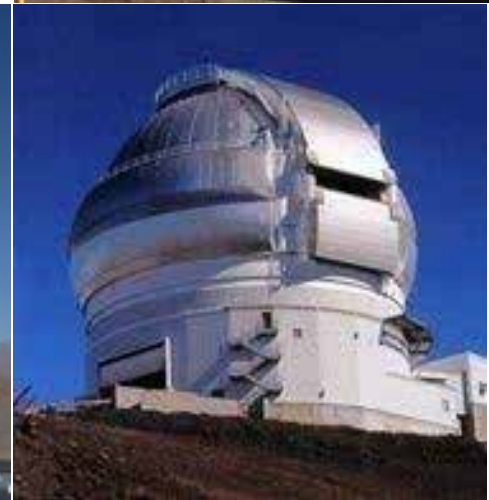




MPS/AST Update: CAA

Ralph Gaume,
Division Director
NSF/MPS/AST
April 1, 2020



Outline



- COVID-19 Impacts
- Staff/Personnel
- AST Facilities
- NSF Budget
- Questions



COVID-19 Impacts



COVID-19 Impacts

- NSF COVID-19 policies announced through Friday May 1st.
- March 16: NSF implemented up to 100 % telework policy.
 - NSF building open to employees for essential/critical reasons.
 - Flexible work schedules for staff, flexible dependent care.
- Work-related travel canceled, IPA travel: Pick and Stick.
- All NSF meetings/panels 100% video conference.
 - AST in middle of panel season.
 - AST has successfully run several panels, 2 POs per panel plus Admin support, AST panels will continue as scheduled.



COVID-19 Impacts

- AST facilities
 - Observing: NRAO (VLA, VLBA), GBO, Arecibo, GONG.
 - Remote observing or skeleton crews.
 - Idle: KPNO, DKIST, Gemini (N & S), CTIO, Rubin Obs., ALMA.
 - AST has processed actions for full FY 2020 funding to facilities.
 - Facilities also have ≥ 3 months *continuity of operations* funding.



COVID-19 Impacts

- Relevant Direction to grantees and facilities
 - OMB M-20-17: *Administrative Relief for Recipients and Applicants of Federal Financial Assistance Directly Impacted by the Novel Coronavirus (COVID-19) due to Loss of Operations* March 19th.
 - NSF: *NSF Implementation of OMB Memo M-20-17.*
 - Includes (but not limited to):
 - Flexibility for Application Deadlines.
 - Allowability of salaries and other project activities.
 - Allowability of Costs not Normally Chargeable to Awards.
 - Extension of closeout.



COVID-19 Impacts

- NSF: *NSF Implementation of OMB Memo M-20-17.*

- Includes (but not limited to):

- Allowability of salaries and other project activities.

Recipients are authorized to continue to charge salaries, stipends, and benefits to currently active NSF awards consistent with the recipients' policy of paying salaries (under unexpected or extraordinary circumstances) from all funding sources, Federal and non-Federal.

The recipient also is authorized to charge other costs to NSF awards that are necessary to resume activities supported by the award, consistent with applicable Federal cost principles and the benefit to the project.

- Allowability of Costs not normally Chargeable to Awards

Recipients who incur costs related to the cancellation of events, travel, or other activities necessary and reasonable for the performance of the award, or the pausing and restarting of grant funded activities due to the public health emergency, are authorized to charge these costs to their award

COVID-19 Impacts



- Decadal Survey:
 - Delays in release of the decadal survey may impact commencement of MREFC funding for large ground-based programs.
 - NSF working on budget 2 or 3 years into the future.



