National Aeronautics and Space Administration

NASA

EXPLORE SOLAR SYSTEM & BEYOND

R&A Update

APAC Meeting | March 30, 2022

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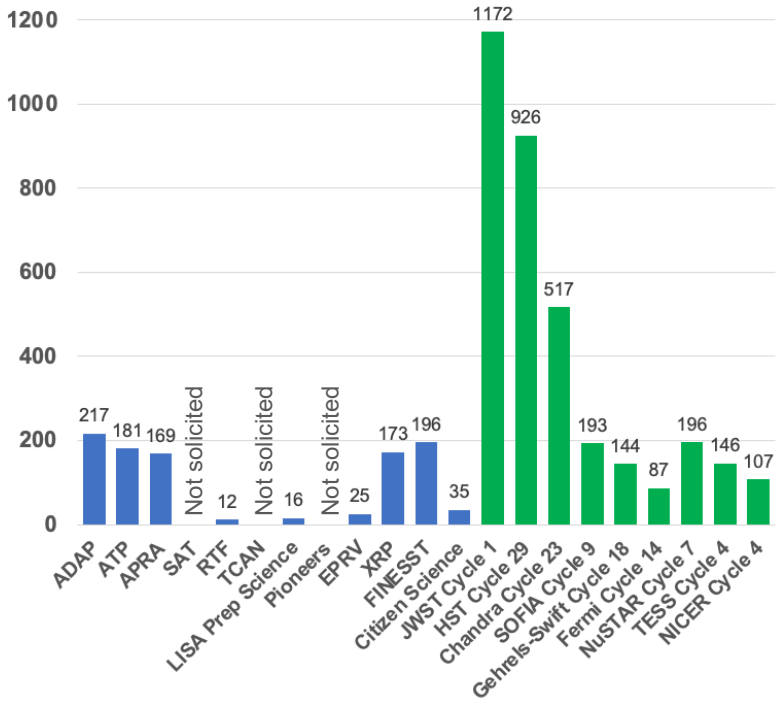
Astrophysics R&A Selection Rates

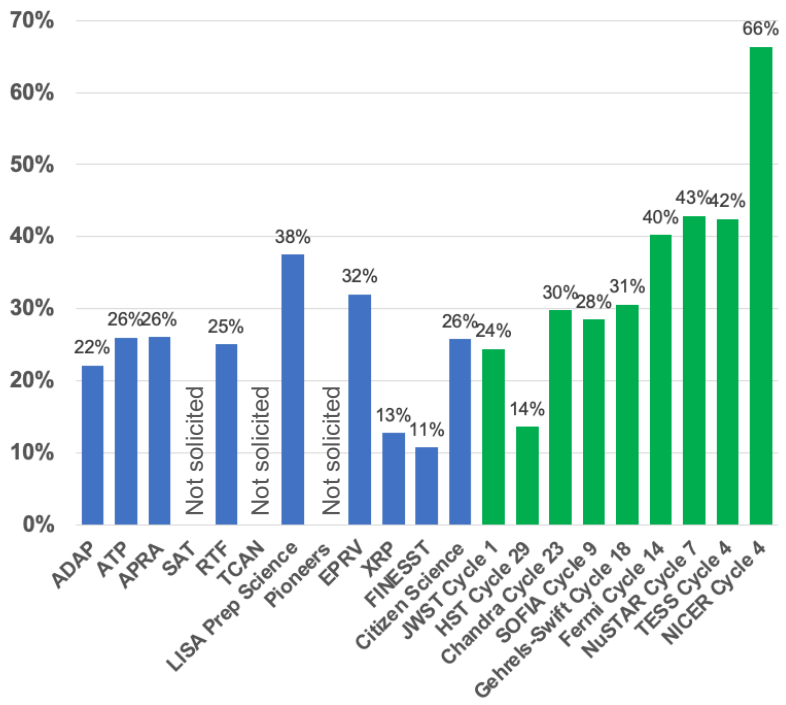
March 2021-2022

Number of Proposals



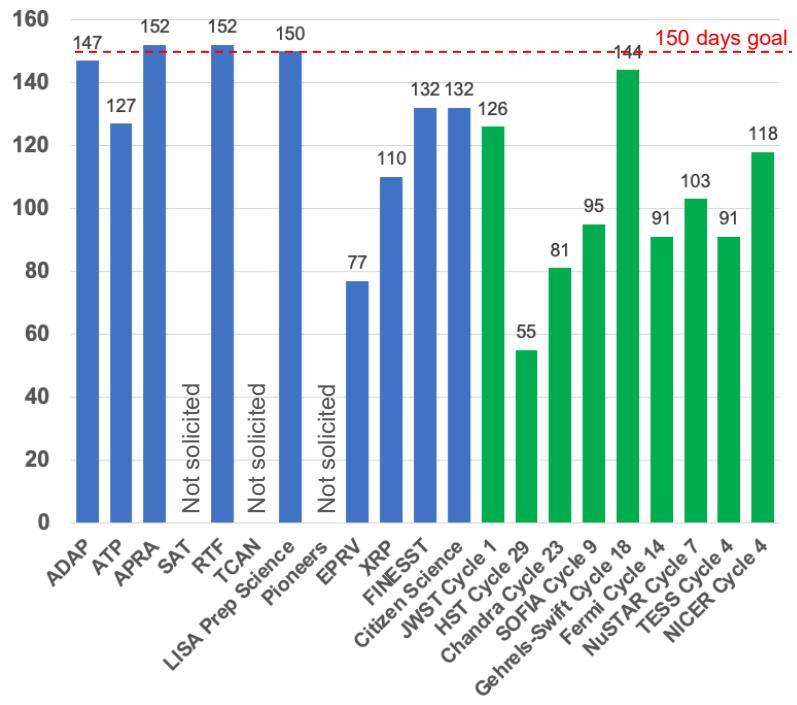
R&A: 1,024 proposals
GO/GI: 3,488 proposals
Total: 4,512 proposals

Selection Rates



R&A: 20%
GO/GI: 27%
Average: 25%

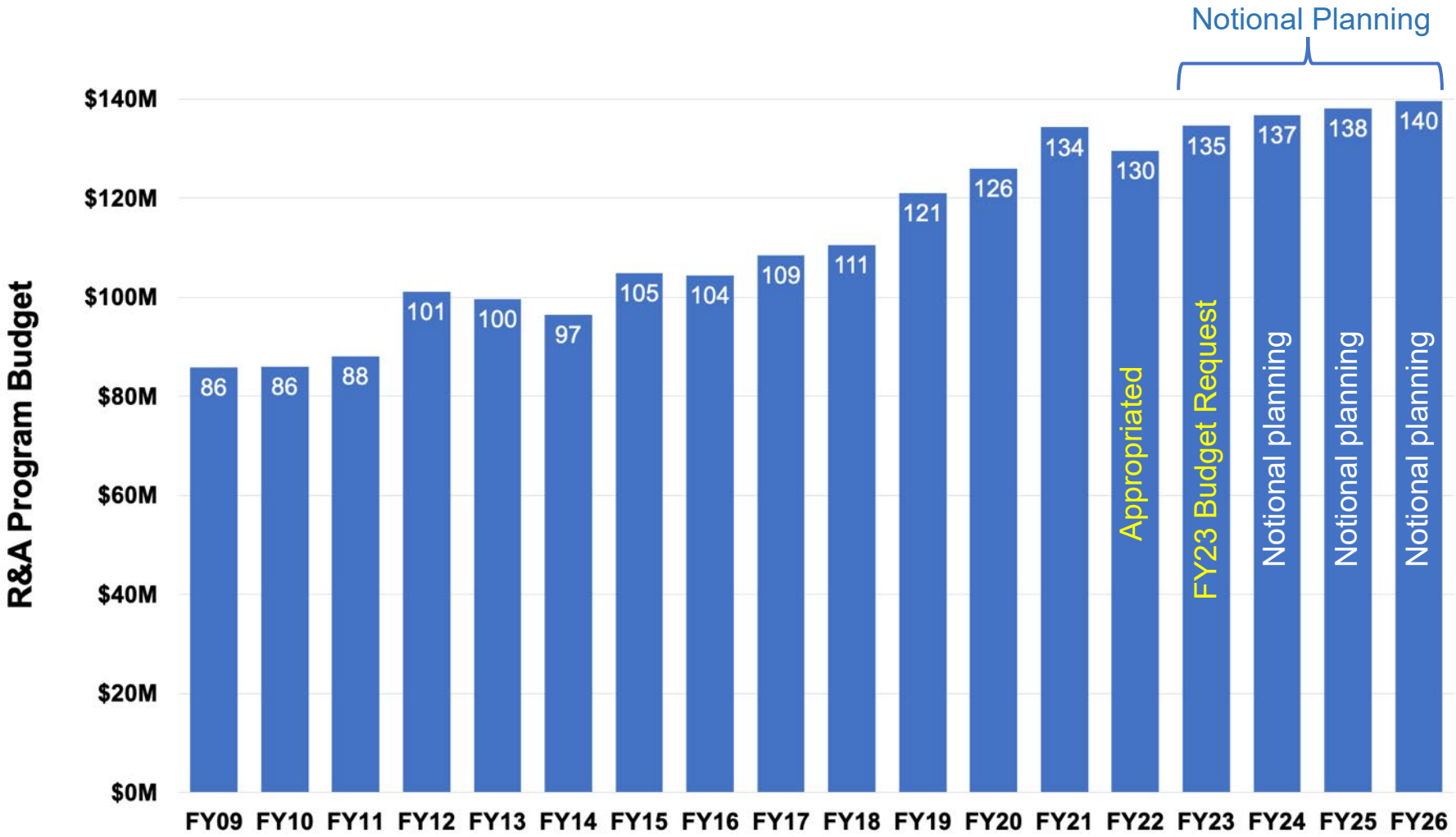
PI Notification (Days)



