

Discussion
Guide

Cosmic

BY THE CARNEGIE MEDAL-WINNING AUTHOR OF *MILLIONS*
FRANK COTTRELL BOYCE



* An Interview with Frank Cottrell Boyce



Dear Readers,

We hope you enjoy *Cosmic* as much as we do. We spoke with the author, Frank Cottrell Boyce, and want to share some of his thoughts about writing the book.

On the origins of *Cosmic*: “My son had a very good friend who used to call for him every day. Then we went to live in France for a year, and when we came back this friend had had a *massive* growing spurt. He was like a giant, mutant version of himself standing in the doorway blocking out the light, and I thought, That’s interesting. How would that feel?”

On writing about space travel: “Every single man my age is obsessed with space travel because when we were young we all really, really believed we would go to the moon. We thought we were living in the space age. I wake up every morning thinking, Where is my jet pack?!”

On writing about online role-playing games such as *World of Warcraft* in *Cosmic*: “I’m not really a gamer. I have a really good friend—Sam—who is. He showed me how it worked, and I sat with him, and I was fascinated. Sometimes, if you don’t do a thing yourself, you see things that people who do it all the time don’t see. For instance, I don’t have a mobile phone and I’m always putting them in stories. People who do use them sort of take them for granted.”

On the influence of Roald Dahl’s *Charlie and the Chocolate Factory*: “While very different, both stories have a crazy, wonderful contest and some clueless, terrible parenting. Thank you for noticing! Yes, I stole from Roald Dahl. I think it shows I have great taste!”

On weaving serious subjects such as fatherhood into humorous stories: “I want [the stories] to be as funny as possible, but I think real comedy needs to be about something important. Also, stories are important, aren’t they? They should always be about something that’s important to you.”





About Cosmic



Liam has always felt a bit like he's stuck between two worlds. This is primarily due to the fact that he's a twelve-year-old kid who looks like he's about thirty. Sometimes it's not so bad, like when his new principal mistakes him for a teacher on the first day of school, or when he convinces a car dealer to let him take a Porsche out on a test drive. But mostly it's just frustrating, being a kid trapped in an adult world. And so he decides to flip things around. Liam cons his way onto the first spaceship to take civilians into space, a special flight for a group of kids and an adult chaperone, and he is going as the adult chaperone. It's not long before Liam, along with his friends, is stuck between two worlds again—only this time he's 239,000 miles from home.

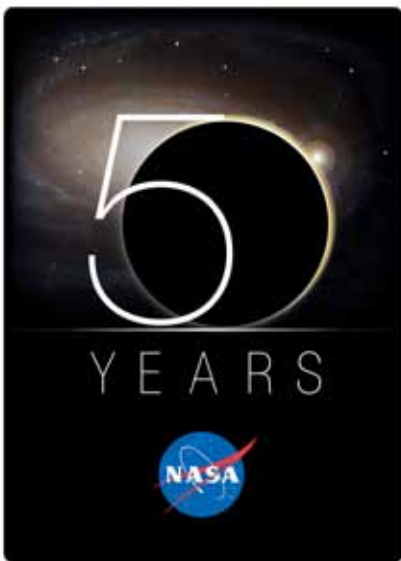


Image courtesy of NASA

Acknowledgments: Walden Pond Press is grateful to the National Aeronautics and Space Administration (NASA) for permission to make use of its extraordinary educational resources. NASA's mission is "to pioneer the future in space exploration, scientific discovery, and aeronautics research." To do that, thousands of people have been working around the world—and above it—for 50 years, trying to answer some basic questions: What's out there in space? How do we get there? What will we find? What can we learn there, or learn just by trying to get there, that will make life better here on Earth?

For more information about NASA, or to make use of NASA's educational materials and programs, please visit: www.nasa.gov

NASA's 50th birthday was in October 2008.

How to use this discussion guide: The artwork on the front of the guide is from the *Cosmic* book jacket and can be used as a poster. In the pages to come, book quotes from *Cosmic* are introduced and then followed by related information from NASA and suggested activities. The *Cosmic* activities in this guide are recommended for readers in Grades 4 through 6 and aligned with National Standards in key content areas. (See last page for list of standards for each activity.)

