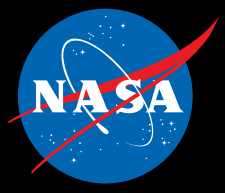
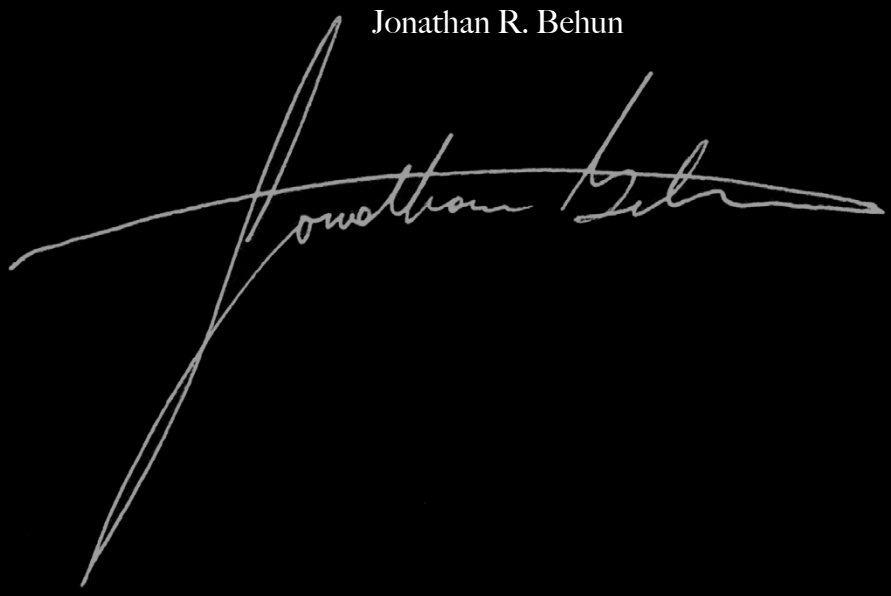


VISUAL COMMUNICATION SOLUTIONS

Jonathan R. Behun



PORTFOLIO

CONCEPTUALIZATION GRAPHIC DESIGN ILLUSTRATION

WEB DEVELOPMENT PRODUCTION

INTRODUCTION

Samples of my work include current NASA LaRC Flight Projects - Orion LAS, Orion AA-2, SAGE III on ISS, CERES, TEMPO, CLARREO, ALHAT, RaD-X, and RBI.

Samples of my work include past NASA LaRC Flight Projects - Ares I-X, ORION Pad Abort-1, ASCENDS, and MISSE-X. Other notable NASA projects and initiatives supported include the National Transonic Facility, STS-135, OPAL, HEART, Combined Federal Campaign, CxP, Game Changing, and the Engineering Directorate.

- POSTERS
- PRESENTATIONS
- DISPLAYS
- SIGNAGE
- COVER IMAGES
- LOGOS
- BROCHURES
- FLYERS
- CERTIFICATES
- FLOW CHARTS
- PRODUCT LABELS
- VEHICLE MARKINGS
- PATCHES
- APPAREL
- TECHNICAL DRAWINGS
- COINS
- WEB DEVELOPMENT


THE
FINAL MISSION
NASA
FERGUSON HURLEY MAGNUS WALHEIM
STS 135
STS-135
LAUNCHING JULY 8TH 2011
NASA PRESENTS THE SPACE SHUTTLE'S FINAL LAUNCH PRODUCED BY THE OFFICE OF THE ADMINISTRATOR
DIRECTED BY THE SPACE TRANSPORTATION SYSTEM AND THE HUMAN SPACEFLIGHT OFFICE
NASA ADMINISTRATOR CHARLES BOLDEN NASA DEPUTY ADMINISTRATOR LORI GARVER NASA ASSOCIATE ADMINISTRATOR WILLIAM GERSTENMAIER PROGRAM MANAGER JOHN SHANNON DEPUTY PROGRAM MANAGER LEROY CAIN
COMMANDER CHRISTOPHER FERGUSON PILOT DOUGLAS HURLEY MISSION SPECIALIST SANDRA MAGNUS MISSION SPECIALIST REX WALHEIM
E
EVERYONE
NASA's STS-135 CONCLUDES THREE DECADES OF HISTORIC HUMAN SPACE FLIGHT
www.nasa.gov
NASA's STS-135 Atlantis launch was shot on location at Kennedy Space Center by many NASA civil servants and contractors.

FPD

National Aeronautics and Space Administration

ORION

Launch Abort System (LAS)

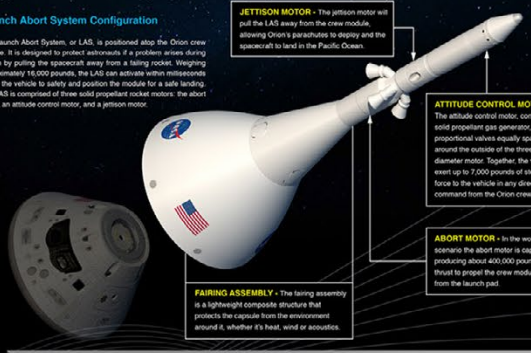
NASA**facts**

Ensuring Astronaut Safety

NASA is developing technologies that will enable humans to explore new destinations in the solar system. America will use the Orion spacecraft, launched atop the Space Launch System rocket, to send a new generation of astronauts beyond low-Earth orbit to places like an asteroid and eventually Mars. In order to keep astronauts safe in such difficult, yet exciting missions, NASA and Lockheed Martin collaborated to design and build the Launch Abort System.

Launch Abort System Configuration

The Launch Abort System, or LAS, is positioned atop the Orion crew module. It is designed to protect astronauts if a problem arises during launch by pulling the spacecraft away from a failing rocket. Weighing approximately 16,000 pounds, the LAS can activate within milliseconds to pull the vehicle to safety and position the module for a safe landing. The LAS is comprised of three solid propellant rocket motors: the abort motor, an attitude control motor, and a jettison motor.



JETTISON MOTOR - The jettison motor will pull the LAS away from the crew module, allowing Orion's parachutes to deploy and the spacecraft to land in the Pacific Ocean.

ATTITUDE CONTROL MOTOR - The attitude control motor, consists of a solid propellant gas generator, with eight proportional valves equally spaced around the outside of the three-foot diameter motor. Together, the valves can exert up to 7,000 pounds of steering force to the vehicle in any direction upon command from the Orion crew module.

ABORT MOTOR - In the worst-case scenario the abort motor is capable of producing about 400,000 pounds of thrust to propel the crew module away from the launch pad.

FAIRING ASSEMBLY - The fairing assembly is a lightweight composite structure that protects the capsule from the environment around it, whether it's heat, wind or acoustics.

FUN FACTS

- The Launch Abort System can activate within milliseconds to carry the crew to a peak height of approximately one mile at 42 times the speed of a drag race car.
- The Launch Abort System's abort motor generates enough thrust to lift 26 elephants off the ground.
- The Launch Abort System's abort motor produces the same power as five and a half F-22 Raptors combined.
- The Launch Abort System can move at transonic speeds that are nearly three times faster than the top speed of a fast sports car.
- The jettison motor can safely pull the Launch Abort System away from the crew module to a height of 240 Empire State Buildings stacked on top of each other.

