



National Aeronautics and
Space Administration

NASA & Science Policy

Dr. Kartik Sheth
Science Mission Directorate
NASA Headquarters



An Academic Career Path

Postdoc (2001-2004)
Science Staff (2004-2009)



MSc in Physics (1993-1995)
but...

almost dropped out of
science

Yes, its in Iowa!

B.A. Physics
(1989-1993)

MSc & PhD in
Astrophysics
(1995-2001)



Astronomer (tenure)
CSV Liaison for North America
Director Office of Diversity & Inclusion

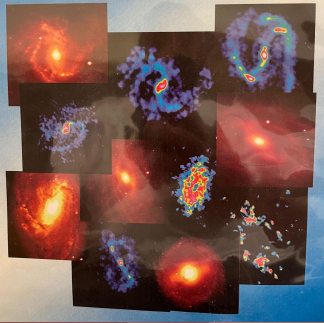


My Professional Astronomy Background



Molecular Gas Properties of Barred Spiral Galaxies

Kartik Sheth



- Multi-wavelength galaxy assembly + evolution over cosmic time.
 - Expertise in barred spirals, molecular gas & star formation, assembly of galaxy disks.
- Broad scientific research from Trojan asteroids to Star Formation, ISM, Galaxies, AGN, black holes and GRBs.
- Pushing state of the art in science was fun (got lucky with several key projects - first mm GRB light curve, CO from a 1 mJy SMG, NICMOS HDF analysis of bars, COSMOS + S4G)
- Loved service-oriented work + working in groups (BIMA, OVRO, CARMA, Spitzer, ALMA)
- Led large groups: BIMA SONG, SINGS, COSMOS, S4G, S4G+
- Loved Observatory Operations / Making processes more efficient / Managing people / Building coalitions

Mission Oriented / Leading People & Change / Results Driven

Towards a Non-Academic Career



My 30+ years in IDEA - A Parallel Career Path

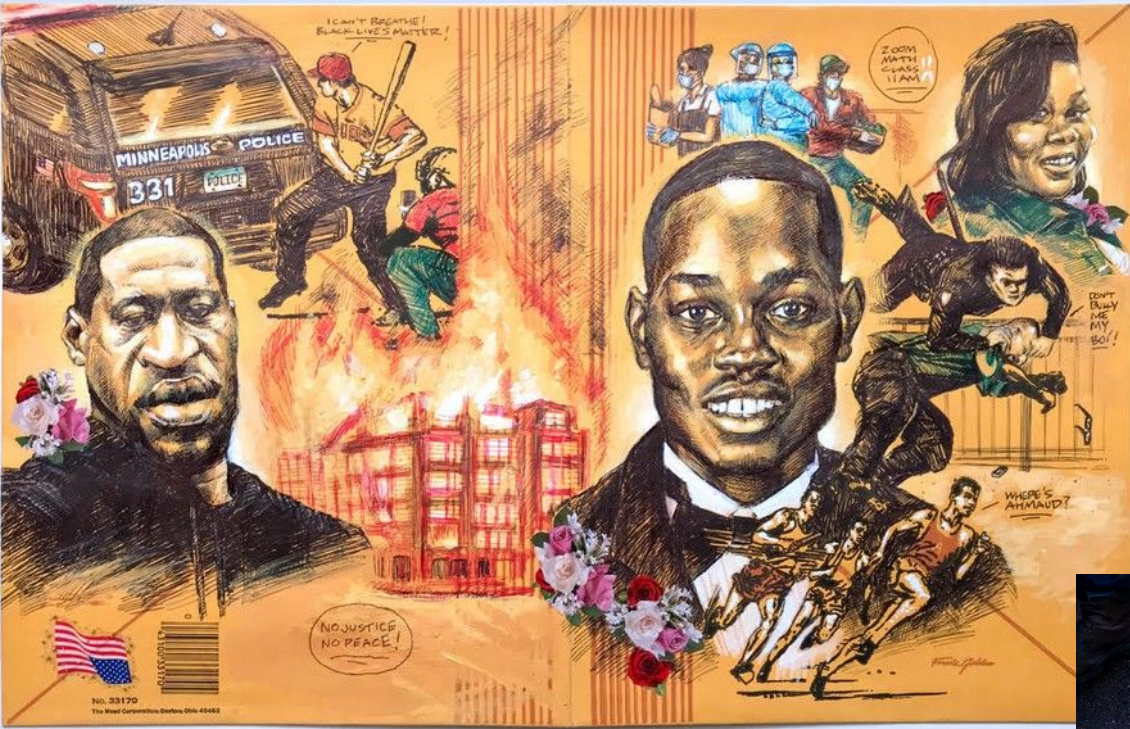


Caltech

UNIVERSITY OF M



- “Brown noser” / High school Hilltop apartment / Xenophobia in the US
- Grinnell bubble / Kesho Scott workshop
- U. Minnesota - dropping out / filing a EEOC complaint and aftermath
- U. Maryland - SHP Trainer
- Los Angeles - LACAAW / PoV - Violence Prevention Specialist
- Los Angeles - Community organizing / Environment
- CSMA, Grey Zone of Ethics - workshops - SHP, ethics, etc.
- Charlottesville - Founding NAC (US / 17 HBCUs) & NINE (Africa, Chile, Brazil)
- Charlottesville - Director of ODI / Weekly abuses
- Charlottesville - Precinct Captain OfA / Monticello rolled down / Riggs Rd
- LCURM - Initiated TEAM UP Report, First Reviewers
- **NASA: Code of Conduct, Review Panel Changes, Hubble changes, DIWG**
- **#ShutdownSTEM**
- External anti-racism group (“Dumbledore Army”), writing essays
- Co-Chair SMD Anti-Racism Action Group (ARAG)
- Chair NASA HQ AANHPI ERG + IDEA SMD Leadership group
- Pioneering Inclusion Plans at NASA; adoption across USG
- Decadal State of the Profession IDEA coordination
- White House - Equity in Advanced Manufacturing,
- White House: HCI Framework for RDI across US government
- White House / Lander, Culture & Toxic Workplaces
- Empowered Earth Alliance - Climate resilience, Climate Justice