Read the book from Walden Pond Press



Cosmic by Frank Cottrell Boyce
Hardcover • ISBN: 978-0-06-183683-1

This guide was developed and produced by:



WALDEN POND PRESS

An Imprint of HarperCollinsPublishers

www.walden.com

www.harpercollinschildrens.com



Walden Pond Press • 17 New England Executive Park • Suite 305 • Burlington, MA 01803

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Human Spaceflight



The mighty space rockets of today are the result of more than 2,000 years of invention, experiments, and discovery. Over the past 50 years, humans have traveled into space and walked on the moon. In coming years, we will travel again to the moon to establish a permanent base. Later, we will expand the human presence to Mars, and then . . . who knows?

Cosmic begins with a news announcement about a manned spacecraft launch. But something is very wrong: The authorities don't seem to know who launched the rocket—or who's in it!

“A rocket, launched yesterday from a private site in northern China, is missing. Yesterday, the Internet was alive with rumors of a secret manned space mission. Today NASA and the Russian Federal Space Agency both confirmed that a rocket did take off but denied it was theirs. The rocket entered high orbit and then disappeared into deep space. No manned rocket has left Earth's orbit since *Apollo 17* in 1972.”

—Cosmic, opening page

Now find out about two human spacecraft launchings and one mission “peopled” by robots!

- **Neil Armstrong Steps onto the Moon:** At 10:56 p.m. Eastern Daylight Time, July 20, 1969, American astronaut Neil Armstrong set foot on the moon and planted an American flag there. It was the first time in history that humans had touched another world. Armstrong was joined on the surface by Edwin “Buzz” Aldrin, Jr. A third astronaut, Michael Collins, remained in lunar orbit in the *Apollo* capsule. The *Apollo 11* mission was the first of six moon landings, which continued until the end of 1972.



Photo courtesy of NASA

- **Assembling a Space Station to Orbit the Earth:** The International Space Station (ISS) has been in orbit for 11 years. Every day the ISS travels around the earth 16 times! As of 2008, the space station had been home to twelve space crews: Fifteen Americans and fourteen Russians have lived and worked aboard the ISS. The current expedition is the twenty-second (written as XXII in roman numerals). The crew of the 22nd expedition is dedicated to the final stages of space station assembly and turning the ISS into a fully operating, orbiting laboratory.



Illustration courtesy of NASA

Each mission to the ISS has its own logo. Here's an explanation of Expedition XXII's logo (shown at left): The sun, providing power and life support to the space station, shines through one of the solar arrays as the ISS orbits above Earth. The oceans and atmosphere, providing life support to Earth, are shown in all their beauty. The moon hovers in the distance as the goal of the next era of exploration. The six stars illustrate the increased capability of the crew. In the border are the national flags and native surnames of the crew members. Expedition XXII continues the effort to acquire the knowledge necessary to extend the reach of exploration from Earth to the moon and beyond.



- In January 2004, two robotic geologists named *Spirit* and *Opportunity* (*Spirit* shown below at left) landed on opposite sides of Mars, “the red planet.” These robotic explorers trekked for miles across the Martian surface. They conducted tests of Mars’s surface and made observations about its atmosphere.

Building on the success of *Spirit* and *Opportunity*, NASA’s next rover mission will launch in 2011 and arrive on Mars in 2012. Twice as long and three times as heavy as *Spirit* and *Opportunity*, the *Mars Science Laboratory* will collect Martian soil and rock samples. It will analyze them to find out what they are made of and to see if there are environmental conditions on Mars that could support life.



Photos courtesy of NASA



Suggested Follow-up Activities:



- Experience the thrill of conducting NASA repair work on the International Space Station. [Play the Station Spacewalk Game.](#)
- “Mars for Students” has an amazing set of activities designed to help you learn about Mars and participate in its exploration. [Click here to find everything you need](#), from help with school homework to the Mars Student Imaging Project.
- Imagine a NASA mission that takes place 100 years in the future. What would it be? Where would it go? What might it find? Write a “news article” about the latest mission, 100 years from now. Design a logo for this mission.
- What do you think the *Mars Science Laboratory* will find? Brainstorm a list of possible findings and share them with your classmates.