First Launch Abort System Test: Pad Abort-1

NASA's Pad Abort-1 flight test was the first fully integrated test of the LAS, which successfully launched May 6, 2010, at the U.S. Army's White Sands Missile Range near Las Cruces, New Mexico. The flight was the first in a series of in-flight demonstrations of the three solid rocket motors and parachute landing system. The test was part of an ongoing mission to develop safer vehicles for human spaceflight applications.

Orion's First Flight: Exploration Flight Test-1

In 2014, NASA will launch the Orion spacecraft for the first time on Exploration Flig
farther into space than any human spacecraft has gone in more than 40 years. Bec
active on the LAS, but the successful jettison of the LAS is critical to the mission's
abort system's performance during the vehicle's trip to space.

First Integrated Test: Exploration Mission-1

Exploration Mission-1 will be the first test of the world's most powerful rocket, the Space Launch System (SLS). During this test, SLS will launch an uncrewed Orion spacecraft to demonstrate the integrated system performance of the rocket and spacecraft before a crewed flight. The jettison motor will be the only active motor on the LAS.

Final Launch Abort System Test: Ascent Abort-2

The Ascent Abort-2 test will launch an Orion mock-up from Space Launch Complex 46 in Cape Canaveral, Florida. During the test, the spacecraft will be integrated with an ascent test booster – a first stage booster from a Peacekeeper missile modified by Orbital Sciences Corporation in Arizona. The Ascent Abort-2 test will be the last test the LAS and its three motors will perform before a human mission. Reaching speeds up to 600 miles per hour, the LAS will demonstrate a successful abort under the highest aerodynamic loads it will experience in flight. Aerodynamic forces build as the booster accelerates through the atmosphere, reaching a maximum when the vehicle reaches speeds up to Mach 1. Then the LAS will ignite, pulling the crew module away from the ascent test booster. All three motors will be active, proving the LAS's readiness for human flight. This test also will assess the capabilities of numerous flight vehicle components, including Orion's avionics, communications, reaction control system and parachutes.

Why Explore?

Exploration is critical to prosperity and human progress.

Human space exploration helps to address fundamental questions about our place in the Universe and the history of our solar system. Through addressing the challenges related to human space exploration we expand technology, create new industries, and help to foster a peaceful connection with other nations. Curiosity and exploration are vital to the human spirit and accepting the challenge of going deeper into space will invite the citizens of the world today and the generations of tomorrow to join NASA on this exciting journey.

First Crewed Flight Test: Exploration Mission-2

Exploration Mission-2 will use SLS to launch the first humans aboard Orion. All three motors will be active on the LAS in the unlikely event of an emergency.

National Aeronautics and Space Administration

Langley Research Center
100 NASA Road
Hampton, VA 23681-2199

www.nasa.gov

FS-2014-06-220-LaRC


NASA | HUMAN EXPLORATION


NASA | ORION MPCV LAS


NASA | PAD ABORT-1


NASA | ORION EFT-1 LAS


NASA | ORION
ORION
MPCV
Multi-Purpose Crew Vehicle

National Aeronautics and Space Administration

NASA

NTF USER GUIDE

National Transonic Facility

www.nasa.gov

II - HISTORY and INTRODUCTION

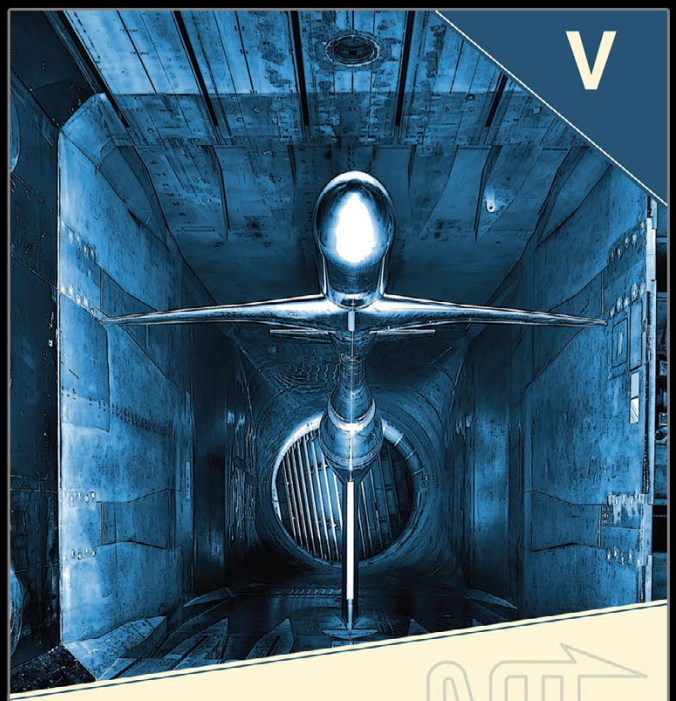
For more than a half-century, flight's transonic regime preoccupied aerodynamicists. By the early 1960s, decision makers and the aeronautics research community had both endorsed the pressing national need for a large transonic tunnel capable of achieving full-scale flow similarity (full scale Reynolds numbers) across a broad range of Mach numbers. Although extensive studies of various alternatives began in 1966, the projected price tag proved excessive.

It was only in the early 1970s, when NASA Langley Research Center engineers demonstrated the cost-effectiveness of a pressurized cryogenic option, that construction of such a facility was finally deemed feasible.

To leverage the success of its unconventional 0.3 meter transonic cryogenic wind tunnel design – operational in 1973 – NASA proposed construction of a 2.5 meter (8.2 foot) pressurized cryogenic transonic tunnel that would fulfill all U.S. commercial, military and scientific research requirements. In 1974, the United States Congress authorized construction of the National Transonic Facility (NTF) at NASA Langley in Hampton, Virginia.

To make room for the new facility, Langley razed its 4-Foot Supersonic Pressure Tunnel. While the tunnel itself was removed, its drive motors, buildings and cooling towers were spared, becoming an integral part of the new complex.

Groundbreaking on the 497-foot-long, 230,000-cubic-foot, aluminum-and-stainless-steel NTF began in 1979. The facility was officially dedicated in 1983 by then-Vice President George H.W. Bush in a ribbon-cutting ceremony on the Langley grounds. Full operation commenced in 1984.



V

NTF

DATA ACQUISITION / REDUCTION

VI - NOTABLE NTF STUDY DETAILS

A wide variety of aerospace vehicles have undergone NTF testing and assessment, including studies related to cruise performance, configuration aerodynamics, stability and control, and stall-buffet onset.

Since its commissioning, the NTF has evaluated models of the space shuttle, the space shuttle booster and the shuttle booster stack, the Delta II Heavy Launch Vehicle, the F-18 E/F Super Hornet, the blended-wing-body aircraft, the Grumman X-29 experimental airplane, and even the Seawolf submarine. The facility's ability to obtain near-flight Reynolds numbers has proven essential in accurately predicting aerospace-vehicle behavior under real-world flight conditions.