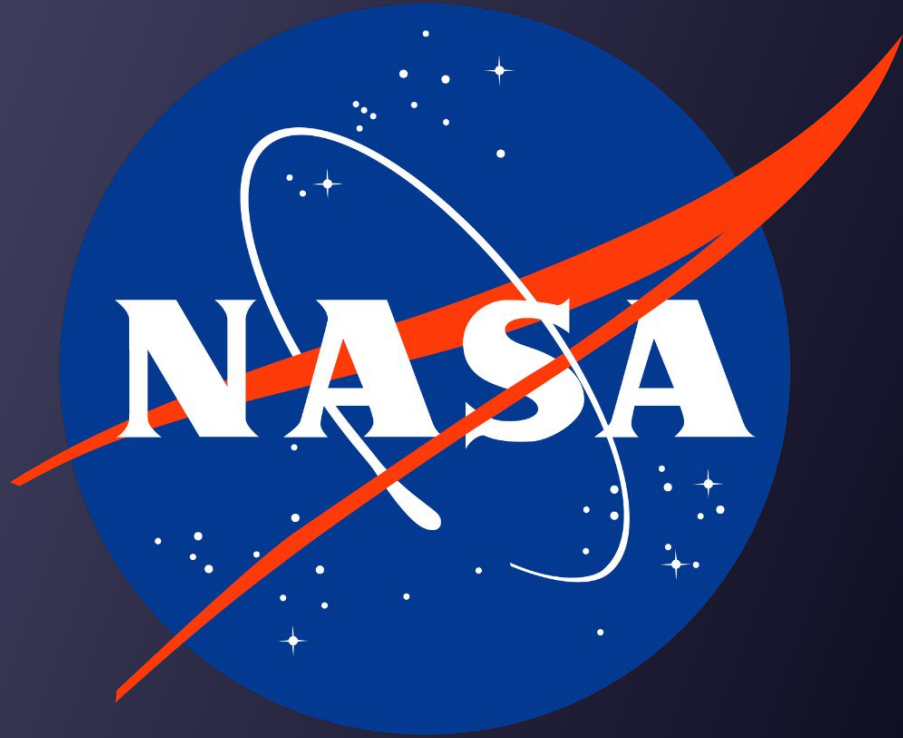


Two Mantras I Use in My Work

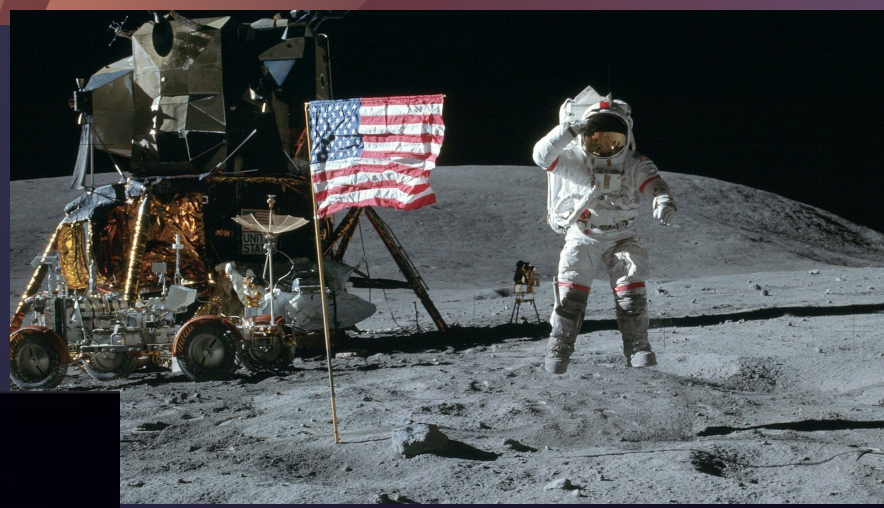


**YOU DON'T
KNOW WHAT YOU
DON'T KNOW**

SOCRATES

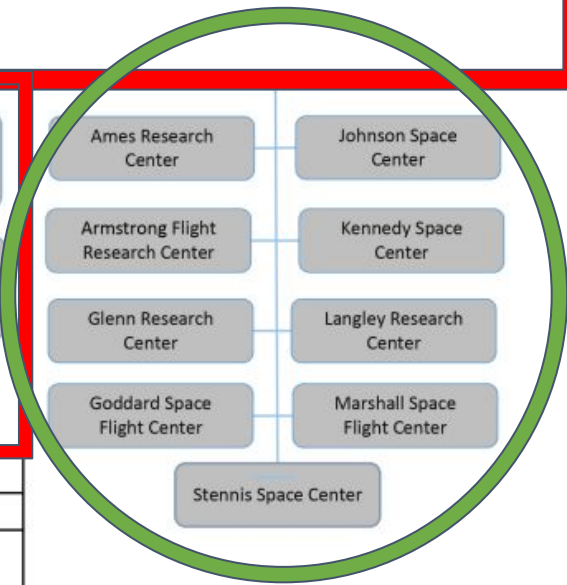
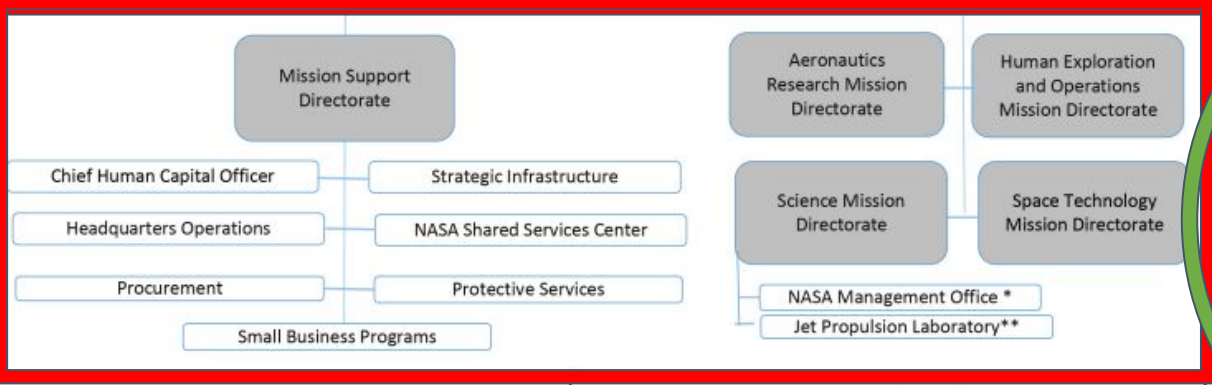