Staff/Personnel



Division of Astronomical Sciences (AST)



Management Team



Ralph Gaume
Division Director



Jim Neff
Deputy Division Director



Craig McClure
Program Support
Manager



Donna O'Malley
Financial & Operations
Specialist

Administration



Elizabeth Pentecost
Project Administrator



Matthew Viau
Program Analyst



Allison Farrow
Program Analyst



Renee Adonteng
Program Analyst
(Pathways Student)

Individual Investigator Programs (IIP)



Hans Krimm
Program Director

Stellar Astronomy &
Astrophysics
IIP Coordinator



Richard Barvainis
Program Director

Extragalactic
Astronomy &
Cosmology (EXC)



Glen Langston
Program Director

Galactic
Astronomy



Harshal Gupta
Program Director

Astronomy &
Astrophysics
Postdoctoral
Fellowships



Nigel Sharp
Program Director

AAG; CDS&E; cross-
NSF programs



Peter Kurczynski
Program Director

Advanced
Technologies &
Instrumentation; EXC;
MRI



Matthew Benacquista
Program Director

REU; EXC; ESP



Kenneth Johnston
Expert

CAREER; AAG



Sarah Higdon
Program Director

AAG



Zoran Ninkov
Program Director

Advanced
Technologies &
Instrumentation

Facilities, Mid-Scale, & MREFC Projects



Christopher Davis
Program Director

AstroLab Ops. MSO,
CSDC, Gemini
Observatory



Joe Pesce
Program Director

National Radio
Astronomy Obs.;
ALMA



David Boboltz
Program Director

AstroLab Transition,
National Solar
Observatory; DKIST



Edward Ajhar
Program Director

Large Synoptic Survey
Telescope



Ashley Zauderer
Program Director

Arecibo Observatory



Richard Barvainis
Program Director

Mid-Scale Innovations Program
(MSIP)
MSRI-1, MSRI-2



Luke Sollitt
Program Director

Planetary
Astronomy



Harshal Gupta
Program Director

Green Bank
Observatory



Martin Still
Program Director

Gemini
Observatory

ESM



Jonathan Williams
Program Director



Ashley Zauderer
Program Director

NSF Office of the Director



- France Córdoba ended a 6-year term as NSF Director March 31.
- Sethuraman Panchanathan nominated by President to be 15th NSF Director (07 Jan. 2020).
- Kelvin Droegemeier named as Acting NSF Director on April 1. Current Director of OSTP and former member of the National Science Board.





