

National Aeronautics and Space Administration



# explore

**Saturday  
9-26-2015**

**@ NASA GODDARD**

# electronic program

# Welcome to Explore@NASAGoddard!

We know you'll have a great time "Celebrating Hubble and the Spirit of Exploration"—the theme for today's event. Look for Hubble Space Telescope-related activities marked by  in this program. Please use the enclosed map to navigate around our center.

## Schedule of Presentations:

### **Bldg 1, E100B**

James Webb Space Telescope Career Panel: 12:30

### **Visitor Center, Science On a Sphere**

- 11:15 Our Changing Planet: Sample View of Changes on Planet Earth with Claire Parkinson
- 12:00 Taking the Pulse of Our Forests with Lola Fatoyinbo
- 1:00 A Tour of Science at Goddard with Jim Garvin
- 2:00 Our Changing Sun with Holly Gilbert
- 3:00 Science at Goddard: More Than You Can Imagine with Michelle Thaller
- 4:00 Sunny With a Chance of Solar Storms with Alex Young

### **Bldg 3 Auditorium**

- 12:00 Heads Up Environmental Management with Joel Donham
- 12:45 Servicing Hubble: Stories from Former Astronaut John Grunsfeld
- 2:00 We Could Not Fail with Author Richard Paul
- 2:30 The Future of Human Exploration with NASA Astronaut Nicole Aunapu Mann
- 3:15 Overview of the Hubble Space Telescope with Jim Jeletic
- 4:00 My Experience as a Nobel Laureate with John Mather

### **Bldg 34, Room W150**

- 12:00 OSIRIS-REx Asteroid Sample Return Mission with Jason Dworkin
- 12:30 Science Overview by Hubble's Senior Project Scientist Jennifer Wiseman
- 1:30 What is NICER? with Keith Gendreau
- 2:30 Dinosaur Tracking in Goddard's Backyard with Ray Sanford
- 3:15 Terra's 15 Years of Data with Kurt Thome
- 4:00 Animating Gamma-ray Science with Robin Corbet

### **Bldg 34, Science On a Sphere Lobby**

- 12:00 Peeking Into the Solar System: James Webb Space Telescope with Stephanie Milam
- 1:00 Science at Goddard: More Than You Can Imagine with Michelle Thaller
- 2:00 Exploring the Outer Solar System with Amy Simon
- 3:30 Seeing Our World as Only NASA Can! with Maurice Henderson

### **Bldg 32, Room E103**

- 1:00 Wallops 360 (video)
- 3:00 The Global Precipitation Measurement Mission with Art Azarbarzin

### **Bldg 28, Room S214 Data Exploration Theater**

- 12:00 Scientific Visualization Studio with Lori Perkins
- 12:30 Climate Supercomputing in High Definition with Dan Duffy
- 1:00 Earth in Motion with Steve Pawson
- 1:30 Our Dynamic Sun: Space Weather and You with Carrie Black
- 2:00 Visualizing Heliophysics with Tom Bridgman
- 2:30 The Making of an Icon: Earthrise with Ernie Wright
- 3:00 A Mars Exposé with Jim Garvin
- 4:00 Hubble Space Telescope: 25 Years of Stunning Images and Science Discovery with Padi Boyd

### **Bldg 28, Room E210 Explore Theater**

- 12:00 Aurorasaurus with Elizabeth MacDonald
- 1:30 Space Weather: The Sun-Earth Connection with Yaireska Collado-Vega
- 2:30 Magnetospheric Multiscale Mission with Brent Robertson
- 3:30 Twitter, Facebook, Instagram & More: NASA & Social Media



# Buildings: 8, 1, 5 and 28

## Building 8

### LEGO: Unleash Your Creativity

Kids of all ages can build with LEGO bricks. Limited capacity. Pick up tickets from auditorium (2<sup>nd</sup> floor) in advance of activity time slots. Activity runs every hour.

## Building 1

### Ask Me About My Career **explore**

Goddard employees, including members of the Hubble Space Telescope missions, will answer questions about their careers.

### James Webb Space Telescope Career Panel

More than engineers and scientists, at 12:30.

### Story Time With the Greenbelt Public Library

Hear space-themed stories.

