Select Slides from 3.5m Director's Report to ARC Board of Governors

Nancy Chanover, Director

Ben Williams, Deputy Director

They Came For Planet X!

First in-person Board of Governors meeting since 2019!!

First Board of Governors meeting at APO!!

2023 Operations Summary

(see 3.5m Operations Report Slides for more details)

- No observing time was lost due to COVID-19
- Excellent telescope operations (0.6% loss time for equipment)
- Substantially more weather loss (40% in 2023, more like 30% in recent past years)
- M1 was realuminized; M2 & M3 coatings degrading
- Several new instrument efforts underway

Operations Highlights: M1 Realuminization

- The 3.5-m primary mirror (M1) was last aluminized in 2015.
- At the end of 2022, we prioritized doing the work at Lowell Discovery Telescope (LDT) south of Flagstaff, AZ.
- Using the LDT chamber, which was optimized for their 4m mirror, required designing and machining specialized fixtures for holding the 3.5-m and 2.5-m mirrors in this chamber. Transport of the 3.5-m mirror involved additional challenges this year:
    - First time using the Starfire transport box without a mirror band
    - Traveling on a new route that had additional DOT (mostly in the state of AZ) permitting issues
    - Farther transport distance
- Aluminization and transport took place August 7 (Monday) - August 12 (Saturday) by Eriksen, Ketzeback, Townsend and DeColibus


OVERSIZE LOAD
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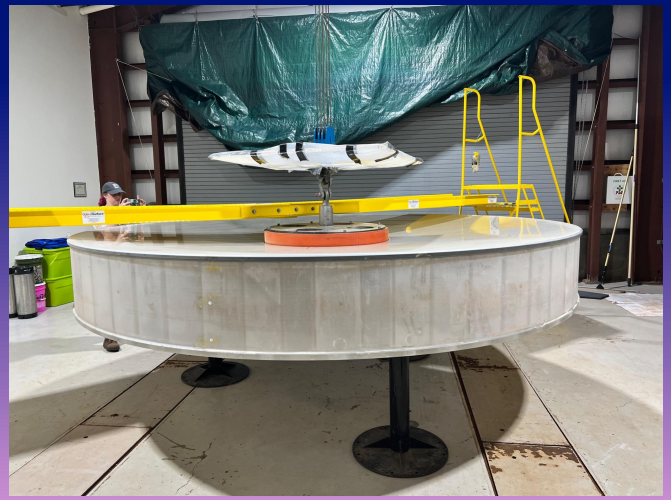