AST Facilities

NSF's National Optical-Infrared Astronomy Research Laboratory NOIRLab



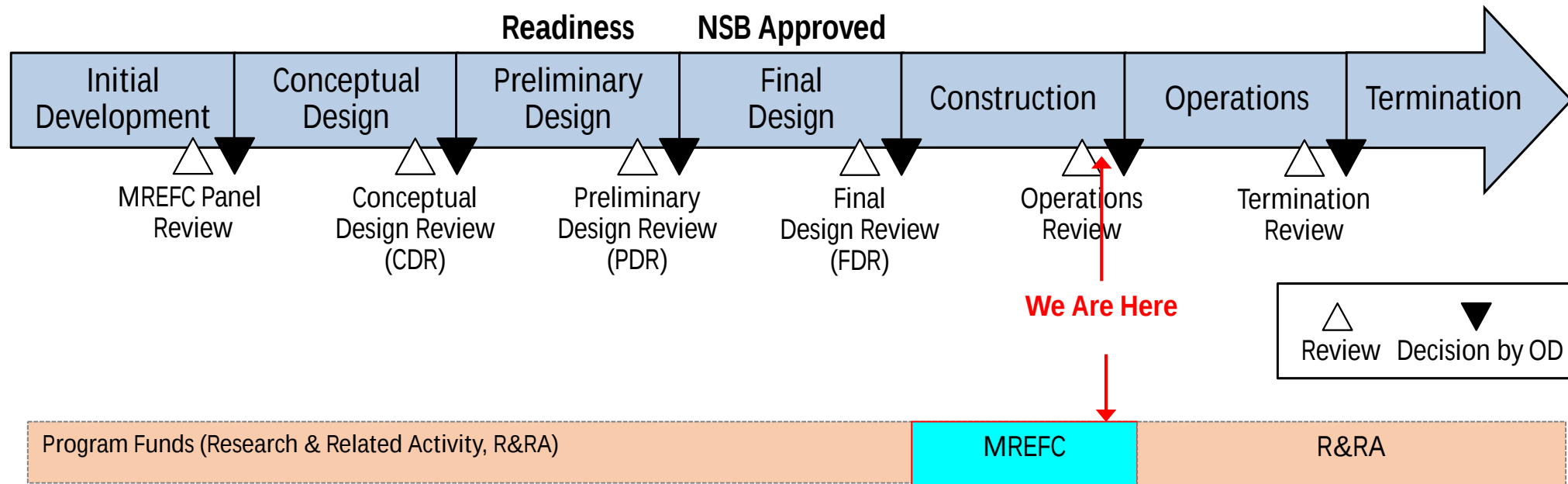
DKI Solar Telescope



DKIST Construction Webcam 2020-02-17 15:32:20



DKIST in the NSF Facility Lifecycle

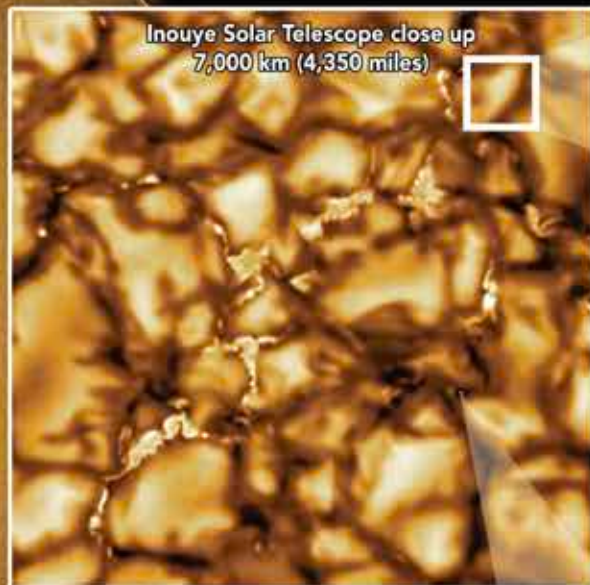




National
Science
Foundation

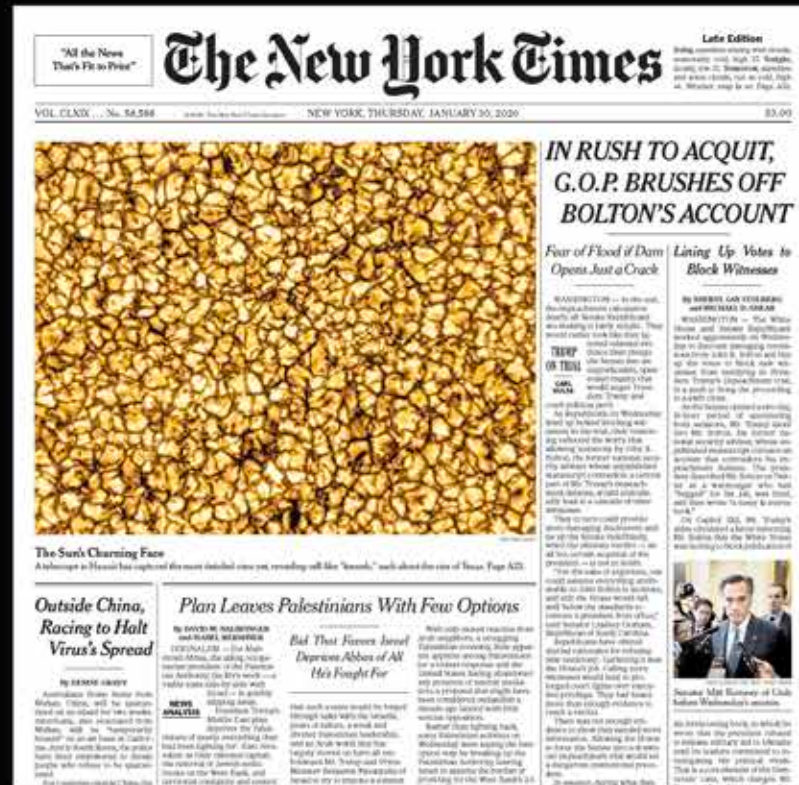
Daniel K. Inouye Solar Telescope

The Inouye Solar Telescope sees large bubbling cells the size of Texas but can also see tiny features as small as Manhattan Island. This is the first time these tiny features have ever been resolved. The Inouye Solar Telescope is showing us three times more detail than anything we've ever seen before. For more information about this telescope, visit www.nso.edu