### How to Get a Job in the Federal Government

See a demo of USAJobs.gov and find out how to apply for positions at Goddard. We do more than rocket science.

### Future Innovative Rising Engineers NSBE Jr. STEM Demo

Watch middle and high school students demonstrate robots they built for STEM competitions.

### Hubble Space Telescope Activities (Café) **explore**

See space tools for the Hubble Space Telescope on display. Learn how spacewalks are optimized for efficiency and safety. See a stunning large display of the Andromeda Galaxy, the closest galaxy to the Milky Way.

### Goddard Film Fest

See short animation films created by Goddard's own Scientific Visualization Studio.

### Assistive Technology Lab Demonstrations

See some of the available tools from this lab, a collaborative effort that provides a facility for testing, analyzing and showcasing various assistive technologies.

## Building 5

### Advanced Manufacturing Branch Tour

See where satellite parts are constructed and crafted.

### NASA-Mobile Machine Shop Trailer

Step into NASA's full-size machine shop on wheels!

### Robotics and Students

See the FIRST Robotics of South River HS PowerHawks Team #1111 and VEX Robotics for the classroom.

### Electrical Training Equipment for Astronauts **explore**

See Hubble's high-fidelity mock-up used to train astronauts for the servicing missions.

## Building 28

### Solar Viewing With Telescopes

Goddard scientists will help you find sunspots and prominences on our closest star!

### Space Weather Kinesthetic

Play this game to understand how a solar storm charges toward Earth's magnetic field to create auroras.

### ITPO: Telling Stories

The Innovative Technology Partnerships Office highlights some of the success stories linking NASA researchers with corporations, startups, universities and other agencies. Get an "I Am Innovation" Polaroid picture.

### UV Radiation **explore**

Make a bracelet from UV beads to understand radiation risks.

### Conceptual Image Work Station

See how Hollywood tools create science animations. Watch a Goddard animator create videos to be used on TV and educational programs.

### See the Sun as NASA Does

Watch live satellite images of the sun. Learn how you can watch the sun from your iPad!

### NASA Center for Climate Simulation: Climate Computing Facility (Room S100)

See a NASA supercomputer in action and learn about its performance, power and cooling demands.

### MMS

See the full-size model of a Magnetospheric Multiscale mission spacecraft. Then use the Oculus Rift virtual reality head mounted display to see the MMS observatories high above Earth.



= Explorer Passport Kids Stamp Activity



= Hubble Space Telescope



= Hands-On Activity



= Walking Required



# Buildings: 28, 3, 13, 14 and 7

## Building 28 (continued)

### 3-D Printing

Watch objects be created with a MakerBot 3-D printer.

### TV Studio (Room N175D)

See the actual studios and control rooms where NASA broadcasts across America interviews with our scientists and engineers.

### Goddard TV Operations (Room N212)

Tour the world-class Goddard TV operations facility which provides engineering and satellite uplinks.

### Flight Dynamics (Room N222)

Visit with spacecraft orbit and control experts and learn how we design a spacecraft's orbit.

### Star Wars Costumed Characters and R2-D2 Droids!

Meet characters from Star Wars who will mingle and pose for photos. This includes R2 droids built by a local group of fans.

### NASA Gear

Spirit wear and other items available for purchase.

## Building 3

### NASA's Office of Inspector General and the Hubble Program

See the mobile command center used by the inspector general. 

### Exploring the Universe With Light and Color

With the Space Telescope Science Institute, discover how astronomers glean information from the light of distant stars, nebulae and galaxies. 

### Hubble Control Center Tour

See where history has been made at the control center for the world's first space telescope. Limited capacity.

## Building 13

### Tracking Data Relay Satellite

NASA provides around-the-clock space communications and navigation services through our nine TDRS satellites. Come talk to real engineers who work on the project. Learn its history, tech specs and future.

### Network Integration Center

See where and how we communicate with the space station.



= Explorer Passport Kids Stamp Activity



= Hubble Space Telescope



= Hands-On Activity



= Walking Required

### How do we communicate with the space station?



### How do satellites and space missions send data to Goddard?

These questions and more can be answered with **18 activities**, like the NetworKing computer game, Laser Pointing and Water Tables.