80% of PI notification:
R&A: 147 days
GO/GI: 119 days

* Only programs with selections made and PIs notified

R&A Research Funding



The Astrophysics R&A Program has seen a sustained growth since the last Decadal Survey:

+47% funding growth in R&A

Projected growth of R&A funding of 8% over the next 5 years (~1.5% per year).

2022 Astrophysics Research Program Elements

ROSES-22

Supporting Research and Technology

- Astrophysics Research & Analysis (APRA) *
- Strategic Astrophysics Technology (SAT) *
- Theoretical and Computational Astrophysics Networks (TCAN) *
- Roman Technology Fellowships (RTF)
- Astrophysics Decadal Survey Precursor Science (ADSPS) */** New

Data Analysis

- Astrophysics Data Analysis (ADAP) **
- GO/GI programs for Fermi, Swift, NuSTAR, NICER, TESS **

Mission Science and Instrumentation

- Astrophysics Pioneers (suborbital science investigations) *
- Suborbital payloads solicited through APRA *
- LISA Preparatory Science *
- Roman Research and Opportunities (moved from ROSES-2021) New
- XRISM Guest Scientist (XGS, moved from ROSES-2021) ** New

Cross Divisional

- Exoplanets Research Program (XRP) **
- Topical Workshops, Symposia and Conferences (TWSC)
- Citizen Science Seed Funding Program
- Graduate Student Research Awards (FINESST)

Solicited Separately

- GO/GI/Archive/Theory programs for JWST, Hubble, Chandra, SOFIA **
- NASA Hubble Fellowship Program (NHFP)
- NASA Postdoctoral Program (NPP)
- Support for XMM-Newton U.S. PIs selected by ESA

Not solicited in ROSES-22

- Astrophysics Theory Program (ATP), every other year
- Astrophysics Explorers U.S. PIs (APEX USPI) is no longer solicited separately, now part of Astrophysics Research & Analysis (APRA)

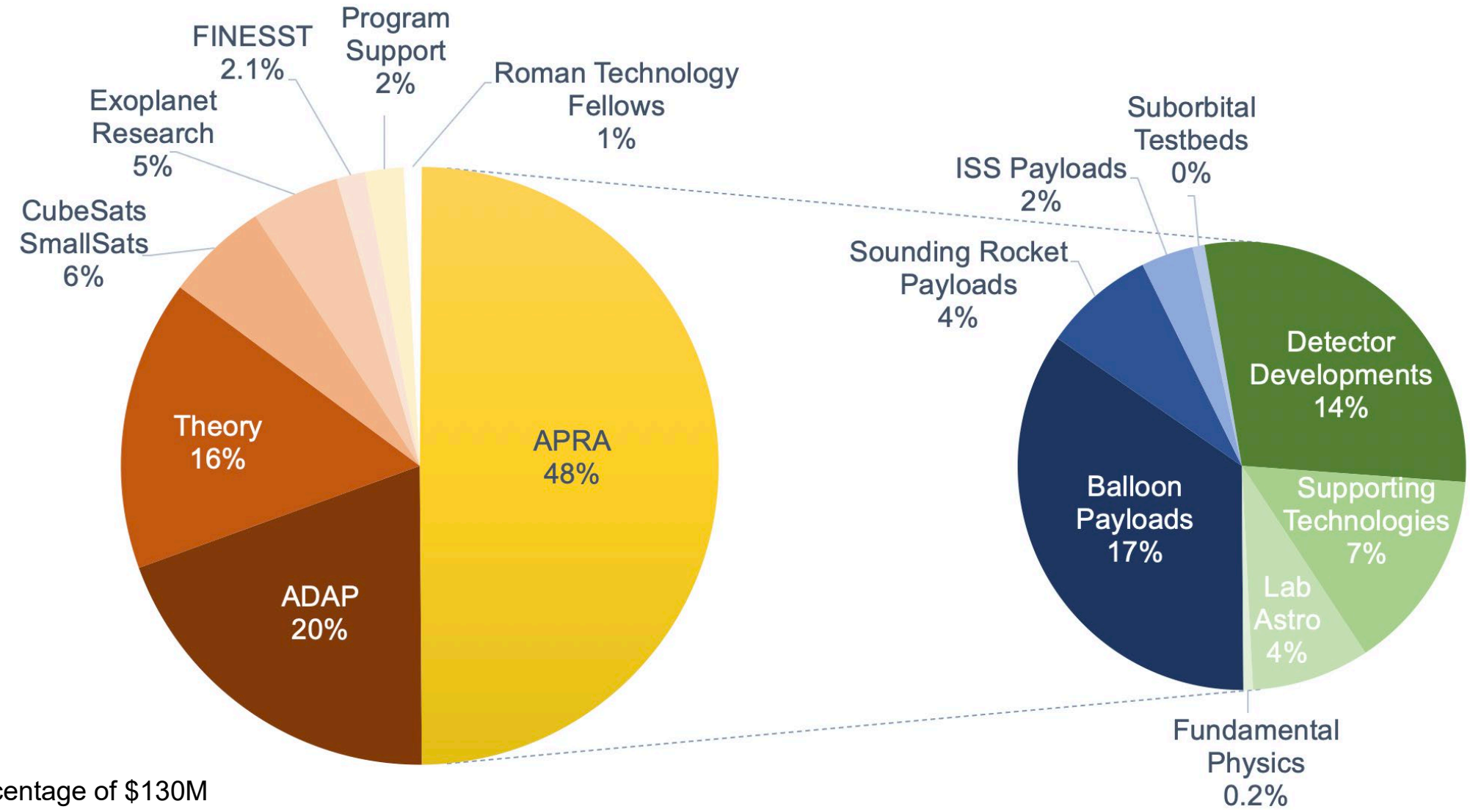
Notice:

ROSES-22 was released on February 14, 2022

* Proposals will require an inclusion plan for creating and sustaining a positive and inclusive working environment. (See slides 20-36 for more details)