Inouye Solar Telescope close up
7,000 km (4,350 miles)

Inouye Solar
Telescope
Full image





SkinnyPop Popcorn  @theskinnypop · Jan 30



You see the sun, we see SkinnyPop. [#2020SolarVision](#)

: [@NSF](#)



Renaming LSST



- **Observatory: Vera C. Rubin Observatory**
- **Prime program: Legacy Survey of Space and Time (LSST)**
- **Telescope name: Simonyi Survey Telescope**

1965 Georgetown Astronomy Department



Image Credit:
Georgetown University Archives



Image Credit:
Carnegie Institute
of Washington





Satellite Constellations:

Impact to Optical and Infrared Ground-Based Astronomy



Internet Satellites and Optical Sensors

- About 7,000 satellites in CelesTrak catalog
- Internet satellites: SpaceX Starlink, OneWeb, Amazon, etc.
 - SpaceX: permission for 12,000, filed for another 30,000
 - ~300 launched to date, plan to launch in batches of 60, twice per month.
 - Amazon: ~3600
 - OneWeb: 648-2,500 (?)
 - Samsung: ~4,600
- Internet satellites typically will be in LEO, up to ~1,000 km altitude.

Satellite Constellations - Update

- NSF funded workshop: “Mega-constellations of Satellites and Optical-Infrared Astronomy” most likely moving to a virtual meeting.
- NSF working within the Federal Government to:
 - Understand specific impacts on Rubin Observatory.
 - Identify mitigation opportunities.
 - Identify good practices/policies for satellite vendors.
- NSF/Rubin Observatory continues to work closely with companies launching satellites to understand causes of optical brightness and to find mutually acceptable solutions.



