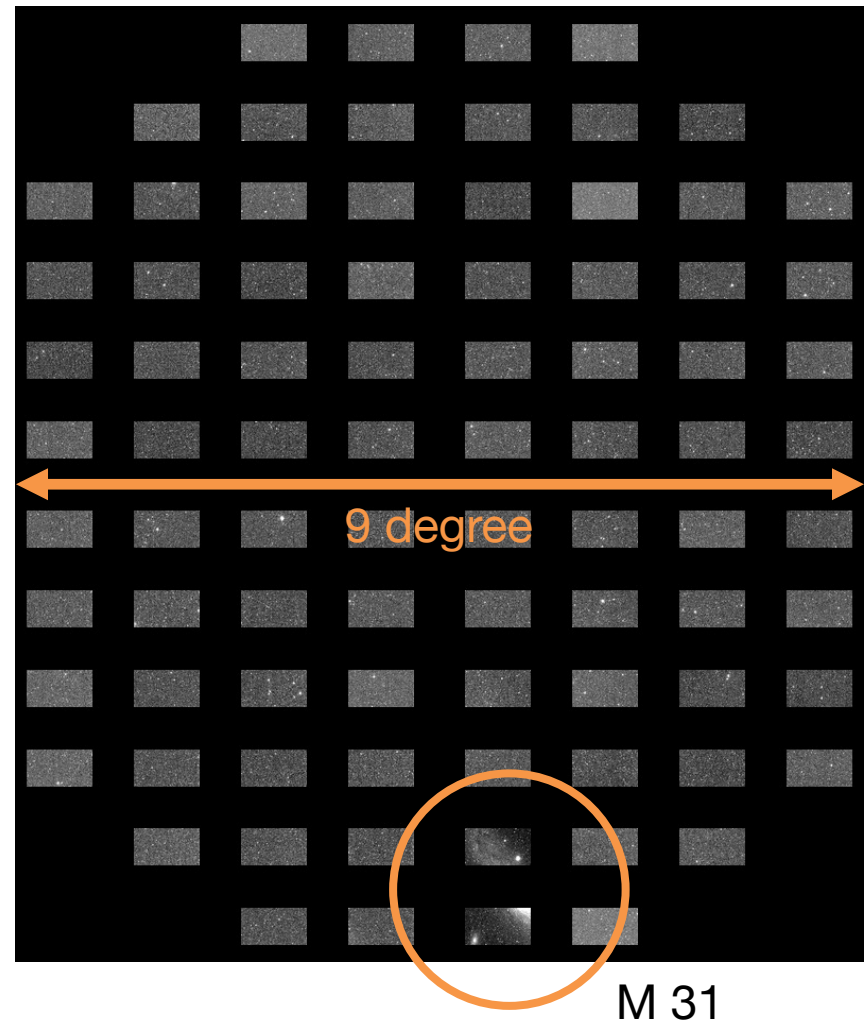
43% of papers
mainly using SMOKA data

Subject of Research using SMOKA Data



- Subaru Telescope
 - VAMPIRES (2021/11/01– , Some common keywords are not included in FITS header (e.g., WCS))
 - REACH (2022/02– , open in conjunction with IRD)
- Seimei Telescope
 - KOOLS-IFU (2020/12/22– , calibration data only
2022/01/27– , object frames of openuse)
- OAO 188 cm telescope
 - HIDES-F (2021/03/30– , openuse data only)
- Kiso Schmidt telescope
 - Color film data of photographic plates (2021/07/14–)
 - Tomo-e Gozen (2021/11/01– , stacked data only)

- Kiso Schmidt
1.05 m telescope
- 84 CMOS sensors
- 2 Hz x 12–18 exposures stacked
 - WCS calibrated
- All-sky survey data
- Data 2 years after observation date become public observed in 2019-10-01/2020-03-31
- 5 million frames, 45 TB
(as of 2022-01-06)
- <https://archive.nao.ac.jp/tomoe>



New Instruments

- Subaru Telescope
 - Fast PDI
 - MEC
 - PFS
- Seimei Telescope
 - TriCCS

- SMOKA is an archive system for optical and infrared observational data, which includes data from 7 telescopes and 34 instruments
- SMOKA mainly releases raw data for the purpose of creating new research results, verifying research results, and promoting research and educational activities
- We offer a variety of search methods and are working to enhance them.
- Thank you for your continued support of SMOKA and its use in research and educational activities
- We hope SMOKA will be used more and more!