Details of such testing appear below:

Orion Multi-Purpose Crew Vehicle (MPCV)

The MPCV spacecraft includes crew and service modules, a spacecraft adaptor, and a launch-abort system. Much larger than its Apollo predecessor, the MPCV can support more crewmembers for short or long-duration missions. The service module is the powerhouse that fuels and propels the spacecraft, stores air and water, and provides space for scientific experiments and cargo.

A 6%-scale MPCV model, including the craft's launch-abort system, was assessed in the NTF to gather launch-related aerodynamic data.

Fundamental Aerodynamics Subsonic Transonic Modular Active Control (FASTMAC) Model

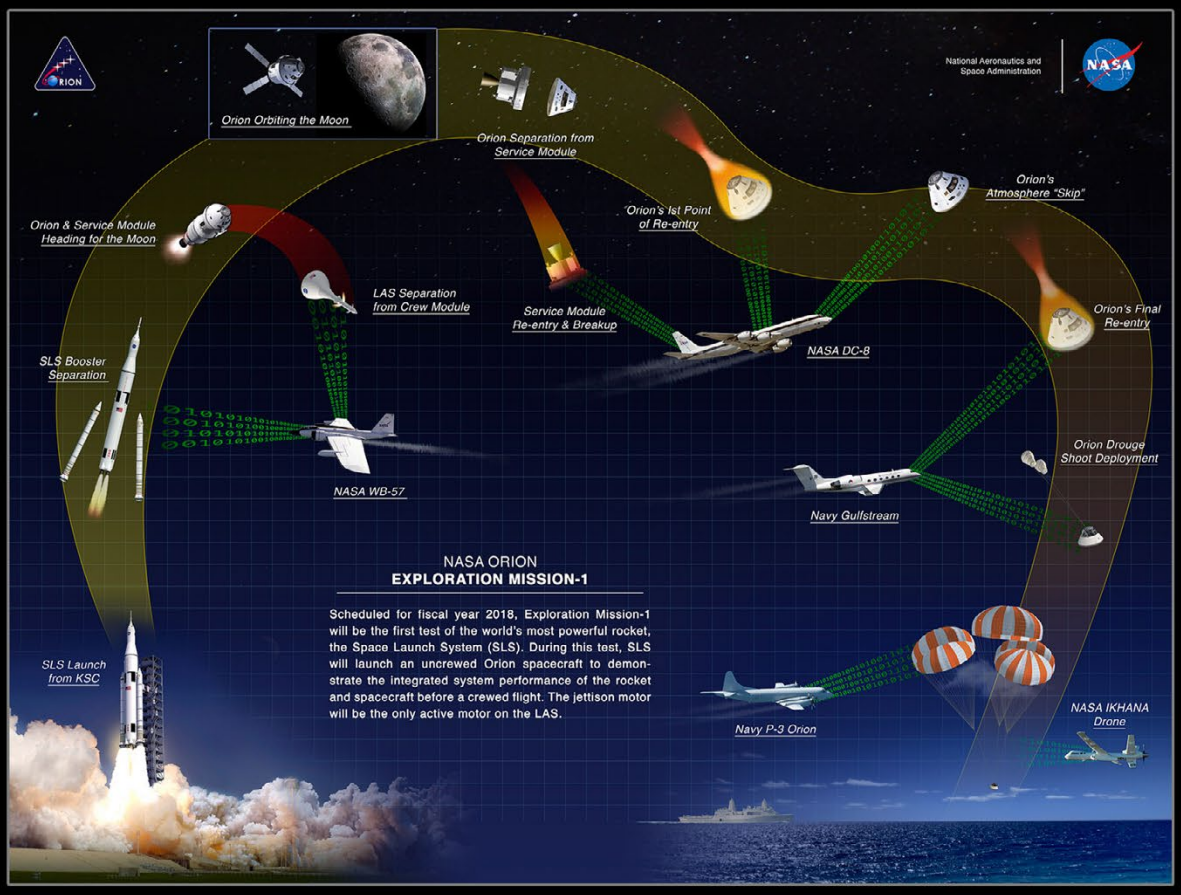
NASA is working with industry, university, and Department of Defense partners to advance the state of the art in prediction techniques associated with circulation control. To better understand the limitations of experimental and computational fluid dynamics (CFD) techniques, researchers are conducting low-speed, physics-based experiments that emphasize off-body measurements.

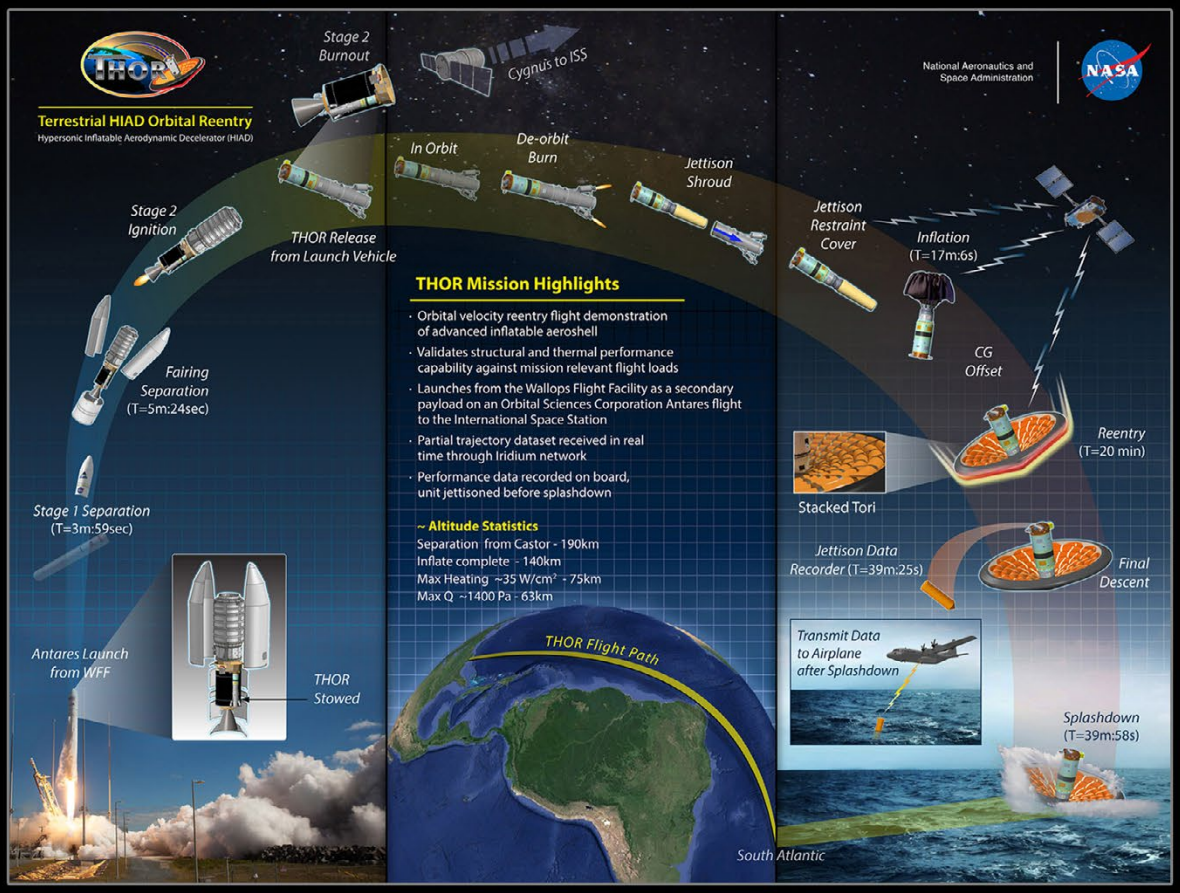
Using the Fundamental Aerodynamics Subsonic Transonic Modular Active Control (FASTMAC) semi-span model, an NTF experiment was conducted to evaluate the effect of Reynolds number on circulation-control aerodynamics, and to develop a FASTMAC open dataset for CFD code validation. The effect of varying the span-wise blowing distribution was also investigated, and cryogenic pressure-sensitive paint data were acquired.