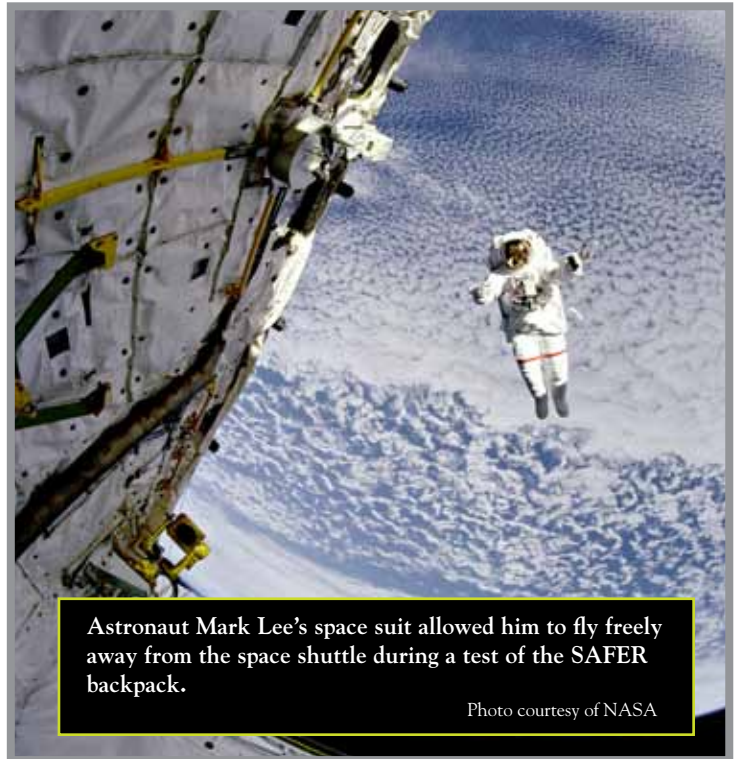


“Space Suits Aren’t Clothes, Idiot. Space Suits Are Equipment.”

Liam Digby and his friend Florida Kirby share the Cosmic adventure of a lifetime. And along the way, Liam learns that Florida knows a lot about space travel—and about space suits in particular.

“Florida Kirby told me about the history of space-suit design. This was actually more unexpected than being abducted by aliens. She explained that because space is such a hostile environment, the space suit has to be like a kind of mini Earth, like a wearable planet, giving you oxygen and keeping you at a constant temperature . . .”

—Cosmic, page 156



Astronaut Mark Lee’s space suit allowed him to fly freely away from the space shuttle during a test of the SAFER backpack.

Photo courtesy of NASA

Suggested Follow-up Activities:

- Read *Cosmic* to learn what Florida Kirby knows about space suits.
- [Click here to compare what Florida Kirby knows about space suits with NASA’S INTERACTIVE SPACE SUIT EXPERIENCE.](#)
- What’s the most interesting fact you learned about space suits?
- Are the liquid space suits in *Cosmic* science fiction or science fact? (See next page.)

Science Fiction and Science Fact

Cosmic is science fiction. It's a story filled with imagination and deals with science that might not yet be true, but could someday be true. Through storytelling, science fiction imagines ways in which science might change our understanding of our place in the universe. Science fiction often centers on travel, either through space or through time, often by use of machinery that hasn't been invented yet. Science fiction tries to take readers to places they have never been. It gets readers to imagine something that's not yet real—like Cosmic's amusement park of the future, Infinity Park.

“In the middle of Infinity Park is this dome, the Infinity Dome. The outside is all mirrors, so that when you walk toward it, you see yourself walking toward you. The entrance is just a narrow door, with the mirrors bending inward. As you get closer, you just melt into your own reflection, like entering a portal to another dimension or something. . . . The dome is where all the best rides are. These are not rides like you've ever seen before. Their names all have to do with the history of space exploration: the Giant Leap, Lake of Fear, Sea of Storms. The biggest one—the Vortex—looks like a kitchen blender from the *Land of the Giants*. . . .”