NASA HQ OVERVIEW



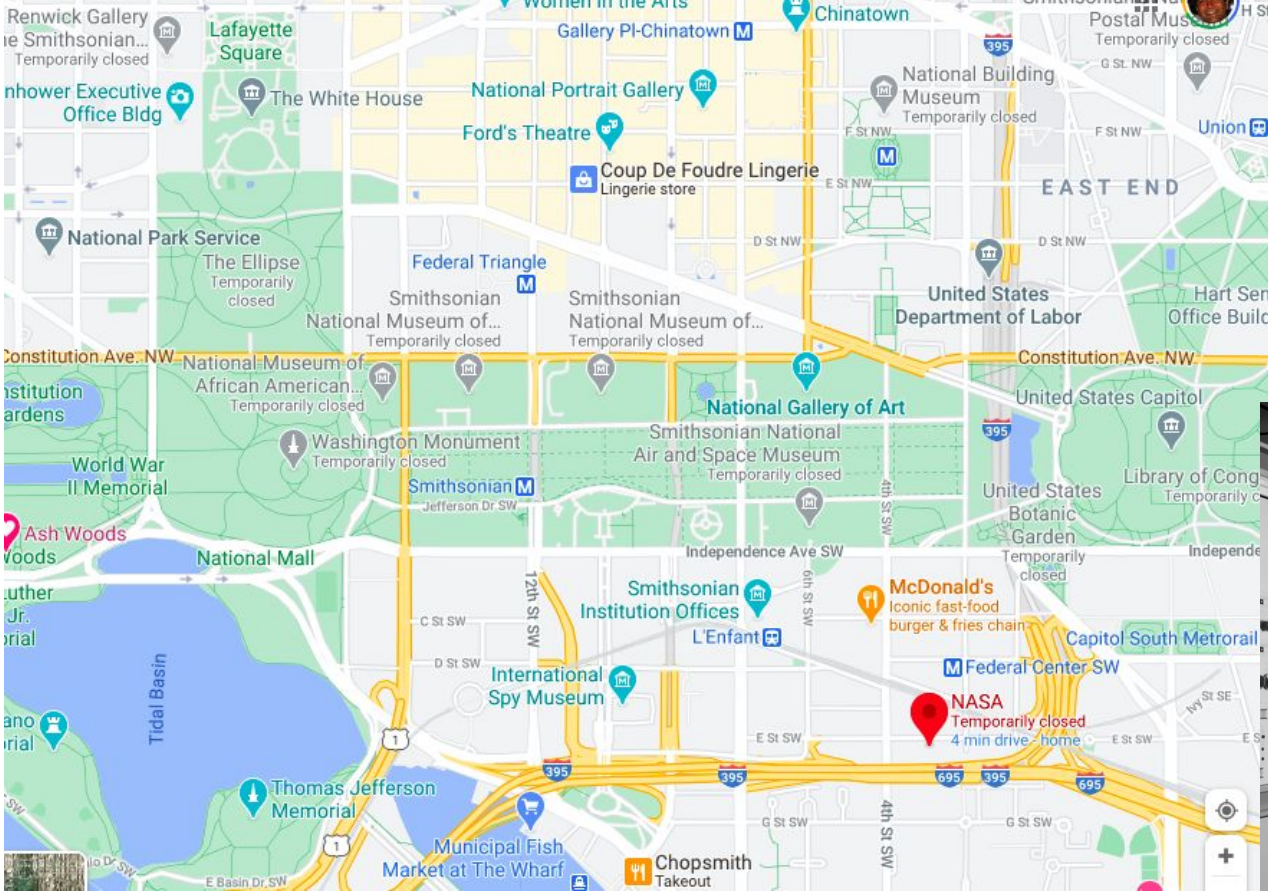


National Aeronautics and Space Administration



NASA HQ in red
10 centers in green circle

Reporting Structure			
	Administrator		Deputy Associate Administrator
	Associate Administrator		AA Strategic Engagement & Assessments





Winner: 11 years in row: 2012-2022!

It is in this spirit that today I am announcing the addition of a fifth NASA core value: *Inclusion*.



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.

Incorporating *Inclusion* as a NASA core value is an important step to ensuring this principle remains a long-term focus for our agency and becomes ingrained in the NASA family DNA. Together, we can continue to accomplish great things for all of humanity.