### Space Mobile Networking

What's next for space communications!

### #AskISS

Send your questions to the International Space Station.

## Building 14

### Space Science Control Room

Tour the control centers for several Goddard missions. Limited capacity.

### NASA Communications Network

Tour NASCOM, the hub for the tracking network that links 2 million circuit miles of communications channels.

## Building 7

### Spacecraft Integration and Test Facility Tour



At your own pace, see where we build and test spacecraft! You'll see clean rooms, a space environment simulator and a centrifuge. Take a peek at the ATLAS instrument for ICESat-2.

### Optics-Enabling Exploration

Hands-on activities about optics and the properties of light: lenses, mirrors, prisms and grating for making rainbows and polarizers.

### Wallops Flight Facility Balloon Program

Learn how NASA uses massive balloons for research and scientific discovery.

### Robots in Space!

From refueling a satellite to capturing an asteroid: What does it take? Answers are in this interactive tour of the Cauldron, a robot-filled incubator for new satellite servicing technologies.

### Rocket Science 101

See how NASA's Launch Services Program at Kennedy Space Center helps send spacecraft into orbit or farther into space.



# Buildings: 29, 32 and 34

## Building 29

### Building the James Webb Space Telescope

Cleaner than an operating room! See where we are building the Webb telescope.

### Infrared Camera Demo

Discover how infrared technology helps scientists see the universe!

### “Behind the Webb”

Watch a series of videos about the Webb telescope.

## Building 32

### Rain Towers

Use blocks to build towers comparing rainfall in cities across the world.

### Greenland Ice Core

Handle a real Greenland ice core and see how scientists use ice to determine what happened in the past.

### What Color Is the Ocean?

Different colors indicate phytoplankton growth. Use a spectrophotometer to compare water samples.

### Sounds of Change

Play a musical game to understand the view from Landsat Earth-observing satellites.

### Earth Science at Wallops Flight Facility

A visual display of Earth science research from Wallops Flight Facility.

### Simple Soil Moisture Measurements

Take measurements and learn how NASA's satellites do it from space.

### Earth Puzzle (tent)

Create a NASA-like image of Earth.

### Exploring Changes in the Land With Landsat (tent)

In this game, identify how land masses change over time.

### Glacier Races!

Make a putty glacier and experiment with what can make it move quickly or slowly.

### GOES-R Goes to Launch!

The future of weather forecasting is coming!

### UV Beads (tent)

Determine your ultraviolet exposure with these beads.

### Are You a Super Sleuth? (tent)

Identify what these NASA Earth science satellite images show by answering clues.

### Suomi NPP Climate Results and Suomi NPP/JPSS Weather

See instrument models and talk to JPSS staff about how Goddard builds satellites. Find out how NOAA uses information from these satellites for weather observations and forecasting.

### GLOBE: Cloud in a Bottle and Hot or Cold

Make a cloud in a bottle, use an infrared scanner on soil samples, and learn how NASA studies clouds, soil, temperature and other environmental aspects through the GLOBE Program.

### A Tour of NASA Worldview (tent)

Visualize global Earth science data to see Earth as it looks right now – or at least within the past few hours.

### Mission Control Center Tours (2<sup>nd</sup> Floor)

See where and how NASA Goddard controls several Earth-observing satellites and the Lunar Reconnaissance Orbiter.

### EOS Mission Control Theater (2<sup>nd</sup> Floor)

Relax and watch a short video of the mission control centers in action!

### Space Geodesy Project (2<sup>nd</sup> Floor)

Connect the dots between quasars and the center of Earth.

### Mineral and Rock Exploration With Earth Science Week!

## Building 34

### Playing With Gravity (Room W120)

Explore how gravity distorts space-time.

### Gamma-ray Constellations (Room W120)

Work with the Fermi mission team to match new constellations with their proper sky positions.



= Explorer Passport Kids Stamp Activity



= Hubble Space Telescope



= Hands-On Activity



= Walking Required



# Buildings: 34 and Visitor Center

## Building 34 (continued)

### Cassini CIRS – More Than a Decade Orbiting Saturn

Learn about the amazing discoveries made by Cassini and talk to the people responsible!

### Gamma-ray Burst Lottery (Room W120)

Can you predict where the next spectacular explosion will occur?

