




National Aeronautics and
Space Administration

EXPLORE SCIENCE

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SENTINEL-6

MICHAEL FREILICH



S HALL

S AMES ARMSTRONG

HALL STENNIS AMES AR



UPDATES



PROGRAMS &
RESEARCH



DIVISION
HIGHLIGHTS



NASA's Mars 2020 Perseverance rover launched on the Atlas V-541 rocket from Launch Complex 41 at Cape Canaveral Air Force Station, Florida on July 30, 2020, at 7:50 a.m.



NASA's James Webb Space Telescope testing teams have successfully completed the Ground Segment Test, a critical milestone focused on demonstrating that Webb will respond to commands once in space.



The Copernicus Sentinel-6 Michael Freilich satellite has passed all tests and is ready for shipment to the Vandenberg launch site in California.



Science Mission Directorate (SMD) Updates

- Diversity, Equity, Inclusion, and Accessibility (DEIA) Initiatives in SMD
 - Recognize as a long-term effort, but immediate action and problem solving will advance initiatives in parallel with systemic, enduring activity
- Deputy Associate Administrator for Exploration (DAAX), Assistant Deputy Associate Administrator for Research (DAAR), and Cyber/Enterprise Protection PE announcements closed, post announcement recruitment process underway, and selection forthcoming
- All missions in Formulation are proceeding and most missions in Implementation are accomplishing some hands-on work
- Mars Exploration Program (MEP) remains independent with strong focus on Mars science and the future:
 - Operating Mars missions, including Mars 2020/Perseverance
 - Sample Return Science (Mars Sample Return campaign managed outside of MEP)
 - Any future Mars development projects
- Jim Watzin moving to new position to support Agency Mars exploration efforts. Director duties to be assumed by Eric Ianson, Michael Meyer to take on additional MEP science and strategic leadership responsibilities

Welcome to the Team, Dr. Wanda Peters



- Welcome Dr. Peters as the Deputy Associate Administrator for Programs in SMD
- Responsible for overseeing and assessing SMD's multi-billion dollar portfolio of over 100 missions
- Previously served as Deputy Director for Planning and Business Management in the Flight Projects Directorate (FPD) at Goddard Space Flight Center
- Thank you to Mayra Montrose who has done amazing work as acting DAAP, and will continue as Deputy to Dr. Peters

Diversity, Equity, Inclusion, and Accessibility (DEIA) Initiatives in SMD

July 2020 - NASA added INCLUSION to our core values to ensure focus on our culture of diversity, inclusion, and equity where all feel welcome, respected, and engaged within a positive and safe work environment

- Action Groups: Anti-Racism and DEIA Working Group
- Workforce Activities: Planning and Training
- Process Evaluation/Changes: Anonymous Peer Review for AO's, Equity Audits, Barrier Analysis
- Input & Communications: Town Halls, Surveys, Focus Groups, Academia & Industry engagement





UPDATES



PROGRAMS &
RESEARCH



DIVISION
HIGHLIGHTS

Astrophysics	Earth	Planetary	JASD
JWST	Landsat-9	Mars 2020	GOES-T
ROMAN	PACE	DART (APL)	GOES-U
ROMAN Coronagraph	NISAR	Lucy	JPSS-2
GUSTO	SWOT	Psyche	JPSS-3 and 4
IXPE	Sentinel-6 Michael Freilich	JUICE	SWFO-L1
Euclid	TEMPO	MMX MEGANE and P-Sampler	
SPHEREx	GeoCarb	Europa Clipper	Helio
ARIEL	EMIT	VIPER	HERMES
XRISM	MAIA	Dragonfly	IMAP
Balloons	CLARREO-PF	Luna-H Map	PUNCH
Athena, LISA	TROPICS	MOMA-MS	AWE
SOFIA	PREFIRE	Lunar Trailblazer	TRACERS
ESSIO	GLIMR	JANUS	EscaPADE
NPLP	TSIS-2		Sounding Rockets
CLPS - Astrobotics, Intuitive Machines, Masten Space Systems	Libera		
LSITP	Airborne Science		