Embeds / POCs

Chief Engineer:
Nick Jedrich

Deputy Chief Engineer:
Synthia Tonn

Safety & Mission Assurance:
Ariel Pavlick/Glen Lockwood

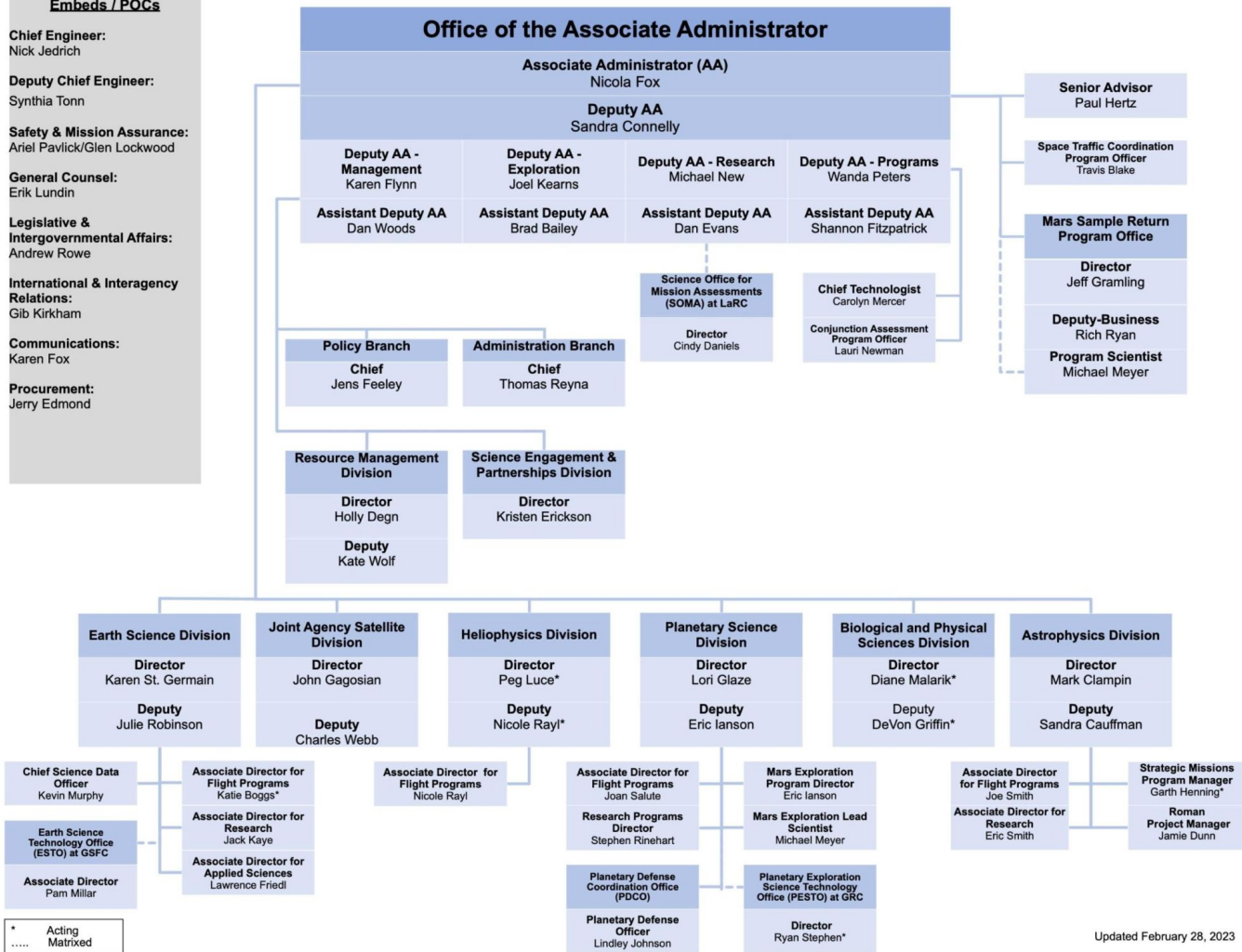
General Counsel:
Erik Lundin

Legislative & Intergovernmental Affairs:
Andrew Rowe

International & Interagency Relations:
Gib Kirkham

Communications:
Karen Fox

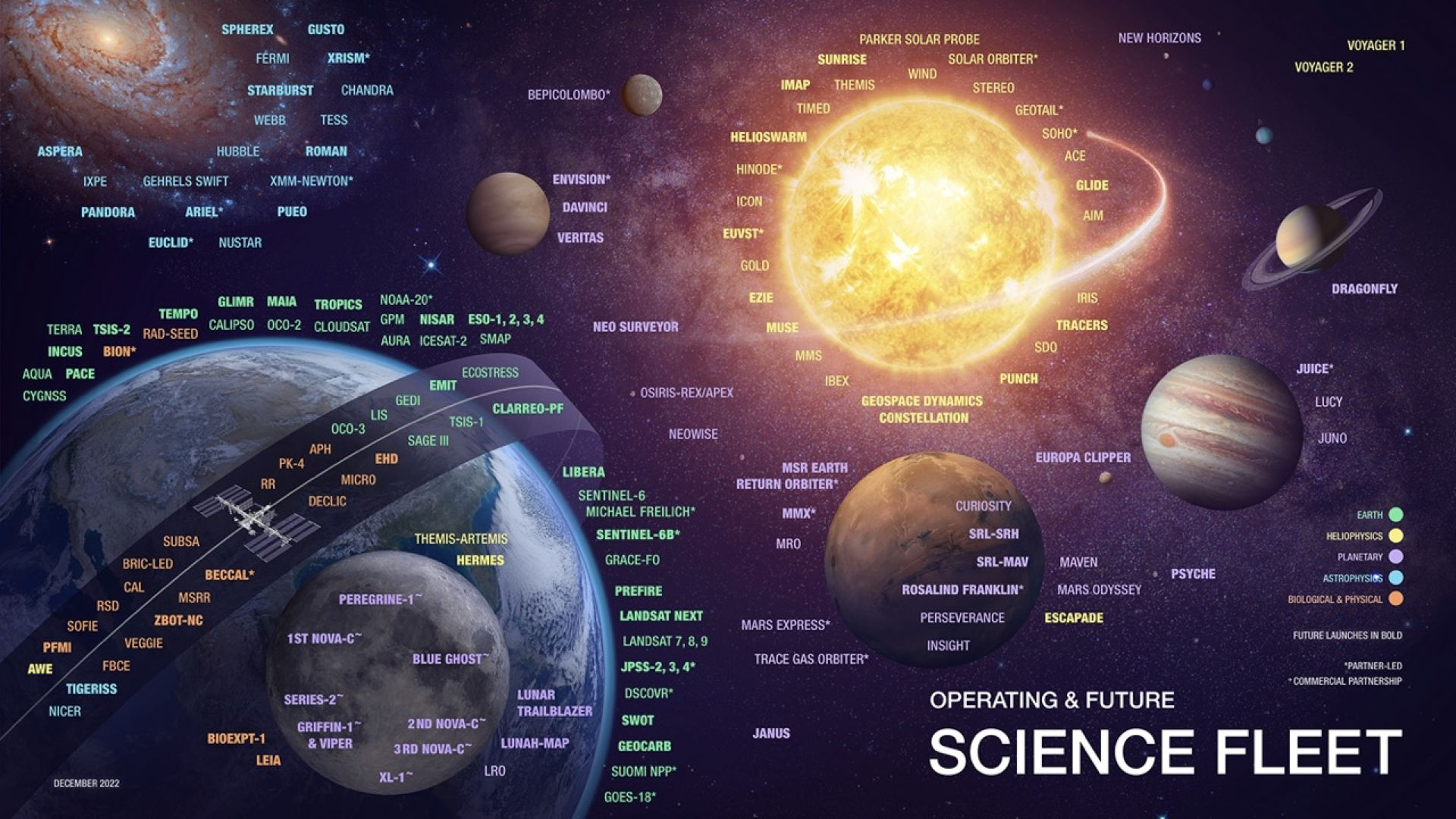
Procurement:
Jerry Edmond



* Acting
..... Matrixed

Updated February 28, 2023

Science Mission Directorate Org Chart



SPHERE-X GUSTO

FÉRMÍ XRISM*

STARBUST CHANDRA

WEBB TESS

ASPERA HUBBLE ROMAN

IXPE GEHRELS SWIFT XMM-NEWTON*

PANDORA ARIEL* PUEO

EUCLID* NUSTAR

TERRA TSIS-2 GLIMR MAIA TROPICS NOAA-20*
 INCUS BION* RAD-SEED CALIPSO OCO-2 CLOUDSAT GPM NISAR ESO-1, 2, 3, 4
 CYGNSS AURA ICESAT-2 SMAP