The FASTMAC model was tested in two configurations: low-speed high-lift and high-speed cruise. The effect of Reynolds number on circulation-control aerodynamics was successfully documented during this test, and an open dataset for CFD code validation was created. A significant increase in lift at low speed was measured, as well as a drag reduction at high-speed conditions. Control of the shock on the wing was also successfully demonstrated.

NOTABLE NTF STUDY DETAILS

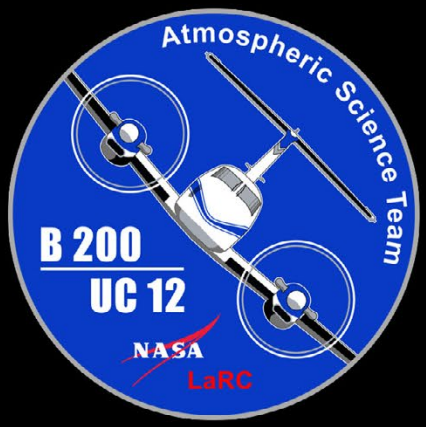
FPD


Orion Orbiting the Moon
National Aeronautics and Space Administration
NASA
Orion Separation from Service Module
Orion's Atmosphere "Skip"
Orion's 1st Point of Re-entry
Orion & Service Module Heading for the Moon
LAS Separation from Crew Module
Service Module Re-entry & Breakup
Orion's Final Re-entry
NASA DC-8
SLS Booster Separation
Orion Drouge Shoot Deployment
NASA WB-57
Navy Gulfstream
NASA ORION
EXPLORATION MISSION-1
Scheduled for fiscal year 2018, Exploration Mission-1 will be the first test of the world's most powerful rocket, the Space Launch System (SLS). During this test, SLS will launch an uncrewed Orion spacecraft to demonstrate the integrated system performance of the rocket and spacecraft before a crewed flight. The jettison motor will be the only active motor on the LAS.
SLS Launch from KSC
Navy P-3 Orion
NASA IKHANA Drone


THOR
Terrestrial HIAD Orbital Reentry
Hypersonic Inflatable Aerodynamic Decelerator (HIAD)
Stage 2 Burnout
Cygnus to ISS
National Aeronautics and Space Administration
NASA
In Orbit
De-orbit Burn
Jettison Shroud
Stage 2 Ignition
THOR Release from Launch Vehicle
Jettison Restraint Cover
Inflation (T=17m:6s)
THOR Mission Highlights
· Orbital velocity reentry flight demonstration of advanced inflatable aeroshell
· Validates structural and thermal performance capability against mission relevant flight loads
· Launches from the Wallops Flight Facility as a secondary payload on an Orbital Sciences Corporation Antares flight to the International Space Station
· Partial trajectory dataset received in real time through Iridium network
· Performance data recorded on board, unit jettisoned before splashdown
~ Altitude Statistics
Separation from Castor - 190km
Inflate complete - 140km
Max Heating ~35 W/cm² - 75km
Max Q ~1400 Pa - 63km
CG Offset
Fairing Separation (T=5m:24sec)
Reentry (T=20 min)
Stacked Tori
Stage 1 Separation (T=3m:59sec)
Jettison Data Recorder (T=39m:25s)
Final Descent
Antares Launch from WFF
THOR Stowed
THOR Flight Path
Transmit Data to Airplane after Splashdown
Splashdown (T=39m:58s)
South Atlantic