Missions in Development: Return to Site Status

Status as of: 9/1/20

- **Green:** Approved to work on site
- **Yellow:** Expected to Submit for Approval
- **Grey:** Not yet requested to work on site

NOTE:

- This chart reflects status at NASA facilities, not work that may be ongoing at other institutions
- Most projects in grey are executing tasks at facilities outside of NASA

Status of SMD Flight Projects

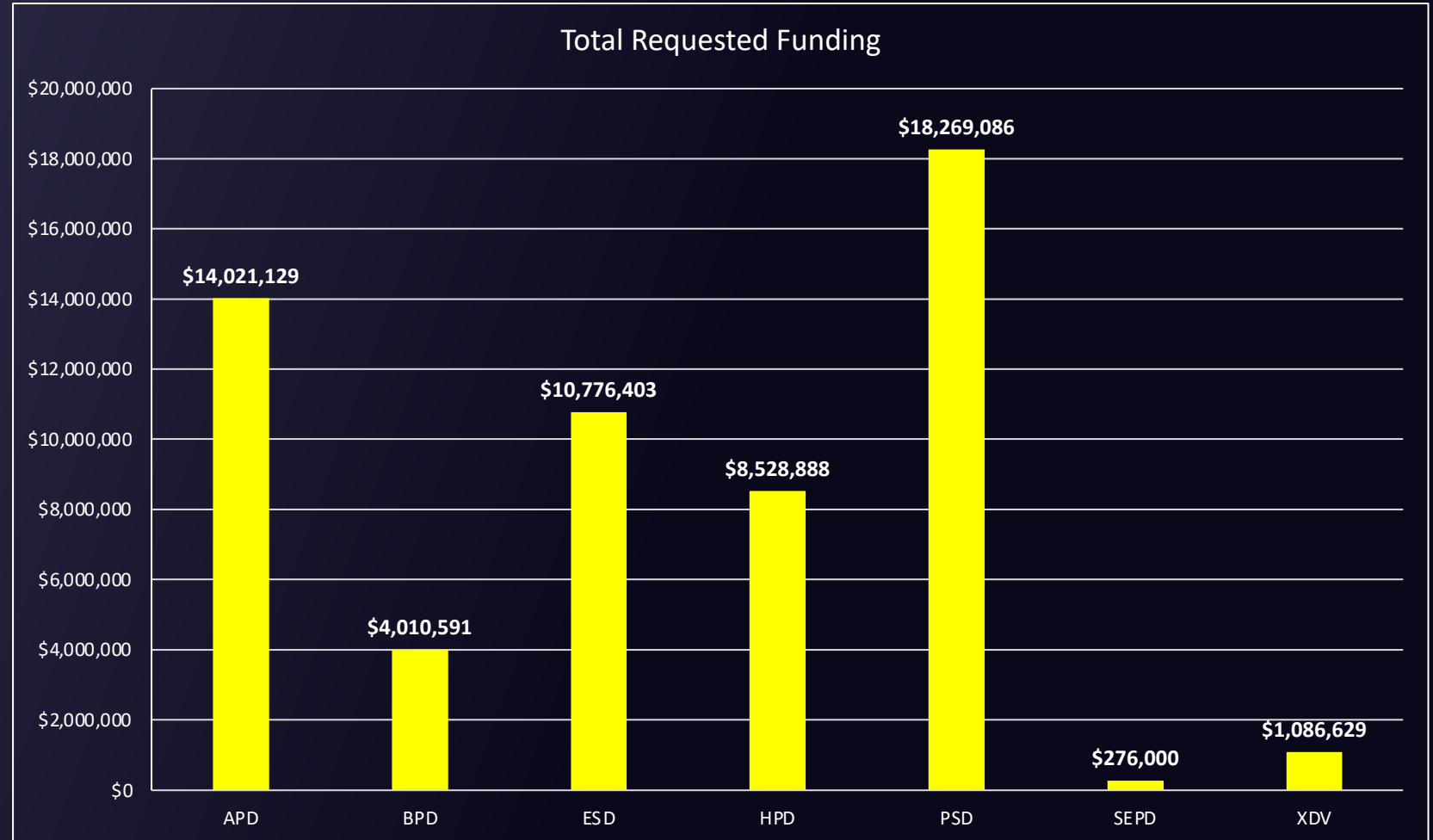
- All SMD missions in Formulation are proceeding and most missions in Implementation are accomplishing some hands-on work. However, SMD continues to experience disruption to all missions due to COVID-related restrictions; we assume these disruptions will continue for the time being
 - Reduced efficiency achieved at work sites and for those working from home, which includes reduced availability of workforce and reduced leave usage
 - Travel restrictions, reduced availability of NASA facilities
 - Disruptions to supply chain for current and future procurements
- At the portfolio level, SMD is considering a series of short- and medium-term actions to mitigate COVID impacts in order to ensure mission success and the overall health of our portfolio
 - Within current budget, the use of HQ-held reserves and/or adjustment of launch date are being employed
 - Where additional funds are necessary, SMD will consider delays or cancellations to planned missions in order to restore overall portfolio risk to acceptable levels
- Life Cycle Reviews (LCR) and some Key Decision Points (KDPs) have continued to virtually report
 - Some challenges/limitations have been observed in the LCR virtual environment regarding the ability of the review team members to have in-depth sidebar conversations