AST Funding

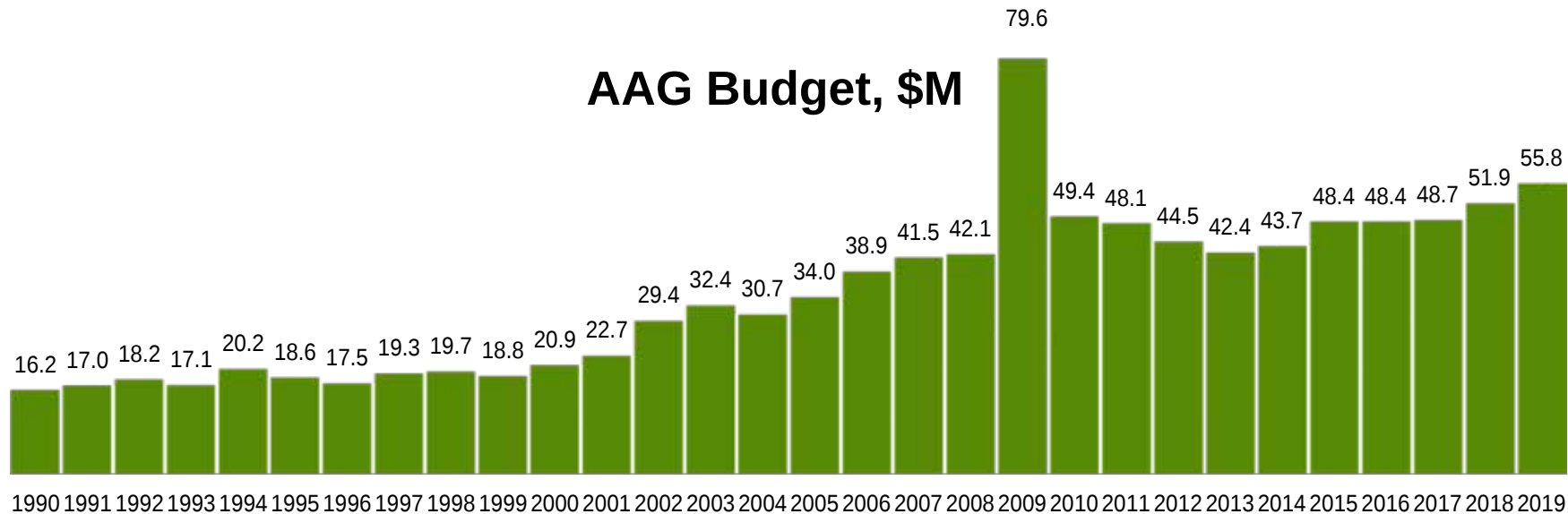


AST: FY 2019

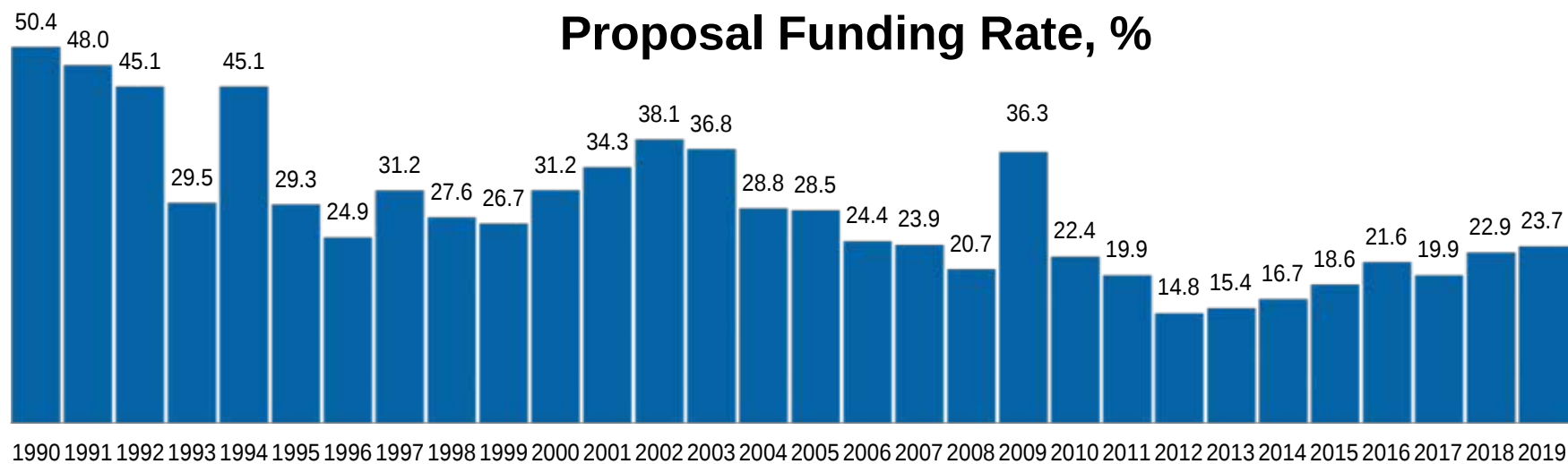
- FY 2019 was a good year:
 - All facilities were fully funded.
 - Additional three months early funding booked for all facilities (continuity of operations).
 - Astronomy and Astrophysics Grants (AAG) program: good year. (next slide)