MISSE
Materials
International Space Station
Experiment - X


TEMPO


Atmospheric Science Team
B 200
UC 12
NASA
LaRC


Space Technology & Exploration Planning
STEP


Engineering Directorate
NASA Langley Research Center


THOR

FPD

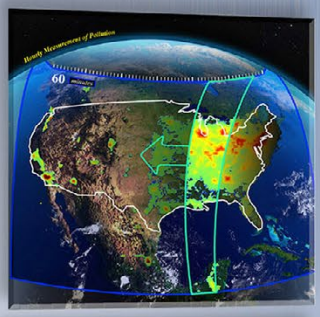
FLIGHT PROJECTS DIRECTORATE

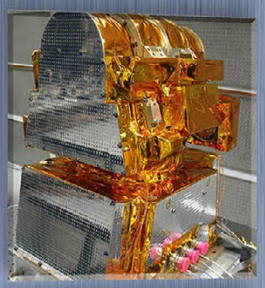
NEWSLETTER

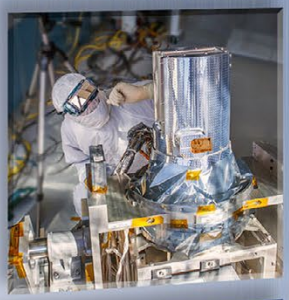
2014 - 1st Quarter Edition

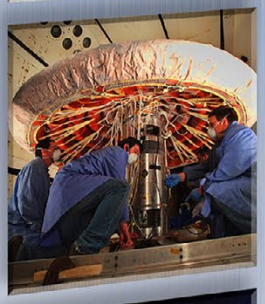
FPD
FLIGHT PROJECTS DIRECTORATE

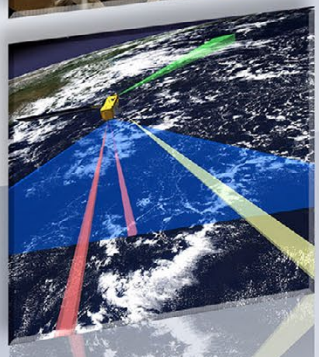
INSIDE the ISSUE

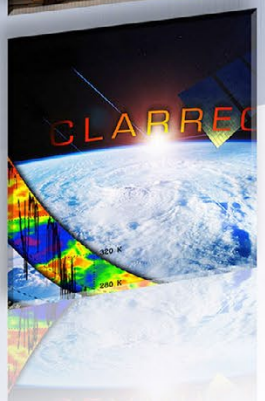






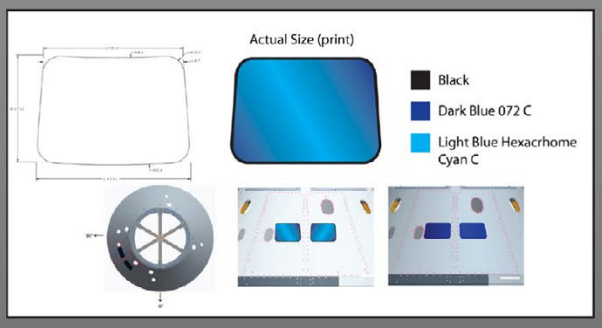






www.nasa.gov

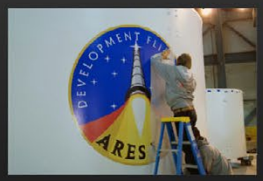
FPD

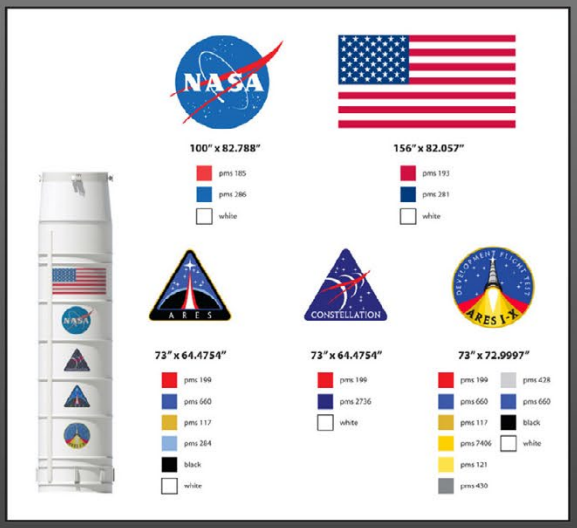

Actual Size (print)
Black
Dark Blue 072 C
Light Blue Hexacrhome Cyan C


NASA


CONSTELLATION

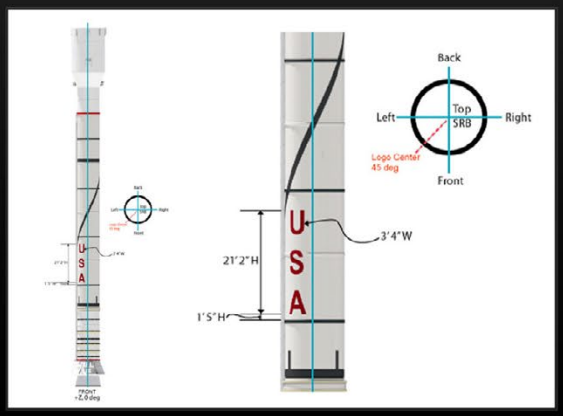

ARES

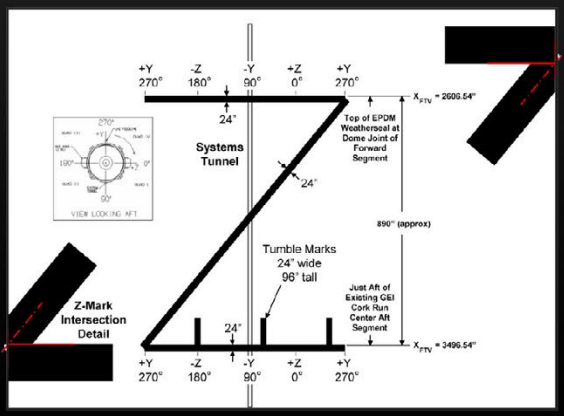

DEVELOPMENT FLIGHT
ARES


NASA
100" x 82.788"
156" x 82.057"
pms 185
pms 286
white
pms 193
pms 281
white
ARES
CONSTELLATION
DEVELOPMENT FLIGHT
ARES 1-X
73" x 64.4754"
pms 199
pms 660
pms 117
pms 284
black
white
73" x 64.4754"
pms 199
pms 2736
white
73" x 72.9997"
pms 199
pms 660
pms 117
pms 7406
pms 121
pms 430
pms 428
pms 660
black
white