R&A Grant Extensions

- SMD does not want the COVID-19 epidemic to derail the careers of future leaders; we continue to focus on mitigating the impacts of the epidemic
- Pursuing a three-pronged strategy for early career researchers
 - SMD Policy (SPD-36): Current grantees may request funded extensions starting on October 1, 2020
 - Highest priority for funding is to support graduate students and postdocs
 - Next highest priority is for funding to support soft-money, early-career researchers
 - Temporary expansion of the NASA Postdoctoral Program (NPP) to more than the 124 Fellows funded by HQ
 - Size of expansion to be no more than 50%, but still under discussion as we learn more
 - Working with Centers to support/fund additional term CS hires focused on additional training and career growth (2-6 years)
- Since all three of these actions must be funded from the R&A Program, size of commitment for all three is expected to be approx. 15% of funding available for new awards
- Expressions of Interest in Augmentations and Funded Extensions requested to bound size of potential commitment

Results of Call for “Expressions of Interest”

- We received over 400 Expressions of Interest!
- Highly unequal distribution across divisions
- Mean request was \$133,104
- Total request was ~\$57M
- SMD expects ~\$28M available
- SMD is considering how this will impact our plans



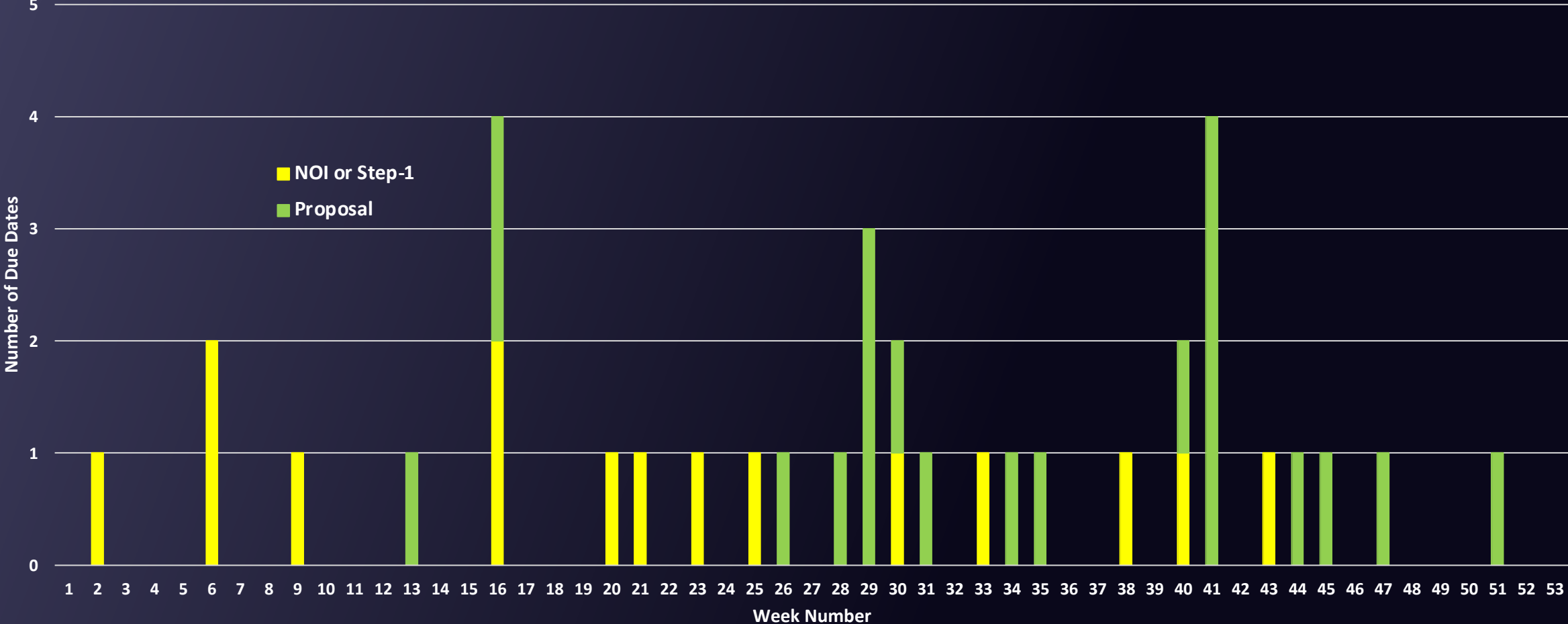
R&A Program Updates

- Continuing to adjust proposal processes