** Proposals evaluated using dual-anonymous peer reviews

Balance of R&A Elements

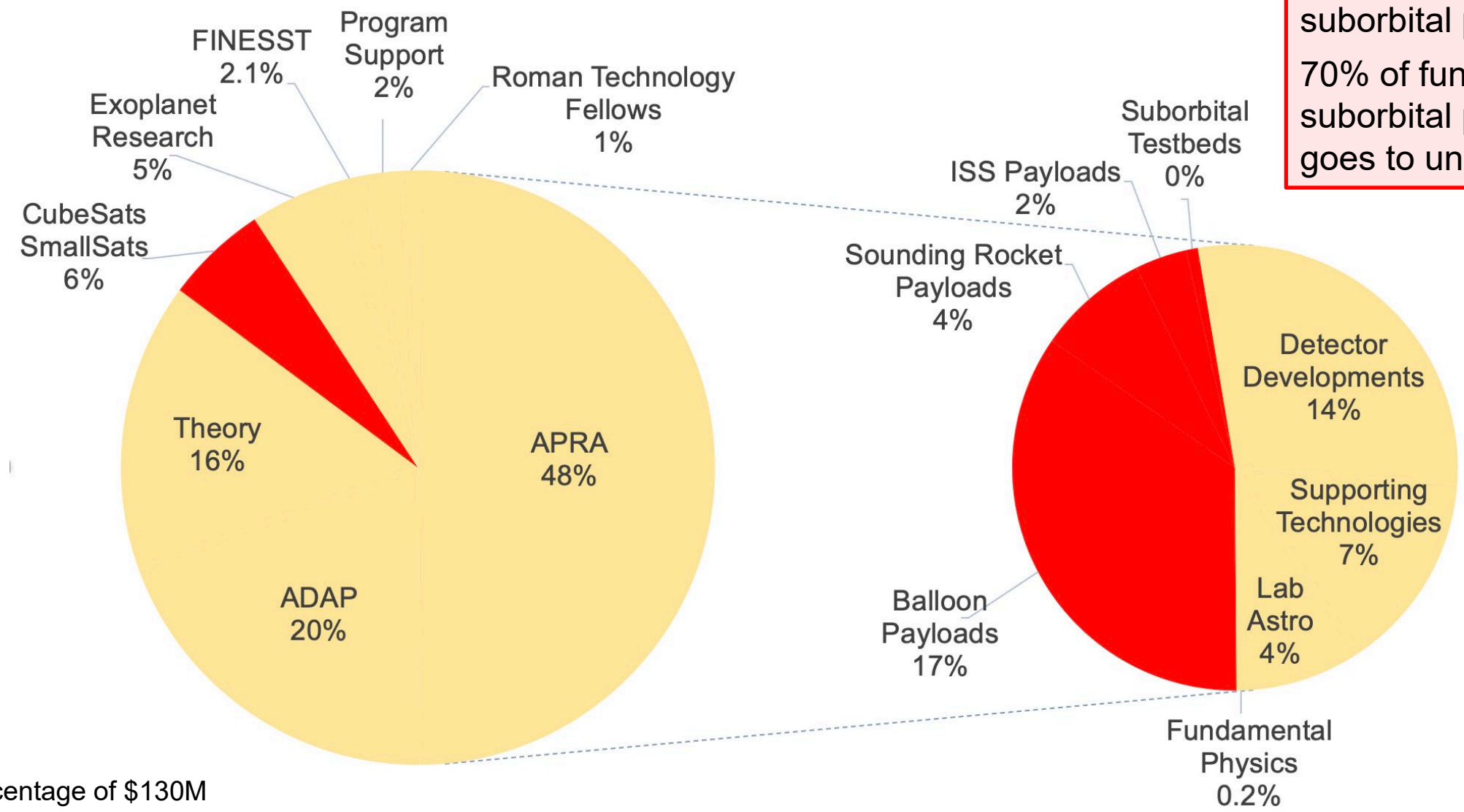


* FY22 percentage of $130M

Balance of R&A Elements

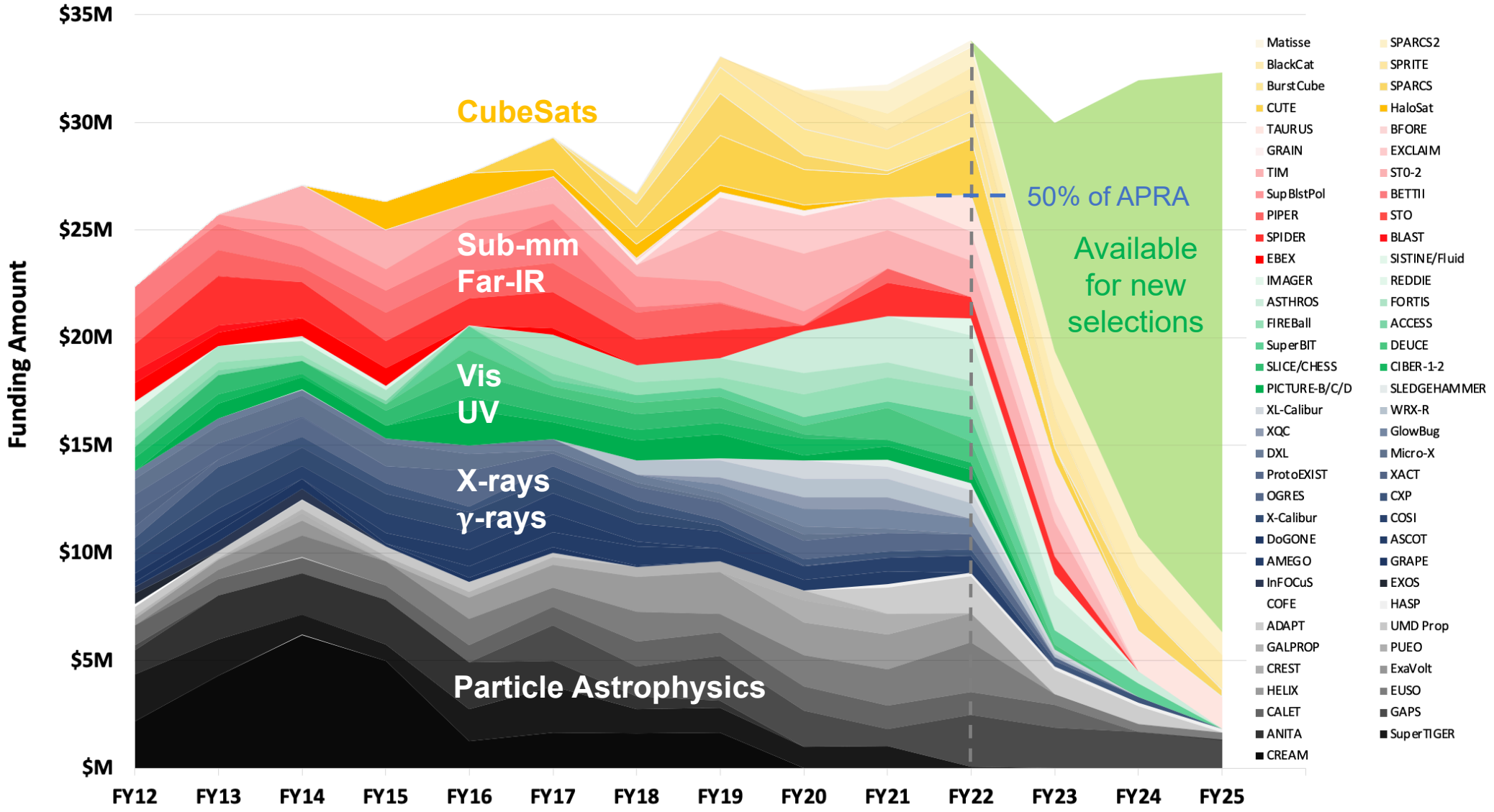
50% of APRA funding is invested in suborbital programs.

70% of funding for suborbital programs goes to universities.