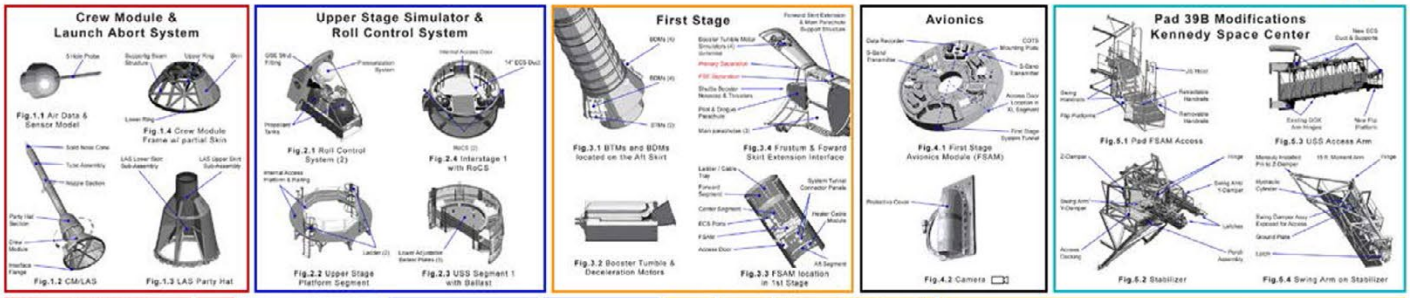

USA


NASA
ATK

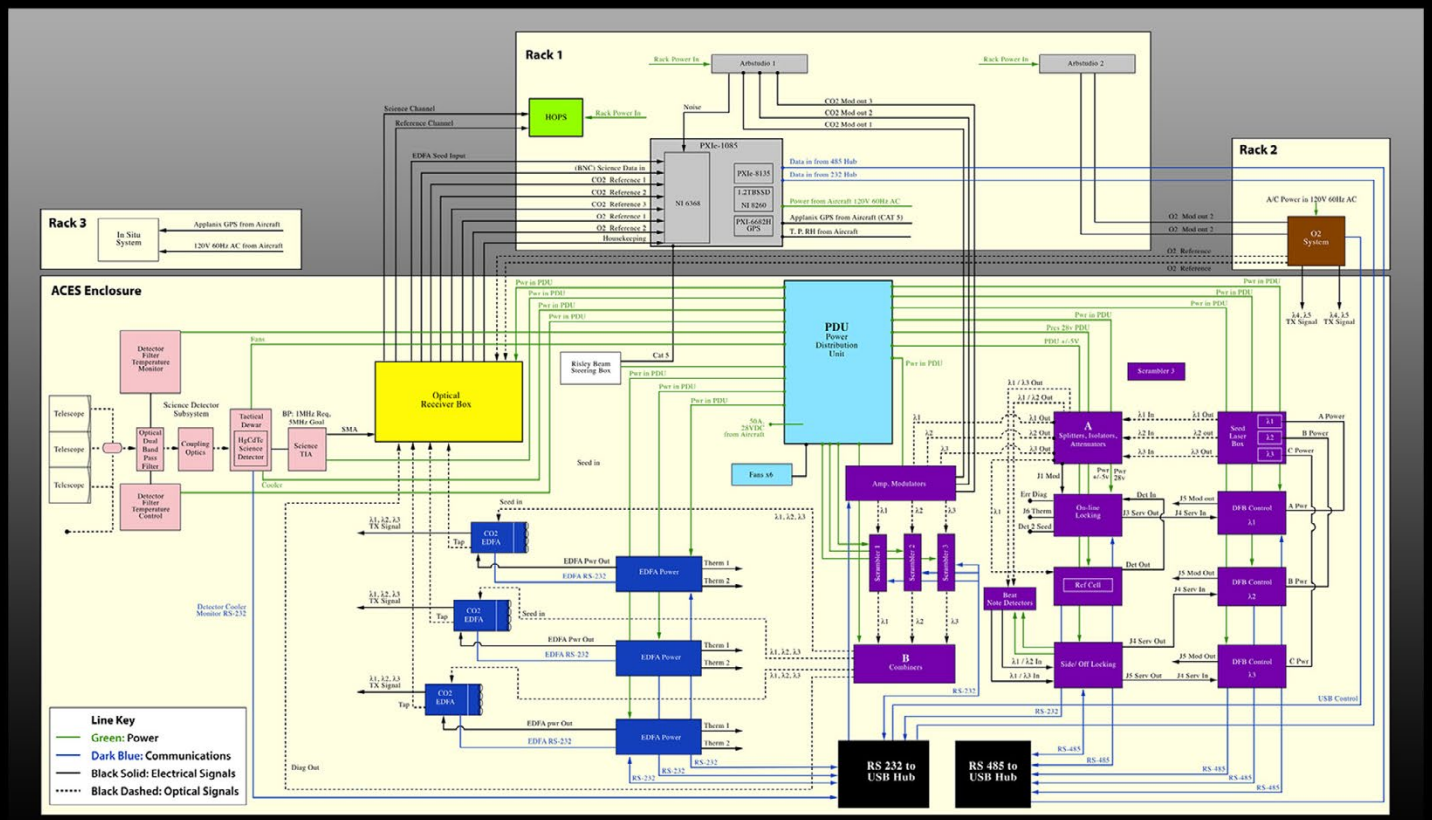

Back
Left
Top SRB
Right
Front
Logo Center 45 deg
USA
3°4"W
21'2"H
1'5"H


+Y 270°
-Z 180°
-Y 90°
+Z 0°
+Y 270°
24"
Systems Tunnel
24"
Top of EPDM Weatherseal at Dome Joint of Forward Segment
X_FTV = 2606.54"
890" (approx)
Tumble Marks 24" wide 98" tall
Z-Mark Intersection Detail
Just Aft of Existing GEI Cork Run Center Aft Segment
24"
X_FTV = 3496.54"
VIEW LOOKING AFT

