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JANUARY 2022

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ELON MUSK GOES BIG

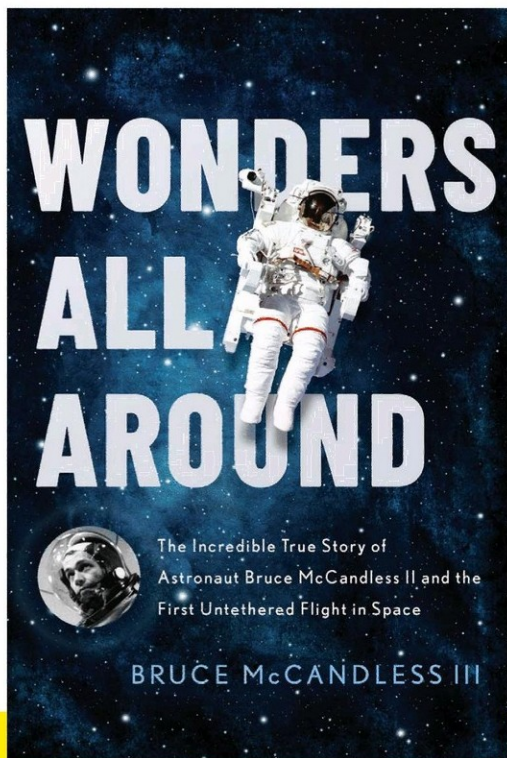
THE MONSTER
BOUND FOR MARS

One Ugly
Airplane

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The Men Who
Tried To Stop
Amelia Earhart

SpaceX
Starship



Author Interview

The Patient Astronaut

Bruce McCandless waited almost two decades for his first space flight.

THE BOOK Most of us know Bruce McCandless II by the famous photograph taken by fellow astronaut Robert “Hoot” Gibson as McCandless tested the manned maneuvering unit, or MMU, a jetpack that propelled him 300 feet away from the space shuttle. His son, Bruce McCandless III, has written a book that fills in the picture of his father’s life before and after that iconic image. *Wonders All Around* documents the setbacks and triumphs of his father’s career, which began with his service as a U.S. Navy pilot. The older McCandless joined NASA in 1966 but did not travel to space until 1984, when he flew aboard the space shuttle *Challenger*.

WHY THE AUTHOR DECIDED TO WRITE IT

“In the last year of his life, my father decided he would write a memoir. Unfortunately, he had some physical problems that prevented him from making much progress. So I decided

to write the story for him. Granted, it’s not as technical a story as he would have written, but I think it’s a little more fun.”

A CHAT WITH BRUCE McCANDLESS III Did being the son of an astronaut ever work to your advantage?

Not that I can tell. My father didn’t get a mission until 18 years after he joined NASA. No one knew who he was until the famous untethered jetpack flight in 1984, at which point I was in graduate school in England. I guess it did help me get a date one time, now that I think about it, but the percentage of people who are impressed by aerospace technology is even lower in the UK than here. Now if he’d been a midfielder for Chelsea, that might have opened some doors.

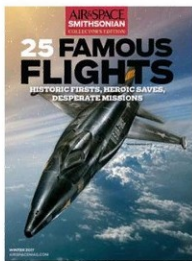
While testing the MMU in space, do you think your father felt afraid?

Great question. He always said he didn’t. I suspect that this was at least in part because he spent years of his life helping to design and test the MMU, and to admit to fear would in effect have been to question his own work. Nevertheless, plans for his test flight called for him to back out from the orbiter, then turn around so that he was facing away from the spacecraft. Watch the video. You’ll notice he never quite got around to letting *Challenger* out of his sight. Is that fear? Or just common sense? I can’t decide.

When you see the famous photo of your father, what are you thinking?

First of all, I’m thinking Hoot Gibson was a heck of a photographer. Aside from that, seeing it puts a smile on my face. My dad’s plans didn’t always work out. He spent an awful lot of years feeling like a washout. But he hung in there, got his shot at a spaceflight, and ended up on a million refrigerators. I get a kick out of that.