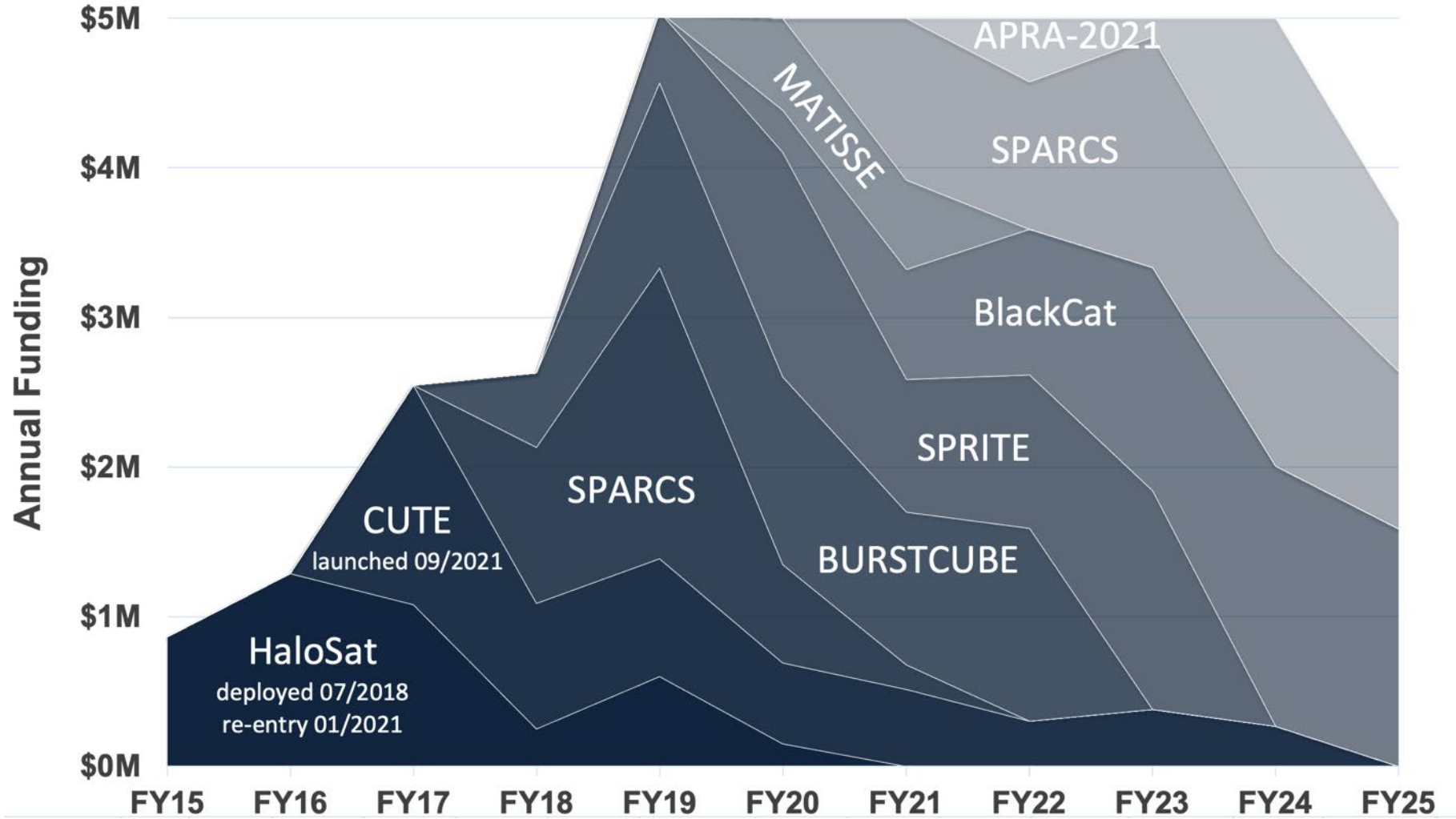


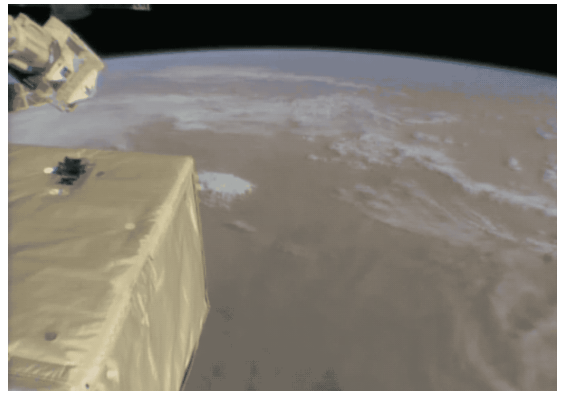
* FY22 percentage of $130M

Suborbital Program Funding



CubeSat Cadence



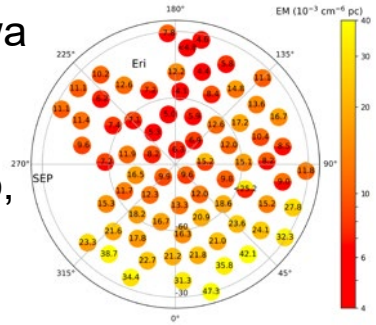


HaloSat deployment

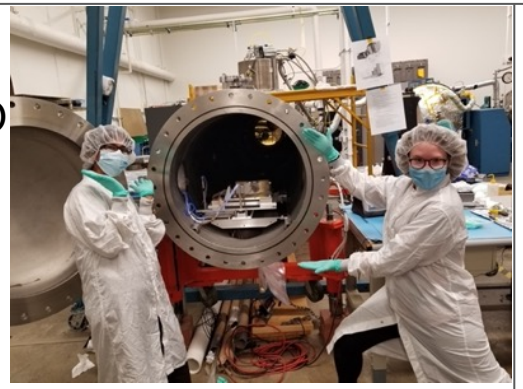
CUTE on dispenser

Astrophysics CubeSats

HaloSat:
PI Phil Kaaret, U of Iowa
Launch 5/2018
Re-entry 1/2021
OIV line in Galaxy Halo, found unexpected structure of Halo,
All Data in NASA's HEASARC data archive

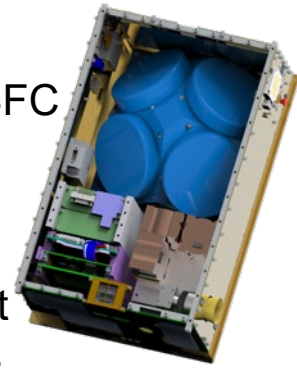


CUTE:
PI Kevin France, U CO
Launch 9/2021
In operation
UV imaging of hot Jupiter ablation,
BCT bus,

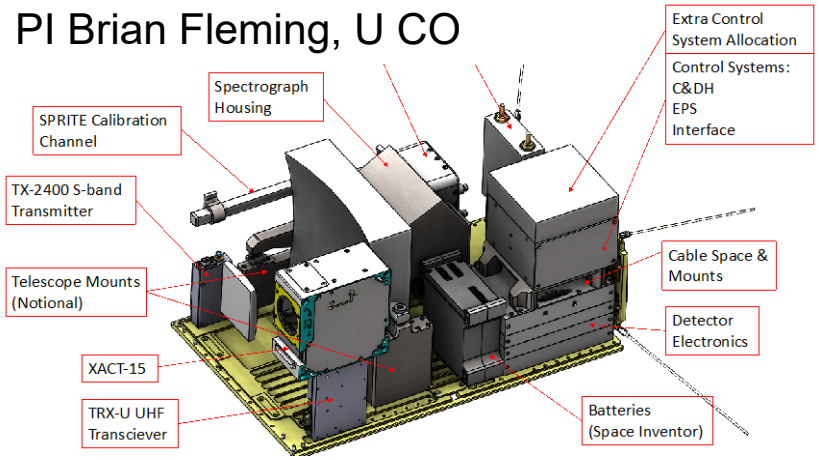


Arika Egan and Ambily Suresh in lab

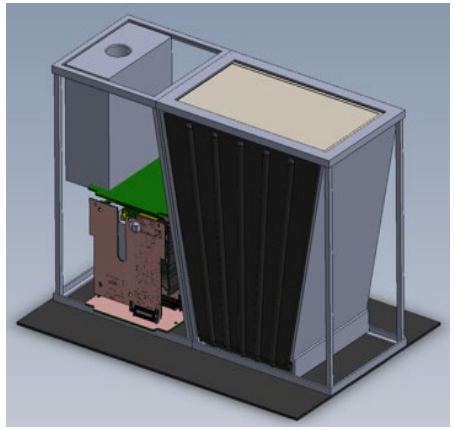
BurstCube:
PI Jeremy Perkins, GSFC
Launch NET Q4/2022,
SpX-26 launch?
GRB monitor with TDRSS real-time event notification, GSFC Bus