AQUA PACE
 CYGNSS

EMIT ECOSTRESS
 CLARREO-PF

LIS GEDI TSIS-1
 OCO-3 APH EHD SAGE III

RR PK-4 MICRO
 DECLIC

SUBSA BRIC-LED BECCAL*
 CAL MSRR

RSD ZBOT-NC
 SOFIE VEGGIE
 PFMI FBCE
 AWE TIGERISS
 NICER

BIOEXPT-1
 LEIA

PEREGRINE-1~
 1ST NOVA-C~
 BLUE GHOST~

SERIES-2~
 GRIFFIN-1~ & VIPER
 2ND NOVA-C~
 3RD NOVA-C~
 XL-1~

BEPICOLOMBO*

ENVISION*

DAVINCI

VERITAS

NEO SURVEYOR

OSIRIS-REX/APEX

NEOWISE

LIBERA

SENTINEL-6

MICHAEL FREILICH*

SENTINEL-6B*

GRACE-FO

PREFIRE

LANDSAT NEXT

LANDSAT 7, 8, 9

JPSS-2, 3, 4*

DSCOVER*

SWOT

GEOCARB

SUOMI NPP*

GOES-18*

PARKER SOLAR PROBE

SUNRISE

IMAP

THEMIS

WIND

SOLAR ORBITER*

STEREO

TIMED

HELIOSWARM

HINODE*

ICON

EUVST*

GOLD

EZIE

MUSE

MMS

IBEX

GEOSPACE DYNAMICS
 CONSTELLATION

MSR EARTH
 RETURN ORBITER*

MMX*

MRO

MARS EXPRESS*

TRACE GAS ORBITER*

JANUS

GEOTAIL*

SOHO*

ACE

GLIDE

AIM

IRIS

TRACERS

SDO

PUNCH

EUROPA CLIPPER

CURIOSITY

SRL-SRH

SRL-MAV

ROSALIND FRANKLIN*

PERSEVERANCE

INSIGHT

MAVEN

MARS ODYSSEY

ESCAPADE

PSYCHE

NEW HORIZONS

VOYAGER 1

VOYAGER 2

DRAGONFLY

JUICE*

LUCY

JUNO

EARTH

HELIOPHYSICS

PLANETARY

ASTROPHYSICS

BIOLOGICAL & PHYSICAL

FUTURE LAUNCHES IN BOLD

*PARTNER-LED

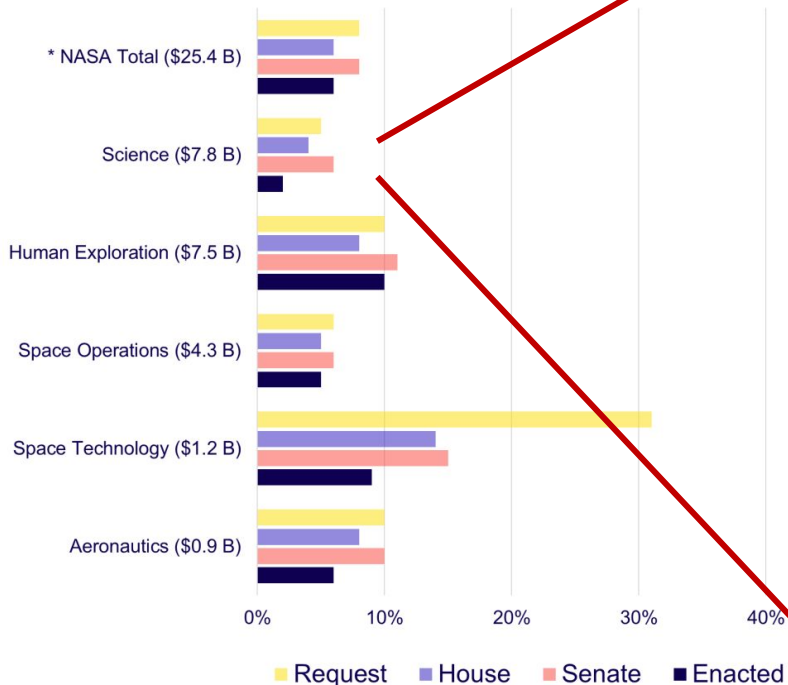
*COMMERCIAL PARTNERSHIP

OPERATING & FUTURE

SCIENCE FLEET

FY23 Appropriations: NASA

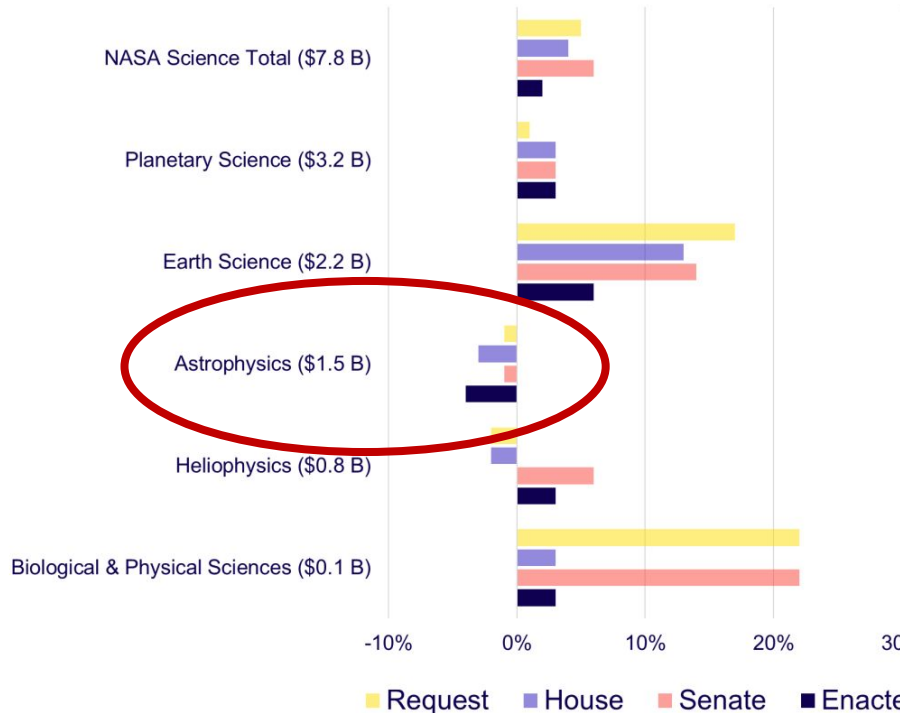
% change from FY22 enacted
\$ in () are FY23 amounts



* Enacted amount includes \$367 million in supplementary funding

FY23 Appropriations: NASA Science

% change from FY22 enacted
\$ in () are FY23 amounts



ASTROPHYSICS BUDGET

- **FY23 appropriation \$1510M, versus FY22 appropriation of \$1589M.**
- **FY24 President's Budget:**
 - **FY24 request \$1557M (FY23 PBR \$1556M)**
 - **Modest decadal wedge begins in FY24 for technology maturation in support of Decadal Survey-recommended GOMAP for Habitable Worlds Observatory**
 - **Extend operating missions per Senior Review recommendations, including Hubble, Chandra and the Transiting Exoplanet Survey Satellite (TESS)**
 - **SOFIA close out budget FY23-25 permits responsible closeout, dispositioning of assets, data reprocessing & archiving, and career transition for early careers**
 - **Delays in Explorers program up to one year**
 - **Reduction in ATHENA funding pending ESA re-formulation activities**

Science Mission Directorate
ASTROPHYSICS
 Organizational Chart

DIVISION MANAGEMENT



Dr. Mark Clampin
Director



Sandra Cauffman
Deputy Director

ADMINISTRATIVE SUPPORT
 Kelly Johnson, Jennifer Baker (C), Pamela King-Williams (C)

DIVISION LIAISONS

Resource Management Erik Edwardson (Lead) Danielle Gervallis Jennifer Holt	Policy Peter Meister (Lead) Enida Santiago-Arce
Communications Alise Fisher (Lead)	Program Support Specialist Sara Schwartzman

CROSS CUTTING

Technologist
 Mario Perez (Chief)
 Omid Noroozian (Deputy)

APD Communications
 Hashima Hasan (Lead)
 Doris Daou (Deputy)
 Liz Landau (C - OCOMM Liaison)
 Natasha Pinol (C - Public Engagement Liaison)