 - All review panels will be virtual until at least September. Extension of this policy to be decided in mid- to late-September. Likely that policy will be extended to at least the end of the year
 - Dual-anonymous Peer Review pilot program progressing as planned
 - New High-Risk/High-Impact process being created; waiting for first group of ROSES-2020 selections
 - Responded to community comments about overloading of ROSES due dates. Rearranged some Step-1 and Step-2 due dates to ensure that there are no more than 5 due dates per week
 - In ROSES-2021, we will investigate reducing that to no more than 4 due dates per week

Hardware-Development Due Dates

- Received community input on the overloading of AOs due dates and hardware-development ROSES solicitations
- Starting this month, hardware-development ROSES solicitations will be included in the quarterly AO Planning List found at:
[https://soma.larc.nasa.gov/StandardAO/doc_files/Planning%20List%20for%20SMD%20Solicitations%20200508-v1\[1\].docx](https://soma.larc.nasa.gov/StandardAO/doc_files/Planning%20List%20for%20SMD%20Solicitations%20200508-v1[1].docx)

Analysis of Hardware Program Element Due Dates





UPDATES



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RESEARCH



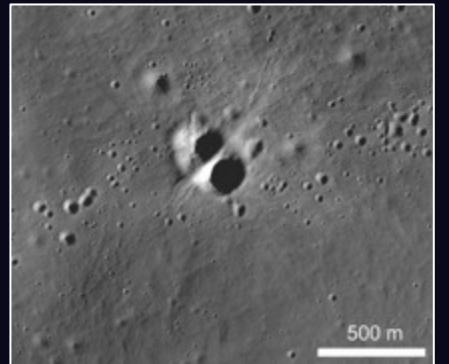
DIVISION
HIGHLIGHTS

Exploration Science and Division Updates

- Exploration Science Strategy and Integration (ESSIO) – David Burns
- Astrophysics – Paul Hertz, Greg Robinson (Webb)
- Biological and Physical Sciences (BPS) – Craig Kundrot
- Earth Science Division – Karen St. Germain
- Heliophysics – Nicky Fox
- Planetary Science – Eric Ianson, Jeff Gramling (Mars Sample Return)