### TESS Exoplanet Transiting Demonstration



How will the TESS spacecraft find exoplanets?

### Uncovering Mysteries of the Universe With WFIRST

Information on a Goddard-built space telescope that will study dark energy and exoplanets.

### Juno: Mission to Jupiter

Entering Jupiter's orbit in 2016, Juno carries magnetometers built at Goddard.

### The Astro-H Mission

See how NASA teamed with Japanese scientists to develop the coldest instrument ever built to study the hottest objects in the universe.

### OSIRIS-REx Mission to Asteroid Bennu



Learn about the asteroid sample return mission launching in 2016.

### The Curiosity Rover Investigates Gale Crater

See a full-scale, inflatable model of the rover and chat with scientists who use Curiosity's data.

### Preparing for Human Exploration With Handheld Field Instruments

See how these instruments have potential use for human exploration on Mars.

### The MAVEN Mission at Mars

What we've learned about Mars!

### Mars Environmental Chamber (Room C180)

### Maryland Space Public Outreach Team (SPOT) (Room 130)



Interactive Space Exploration for Kids, presented at 12:00, 1:00, 2:00 and 3:00.

## Visitor Center

### Exploring the Moon

See the Lunar Reconnaissance Orbiter model and ask the mission scientists and engineers questions. See moon rocks returned from the Apollo missions!

### Space Racers (Auditorium)



Watch your favorite episodes and do fun activities.

### Space Operations Learning Center



Using an interactive web portal, learn about this education and outreach effort engaging students in science and engineering.

### Measuring Our Atmosphere

Build an energy meter and see how the Aura satellite measures the composition of Earth's atmosphere from space.

### Ozone Garden

Plants can be damaged by pollution and that makes them a good indicator of pollution exposure.

### Scouts Explore Goddard (tent)



A STEM scavenger hunt sponsored by Girl Scouts.

### Light-up NASA Badge



Assemble an electrical circuit and illuminate a NASA badge.

### A How-to Launch

Build and launch your own pop rockets at the tent. Then at 12:30 and 3:00, the National Association of Rocketry Model Rocket Club, Section #139, will show us how to launch model rockets.

### Astrobiology Walk (Rocket Garden)

Guided tours through the newest exterior exhibit at the visitor center.

### Earth and Planetary Tic-Tac-Toe



This game uses the discoveries of Goddard's missions and research.

### Star Wars Costumed Characters!

Meet characters from Star Wars who will mingle and pose for photos.



= Explorer Passport Kids Stamp Activity



= Hubble Space Telescope



= Hands-On Activity



= Walking Required

## SEE THE VISITOR CENTER ANYTIME

Open year-round, you can browse the unique, informative exhibits such as "Solarium," the Webb telescope and Science On a Sphere. Participate in monthly model rocket launches and Sunday Experiments.

[www.nasa.gov/centers/goddard/visitor](http://www.nasa.gov/centers/goddard/visitor)

## On the Mall

### Need Help?

#### Information Booth

#### Event Headquarters

**First Aid** (Available in two locations for your convenience.)

### Entertainment on the Stage

Volunteer Performers from Goddard

11:00 Event Opening with DJ Scientific

11:30 Kickoff with Goddard Director Christopher Scolese

12:00 Goddard Dance Club (Salsa Demo and Mini-Lesson)

12:20 Kasha Patel (Science Comedy)

12:45 Alicia Rae (Singer/Songwriter/Pop Artist)

1:25 KNS Indian Dance School (Indian Dance)

1:50 The Chromatics (Science A Cappella)

2:30 Mad Science Demo

3:10 Goddard's Music and Drama Theatre

3:50 Michael Kelly (Alt-Country, Folk and Blues)

4:30 Arundelair Chorus (A Cappella)

### Mad Science of Washington, D.C.

Amazing science demonstrations!

### Pursuing Sustainability Through Environmental Management

Goddard's stewardship in stormwater management and energy.

### Create with KID Museum

Using a variety of everyday materials, create a flying object and test it in our wind tubes.

### Office of Education

Stop by to see what Goddard's Office of Education has to offer students and parents.

### NASA Gear

Spirit wear and other items available for purchase.