Inclusion, Diversity, Equity, and Accessibility
 Kartik Sheth (Lead)
 Antonino Cucchiara (Deputy)

GOMAP Program
 Julie Crooke (Executive)
 Shawn Domagal-Goldman (Scientist)

APD Information Manager
 Rhiannon Roberts (C)

FLIGHT PROGRAMS

Associate Director
 Joseph Smith

PROGRAM EXECUTIVES

Rachele Cocks
 Lucien Cox
 Shahid Habib
 Janet Letchworth
 Mark Sistilli

RESEARCH & ANALYSIS

Associate Director
 Eric Smith

R&A Lead
 Stefan Immler

PROGRAM SCIENTISTS

Manuel Bautista	Patricia Knezek
Dominic Benford	Bill Latter
Valerie Connaughton	Sangeeta Malhorta
Antonino Cucchiara (C)	Roopesh Ojha
Doris Daou	Joshua Pepper
Michael Garcia	Mario Perez
Thomas Hams (C)	Kartik Sheth
Hashima Hasan	Eric Smith
Doug Hudgins	Linda Sparke
Stefan Immler	Sanaz Vahidinia
Hannah Jang-Condell	

PROGRAM SUPPORT SPECIALIST
 Ingrid Farrell (C)

ASTROPHYSICS STRATEGIC MISSIONS

Program Director
 Sandra Cauffman

Program Manager (Acting)
 Garth Henning

PROGRAM EXECUTIVES

Ed Griego
 Lucas Paganini
 Miles Skow

PROGRAM SUPPORT
 Tony Comberiate (C), Andre Davis (C)

Legend
 C - Contractor

RESEARCH

- ~**400** U.S. Science PIs Funded
- ~**128** Individual Institutions Selected
- ~**\$135M** Awarded Annually

TECHNOLOGY DEVELOPMENT

~**\$220M** Invested Annually

REFEREED PUBLICATIONS

- 20,122** Total Publications
- 4,857** Hubble Publications (2017-2021)
- 101** JWST Publications (First 6 months)

SMALLSATS/ CUBESATS

- 2** Science Missions Launched
- 8** Science Missions in Development
- 1** ISS-attached Science Mission

SOUNDING ROCKETS

- 14** Science Missions Launched (Suborbital)
- 4** In Development

BALLOONS

- 14** Suborbital Balloons Launched
- 20** Missions in Development

Astrophysics by the NUMBERS

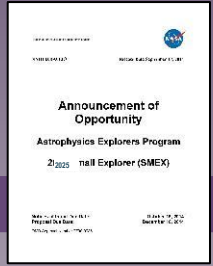
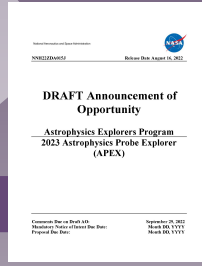
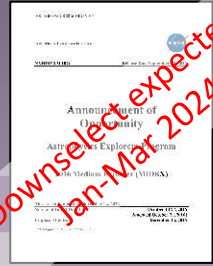
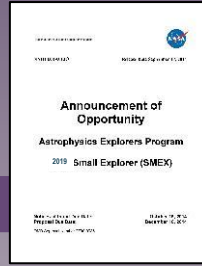
ASTROPHYSICS EXPLORERS PROGRAM