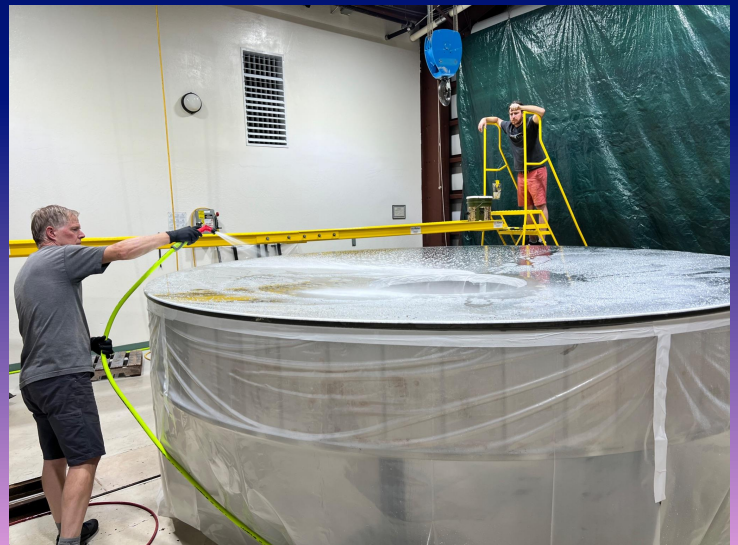

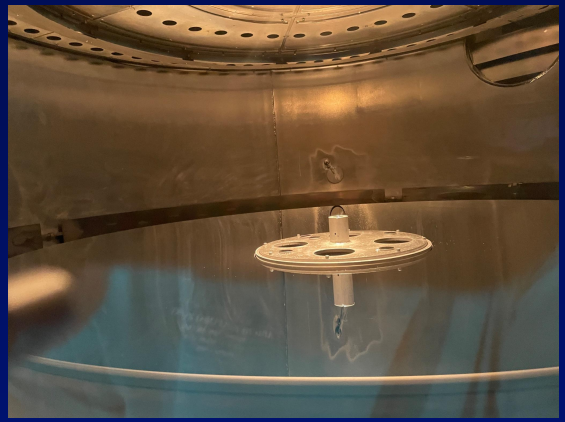


Dynavac

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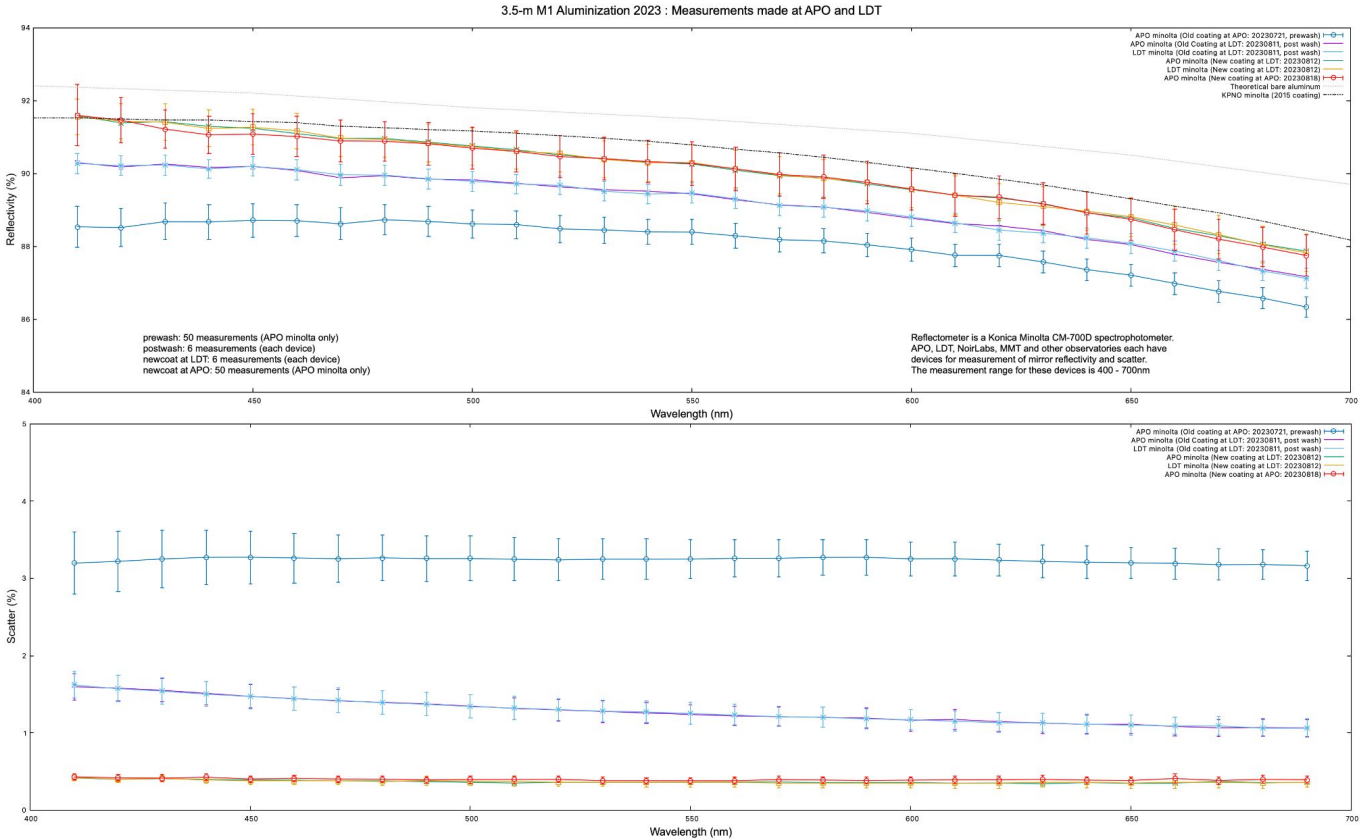