### University of Maryland

Learn about a variety of MBA/MS part-time programs at the university's Smith School of Business.

### Capitol Technology University—Feed Your Geek

Meet reps from Maryland's only independent school dedicated to engineering, computer science, information technology and business.

### We Are GISS

Highlights of the Goddard Institute for Space Studies work on Earth's changing climate and search for Earth-like planets in distant solar systems.

### Goddard Dance Club

### Build and Test a Paper Airplane

Choose your design and document the results! Learn to "build quality in" with this simple experiment.

### Chesapeake Bay From Space

A large canvas of the bay as seen by the Landsat satellite.

### Moonbounce Sponsored by NASA Federal Credit Union

### Tesla Motors: The Model S

Find out about this vehicle's uniquely engineered features.

### SMARTLabs: Achieve and Commit Mobile Lab

Explore mobile laboratories and more than 30 air-quality instruments—including radars, gas monitors and aerosol detectors—as they operate in real time.

### M-NCPPC Department of Parks and Recreation,

### Prince George's County

"Live More, Play More"

### Ask a Scientist

Bring your best questions for Goddard's brightest stars!

### Meet and Greet

11:00 Celebrity Chef Tobias Dorzon

12:00 Astronaut Nicole Aunapu Mann

1:00 Astronaut Paul Richards

2:00 TV News Coordinator Micheline Bowman

3:00 Former Astronaut John Grunsfeld

### Explore @ NASA Goddard Food Vendors

- Mall Food Vendors:** Chatpat (Indian Vegetarian), Kaifa Mania (Mediterranean), Captain Cookie & the Milkman (Ice Cream/Dessert), California Sliders (Sandwiches), Red Hook Lobster Pound (Seafood), Tapas, Chick-fil-A.
- Building 28 Food Vendors:** Tasty Kabob (Mediterranean), Simple on Wheels (Ethiopian), Weakness for Sweetness (Jamaican), Big Cheese (Sandwiches), Feelin' Crabby (Seafood), Bay's Soft Ice Cream (Ice Cream).
- Building 32 Food Vendors:** Luncheonette Lady (Sandwiches/Salads), Little Morocco (Moroccan), Mesob on Wheels (Ethiopian), Rito Loco (Mexican), BONIMI (Vietnamese), Hardy's BBQ (BBQ), Momma's Kitchen (Desserts), Frozen Yo to Go (Yogurt).

### Information to Use

- In case of emergency, call 301-286-9111. Notify a volunteer in an orange vest.
- Got a question? Find an Info Booth marked with blue pennants, call the Event HQ at 301-286-9976, or tweet us @NASAGoddard.
- Let us know how much you enjoyed Explore@NASAGoddard GSFC-ENG-Feedback@mail.nasa.gov