AAG Budget, \$M



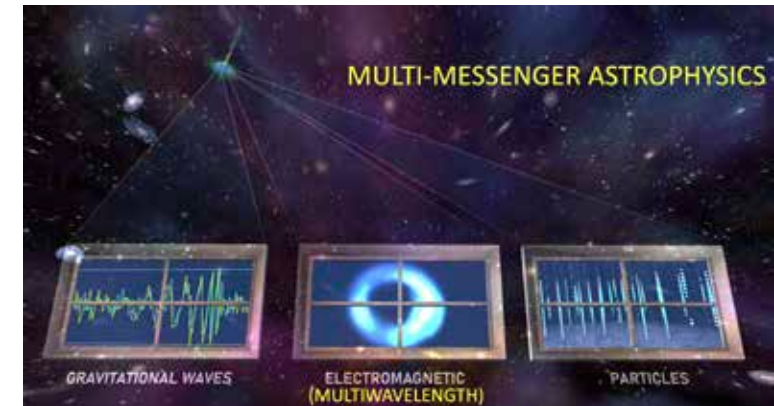
Proposal Funding Rate, %





AST: FY 2019

- FY 2019 was a good year:
 - All facilities were fully funded.
 - Additional three months early funding booked for all facilities (continuity of operations).
 - Astronomy and Astrophysics Grants (AAG) program: good year.
 - Advanced Technology and Instrumentation (ATI) program: good year.
 - Windows on the Universe (NSF Big Idea) \$30M funding.
 - FY 2019 was initial year.
 - Participating Divisions: MPS/AST, MPS/PHY, GEO/OPP.
 - AST Mid-scale Innovations Program (MSIP): funding for 2nd year of awards FY 2018 awards fully provided.
 - Mid-scale Research Infrastructure (MSRI-1): Programs < \$20M, inaugural year, 2 astro. Awards (EHT & CMB S4).



AST Mid-Scale Innovation Program (MSIP)

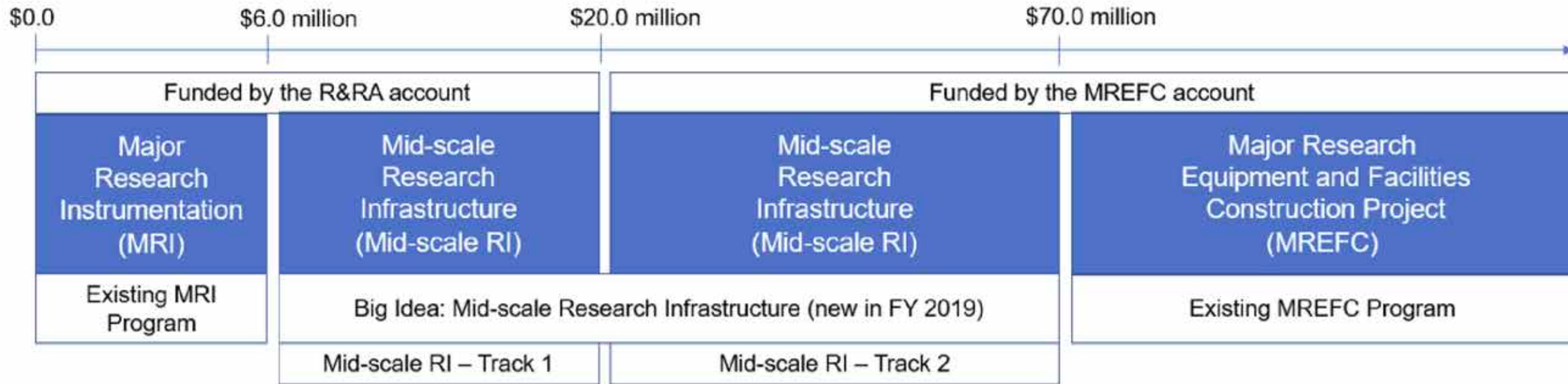


- Astronomy/Astrophysics focused.
- Offered every other year.
- Supports a variety of astro-related activities, cost range up to \$30M.
 - Limited-term, self-contained science projects,
 - Longer-term, mid-scale facilities,
 - Development investments for future mid-scale and large-scale projects,
 - Community open-access capabilities.
- MSIP offered in FY 2020.
 - Preliminary proposals were due December 19, 2019.
 - Full proposals will be due May 6, 2020 (deadline extension?)

NSF-wide Mid-scale Opportunities



NSF Portfolio of Central Instrumentation and Infrastructure Implementation Programs



10 Awards made in FY 2019
2 to astronomy programs:
EHT and CMB-S4

50 pre-proposals received,
awards to be made in FY 2020

AST: FY 2018 vs FY 2019

- Bottom line roll up:
 - MREFC total:
 - FY 2018: \$77.80M DKIST and Rubin Obs. (full planned funding).
 - FY 2019: \$64.95M DKIST and Rubin Obs. (full planned funding).
 - AST Research and Related Activities:
 - FY 2018: \$311.16M.
 - FY 2019: \$287.01M.