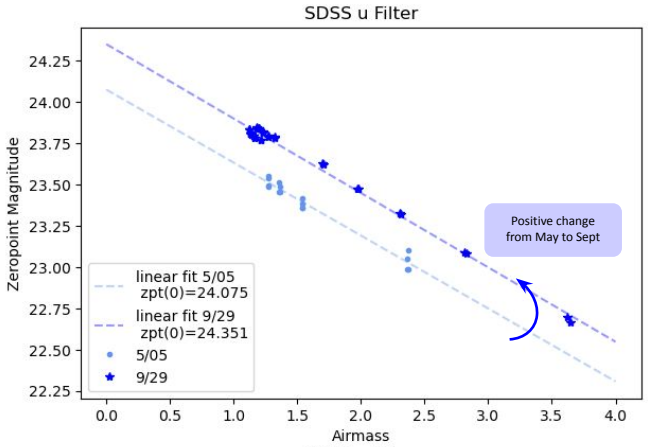
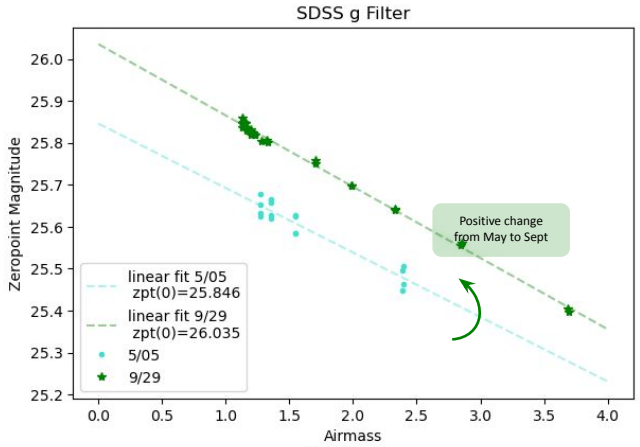
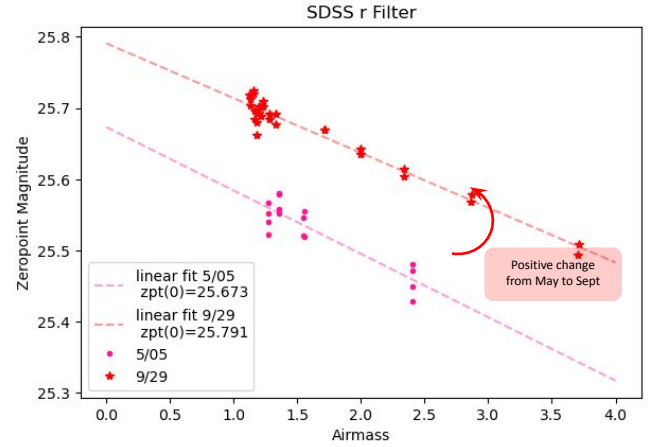
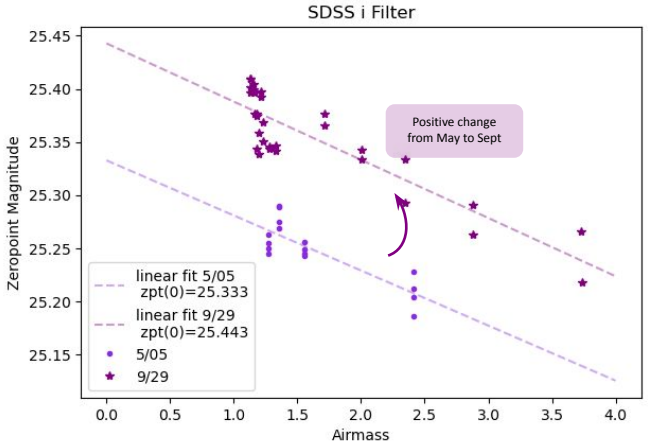