SPRITE:
PI Brian Fleming, U CO



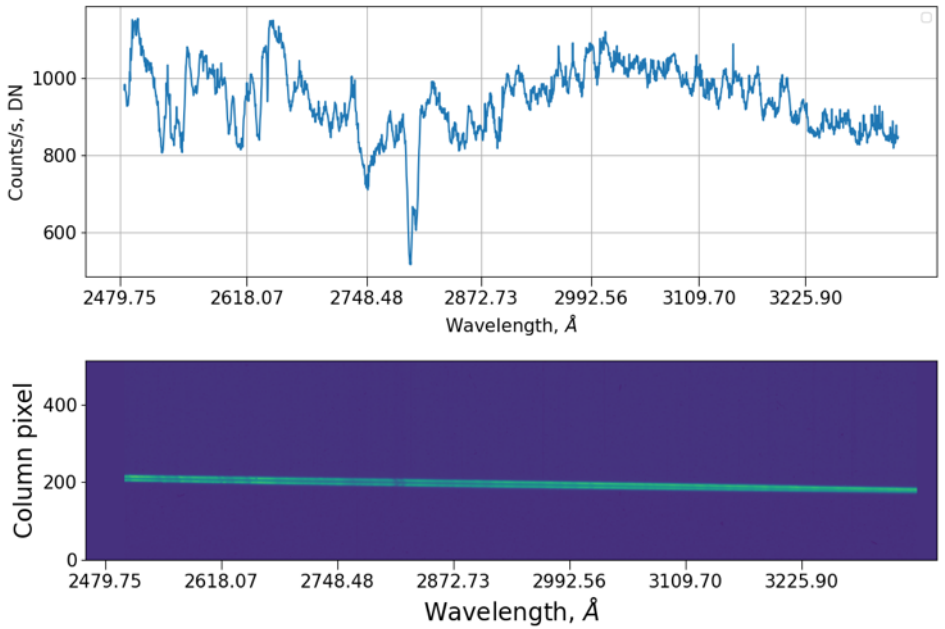
BlackCat:
PI Abe Falcone, PSU
Launch NET 3/2024,
2-20 KeV wide FOV localization of X-ray transients, real-time 'cell phone' downlink,
NanoAvionics bus



SPARCS:
PI Evgenya Shkolnik, ASU
Launch NET 2/2024,
Two UV band monitoring of M-star flares to investigate planetary habitability effects, BCT bus

Colorado Ultraviolet Transit Experiment (CUTE) In Science Operation

- CUTE is a 6U cubesat with an NUV (255 – 330nm) telescope and spectrograph to study transiting planets around bright stars
- Launched September 27, 2021, as a secondary payload on the LANDSAT-9 mission. Spacecraft tracked and communications established within 2 days in coordination with amateur satellite community



- Completed spacecraft and instrument commissioning in February 2022
- Science operations underway: **Completing 6 transit observations of first Early Release Science target now**
- Science mission scheduled to be completed in December 2022

Left: Flux calibration spectrum from CUTE (K. France, University of Colorado)
Right: CUTE on secondary payload adapter

LANDSAT-9 launch
Sept 27, 2021

Suborbital Achievements – Sounding Rockets (I/II)

- Both the Sounding Rockets and Balloon Program have developed a process to resume launches with covid-safe protocol (developed by the GSFC Medical Office)
- In FY21 the Sounding Rocket had 12 successful CONUS launches (2 Astrophysics: **DEUCE**, **CIBER-2**)
- In FY22 the Sounding Rocket had 7 successful launched so far (2 Astrophysics: **SISTINE 2**, K. France , 11/8/21, WSMR; **DXL 3**, M. Galeazzi, 01/09/22)
- The Sounding Rocket Program Office is preparing a launch campaign June/July 2022 from Equatorial Launch Australia with three Astrophysics payloads: **XQC**, D. McCammon, **SISTINE,** K. France, **DEUCE**, B. Fleming
- In addition, there are 2 more Astrophysics Sounding Rocket launches scheduled in FY22: **tREXS**, R. McEntaffer 05/23/22, WSMR; **Micro-X**, E. Figueroa, 09/01/22, WSMR;

See presentation by Thomas Hams

Setup of mobile Sounding Rocket range support equipment at Equatorial Launch Australia

Suborbital Achievements – Sounding Rockets (II/II)

See presentation by Thomas Hams

Setup of mobile Sounding Rocket range support equipment at Equatorial Launch Australia (October 13, 2021)

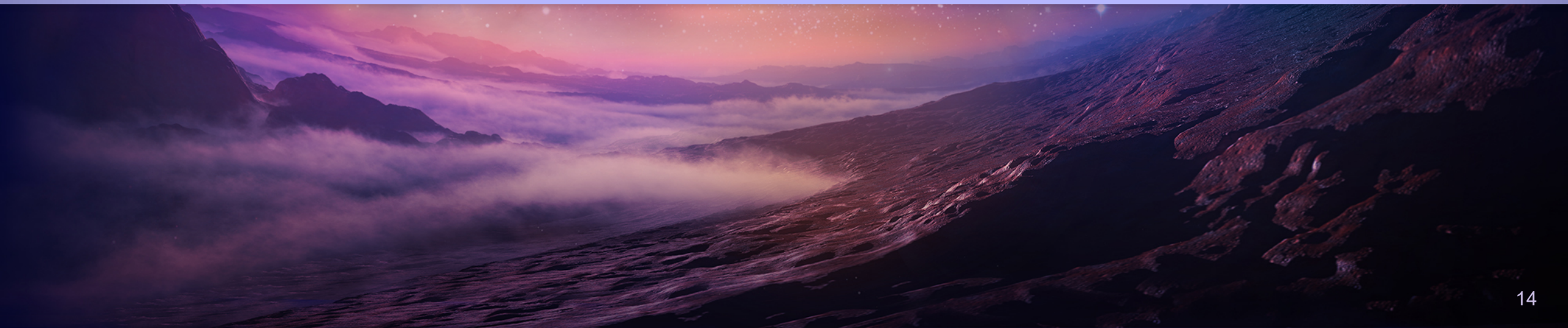
Suborbital Achievements – Balloons

See presentation by Thomas Hams

- The Balloon Program conducted successful Spring and Fall Fort Sumner, NM campaigns with 10 balloon launches in FY21 plus a crew chief training of a super pressure balloon replica inflation exercise ahead of the upcoming NZ super-pressure campaign
- For FY22 the Balloon Program is supporting the Fall Fort Sumner, NM campaign plus two international campaigns in Wanaka, NZ and Esrange, Sweden
- Wanaka, NZ (March-April 2022) up to 1 super-pressure balloon launch: test platform
- Esrange, Sweden (May-Jun 2022) 3 science payloads: one Astrophysics **XL-Calibur**/H. Krawczynski
- See backup slides for FY22 Balloon Program flight manifest

Right: Practice inflation of a super-pressure balloon replica in Ft Sumner. The small balloon on top is a tow balloon that carries the weight of the metal balloon closeout plate until the super pressure balloon is sufficiently inflated to support the load.

Astro2020 Decadal Survey Recommendations in R&A



Astro2020 Decadal Survey Recommendations (I/IV)

- **“Compile and regularly report data on proposal submissions and success rates”**
  NASA will continue to release data on proposal success rates, both aggregated and by program element, at every AAS Town Hall and at meetings of the Astrophysics Advisory Committee (see slide 2).
- **“Improve coordination among U.S. data centers supported by NSF and NASA NSF”**
  NASA, NSF, and DOE have established a cross-agency working group to improve coordination among U.S. archive centers for astronomical and astrophysical data.
- **“Collecting, evaluating, and reporting demographic data and indicators for equitable outcomes”**
  NASA has charged the National Academies with conducting a study that will enumerate the types of data that NASA should be collecting.
- **“Include diversity in evaluation of funding awards”**
  In 2021, NASA required an inclusion plan from all proposers to the Astrophysics Theory Program. The plans were evaluated, and feedback was provided to the proposers, but the inclusion plans had no role in selections. Based on lessons learned from that pilot program, NASA is expanding the inclusion plan requirement to 6 astrophysics elements and 4 additional elements of ROSES in 2022. (See slides 20-36)
- **“Review NASA’s balloon program for optimal balance”**
  NASA will discuss the formation a Balloon Program Review task force with the APAC at its Spring 2022 meeting.

Astro2020 Decadal Survey Recommendations (II/IV)

- **“Augmentation and restoration of annual proposal calls for Astrophysics Theory Program”**

  NASA is considering:

  1) Keep biannual solicitation for the Astrophysics Theory Program (no change, keep selection rate >20%)
  2) Change solicitation to every year cadence, leading to a lower selection rate (~11%) unless augmented
  3) Add a solicitation of proposals from early-career theorists in alternative years
  4) Other options

NASA advertised two internship opportunities that will help inform a decision in the Fall. One of the interns will focus on developing data and statistics how the biannual solicitation for ATP has affected the selection rates early-career researchers.