■ DIANE TEDESCHI IS A SENIOR ASSOCIATE EDITOR AT AIR & SPACE/SMITHSONIAN. ■ READ THE FULL INTERVIEW AT AIRSPACEMAG.COM/MC-CANDLESS



Aviation

25 Famous Flights

Thrilling rescues, record-setting flights, daring combat missions, outstanding joy rides—all made aviation history. This issue tells the stories behind them with text accompanied by full-color photographs. *books. smithsonianmag.com/famousflights*



History

World War II in 65 Airplanes

From the fearsome Junkers Stuka that started the war to the airplane that ended it—the Boeing B-29 Superfortress—this issue recounts the history of World War II through profiles of the now legendary aircraft that fought it. *books. smithsonianmag.com/ww2*

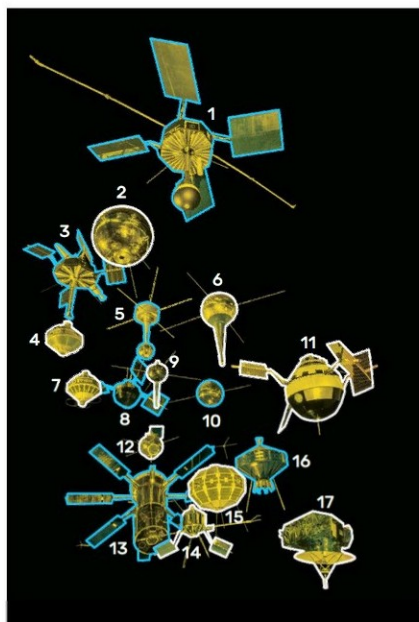


Space

50 Greatest Moments of the Space Age

This history of the Space Age from the launch of Sputnik to the current U.S. return to the moon presents 50 stunning photos of historic moments and explains their significance to space exploration. *books. smithsonianmag.com/spaceage*

ONE MORE THING



PAGE 84 IMAGE KEY

Name That Satellite

- 1 Explorer 18 (IMP-A) 1963
- 2 Explorer 17 1963
- 3 Explorer 12 1961
- 4 Explorer 8 1960
- 5 Explorer 10 1961
- 6 Vanguard 3a 1959
- 7 Explorer 7 1959
- 8 Explorer 6 (Able 3) 1959
- 9 Vanguard 3 1959
- 10 Vanguard 2 1959
- 11 Pioneer 5 1960
- 12 LOFTI 1 1961
- 13 Advanced Orbiting Solar Observatory (canceled before launch)
- 14 Ariel 1 1962
- 15 Alouette 1962
- 16 Pioneer 1 (Able 2) 1958
- 17 New Horizons 2006