3.5-m Throughput Changes in 2023









Initial throughput measurements with partial datasets from before & after shutdown:

- May UT230505
- September UT230929

With the standard stars:

- Feige 22
- SA 113-339
- G163-50
- G163-51

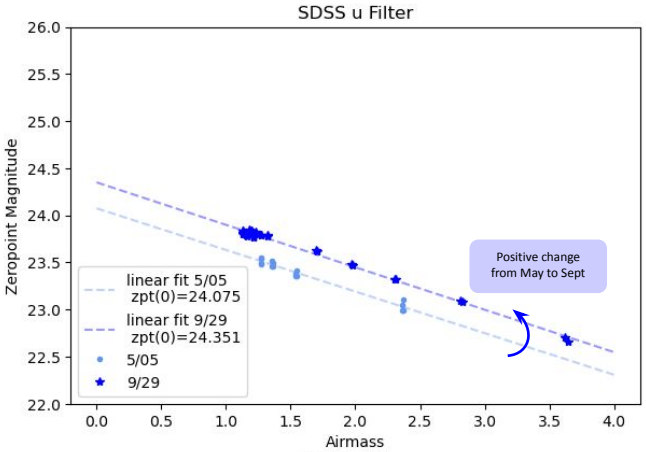
$$zpt = 2.5\ log_{10}\left(\frac{Flux}{t}\right) + mags_{td}$$

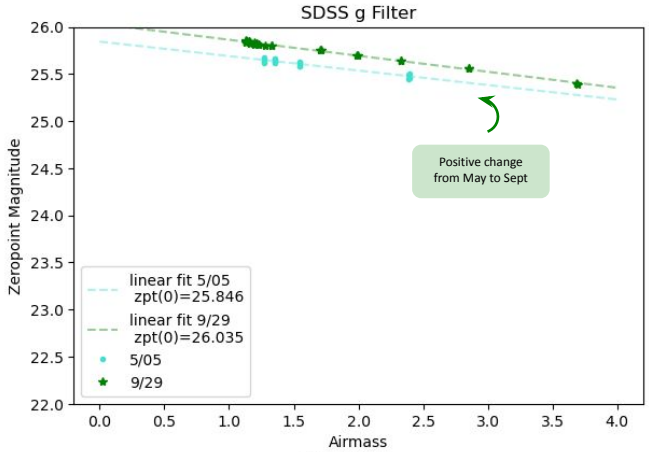
Improvement From May to September due to Mirror Recoating:

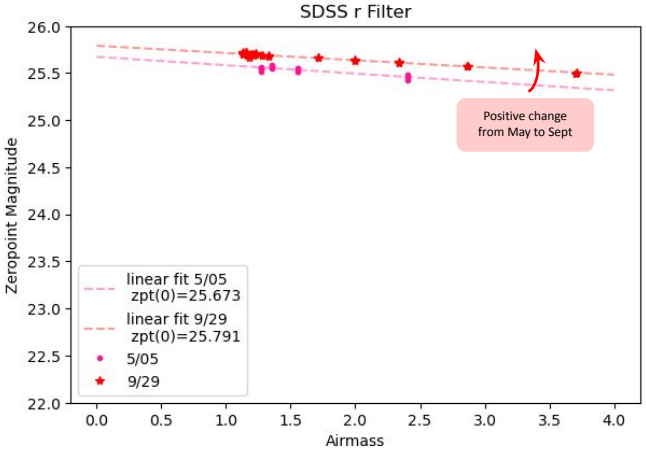
SDSS u: + 0.276 mags
SDSS g: + 0.189 mags
SDSS r: +0.118 mags
SDSS i: + 0.110 mags

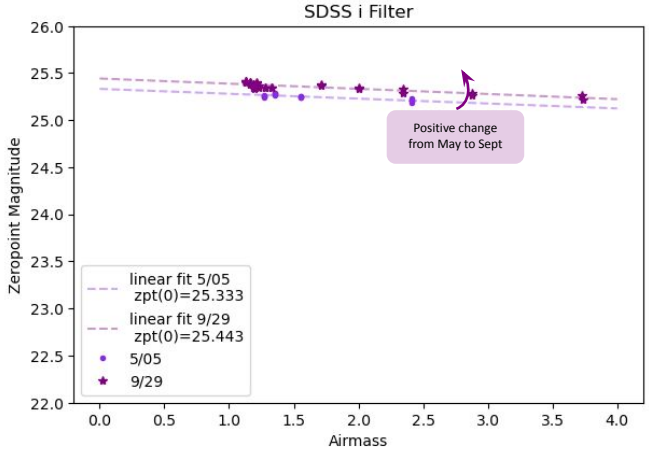
analysis by A. Townsend (APO)