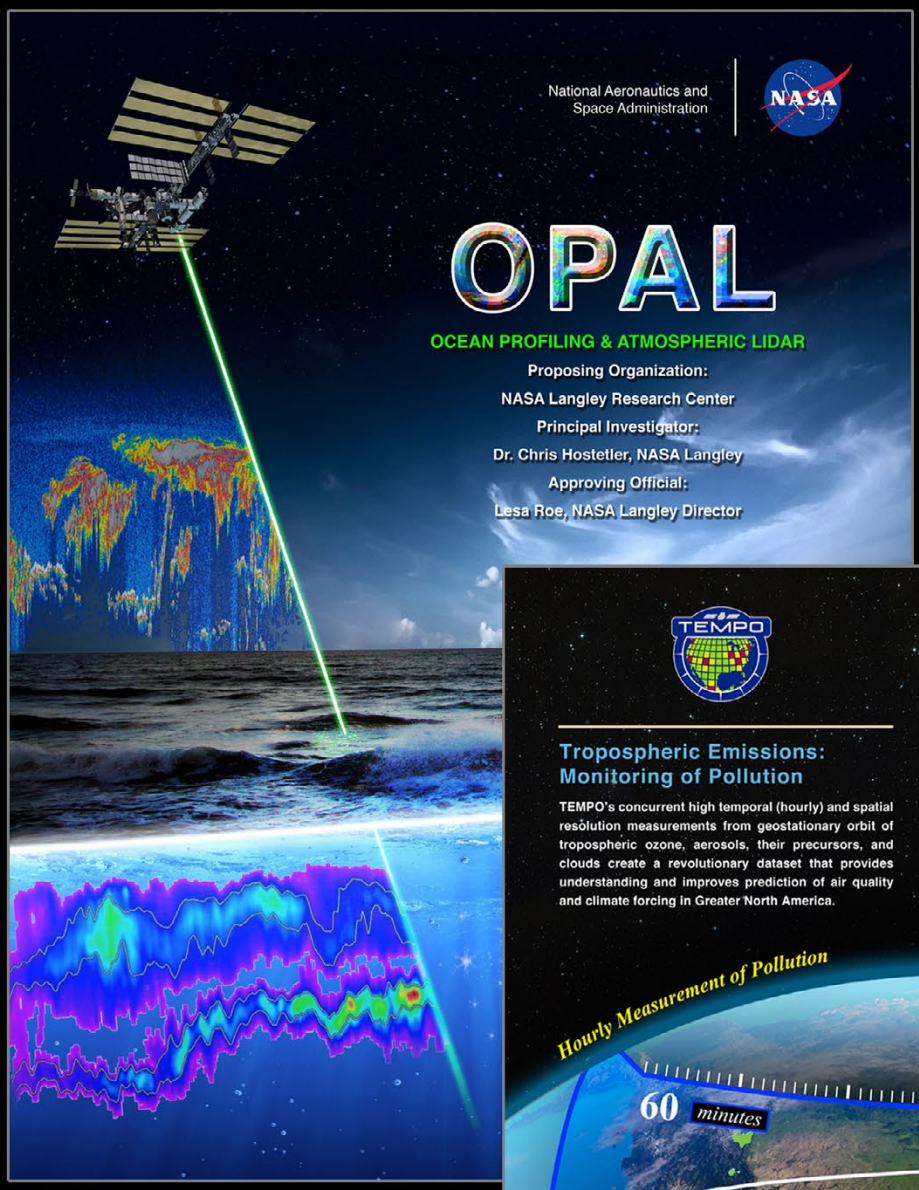
Ares I-X Flight Test Vehicle

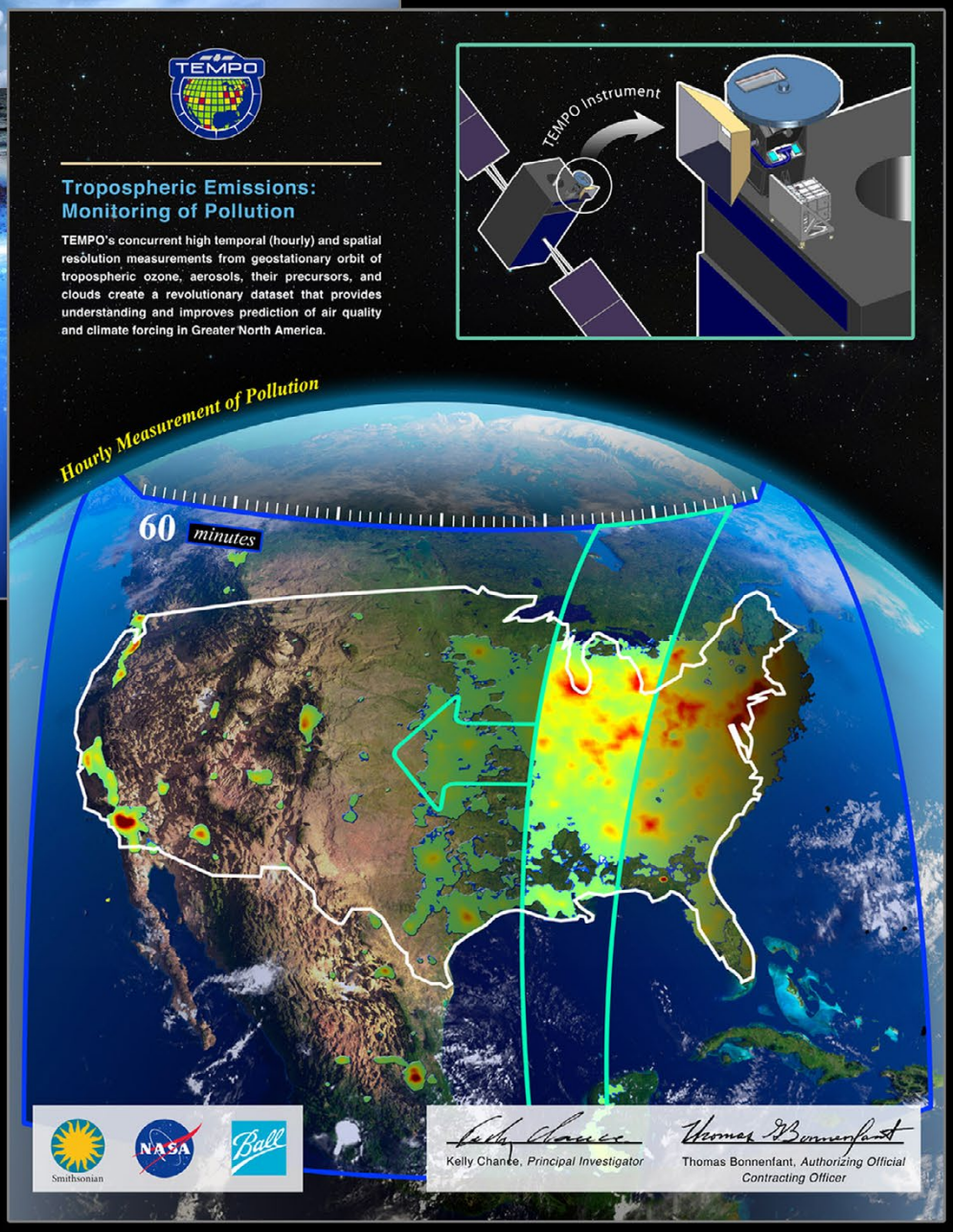


Acronyms - **APUC** - Auxiliary Power Unit Controller, **Assy** - Assembly, **BDM** - Booster Deceleration Motors, **BTM** - Booster Tumble Motors, **CM** - Crew Module, **COTS** - Commercial Off the Shelf, **DFI** - Development Flight Instrumentation, **ECS** - Environmental Control System, **FSAM** - First Stage Avionics Module, **FTINU** - Fault Tolerant Inertial Navigation Unit, **GOX** - Gaseous Oxygen, **LAS** - Launch Abort System, **MDAU** - Master Data Acquisition Unit, **RDAU** - Remote Data Acquisition Unit, **RoCS** - Roll Control System, **RSRM** - Reusable Solid Rocket Motor, **RRGU** - Redundant Rate Gyro Unit, **USS** - Upper Stage Simulator



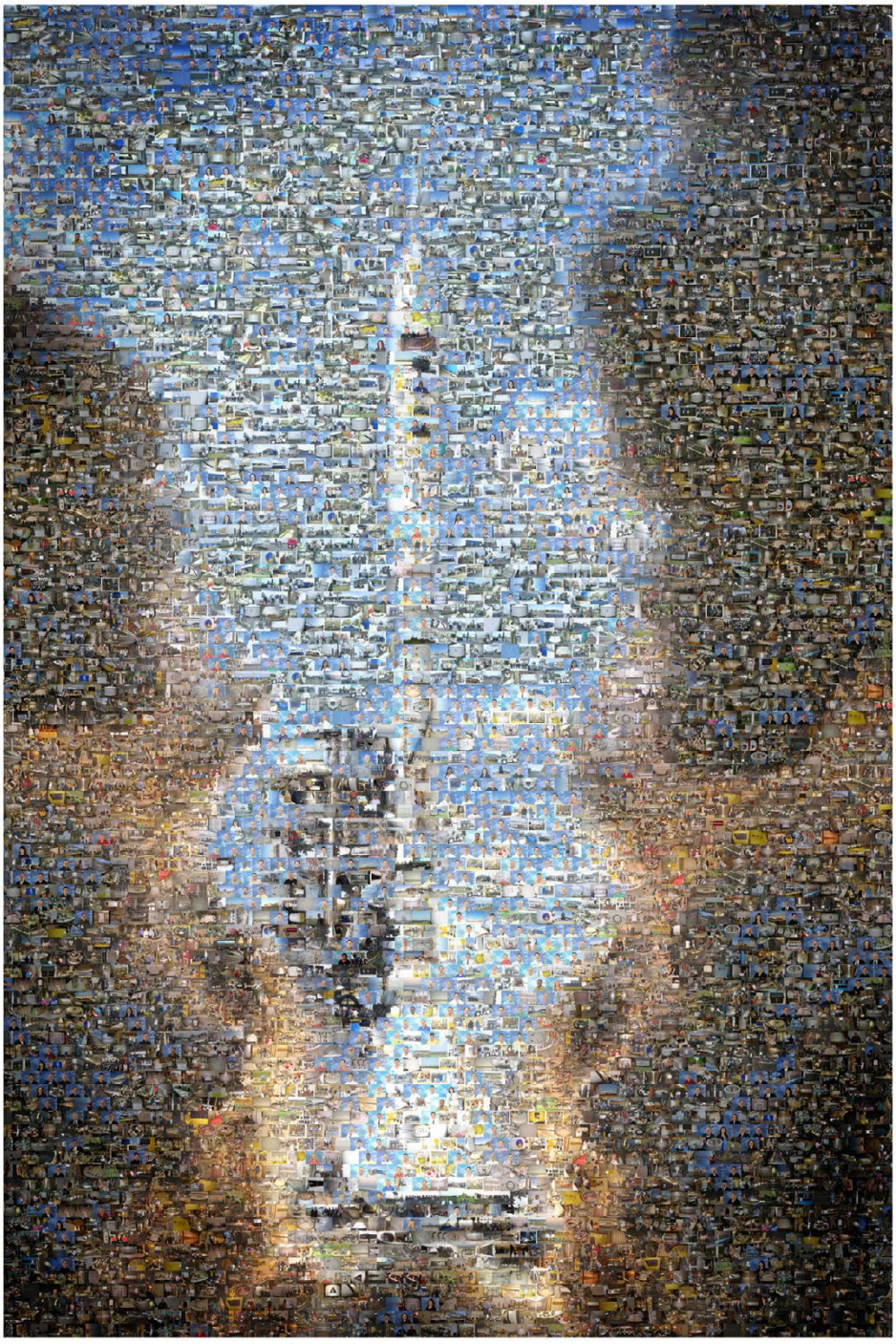
FPD


National Aeronautics and
Space Administration
NASA
OPAL
OCEAN PROFILING & ATMOSPHERIC LIDAR
Proposing Organization:
NASA Langley Research Center
Principal Investigator:
Dr. Chris Hostetler, NASA Langley
Approving Official:
Lesa Roe, NASA Langley Director