ESSIO Highlights

- ESSIO co-led the 3rd, 4th, and 5th Lunar Surface Science Workshop (LSSW) sessions on volatiles (Jul. 29), samples (Jul. 30), and lunar dust and regolith (Aug. 20)
- The LRO spacecraft completed its 50,000th orbit of the Moon on Saturday, Aug. 1
 - Over its 11-year operation, LRO has generated more data than all other planetary missions combined, and is providing data that is critical to support human landings on the lunar surface
- Task Order 19D draft has been released, and a pre-RFTOP (Request For Task Order Proposal) payload workshop has taken place
 - In addition to delivery of 7 SMD-provided payloads to the lunar surface, there will be 1 HEO and 2 STMD payloads
- The Lunar Environment heliospheric X-ray Imager (LEXI) completed its Critical Design Review on Aug. 18
 - This instrument will be on the CLPS Task Order 19D delivery and will study the interaction between the solar wind and Earth's magnetosphere
- The Near Infrared Volatile Spectrometer Subsystem (NIRVSS) completed assembly the week of Aug. 10
 - This instrument will be carried by Astrobotic on their Task Order 2 delivery next year



Astrophysics Division Highlights

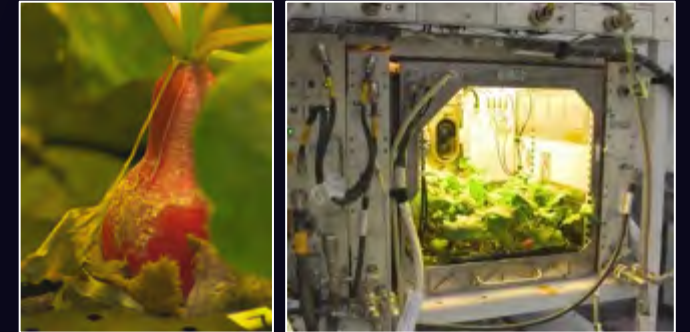
- TESS completed prime mission and begun extended mission in July; the extended mission will have improved image cadence
- SOFIA airborne observatory resumed science flights on Aug. 17, ending COVID suspension of flights that began March 2020
- All mirrors in the Roman telescope assembly have been coated and are now undergoing acceptance testing
- First sounding rocket since COVID began, was launched on Sept. 8 from White Sands Missile Range: DUST-2, PI Joseph Nuth (GSFC)
- IXPE, the next astrophysics SMEX, passed System Integration Review and continues progress toward Fall 2021 launch
- Fall balloon campaign in Ft. Sumner NM was cancelled due to COVID, no balloon campaigns in CY2020. Next planned campaign is Spring 2021 in Wanaka, New Zealand
- Hubble solved mystery of Betelgeuse dimming: ejection of massive amount of superhot material captured by Hubble led to dimming
- Webb Space Telescope has begun observatory-level environmental testing – acoustic testing complete, vibration testing ongoing