3.5-m Throughput Changes in 2023









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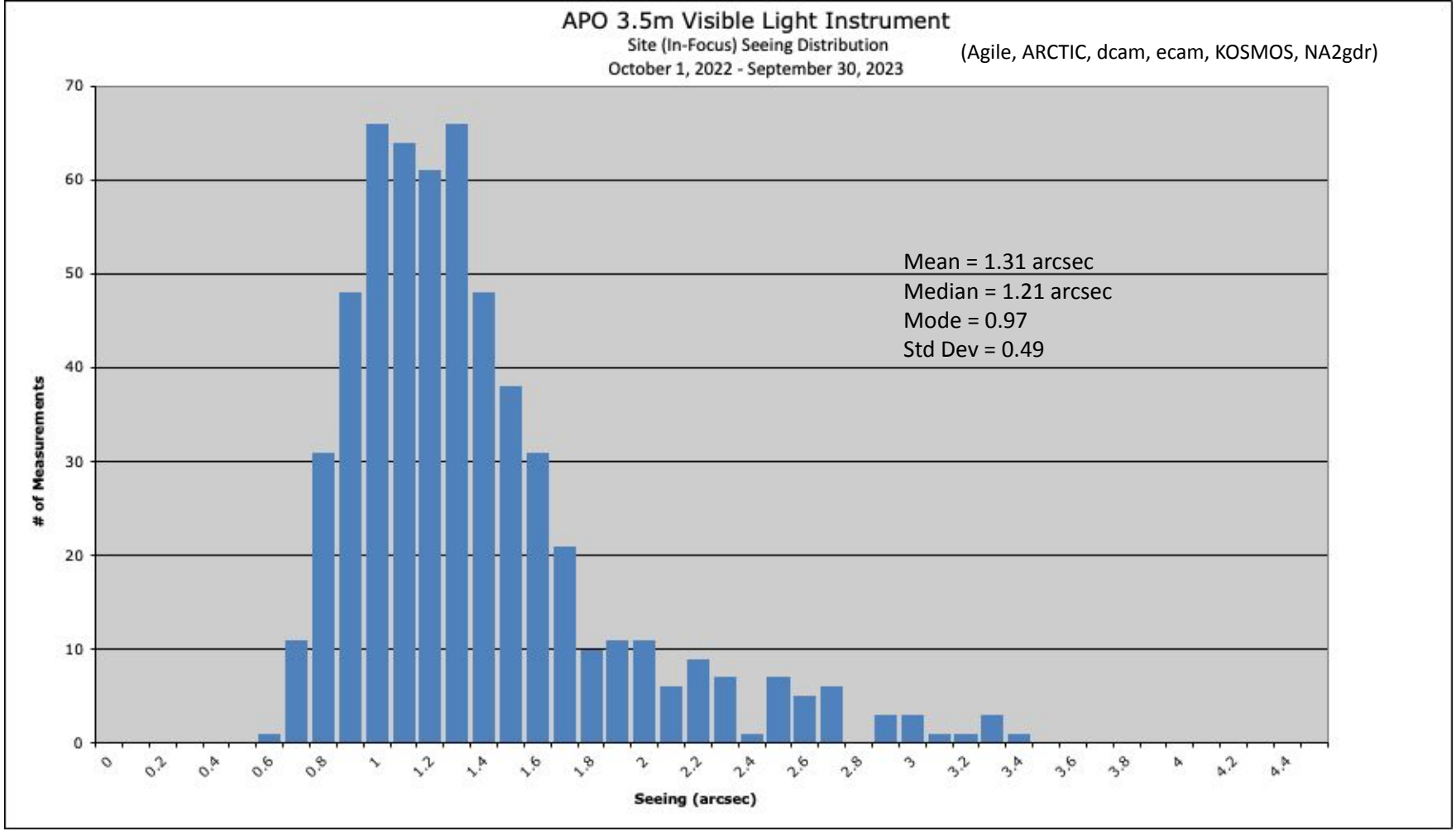