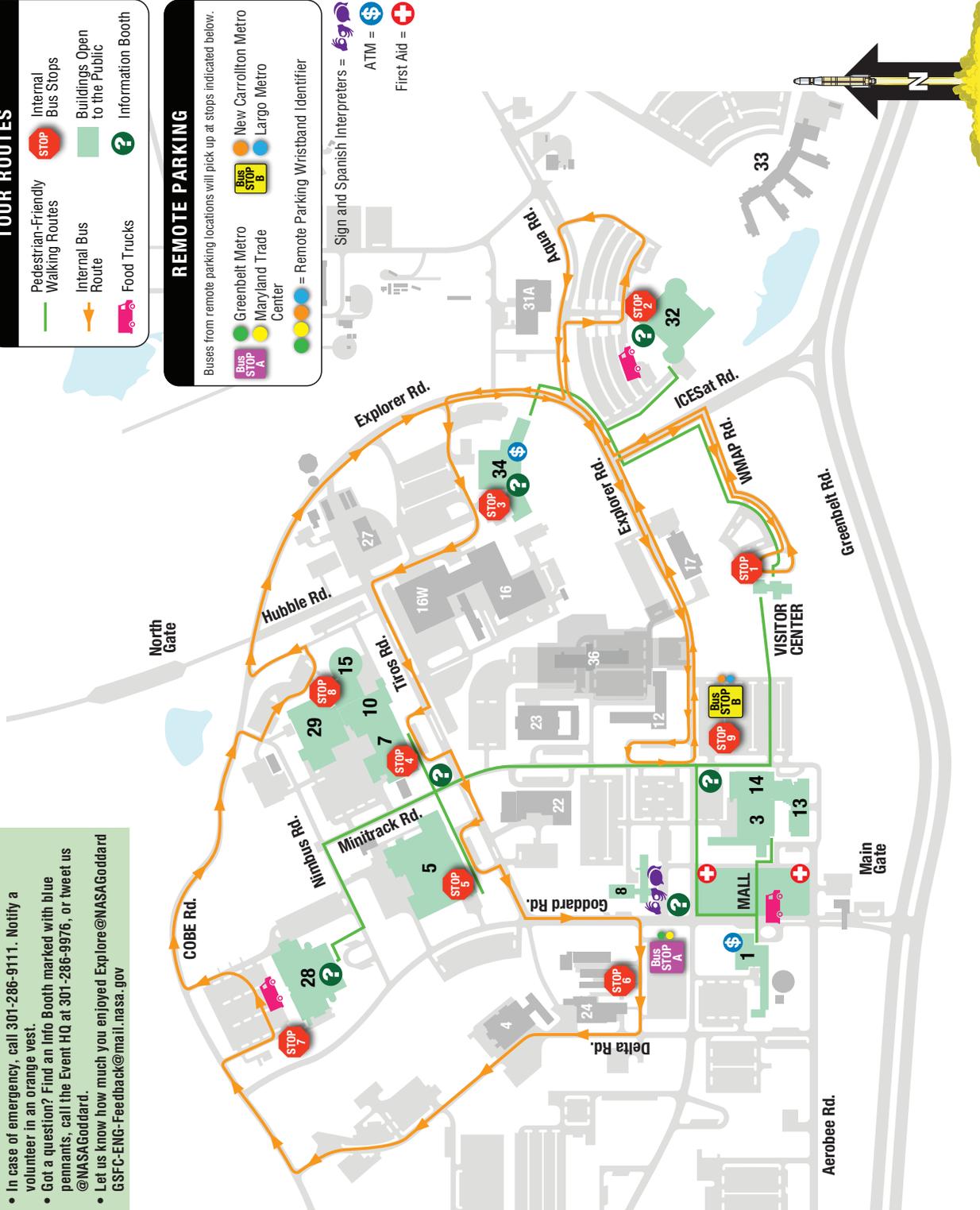
### TOUR ROUTES

- Pedestrian-Friendly Walking Routes
- Internal Bus Routes
- Food Trucks
- Internal Bus Stops
- Buildings Open to the Public
- Information Booth

### REMOTE PARKING

- Buses from remote parking locations will pick up at stops indicated below.
- Greenbelt Metro
  - New Carrollton Metro
  - Maryland Trade Center
  - Remote Parking Wristband Identifier

- Sign and Spanish Interpreters =
- ATM =
- First Aid =



### Earth Right Now—Your Planet Is Changing. We're on It.

See it in Building 32, the Mall and Visitor Center.  
International Space Station—We're Working Off the Earth, For the Earth

See it in Building 13.  
Mars—Journey to Mars  
See it in Building 34.

Solar System and Beyond—NASA: We're Out There  
See it in Buildings 1, 14, 34 and 28.

Aeronautics Research—NASA Is With You When You Fly  
See it in Building 7 and Visitor Center.  
Technology—Technology Drives Exploration  
See it in Buildings 1, 5, 7, 13, 28 and 29.

### Pedestrian-Friendly Walking Routes

- Mall to Building 5**  
(Est. Distance: 1,185 ft / 6 minutes) —Slight incline along route
- Mall to Visitor Center**  
(Est. Distance: 2,213 ft / 8 minutes) —Steep incline up back walkway
- Building 5 to Building 28**  
(Est. Distance: 1,320 ft / 5 minutes)
- Building 7 to Building 28**  
(Est. Distance: 1,320 ft / 5 minutes)
- Visitor Center to Building 32**  
(Est. Distance: 2,353 ft / 8 minutes)
- Building 32 to Building 34**  
(Est. Distance: 1,088 ft / 6 minutes)

NOTE: Look for directional signs along the routes.