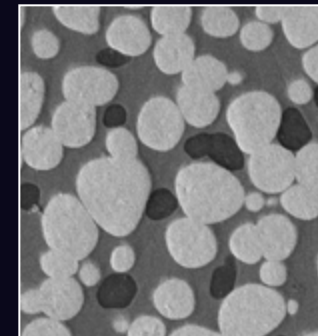


BPS Division Highlights

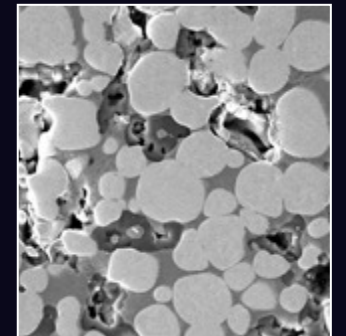
- Decadal Survey
 - Finalizing BPS Statement of Task with National Academies of Sciences, Engineering, and Medicine (NASEM)
 - NASEM Committee on Biological and Physical Sciences in Space Sept. 29
- Space Biology
 - ISS Spectrum Multi-Spectral Fluorescence Imager completed check-out
 - ISS PH-02 radish plant investigation ready for launch on NG-14
 - Space Biology grant award announcement scheduled for Sept. 18
 - Release of two NRA solicitations in November: the ROSES 2020 Space Biology NRA and the BPS/HRP/NIH/BARDA collaborative NRA on tissue chips
- Physical Sciences
 - ISS Gravitational Effects on Distortion in Sintering (GEDS) run
 - Dusty plasma method removes lunar dust from surfaces. *Acta Astronautica* 177 (2020) 405 – 409
 - ISS Advanced Combustion via Microgravity Experiments (ACME) has run over 1000+ tests since 2018. Completed S-Flame ops, moving to Burning Rate Emulator (BRE)
 - Released NRA for use of ISS Flow Boiling & Condensation rig; Oct. NRA for Physical Sciences Informatics



PH-02



GEDS
Ground

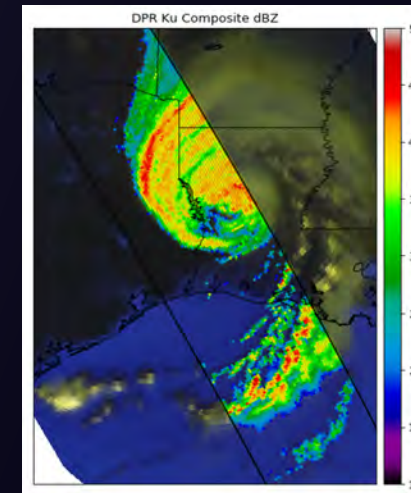


GEDS
Microgravity

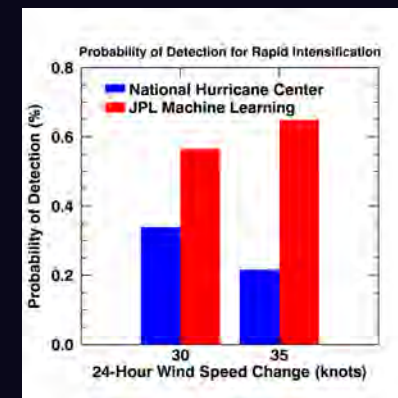
Earth Science Division Highlights

- The Sentinel-6 Michael Freilich satellite ready to ship to VAFB
- EVM-3 Announcement is ready for imminent release
- HARP won the SmallSat Mission of the Year Award
- Commercial Small Sat Data RFI for on-ramp to be released in October
- RRNES awarded ~\$2 million for research on environmental effects of societal response to COVID-19
- Research using machine learning shows potential to double the forecast skill for predicting hurricane rapid intensification
- Analysis of airborne & satellite air quality data show higher pollution levels (NO2) in lower income & minority neighborhoods of Houston
- Disaster Response Support:
 - Beirut Explosion: Damage proxy maps to support FBI analyses
 - CA Wildfires: Tier 1 Activation. Fire maps to front line emergency responders; work with Cal Fire, Cal Natl Guard, Gov. Off. of Emer. Svcs. Support on air quality plus mitigate post-fire hazards like mudslides
 - Hurricane Laura: Tier 1 Activation. Engaged with FEMA, USACE, DOD/NorthCOM, NOAA/NWS, USGS, USDA, NGA, Governors offices

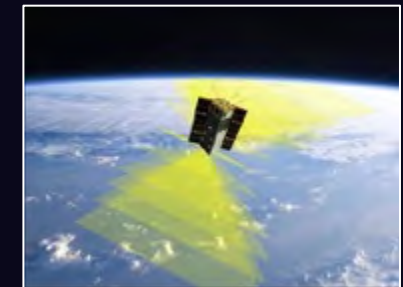
NASA's ARIA team (JPL) and Earth Observatory of Singapore, used Sentinel-1 radar data to map Beirut explosion damage >>



<< GPM overpass after Cat. 4 Hurr. Laura made landfall 27-August. GPM DPR data overlaid on GMI data showing intensity of precipitation