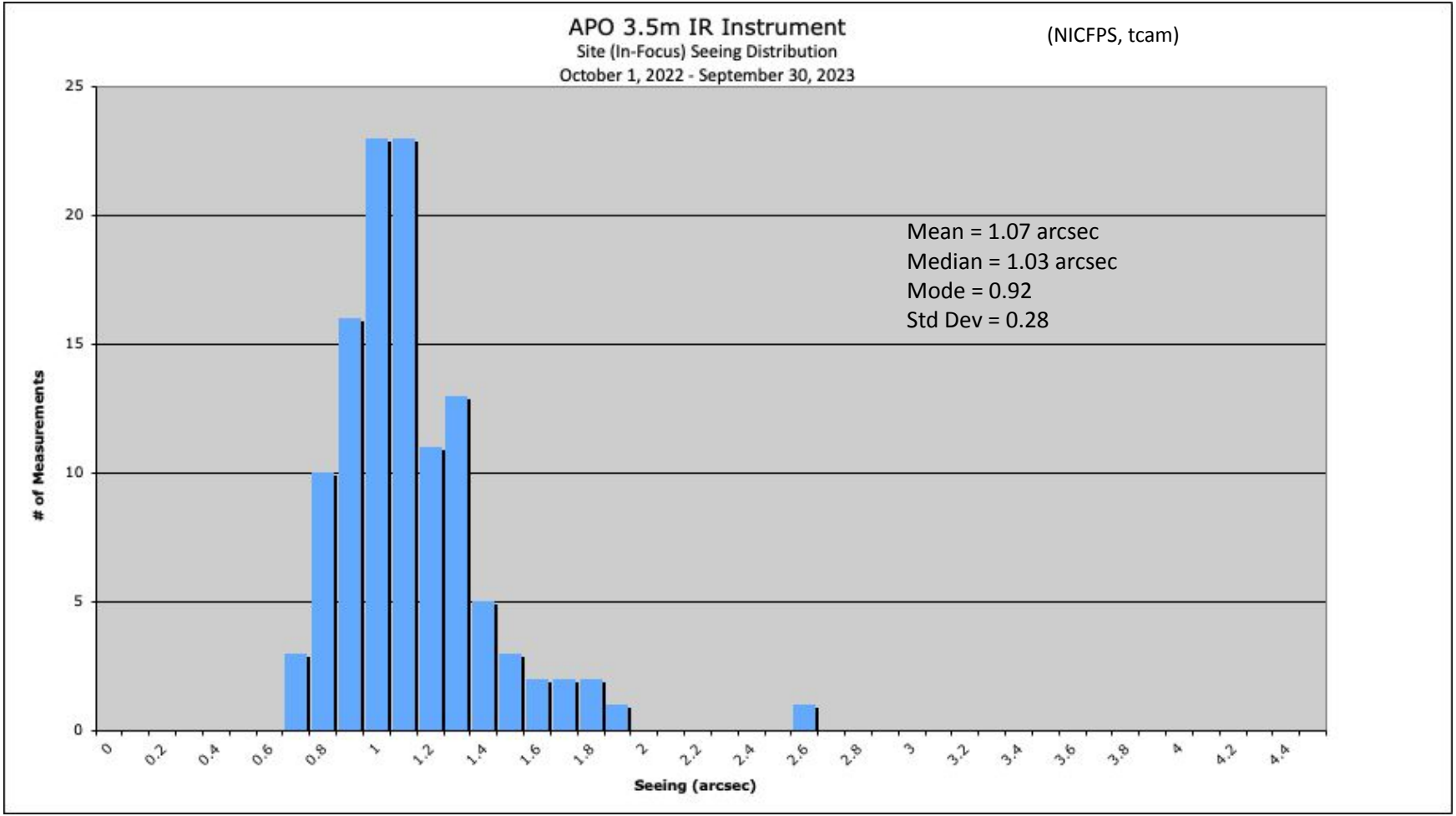
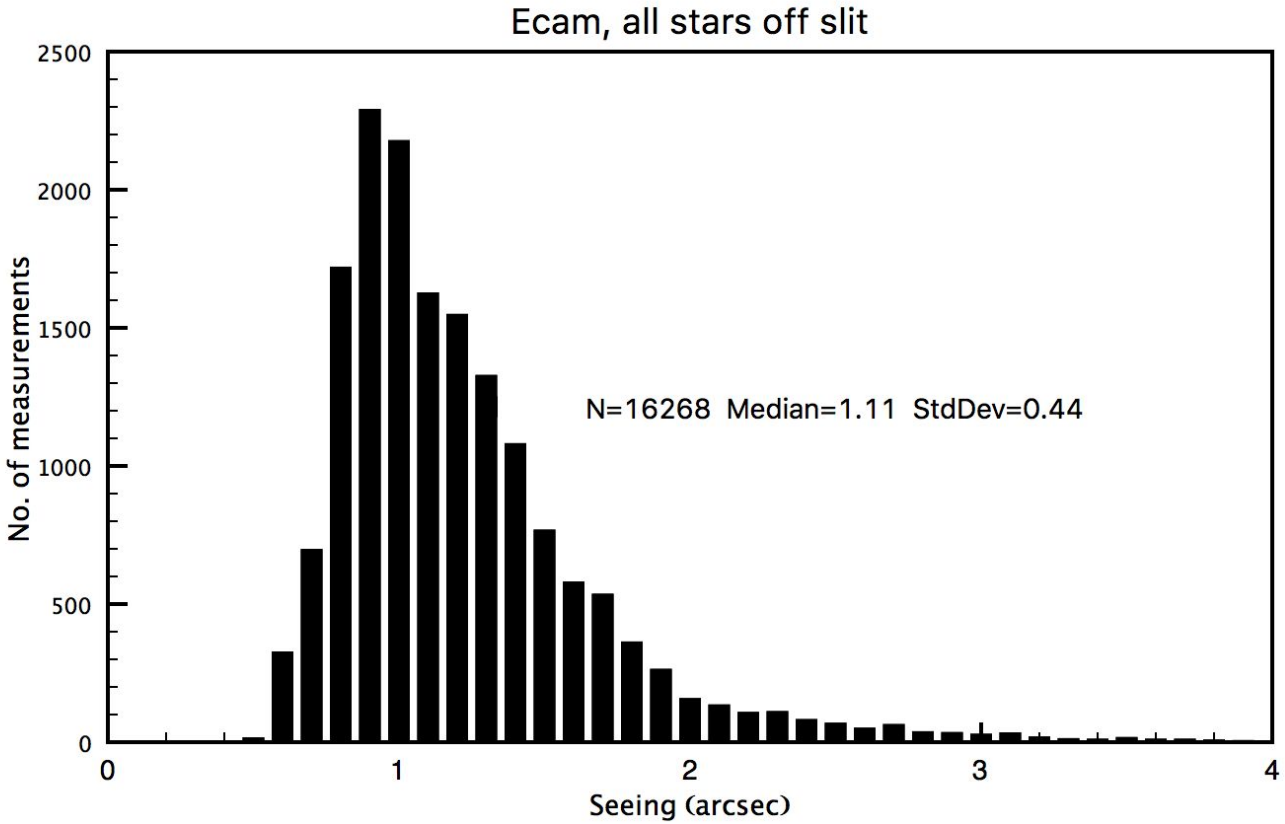
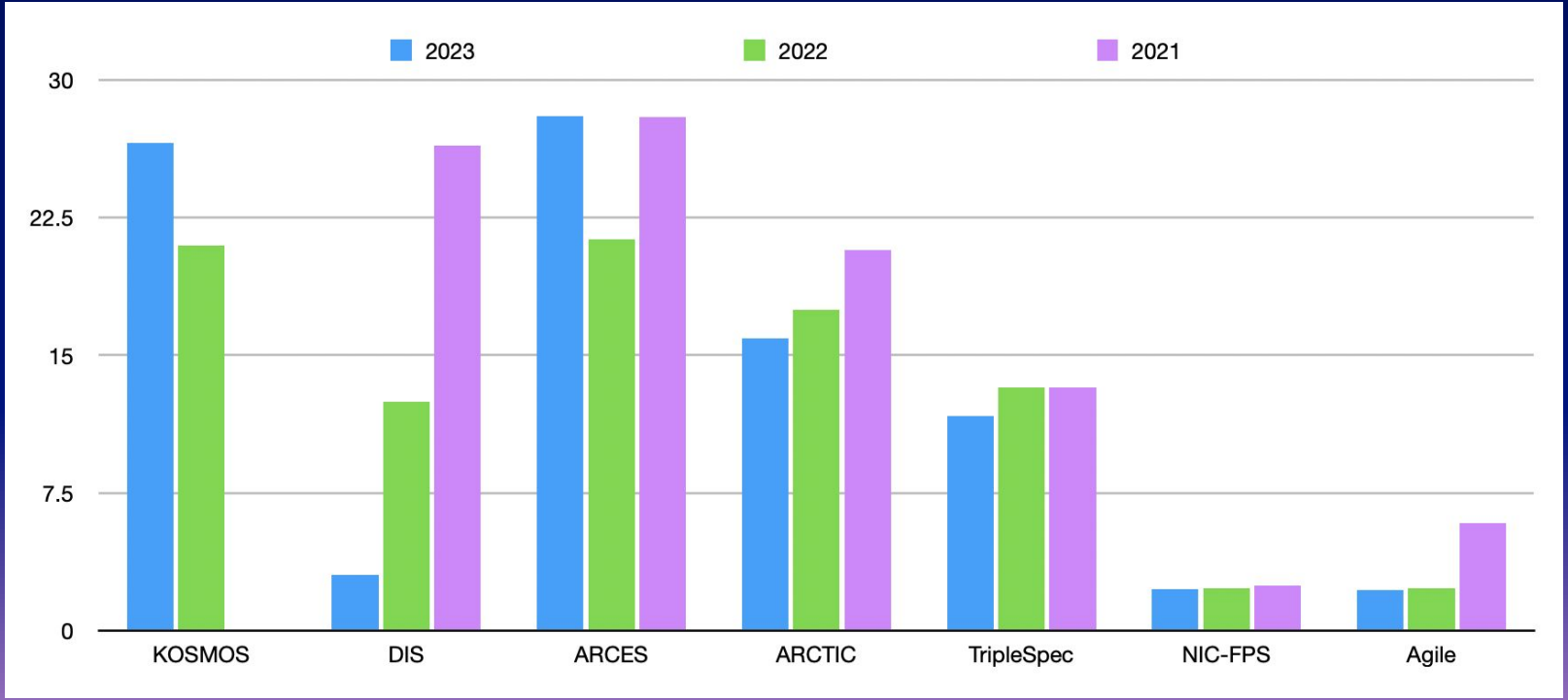