After NASA has conducted the study in the summer, the findings will be presented at the next APAC meeting for community input whether ATP should keep the biannual cadence or go back to annual solicitations of proposals.

Astro2020 Decadal Survey Recommendations (III/IV)

- **“Undergraduate and graduate “traineeship” funding”**

  NASA is considering:

  1) Funding augmentation for FINESST to keep selection rate >10% despite growing proposal pressure
  2) Consider adding training component to FINESST beyond grant for research program (SMD discussions)

- **“Augmentation and improved coordination of Laboratory Astrophysics funding”**

  NASA is considering:

  1) No action needed now: selection rate of Lab Astro proposals (28% in ROSES-20) is in family with APRA (26%) and one of the highest in R&A. Ramp-up of Lab Astro funding is already in progress ($1.4M in FY21 to $4.6M in FY24) and the Lab Astro proposal submission rate is not increasing
  2) NASA and NSF will convene a broad panel under FACA committee / AAAC to identify the needs of laboratory data to interpret the results of astronomical and astrophysical observatories and missions

- **“Faculty diversity, and early-career faculty awards”**

  Discussions pending. Options include, among others, increase of RTF funding, ATP solicitation every other year for early-career theorists

Astro2020 Decadal Survey Recommendations (IV/IV)

- **“Independent postdoc fellowships”**

  Discussed as part of implementation plan for the response to the NASA Hubble Fellowship Program panel report

- **“Augmentation to NASA Astrophysics Research and Analysis program (APRA)”**
  1) Selection rate of APRA is healthy (26% in ROSES-20) and there is no cap on individual proposal budgets
  2) Internal review of APRA program against Astro2020 Decadal Survey (with help from summer intern)

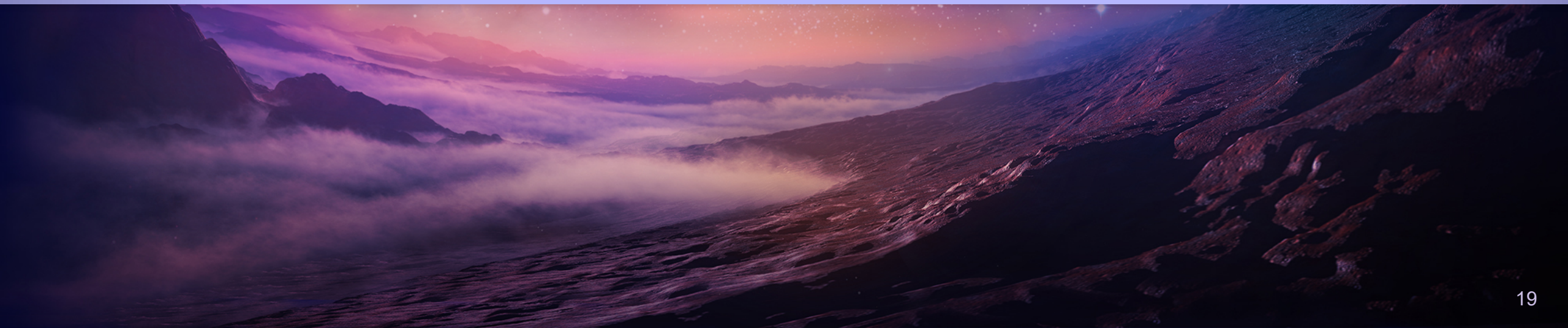
- **“Continue NASA Strategic Astrophysics Technology program, expand to Explorer/Probe missions**

  NASA has already modified the SAT call in ROSES-21 and ROSES-22 to include technologies for identified future Great Observatories and identified future Probe missions (see ROSES-21, Amendment 37)

- **“Increase the use of hybrid and remote conferences, to decrease travel impact on carbon emissions and climate change”**

  NASA considers the use of virtual panels for R&A programs in perpetuity while assessing the impact on networking opportunities, work-family balance, efficiency of the review process, and quality of the outcome.

Inclusion Plan Update



Astrophysics Theory Inclusion Plan Pilot Program (I/XVII)

Inclusion

NASA is committed to a culture of diversity, inclusion, and equity, where all employees feel welcome, respected, and engaged. To achieve the greatest mission success, NASA embraces hiring, developing, and growing a diverse and inclusive workforce in a positive and safe work environment where individuals can be authentic. This value will enable NASA to attract the best talent, grow the capabilities of the entire workforce, and empower everyone to fully contribute.

NASA Science Plan 2020-2024, Strategy 4.1: Increase the diversity of thought and backgrounds represented across the entire SMD portfolio through a more inclusive and accessible environment.

ROSES: SMD's goals are to develop a workforce and scientific community that reflects the diversity of the country and to instill a culture of inclusion across its entire portfolio.

Astrophysics Theory Inclusion Plan Pilot Program (II/XVII)

In support of NASA's core value of inclusion, proposals submitted to the Astrophysics Theory Program (ATP) in ROSES-2021 were required to include a 2-pages Inclusion Plan and to address:

- Plans for creating and sustaining a positive and inclusive working environment for those carrying out the proposed investigation
- Contributions the proposed investigation will make to the training and development of a diverse and inclusive scientific workforce

Like the Science/Technical/Management section, the Inclusion Plan must be anonymized according to dual-anonymous peer review policies.

The plan should be particular to the investigation being proposed and, if it includes a restatement of policies of the host institution, it should also provide a clear discussion of how these policies connect to the proposed investigation.

Progress in executing the investigation's inclusion plan should be reported in the annual progress report.

Astrophysics Theory Inclusion Plan Pilot Program (III/XVII)

Evaluation Factors of the Inclusion Plans:

As outlined in the solicitation, the Inclusion Plans were evaluated for adequacy and completeness including the following factors:

- Does the Inclusion Plan adequately communicate the goal of a positive and inclusive working environment for the investigation team?
- Does the Inclusion Plan provide adequate processes for creating and sustaining a positive and inclusive working environment for the investigation team?
- Are these processes likely to be successful in achieving the goal?
- Does the Inclusion Plan adequately describe the contribution of the proposed investigation to the training and development of a diverse and inclusive workforce?
- Does the Inclusion Plan provide an adequate plan for achieving the identified contribution?
- Is the plan likely to be successful in realizing the identified contribution?

Astrophysics Theory Inclusion Plan Pilot Program (IV/XVII)

Evaluation Process of the Inclusion Plans:

The inclusion plans were evaluated during the ATP peer review by two independent panels:

- **20 science panels** evaluated all 184 Inclusion Plans and captured their findings as strength and weaknesses in a separate Inclusion Plan evaluation form
- **4 inclusion panels** performed more in-depth evaluations of 120 Inclusion Plans (30 per panel). These panels consisted of astrophysicists with significant experience in improving diversity, equity and inclusion, and DEI experts (social scientists, education professionals, HBCU department chairs, DEI consultants, academic DEI directors and presidents, etc.)

The summary evaluations were provided to the proposers as part of the panel review summaries.

The panels' findings were not folded into the adjectival ratings and did not inform the selection processes.

NASA invited comments from proposers regarding this pilot program after they received their comments from the panel evaluations.

Astrophysics Theory Inclusion Plan Pilot Program (V/XVII)

Main Goals of the Inclusion Plan Pilot Program:

- Send a strong message to the proposing community that inclusion is one of NASA's core values and that we expect all NASA-funded PIs to support it and to create inclusive work environments
- Learn from the PIs responses about their understanding of DEI (which varied greatly)
- Learn whether panels of astrophysicists have the required expertise to evaluate Inclusion Plans, using DEI expert panels as control groups
- Solicit extensive feedback from the panels on how we can improve on this pilot program
- Inform an expansion of the Inclusion Plan pilot program to more R&A elements in ROSES-22

NASA has internally reported on the outcome of the Inclusion Plan Pilot Program at an SMD-wide Science Management Council (SMaC) meeting in December 2021 (presenter Evan Scannapieco).

The lessons learned from the ATP pilot program are being incorporated in the formulation of Inclusion Plan requirements for 6 ROSES-22 solicitations in Astrophysics and 4 solicitations in other Divisions within SMD.