—Cosmic, page 176



The picture above is the cover of a popular science fiction magazine *Amazing Stories*. Published in November 1928, it shows a painting of space tourists exiting their planetary “lander” and setting foot on a tropical satellite of Jupiter.

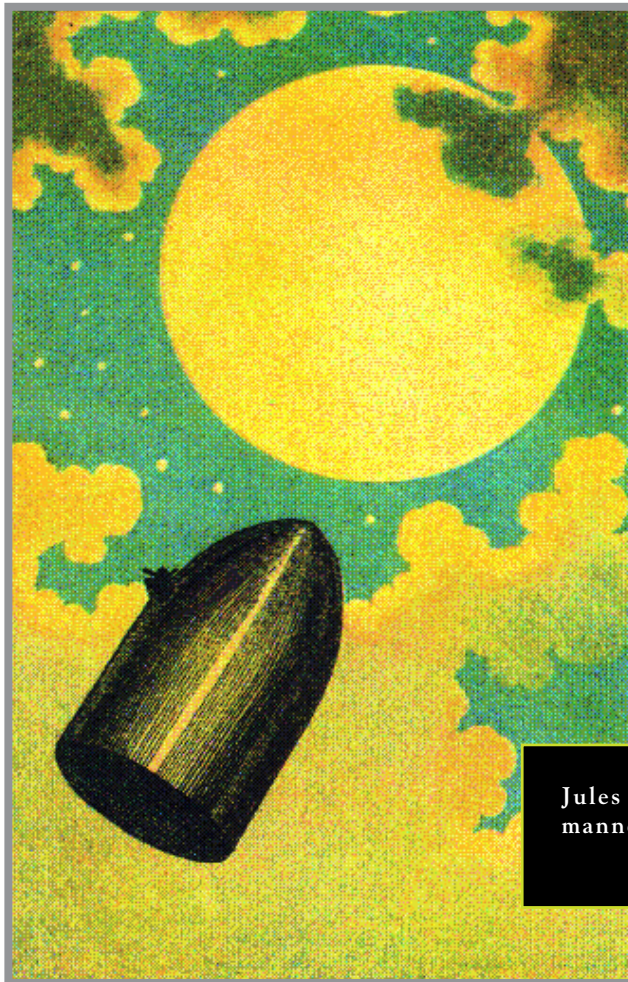
Illustration courtesy of NASA

Land of the Giants was an hour-long science fiction TV show lasting two seasons beginning September 1968 and ending March 1970. Set in the year 1983, it tells the tale of the crew and passengers of a spaceship called the *Spindrift*. The *Spindrift* is en route from Los Angeles to London when it encounters a space storm and is transported to a mysterious planet where everything is twelve times larger than on Earth.



Suggested Follow-up Activities:

- Read *Cosmic* and discuss “scientific” story elements in it that are true or not true, or that might someday become true.
- Working in pairs, brainstorm a list of machines that were once only imaginary but are now real.
- Illustrate what you think the rides from Infinity Park described on the previous page might look like and how they operate.
- Read about one of the most famous science fiction writers of all time, Jules Verne. Please see [“A Brief Biography of Jules Verne.”](#)
- [Take NASA’S Interactive “Science Fact or Science Fiction” Quiz.](#)



Jules Verne drew this early picture of a manned rocket flying toward the moon.

Illustration courtesy of NASA

The “Vomit Comet”

The “Vomit Comet” described in *Cosmic* is a real type of airplane (see photos at right and below) that can provide the brief experience of a nearly weightless environment. “Vomit Comets” are used to train astronauts and for research purposes.

“Dr. Drax said, ‘This plane is officially called the Draxcom Zero Star. But the people who’ve been testing it have been calling it something a bit more informative—the Vomit Comet.’

‘Oh.’

‘Because most people who ride on it throw up. . . .’

The outside of the Vomit Comet might look like an ordinary plane, but the inside certainly doesn’t. There’s only one seat—a long bench thing with lap belts. The walls are covered with giant white cushions. There’s nothing else in there but a big empty space. . . .”