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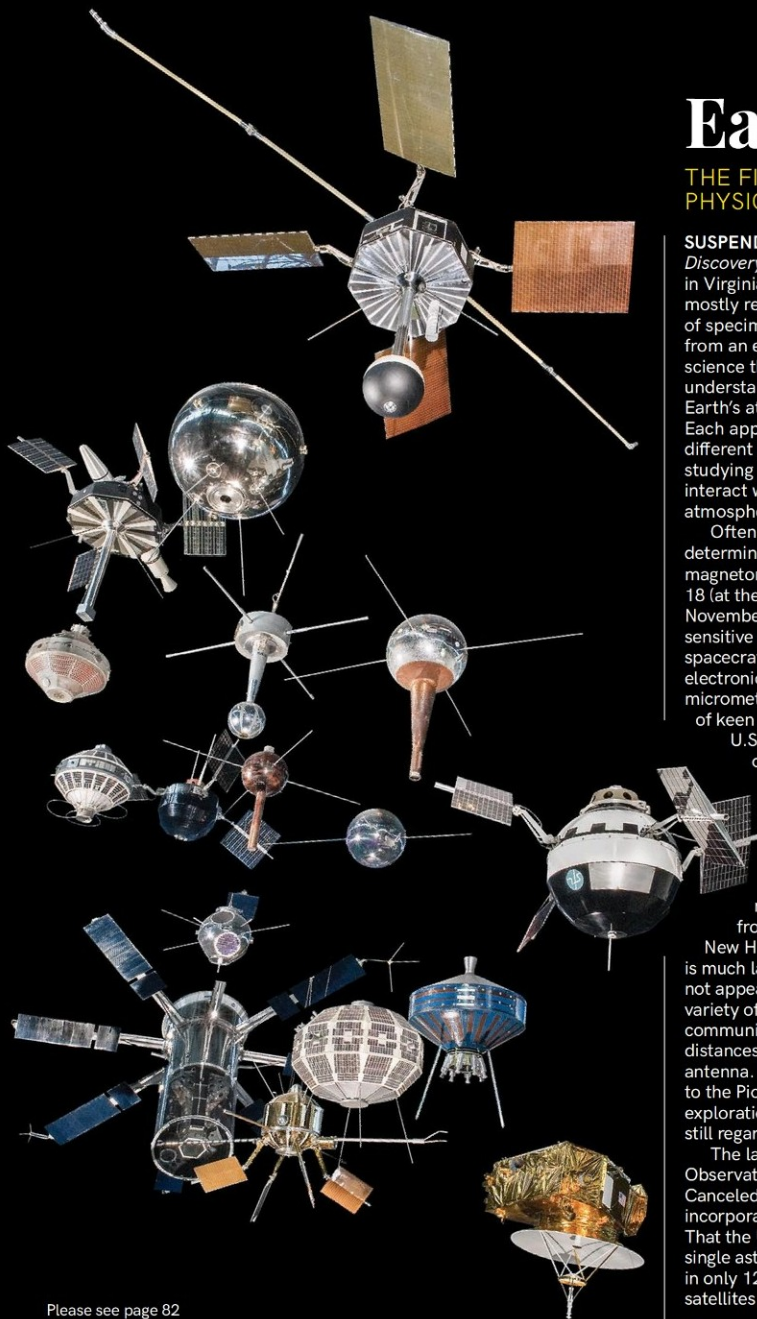
Discovery at the Steven F. Udvar-Hazy Center in Virginia, this constellation of satellites, mostly replicas, is made up almost entirely of specimens from the 1950s and '60s, relics from an early but fast-evolving era of space science that gave researchers their first genuine understanding of the uppermost layers of Earth's atmosphere and its magnetic field. Each appears unique—they were designed by different agencies—but most shared a purpose: studying how radiation and solar particles interact with the molecules in the upper atmosphere.

Often the instrumentation payload determined the design: Those carrying magnetometers, for example, like Explorer 18 (at the top), which entered Earth orbit in November 1963, needed a boom to carry those sensitive instruments at a distance from the spacecraft bus to avoid interference from other electronics. Others carried instruments to detect micrometeorite impacts, which were a subject of keen interest to the planners of the earliest U.S. crewed spaceflights. While function overwhelmingly dictated form, Matt Shindell, curator of Planetary Science and Exploration in the Space History Department of the National Air and Space Museum, finds the identifiably mid-century design aesthetic of these satellites striking. Many of them resemble "a lamp you would've bought from the Herman Miller catalog," he says.

New Horizons, at the bottom of this page, is much larger than the others though it does not appear so in this photo. It carries a greater variety of instruments than its ancestors, and communicates with Earth from vastly greater distances, hence its prominent high-gain antenna. Its 2015 flyby of Pluto was a bookend to the Pioneer-Mariner-Voyager era of planetary exploration, Shindell notes, a period when we still regarded Pluto as a planet.

The large Advanced Orbiting Solar Observatory, at bottom left, never flew. Canceled in 1965, its instruments were instead incorporated into Skylab, launched in 1973. That the United States went from orbiting a single astronaut to orbiting a crewed observatory in only 12 years is indicative of how much these satellites had to teach us.

CHRIS KLUMEK IS AN AIR & SPACE/SMITHSONIAN ASSOCIATE EDITOR.



Please see page 82 for a guide to the satellites above.