APO 3.5m Visible Light Instrument
Site (In-Focus) Seeing Distribution
October 1, 2022 - September 30, 2023
(Agile, ARCTIC, dcam, ecam, KOSMOS, NA2gdr)
Mean = 1.31 arcsec
Median = 1.21 arcsec
Mode = 0.97
Std Dev = 0.49
# of Measurements
Seeing (arcsec)
0
10
20
30
40
50
60
70
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3
3.2
3.4
3.6
3.8
4
4.2
4.4

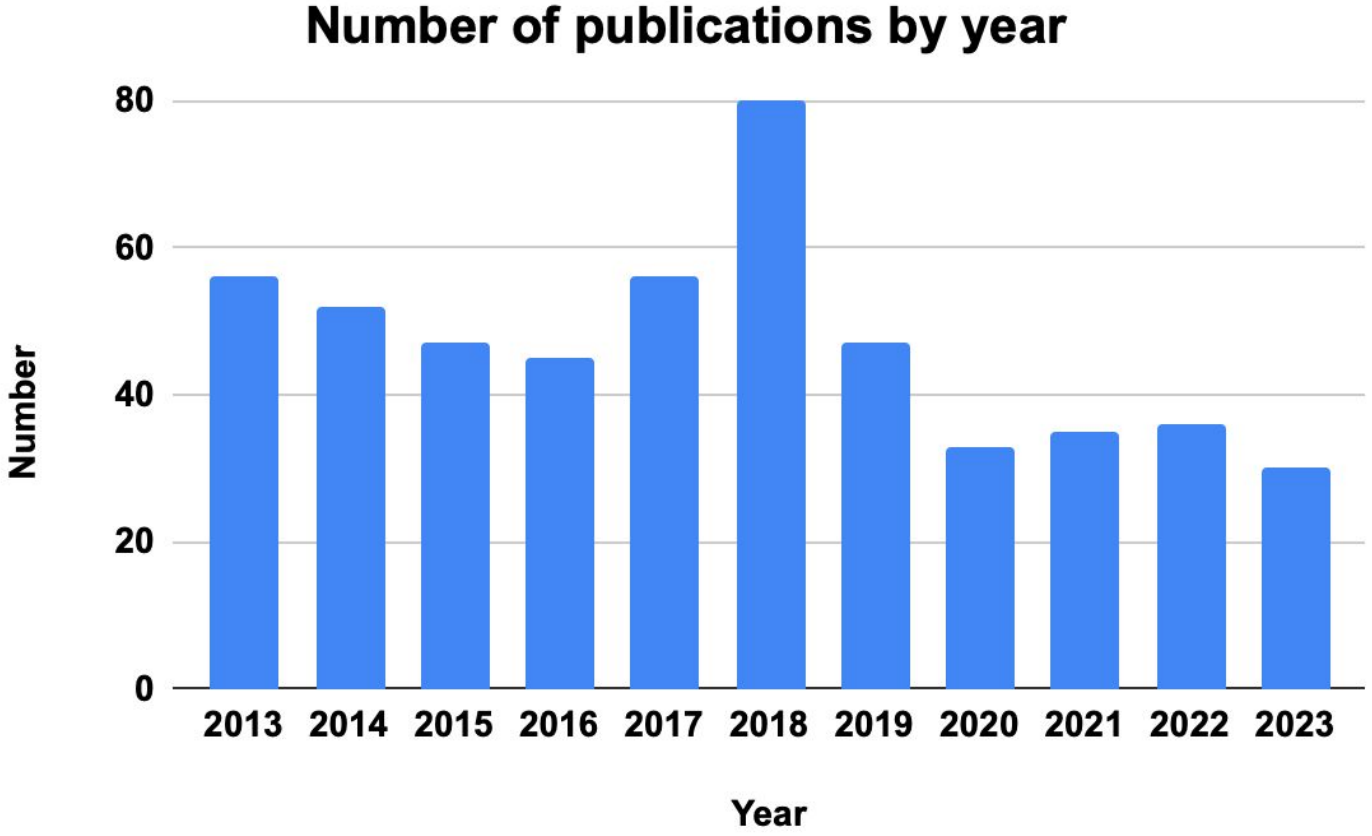

APO 3.5m IR Instrument
Site (In-Focus) Seeing Distribution
October 1, 2022 - September 30, 2023
(NICFPS, tcam)
Mean = 1.07 arcsec
Median = 1.03 arcsec
Mode = 0.92
Std Dev = 0.28
# of Measurements
Seeing (arcsec)
0
5
10
15
20
25
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3
3.2
3.4
3.6
3.8
4
4.2
4.4



Data for this plot were harvested from all ecam images during Oct 2022-Sep 2023, not just the few measurements per night reported in the night logs (shown in the previous 2 slides)

Instrumentation Usage, 2021-2023





2022 is the last year for which we have relatively complete data

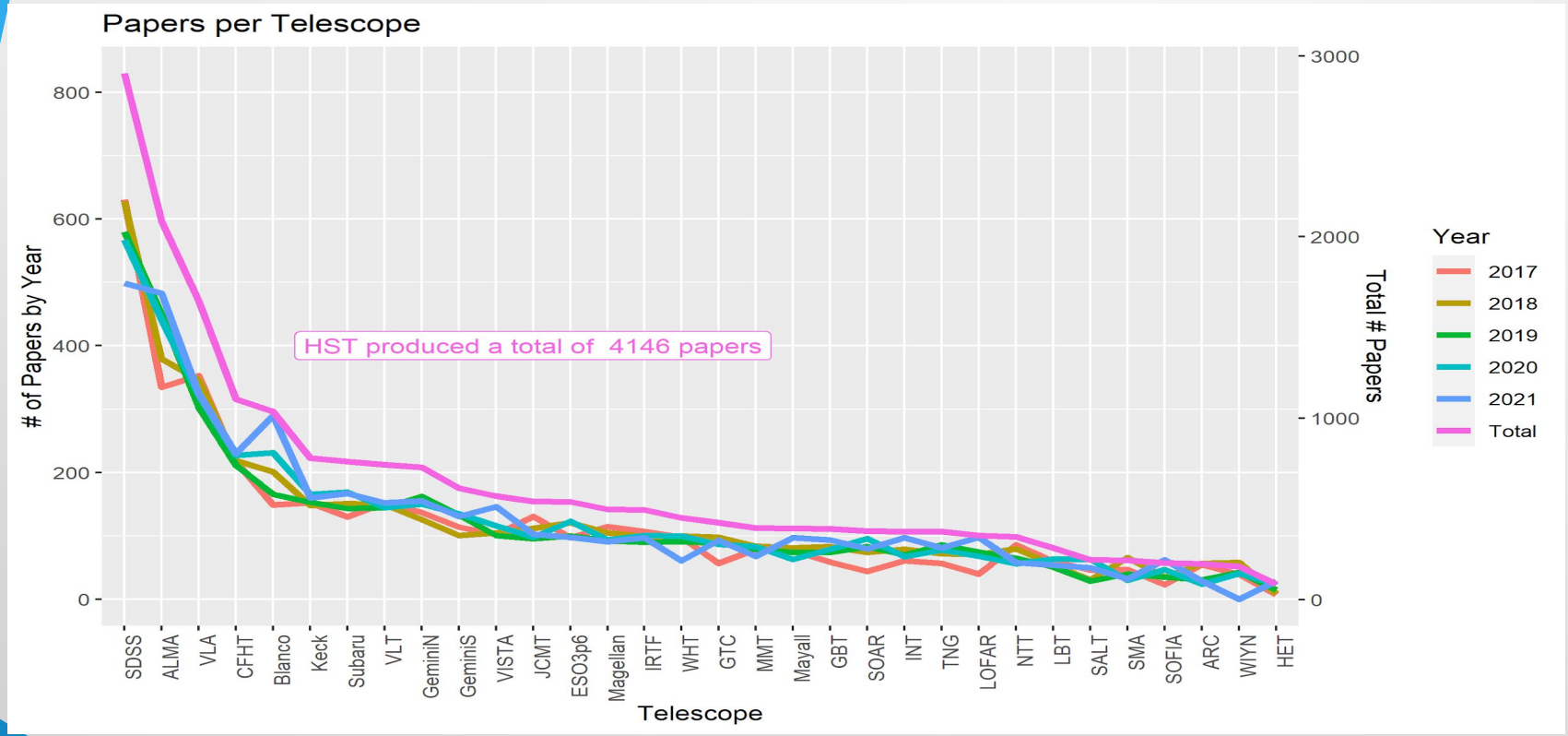
Observatory Publications October 2023 Update