—*Cosmic*, page 165



Photo courtesy of NASA



Photo courtesy of NASA

Suggested Follow-up Activities:

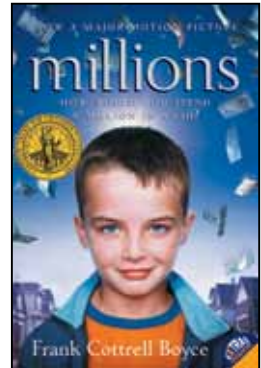
- Read *Cosmic* to find other examples of actual scientific concepts or technology used in the story.
- [Read about the most recent flight of NASA’s KC-135A aircraft](#), known in real life by the press as the Vomit Comet.
- People can actually experience weightlessness and ride in a commercial version of the Vomit Comet. [Check out this ad for the ride-of-a-lifetime.](#)

Other Books by Frank Cottrell Boyce

About *Millions*

It was a one-in-a-million chance. A bag crammed with cash comes tumbling out of the air and lands right at Damian's feet. Suddenly the Cunningham brothers are rich. Very rich. They can buy anything they want. There's just one problem—they have only seventeen days to spend all the money before it becomes worthless. And the crooks who stole the cash in the first place are closing in—fast. A funny, brilliantly clever, and utterly thrilling debut novel that is, quite simply, unforgettable.

HarperCollins Children's Books / 2004 • ISBN: 978-0-06-073330-8 • Tr / 2005 • ISBN: 978-0-06-073332-2 • Pb



About *Framed*

A few things to know about Dylan: He is the only boy in his entire town—so forget about playing soccer. His best friends are two pet chickens. His family owns the world's only gas station/coffee house—their pies are to die for, but profits are in the hole. Criminal instincts run in his family—his sister is a mastermind-in-training, and the tax men are after his father for questioning. And one more small thing about nine-year-old Dylan—the crime of the century has just fallen into his lap. With the same easy mix of wit, warmth, and wonder that made his debut novel, *Millions*, an award-winning international bestseller, Frank Cottrell Boyce tells the story of a boy who reminds an entire town of the power of art.

HarperCollins Children's Books / 2006 • ISBN: 978-0-06-073402-2 • Tr / 2008 • ISBN: 978-0-06-073404-6 • Pb

National Content Standards for *Cosmic Activities*

HUMAN SPACEFLIGHT

- NCTE/IRA ENGLISH/LANGUAGE ARTS Standard 1: Reading for Perspective
- NCSS SOCIAL STUDIES Standard 8: Science, Technology, and Society
- NSES SCIENCE AND TECHNOLOGY STANDARDS: Understanding about Science and Technology;
EARTH AND SPACE SCIENCE: Understanding the Structure of the Earth's System; Earth's History; Earth in the Solar System

“SPACE SUITS AREN'T CLOTHES, IDIOT. SPACE SUITS ARE EQUIPMENT.”

- NCTE/IRA ENGLISH/LANGUAGE ARTS Standard 2: Reading for Understanding
- NCSS SOCIAL STUDIES Standard 3: People, Places, and Environments; Standard 8: Science, Technology, and Society
- NSES SCIENCE AND TECHNOLOGY STANDARDS: Understanding about Science and Technology

SCIENCE FICTION AND SCIENCE FACT

- NCTE/IRA ENGLISH/LANGUAGE ARTS Standard 3: Evaluation Strategies
- NCSS SOCIAL STUDIES Standard 2: Time, Continuity, and Change; Standard 8: Science, Technology, and Society
- NSES SCIENCE AND TECHNOLOGY STANDARDS: Understanding about Science and Technology;
HISTORY AND NATURE OF SCIENCE: History of Science

THE “VOMIT COMET”

- NCTE/IRA ENGLISH/LANGUAGE ARTS Standard 2: Reading for Understanding
- NCSS SOCIAL STUDIES Standard 3: People, Places, and Environments; Standard 8: Science, Technology, and Society
- NSES SCIENCE AND TECHNOLOGY STANDARDS: Understanding about Science and Technology