Astrophysics Theory Inclusion Plan Pilot Program (VI/XVII)

Panel Responses: "Can inclusion be effectively incorporated into our review process?"

YES

Panel 1: Yes - Our goal should be to redefine scientific excellence.

Panel 2: Yes - The panel strongly urges NASA to continue this and related processes.

Panel 3: Yes - NASA should adopt "barriers to equity and inclusion for this project" as a key adjudicated metric.

Panel 4: Yes - The panel unanimously agreed that plans for inclusion can and should be incorporated as a selection criterion.

Science Panels: Yes - Overwhelmingly agreed that it can and should be included.

Astro 2020 DS Recommendation: NASA, DOE, and NSF should consider including diversity—of project teams and participants—in the evaluation of funding awards to individual investigators, project and mission teams, and third-party organizations that manage facilities. Approaches would be agency specific, and appropriate to the scale of the projects.

Astrophysics Theory Inclusion Plan Pilot Program (VII/XVII)

Panel Responses: "Who should review the Inclusion Plans?"

Specialized Panels

Panel 1: Embed IDEA STEM experts on the science panels.

Panel 2: Reviewers of inclusion plans should know what they are doing.

Panel 3: There should be a separate inclusion plan review.

Panel 4: Inclusion plans be evaluated by a distinct panel composed of experts in IDEA work and at least one theoretical astrophysicist with experience in IDEA work in this field.

NASA HQ Panel Monitors: The inclusion plan reviews conducted by the science panels varied in quality and resulted in findings that may not be defensible in case of a request for reconsideration.

Astrophysics Theory Inclusion Plan Pilot Program (VIII/XVII)

Panel Responses: "What should be our goal for including Inclusion Plan findings in selection decisions?"

IDEA should be its own merit criteria for evaluation

Panel 1: Equal weight to the science rating in determining funding.

Panel 2: No response.

Panel 3: These proposals are so competitive that getting a zero on this criteria would put them out of the running. If the plan gets a 0, it should be disqualifying.

Panel 4: The panel strongly believes that the inclusion plan must be given sufficient weight to deem the proposal unfundable if minimum criteria are not met.

Astrophysics Theory Inclusion Plan Pilot Program (IX/XVII)

Panel Responses: "Solicitation Language should …"

Be as targeted as possible

The pilot language was general (on purpose), but future calls need to be explicit about the areas in which NASA seeks to make progress.

Panel 1: No response.

Panel 2: NASA needs to come to an agreement on the purpose of the inclusion plan requirement.

Panel 3: Multiple proposals interpreted diversity as differences in research focus or career stage, without speaking elements of diversity closer to NASA's intent.

Panel 4: It is crucial that the solicitation defines what is meant by terms such as "inclusion," "diversity," and "URM."

Astrophysics Theory Inclusion Plan Pilot Program (X/XVII)

Panel Responses: "Solicitation Language should …"

Ask the Team to Define the Challenge

The solicitation needs to push the team to address the "intentionality" of their work by providing a clear description of barriers specific to the group and what they specifically want to overcome or achieve.

Panel 1: Panels should look for: intentionality, details, and actions.

Panel 2: The goal of this exercise should have been for applicants to take a long and hard look at what diversity and inclusion mean to them, and what they are doing to address them in their research groups.

Panel 3: There needs to be intentionality.

Panel 4: Adopt "barriers to equity and inclusion for this project" as a key adjudicated metric.

Astrophysics Theory Inclusion Plan Pilot Program (XI/XVII)

Panel Responses: "Solicitation Language should …"

Ask the Team to Define Success

The solicitation needs to push the team to define evidence-based actions, and how they will assess their progress using metrics of success tied to inclusion. Solutions should be implementable, measurable and sustainable.

Panel 1: Plan should include: specific goals, target populations, measurable outcomes, and evidence-based or promising practices.

Panel 2: A plan must spell out goals, activities to achieve these goals, metrics for measuring how well activities are working and if goals have been met.

Panel 3: Anything they propose to do needs to be measurable and geared to inclusion (not diversity).

Panel 4: The solicitation should encourage PIs to cite research that supports the use of specific practices and/or metrics for how they will determine if the plan or its components are effective.

Astrophysics Theory Inclusion Plan Pilot Program (XII/XVII)

Panel Responses: "Solicitation Language should …"

Clarify that Inclusion ≠ Outreach

The solicitation should distinguish inclusion from "added on" NSF broader impacts-style outreach. This should not be about "outreach" but specifically note measurable outcomes for the team.

Panel 1: IDEA is an integral part of how to do science, not a separate piece.

Panel 2: The ATP21 solicitation often led people to talk about outreach in the NSF "broadening participation" sense, rather than check that they are actually including diverse identities on their team.

Panel 3: No response.

Panel 4: Solicitation should clarify to what extent/in what context the PI's outreach efforts should be referenced within the inclusion plan.

Astrophysics Theory Inclusion Plan Pilot Program (XIII/XVII)

Panel Responses: "Solicitation Language should …"

Clarify that IDEA Work need not be Free

SMD should be explicit that funds can be used on IDEA activities to boost IDEA, including for assessment / evaluation purposes.

Panel 1: Message that proposers can ask for $ in budget for IDEA efforts and experts

Panel 2: No response.

Panel 3: It would be advantageous to allow a budget line for expert IDEA consultation and training.

Panel 4: Solicitation should strongly encourage external evaluation in partnership with local sociology or education research departments.

Astrophysics Theory Inclusion Plan Pilot Program (XIV/XVII)

Panel Responses: “Accountability”

Accountability is crucial

Additional positive / negative incentives for showing progress in yearly reports may be needed. NASA POs may need additional training.

Panel 1: Annual reports should include detailed updates on inclusion plan efforts, continued funding should require progress on these efforts (ideally based on metrics). POs will need to be trained in how to do this.

Panel 2: No response.

Panel 3: There needs to be intentionality in the review process of the respective annual reports. Accountability is needed, and this could mean having a panel review of the annual reports.

Panel 4: Annual grant reporting should include a progress report on the activities in the inclusion plan. Clear guidelines should be provided to proposers. NASA should provide training and establish uniform guidelines for Program Officers.

Astrophysics Theory Inclusion Plan Pilot Program (XV/XVII)

Panel Responses: "Resources"

Links to Resources are not enough

Even with a more specific solicitation, many PIs will be lost and propose ineffective plans. This is new to many in the community, and everyone needs to learn and do better when it comes to implementing IDEA with measurable outcomes. Workshops, conversations, partnerships with professional societies could be useful.

Panel 1: NASA should engage social scientists in developing training programs and workshops to disseminate what is known about evidenced-based practices.

Panel 2: The community is, on average, relatively ignorant of what it will take to create inclusive workspaces. It is clear that NASA will need to educate proposers.

Panel 3: This is a big culture shift that will require a lot of coaching by NASA for DEI plans to improve. Will require years of ramp-up. Suggestion: webinars, office hours, and connection to resources.

Panel 4: It is recommended that seminars and other forums be established to enable the community to develop and implement high-quality inclusion plans.

Astrophysics Theory Inclusion Plan Pilot Program (XVI/XVII)

Panel Responses: "Is an Inclusion Plan Review Compatible with Dual-Anonymous Review?"

Yes

Panel 1: Yes - We support the dual anonymous process, including for the inclusion plans.
Panel 2: Yes - Information on proposers is not needed to effectively review the plans.
Panel 3: Yes - Dual anonymous was not prohibitive to effective evaluation.
Panel 4: Yes - The panel strongly recommends that the inclusion plan remain anonymous.

Astrophysics Theory Inclusion Plan Pilot Program (XVII/XVII)

Summary and Conclusion:

The evaluation of 120 Inclusion Plans for the ROSES-2021 Astrophysics Theory Program gave us important feedback from participants (PIs and panel reviewers) how to improve the process. NASA may not be able to implement all the detailed recommendations because selections cannot be made based on protected classes. NASA is discussing ways in which the intended goals of having our science enterprise reflect the diversity of America and diversity of thought can be achieved in alignment with Nasa's core value of inclusion.