2017 -2021

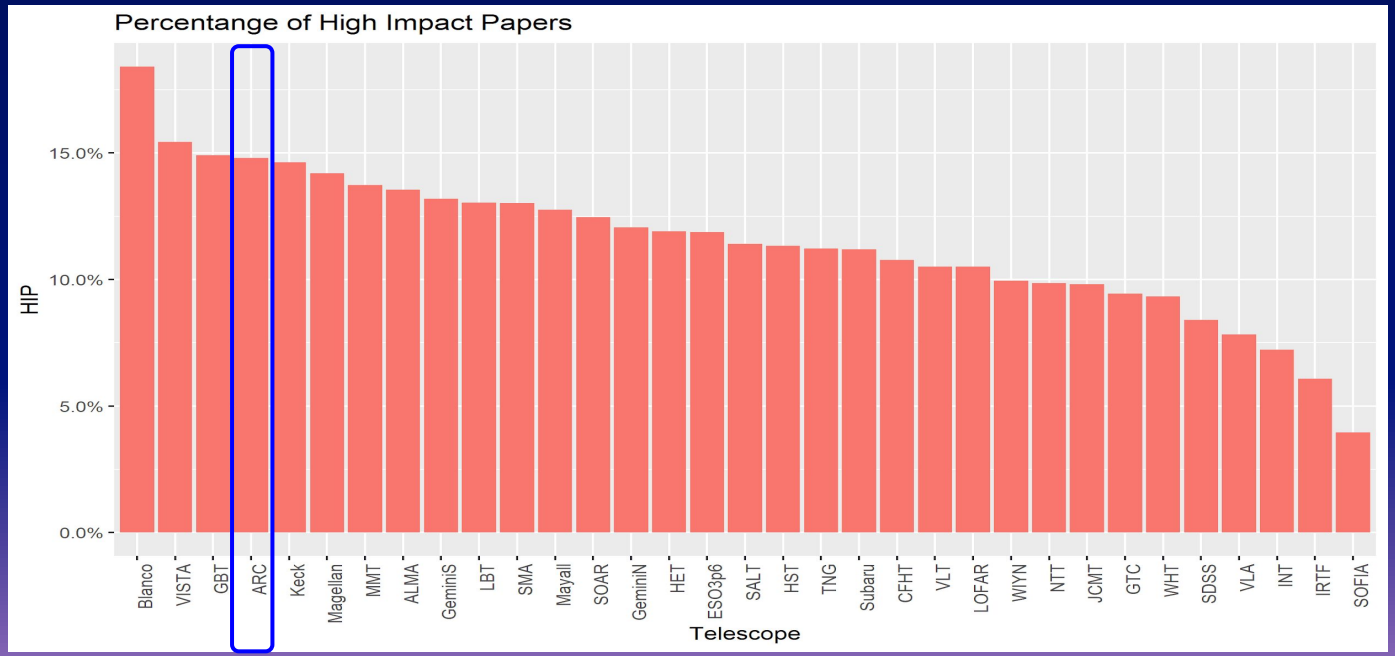
Dennis Crabtree
NRC Herzberg Astronomy & Astrophysics

Introduction

- This update includes data for 2017– 2021 publications
  - Citations updated September 2023
- SDSS and LOFAR now included! AAT and UKIRT not included
- Productivity numbers for multi-telescope facilities divided by the # of telescopes to give productivity per telescope.
- ApJ used as the journal used to normalize citations for the "age effect".
- The *impact* of a paper is the ratio of the number of citations that paper has received to the citation count for the median ApJ paper of the *same* year
- AIPP – Average Impact per Paper; MIPP – Median Impact per Paper


Papers per Telescope
# of Papers by Year
Total # Papers
Telescope
HST produced a total of 4146 papers
Year
2017
2018
2019
2020
2021
Total
0
200
400
600
800
0
1000
2000
3000
SDSS
ALMA
VLA
CFHT
Blanco
Keck
Subaru
VLT
GeminiN
GeminiS
VISTA
JCMT
ESO3p6
Magellan
IRTF
WHT
GTC
MMT
Mayall
GBT
SOAR
INT
TNG
LOFAR
NTT
LBT
SALT
SMA
SOFIA
ARC
WIYN
HET

Science Impact



The impact of a paper is defined as the number of citations to the paper divided by the number of citations received by the median ApJ paper of the same year.

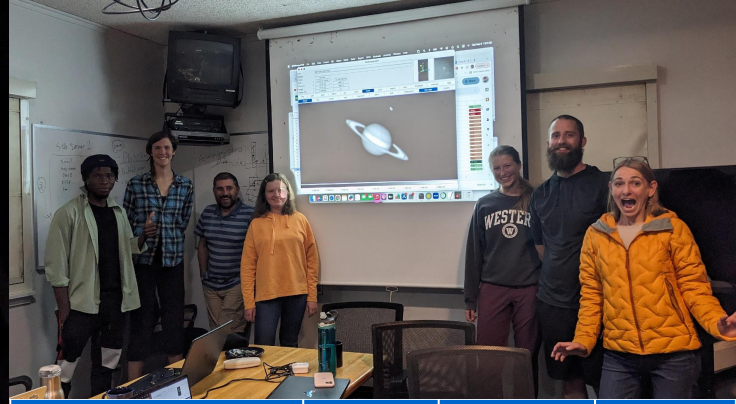
A paper is “high impact” if it is in the 90th percentile of the complete distribution of papers.

The ARC 3.5m has a relatively high percentage of high impact papers!

2023 Training Summary

Apache Point Observatory: A Gateway to the Stars

- More In-person training!
  - Undergrads, grads, and PhD observers
  - Three nights on sky
  - Eyepiece tours!
- Virtual training
  - Will continue to be made available
  - Quarterly training for PhDs
  - Two pre-observing training sessions
  - Three on-sky observing sessions
- Invaluable experience for all!



Nov 2022 – Oct 2023 Training	Remote	In-Person	Total
Participating Consortium members	3	6	**9**
Groups Trained	4	9	**13**
Total People Trained	71	20	**91**