Selected before 2011



NuSTAR

4 AOs per decade



PROBE 2023

SMEX 2024 2025

Download expected Jan-Mar 2024

MIDEX 2011

SMEX 2014

MIDEX 2016

SMEX 2019

MIDEX 2021

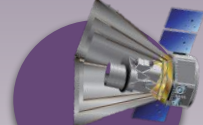
Small and Mid-Size Missions



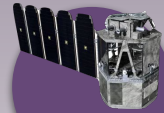
TESS



IXPE



SPHEREx

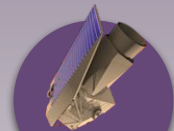


COSI



STAR-X UVEX

Directed 2013



Euclid

Missions of Opportunity



NICER



GUSTO



ARIEL



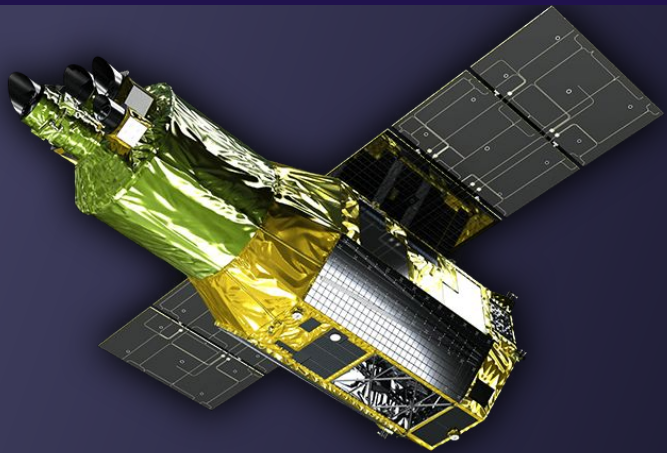
LEAP MoonBEAM

Directed 2017

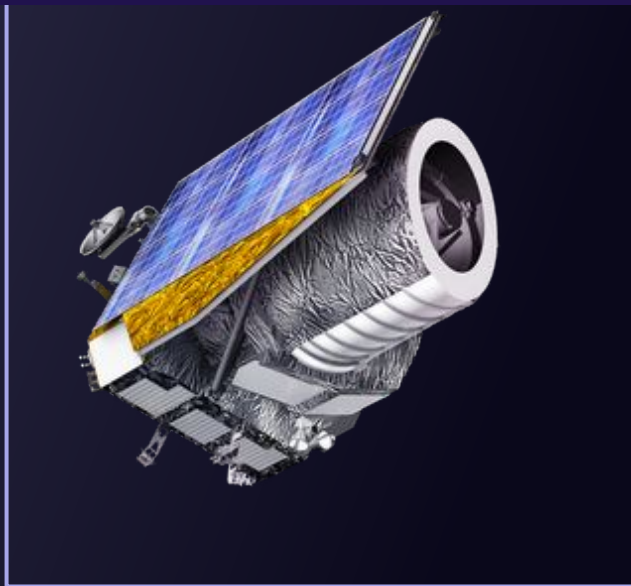


XRISM

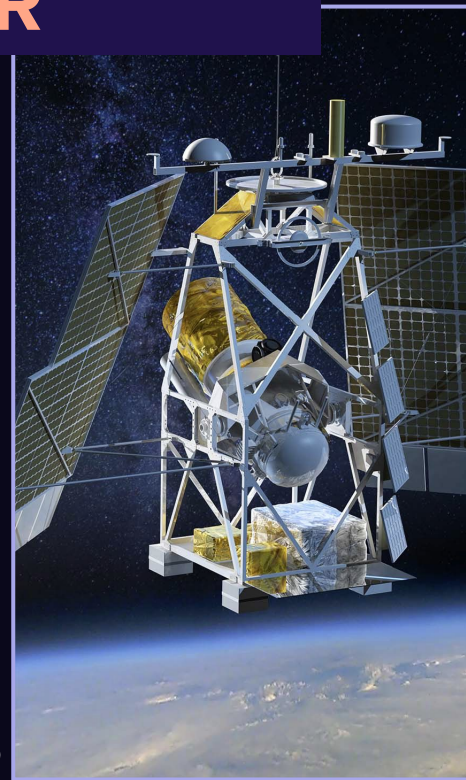
ASTROPHYSICS LAUNCHES THIS YEAR



XRISM:
Tanegashima, Japan Spring 2023

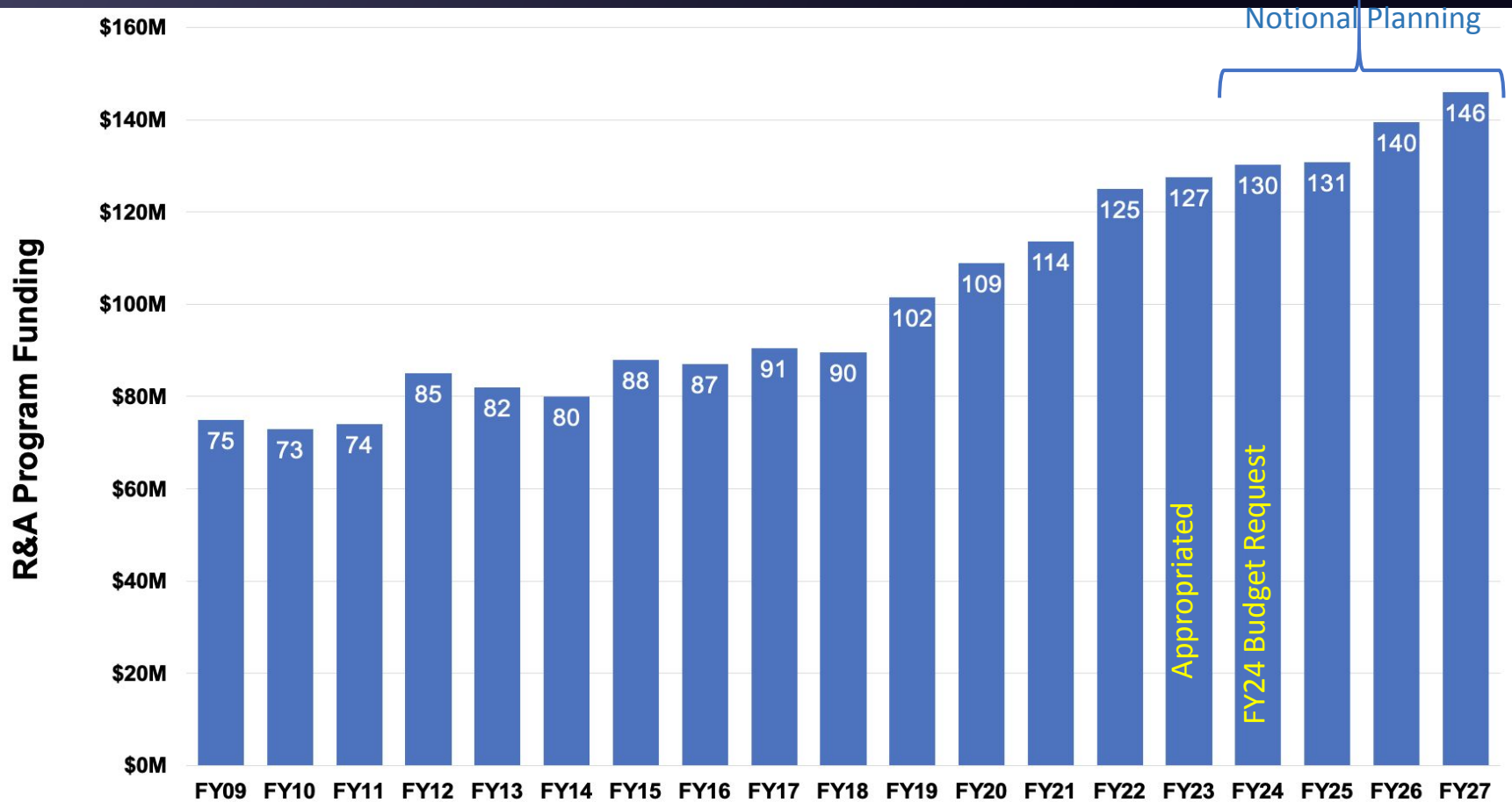


Euclid
Kennedy Space Center, July 2023



GUSTO (SMEX Balloon)
Antarctica December 2023

RESEARCH & ANALYSIS FUNDING



2023 Astrophysics Research Solicitations

Supporting Research and Technologies				Solicited Separately			
Astrophysics Research & Analysis	APRA	IP		JWST, Hubble, Chandra	GI		DAPR
Strategic Astrophysics Technology	SAT	IP		GO/GI/Archive/Theory			
Astrophysics Theory Program	ATP	IP	DAPR	NASA Hubble	NHFP		
Nancy Grace Roman Technology Fellowships	RTF			NASA	NPP		
Astrophysics Decadal Survey Precursor Science	ADSPS		DAPR	Support for U.S. PIs	XMM GO		
Data Analysis				Solicited in ROSES-23			
Astrophysics Data Analysis	ADAP			Theoretical and Computational	TCAN	IP	DAPR
Fermi, Swift, NuSTAR, NICER, TESS, IXPE New				Astrophysics Networks, every other year			
Mission Science and Instrumentation							
Astrophysics Pioneers (suborbital science)			DAPR				
Suborbital payloads solicited through	APRA	IP	DAPR				
Roman Research and Operations	Roman	IP	DAPR				
Cross Divisional							
Exoplanet	XRP		DAPR				
Topical Workshops, Symposia and Conferences	TWSC						
Citizen Science Seed Funding Program	CSSFP						
Graduate Student Research Awards	FINESST						