TEMPO
Tropospheric Emissions:
Monitoring of Pollution
TEMPO's concurrent high temporal (hourly) and spatial resolution measurements from geostationary orbit of tropospheric ozone, aerosols, their precursors, and clouds create a revolutionary dataset that provides understanding and improves prediction of air quality and climate forcing in Greater North America.
TEMPO Instrument
Hourly Measurement of Pollution
60 minutes
Smithsonian
NASA
Ball
Kelly Chance, Principal Investigator
Thomas Bonnenfant, Authorizing Official
Contracting Officer

FPD

National Aeronautics and Space Administration



Ares I-X

The First Flight of a New Era

Developed by: NASA LaRC, NASA MSFC/Teledyne Brown/ATK Thiokol/Lockheed Martin, NASA GRC, NASA JSC, NASA KSC/United Space Alliance

www.nasa.gov

NW-2009-07-0026-LaRC


SAGE III • ISS
SAGE III | on ISS


CERES
CERES | on JPSS
Outgoing Longwave TOA Flux
0 63 127 190 253 317 380
Watts/meters²

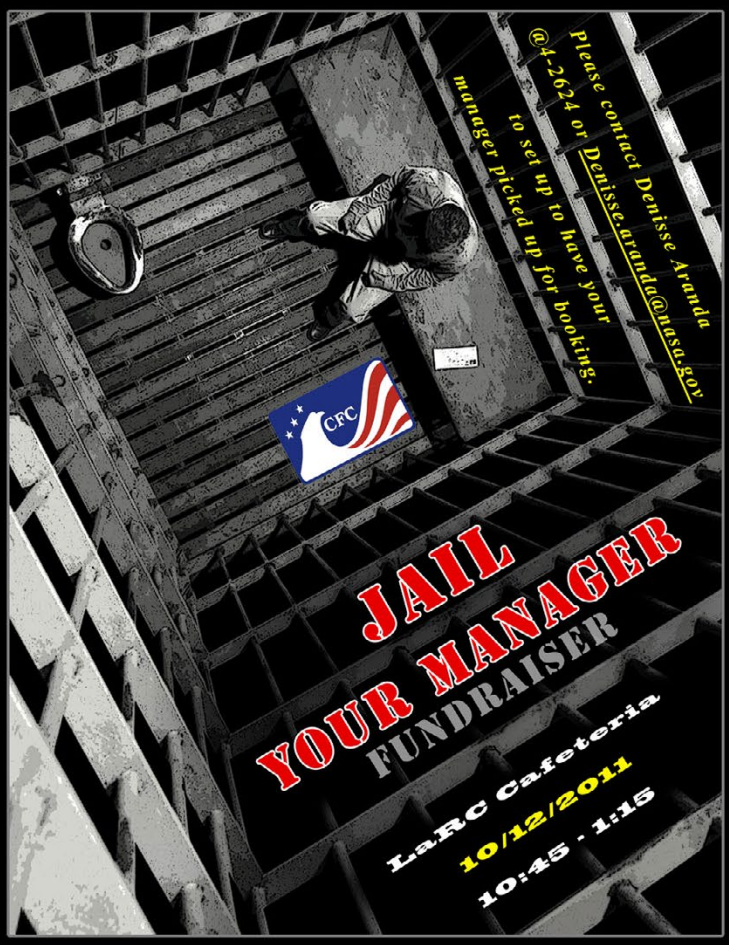

DEVELOPMENT FLIGHT TEST
ARES I-X
NASA | Ares I-X


NASA
EDGE
An Inside and Outside
Look at All Things NASA


DEVELOPMENT FLIGHT TEST
ARES I-X

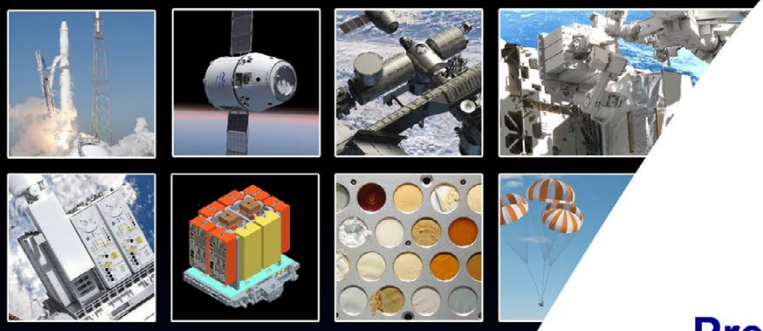
FPD


LaRCtoberfest
presented by the
LaRC Exchange
2010
join us October 22nd
MAIN EVENT…
4:00-9:00 pm - Food, Games, and live Music at the Reid Picnic Pavilion
POC: Donis Anders
donis.m.anders@nasa.gov
CFC EVENTS…
11:00 am - Pumpkin Fest in the Cafeteria
POC:Stan Ward
stan.ward@nasa.gov
2:00 pm - Parade and Car Show
POC: Lindsay Rogers
lindsay.m.rogers@nasa.gov
Combined Federal Campaign &
Langley Emerging Professionals Social Committee
CFC


Please contact Denisse Aranda @4-2624 or Denisse.aranda@nasa.gov to set up to have your manager picked up for booking.
CFC
JAIL
YOUR MANAGER
FUNDRAISER
LaRC Cafeteria
10/12/2011
10:45 - 1:15


3nd Annual NASA Langley CFC
PARADE AND
CAR SHOW
NOVEMBER 7TH, 2011
CFC


CFC & LEPSC
Events Present
the Up and Coming, First Ever!
LaRC Parade & Car Show
CFC
Prepare your worthy Car, Truck, or Motorcycle to enter in a parade and static show on October 22nd. Open to all makes, models, and years.
PRIZES
DASH PLAQUES
and MORE!
A nominal donation to CFC will be accepted for registration. Looking for... Best Sound System - Best "Geek-My-Ride" - Classics - Motorcycles - Trucks - Most Traveled
Donations made through this event will be counted as undesignated contributions to the CFC and distributed according to CFC regulations.
POC for Registration:
Lindsay Rogers
lindsay.m.rogers@nasa.gov
864.7283
or Wendy Pennington
wendy.f.pennington@nasa.gov
864.7126
LaRC
Combined Federal Campaign &
Langley Emerging Professionals Social Committee



National Aeronautics and Space Administration

NASA

Presentation Title

Presenter, *Presenter Title*

MISSE

Materials International Space Station Experiment - X

www.nasa.gov

February 5, 2015

(757).864.XXXX

Your.M.Name@NASA.gov

National Aeronautics and Space Administration

NASA

Presentation Title

Presenter, *Presenter Title*

Engineering Directorate

NASA Langley Research Center

February 5, 2015

(757).864.XXXX

Your.M.Name@NASA.gov

FPD