AST: FY 2018 vs FY 2019

- **Research** (AAG, Special Pgms, CAREER, Taxes, IPAs, Facility Reviews):
 - FY 2018: \$65.35M.
 - FY 2019: \$68.60M.
 - Note: WoU-MMA funding not included in FY 2019 total.
- **Education** (AAPF, REU sites, REU Supplements):
 - FY 2018: \$4.73M.
 - FY 2019: \$4.43M.
- **Infrastructure** (Arecibo, GBO, MSIP, NRAO, NSO, OIR Lab, Research Resources):
 - FY 2018: \$241.08M.
 - FY 2019: \$213.98M.
 - Note: FY 2018/2019 differential largely attributed to:
 - DKIST and LSST operations forward funding in FY 2018.
 - Robust amount of 1st year awards for MSIP in FY 2018.
 - Also Note: Continuity of operations into FY 2020 in the amount of \$16.5M was provided by MPS/OMA in FY 2019 and not included in AST FY 2019 Infrastructure.

FY 2020 Budget



- Continuing Resolution through Dec 20th .
- Enacted Foundation appropriation increases R&RA 3% (to \$6,737M).
- MREFC line fully funds LSST (Rubin Obs) at request level.
 - FY 2019 was last year for DKIST MREFC (per construction plans).
- AST/AAG: should be reasonable year.
- AST/MSIP: should be reasonable year.
- NSF/Mid-scale RI-2 (MSRI-2) awards planned (programs in the \$20M - \$70M range).



Future budgets



- President's Budget Request (PBR) FY 2021 released February.
 - As in previous recent PBRs, funding requested for NSF is reduced from recent fiscal year appropriations.
 - Recently, Congress has appropriated NSF funding above the PBR level.



AST: FY 2018 vs FY 2019 and FY 2021 (President's. request)

- Bottom line roll up:
 - MREFC total:
 - FY 2018: \$77.80M DKIST and Rubin Obs. (full planned funding).
 - FY 2019: \$64.95M DKIST and Rubin Obs. (full planned funding).
 - FY 2021: \$40.75M Rubin Obs. (full planned funding).
 - AST Research and Related Activities:
 - FY 2018: \$311.16M.
 - FY 2019: \$287.01M.
 - FY 2021: \$242.10M.

AST: FY 2018 vs FY 2019 and FY 2021 (President's. request)

- **Research** (AAG, Special Pgms, CAREER, Taxes, IPAs, Facility Reviews):
 - FY 2018: \$65.35M.
 - FY 2019: \$68.60M.
 - Note: WoU-MMA funding not included in FY 2019 total.
 - **FY 2021: \$61.57M.**
- **Education** (AAPF, REU sites, REU Supplements):
 - FY 2018: \$4.73M.
 - FY 2019: \$4.43M.
 - **FY 2021: \$4.690M.**
- **Infrastructure** (Arecibo, GBO, MSIP, NRAO, NSO, OIR Lab, Research Resources):
 - FY 2018: \$241.08M.
 - FY 2019: \$213.98M.
 - Note: FY 2018/2019 differential largely attributed to:
 - DKIST and LSST operations forward funding in FY 2018.
 - Robust amount of 1st year awards for MSIP in FY 2019.
 - Also Note: Continuity of operations into FY 2020 in the amount of \$16.5M was provided by MPS/OMA in FY 2019 and not included in AST FY 2019 Infrastructure.
 - **FY 2021: \$175.84 (Facilities full planned funding).**

Future budgets



- President's Budget Request (PBR) FY 2021 released Feb.
 - As in previous recent PBRs, funding requested for NSF is reduced from recent fiscal year appropriations.
 - Recently, Congress has appropriated NSF funding above the PBR level.
- Decadal funding:
 - Bipartisan support in Congress to ramp up Federal R&D funding in the 2020s.
 - For example: In late January House Science Committee Republicans introduced *Securing American Leadership in Science and Technology Act*
 - F. Lucas (R-OK) (paraphrased): S&T is foundational for addressing generational challenges: competition with China and climate change.
 - Increases NSF budget to \$14.9B by 2029.
 - Long term impact of COVID-19 on economy ???





Questions/Discussion