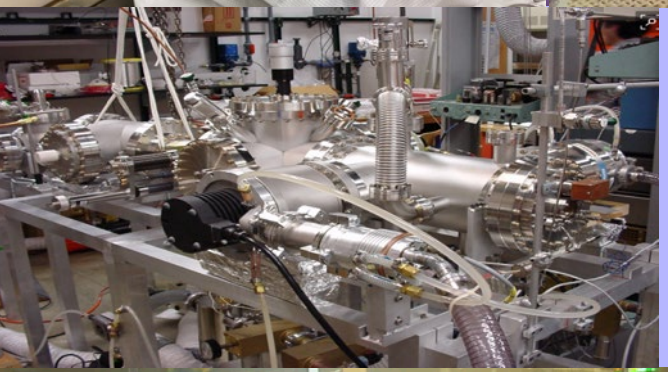
As a result of the ATP Inclusion pilot program, NASA is extending the program to 6 Astrophysics and 4 additional R&A solicitations in other Divisions in this year's ROSES-2022, where PIs are required to add Inclusion Plans in their proposals. The Inclusion Plans will not be part of the adjectival ratings and selections of these proposals.

ROSES-2022 Program Element	NOI Due date	Proposal Due Date
Astrophysics Research & Analysis (APRA)	10/21/22	12/15/22
Strategic Astrophysics Technology (SAT)	TBD	TBD
Theoretical and Computational Astrophysics Networks (TCAN)	TBD	TBD
Astrostrophysics Decadal Survey Precursor Science (ADSPS)	TBD	TBD
Astrophysics Pioneers (suborbital science investigations)	1/27/23	3/16/23
LISA Preparatory Science (LPS)	12/16/22	3/16/23

NASA is in the process of hiring a DEI expert as a contractor who will create a pool of expert reviewers and run separate Inclusion Plan review panels with participation from astrophysics experts. If interested, please let us know. Kartik Sheth is leading the SMD-wide coordination and implementation of the Inclusion Plan program.



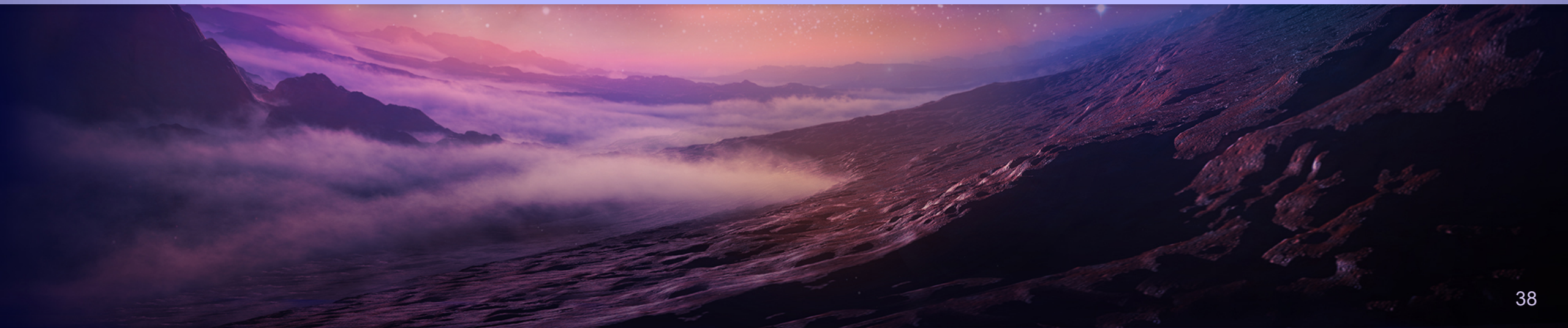




Questions?




Backup Slides



Astrophysics Sounding Rocket Manifest

MISSION	EXPERIMENTER	PROJECT	RANGE	DATE (ET)	DISCIPLINE
36.323 UG	France	CHESS	WSMR	2017-06-27 00:10:00 S S S S	UV/VISIBLE
36.311 UG	Green	DEUCE	WSMR	2017-10-30 05:00:00 S F – F	UV/VISIBLE
36.329 UH	Galeazzi	DXL	PFRR	2018-01-19 07:17:00 S S S F	HIGH ENERGY
36.330 UH	McEntaffer	WRX-R	KWAJ	2018-04-04 06:40:00 S S S S	HIGH ENERGY
36.333 UG	France	CHESS	KWAJ	2018-04-16 5:16:47 S S S S	UV/VISIBLE
36.245 UH	Figueroa	MICRO-X	WSMR	2018-07-23 02:00:00 S F S F	HIGH ENERGY
36.331 UG	Green	DEUCE	WSMR	2018-12-18 02:46:00 S S S S	UV/VISIBLE
36.346 UG	France	SISTINE	WSMR	2019-08-11 02:07:00 S S S S	UV/VISIBLE
36.343 GG	Nuth	DUST-1	WSMR	2019-10-07 11:00:00 S S S S	LAB ASTRO
36.352 UG	McCandliss	FORTIS	WSMR	2019-10-28 00:30:00 S S S S	UV/VISIBLE
36.365 GG	Nuth	DUST-2	WSMR	2020-09-08 14:00:00 S S S S	LAB ASTRO
36.368 UH	Green	DEUCE	WSMR	2020-11-02 5:20:00 S S S S	UV/VISIBLE
36.281 UG	Zemcov	CIBER-2	WSMR	2021-06-07 02:25:00 S S S S	UV/VISIBLE
36.373 UG	France	SISTINE-2	WSMR	2021-11-08 04:25:00 S S S S	UV/VISIBLE
36.363 UH	Galeazzi	DXL-3	WFF	2022-01-09 00:00:00 S S S S	HIGH ENERGY
36.347 UH	McCammon	XQC	AUS	2022-06-27	HIGH ENERGY
36.339 UG	France	SISTINE	AUS	2022-07-05	UV/VISIBLE
36.350 UG	Fleming	DEUCE	AUS	2022-07-15	UV/VISIBLE
36.367 UH	McEntaffer	tREXS	WSMR	2022-08-22	HIGH ENERGY
36.355 UH	Figueroa	MICRO-X	WSMR	2022-09-01	HIGH ENERGY
36.383 UG	Zemcov	CIBER	WSMR	2023-01-01	UV/VISIBLE
36.375 UG	Fleming	INFUSE	WSMR	2023-04-24	UV/VISIBLE
36.384 UG	McCandliss	OAxFORTIS	WSMR	2023-06-01	UV/VISIBLE
36.298 UH	McEntaffer	OGRE	PFRR	2023-01-24	HIGH ENERGY

Balloon FY22 Manifest

Mission	Discipline	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Wanaka, New Zealand	***Austral Fall '22***												
Jones / PU / SuperBIT [Payload of Opportunity]	SuperBIT (PO)						◆	*Cancelled by PI*					
Fairbrother / WFF / SPB SN07	Qualification Flight							◇					
Fairbrother / WFF / SPB SN08	Qualification Flight								◆	*Cancelled by PI*			
Esrange, Sweden	***Summer '22***												
Roth / WFF/ 60 MCF Test / Sample / MSU / BOOMS	Qual. Flight / BOOMS (PB)								◇				
Krawczynski / WUSTL / XL-Calibur	Gamma-Ray								◇				
Wakely / UC / HELIX	Cosmic Ray, Particle									◆	*Delayed by PI*		
Solanki / MPS / SUNRISE-III	Heliophysics									◇			
Fort Sumner, New Mexico	***Fall '22***												
Salter / CSBF / CSBF Test Flight Salter	Test Flight											◇	
Kogut / GSFC / BOBCAT	IR, Submillimeter, Radio											◇	
Zhou / UCLA / BALBOA	Heliophysics (ETF)											◇	
Fries / JSC / CDCP	Solar System (ETF) [H/L]											◇	
Boering / UCB / MATTADOR-TF	Upper Atmosphere										*Cancelled by PI*	◆	
Guzik / LSU / HASP	Student Outreach												◇
Mullenax / CSBF / CSBF TF Mullenax	Test Flight												◇
Switzer / GSFC / EXCLAIM	IR, Submillimeter, Radio										*Cancelled by PI*		◆
Martin / CalTech / FIREBall-II	UV and Visible												◇
Young / SWRI / THAI-SPICE	UV and Visible												◇
Kogut / GSFC / PIPER	IR, Submillimeter, Radio												◇
Chakrabarti / UMASS / PICTURE-C	UV and Visible												◇
Wender / LANL / TinMan	Gamma Ray [H/L]												◇