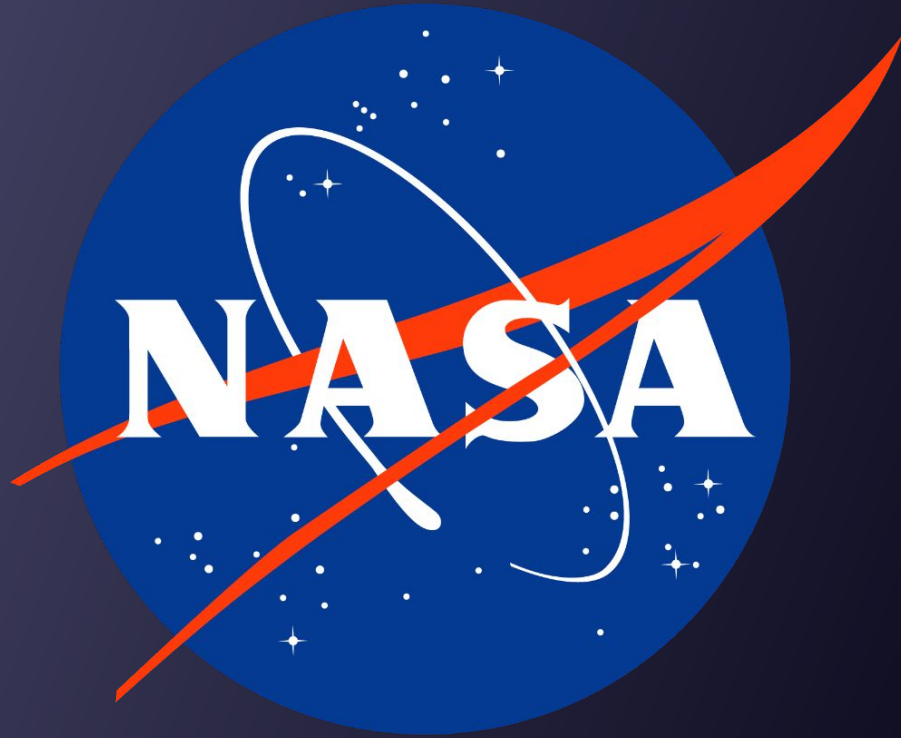
PLEASE VOLUNTEER TO SERVE ON PANELS!

IP: Proposals require an Inclusion Plan for creating and sustaining a positive and inclusive working environment.

Assessment of IP not part of adjectival rating / does not inform selection of proposals. However, funding only released after a satisfactory Inclusion Plan is accepted.

Inclusion Plan pilot program will continue in 2023 but likely not expand until later.

DAPR: Proposals evaluated using dual-anonymous peer reviews where panelists do not know the identities of the proposing teams and institutions.

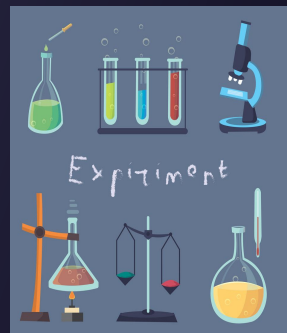
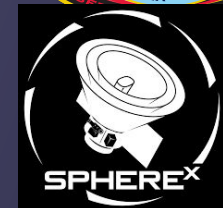


MY WORK AT NASA

SO WHAT DO YOU DO?



Asian American
Pacific Islander
NASA Headquarters



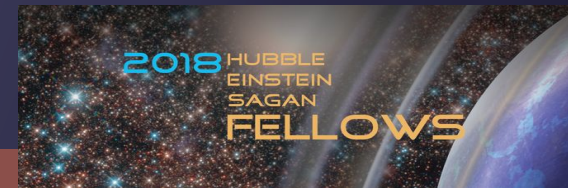
EARLY ADOPTERS

VALUABLES

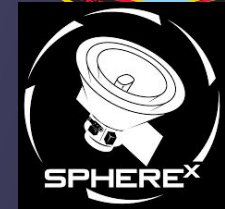
ORIGINS Space Telescope

UN HABITAT

SUSTAINABLE DEVELOPMENT GOALS



SO WHAT DO YOU DO?



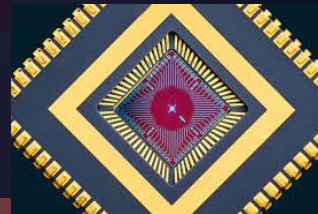
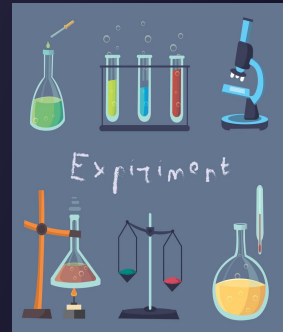
- Program Scientists work with Program Executives to ensure successful formulation, development, launch, operations and phase out of missions.
- Ensure that the core science of the mission is preserved as trades are made in development
- Engage with all stakeholders throughout Pre-Phase A (formulation) → Phase F (closeout)
- After launch provide oversight of operations via the project scientists & science center to ensure community is best served throughout the mission

Each mission is different with unique problems and challenges!

SO WHAT DO YOU DO?



Ensure NASA communications are scientifically accurate / sensitive to optics / stakeholders.



- ~\$15M per year for “Low Energy” Astrophysics Research & Analysis
- Research proposals in direct detectors, heterodyne, suborbitals, and supporting technologies.
- 50% → suborbitals
- Strategic changes for future FIR/submm astrophysics

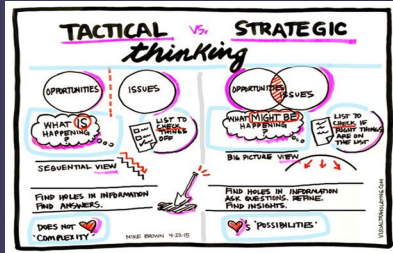
Watch for announcements for strategic meetings this summer.

- Restructured Hubble Fellowships from 3 separate programs to one.
- Changed benefits requirements to ensure employee status offered to all fellows!



SO WHAT DO YOU DO?

EARLY ADOPTERS



UN HABITAT



SUSTAINABLE DEVELOPMENT GOALS



1.5 years in Earth Science / Applied Science Program

- Assessed decade long program called Early Adopters
- Managed group of economists and built microecon framework for societal benefits from EO
- Improved science to applications for UN SDG 11, 14 and 15.

- SMD Strategic Workforce Study
- Interdisciplinary gaps RFI
- Technology Startups
- Climate Action Plan / Climate Summit Breakouts
- Independent Balloon Program Review

SO WHAT DO YOU DO?



- **Co-Chaired Anti-Racism Action Group with AA**
 - **IDEA actions over words**
 - **Used design thinking → 8 actions implemented**
 - **200+ other ideas now being considered by 60+ strong IDEA WG**
- **HAAPI leadership themes**
 - **Break the bamboo ceiling**
 - **Increase visibility**
 - **Build and empower community**

Caltech



MSc in Physics (1993-1995)
but...
almost dropped out of
science

Astronomer (tenure)
CSV Liaison for North America
Director Office of Diversity & Inclusion



Yes, its in Iowa!

B.A. Physics
(1989-1993)

MSc & PhD in
Astrophysics
(1995-2001)



People seek out those with with scientific & technical knowledge and have these qualities:

- Good listener
- Excellent teammate
- Effective Communicator
- Inclusive / Creates belonging
- Decisive
- Problem solver
- Critical thinker
- GROWTH mindset
- Connector