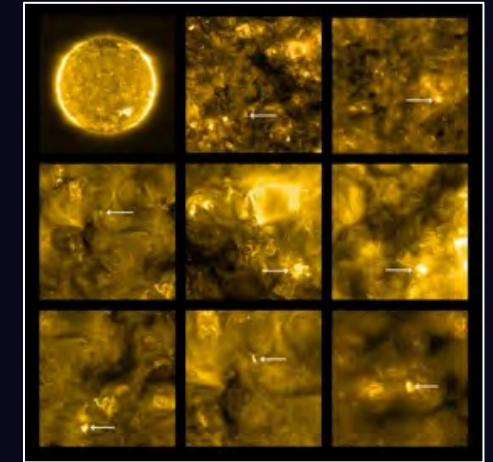
Probability of predicting rapid intensification



HyperAngular Rainbow Polarimeter HARP

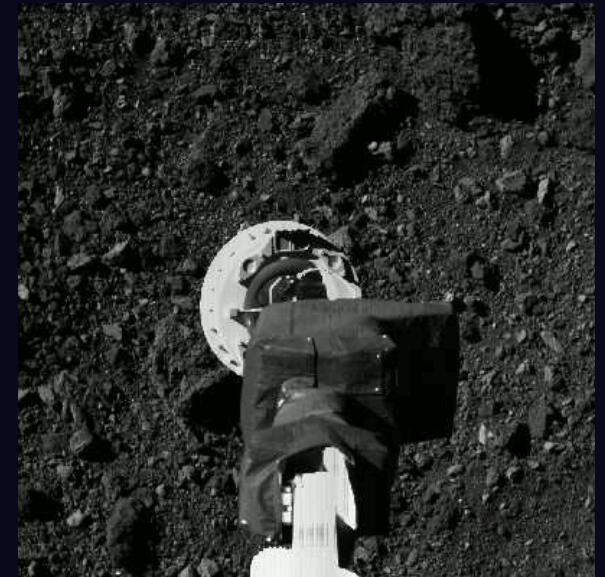
Heliophysics Division Highlights

- Parker Solar Probe performed a successful Venus Gravity Assist on Jul. 11
 - Spacecraft and instruments remain nominal
 - On track for Perihelion #6 on Sept. 27
- Solar Orbiter's first images were released to the public on Jul. 17, including the closest pictures ever taken of the Sun. Photo to the right depicts little "camp fires", actually nano flares, scattered across the Sun's surface
- MIDEX-19 Step-1 selections announced Aug. 28. Congratulations to STORM, HelioSwarm, MUSE, ARCS, and Solaris!
- Space Weather
 - HERMES instrument Concept Reviews completed Aug 2020, KDP-C, Dec 2020, instrument team to be competed FY21
 - SWIMS RFI was released on Aug 17 to assess community interest, concepts, and ROM cost for a future pipeline of space weather instrumentation
- DUST-2 Sounding Rocket successfully launched from White Sands Missile Range on Sept. 8!
 - Dedicated to Frank Lau
- Geospace Dynamics Constellation (GDC) successfully passed KDP-A on Sept. 8!



Planetary Science Division Highlights

- Mars2020/Perseverance: launched on July 30!
- OSIRIS-REx:
 - Successful Matchpoint rehearsal on Aug. 11
 - Sampling event (TAG) at Nightingale Oct. 20
- Lucy: Passed KDP-D on Aug. 25, on track for launch in 2021
- Janus: Passed PDR; KDP-C held Sept. 3, on track of launch with Psyche in 2022. Janus is the first SIMPLEX mission passing confirmation
- VIPER: PDR successfully passed PDR on Aug. 27; SMD Snapshot Outbrief held September 1 (KDP-C will be in October)
- Mars Sample Return: currently being reviewed by a senior Independent Review Board before Mission Concept Review (MCR) this fall, with the intent of positioning the project for success as it transitions to Phase A



Matchpoint rehearsal, Nightingale (SamCam)

QUESTIONS



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with us

