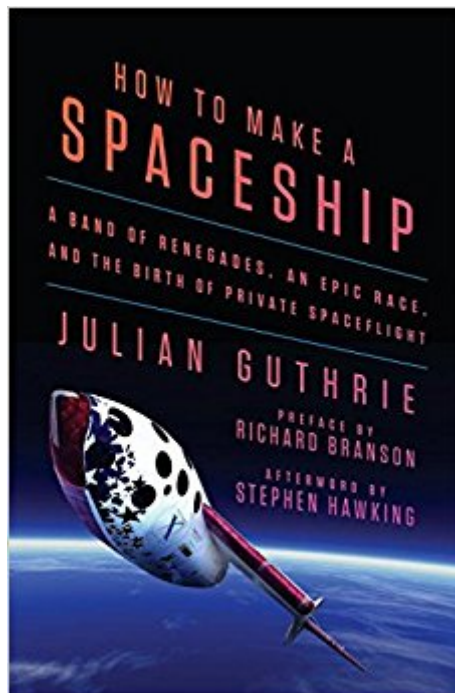




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# How To Make A Spaceship: A Band Of Renegades, An Epic Race, And The Birth Of Private Spaceflight



## Synopsis

A New York Times bestseller! **“The historic race that reawakened the promise of manned spaceflight”** A Finalist for the PEN/E. O. Wilson Literary Science Writing Award **“Alone in a Spartan black cockpit, test pilot Mike Melvill rocketed toward space. He had eighty seconds to exceed the speed of sound and begin the climb to a target no civilian pilot had ever reached. He might not make it back alive. If he did, he would make history as the world’s first commercial astronaut. The spectacle defied reason, the result of a competition dreamed up by entrepreneur Peter Diamandis, whose vision for a new race to space required small teams to do what only the world’s largest governments had done before. Peter Diamandis was the son of hardworking immigrants who wanted their science prodigy to make the family proud and become a doctor. But from the age of eight, when he watched Apollo 11 land on the Moon, his singular goal was to get to space. When he realized NASA was winding down manned space flight, Diamandis set out on one of the great entrepreneurial adventure stories of our time.”** **“If the government wouldn’t send him to space, he would create a private space flight industry himself.”** **“In the 1990s, this idea was the stuff of science fiction. Undaunted, Diamandis found inspiration in an unlikely place: the golden age of aviation. He discovered that Charles Lindbergh made his transatlantic flight to win a \$25,000 prize. The flight made Lindbergh the most famous man on earth and galvanized the airline industry. Why, Diamandis thought, couldn’t the same be done for space flight?”** **“The story of the bullet-shaped SpaceShipOne, and the other teams in the hunt, is an extraordinary tale of making the impossible possible. It is driven by outsized characters—Burt Rutan, Richard Branson, John Carmack, Paul Allen—and obsessive pursuits. In the end, as Diamandis dreamed, the result wasn’t just a victory for one team; it was the foundation for a new industry and a new age.”**

## Book Information

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## Customer Reviews

“If you admire those who aim really high, How to Make a Spaceship belongs on your bookshelf. [It] offers a rousing anthem to the urge to explore.”

• Wall Street Journal

“Guthrie has a gift of building suspense around these airborne incidents of inherent drama—such as a balloon flight gone wildly wrong that ends in a botched parachute jump—as well as larger questions about space, technology and life’s purpose . . . How to Make a Spaceship is . . . ultimately flight-worthy and impressively ambitious. When the history of 21st century American space efforts is written decades or centuries from now, this book will be a valuable contemporary record of what it was like when humanity was trying to break out of its home.”

• San Francisco Chronicle

“[How to Make a Spaceship] reads like a thriller. The story sounds incredible, as if torn from the pages of science fiction. And it has a happy ending. But as with all entrepreneurial ventures, nothing went according to plan: It was riddled with failure and disappointment; ugly battles broke out between friends and founders; the world often looked like it was coming to an end; and Diamandis had to gamble everything he had.”

• Vivkek Wadhwa, Washington Post

“[How to Make a Spaceship] includes enough death-defying stunts, madcap schemes, wild coincidences, and rousing redemptive moments to fuel a dozen Hollywood blockbusters.”

• Wired.com

“Ms. Guthrie’s tale is sometimes tragic, but ultimately it is an uplifting one that will appeal to adventure junkies as well as to those who prize free-market solutions to monumental challenges.”

• Wall Street Journal

“If readers are looking for scientific discussions, humorous anecdotes, and intense action, Guthrie covers those. The flights are written to make readers feel like they’re experiencing them in real time, nerves and all.”

• Publishers Weekly

“Engaging”

| Just the thing for aspiring astronauts and rocketeers.

• Kirkus

“I don’t know how Julian Guthrie does it. In her last book, she didn’t race in the America’s Cup, yet readers felt they had. And now in How to Make a Spaceship, although she wasn’t strapped into the cockpit of the first civilian spacecraft to rocket into outer space, her vivid writing places readers right there. With the flair of a novelist and the precision of a fine journalist, she takes readers on a journey not just into

space but into the hearts and minds of the adventurers who dare go where NASA no longer does. Her tale will quicken your pulse.

•Ken Auletta, author of *Googled: The End of the World as We Know It* “The story of Peter Diamandis is a reminder of the power of passion and persistence. *How to Make a Spaceship* chronicles the amazing journey of a key figure in the private race to space—a dreamer who, in the face of multiple setbacks and naysayers, simply refused to let go of his dream.

•Arianna Huffington, author, cofounder of *The Huffington Post* “Too few kids and young adults understand the power of science and technology. We need role models demonstrating the power of passion and perseverance to make dreams come true. *How to Make a Spaceship* is filled with innovators and doers. The story will inspire makers of all ages.

•Dean Kamen, inventor, entrepreneur, founder of *FIRST Robotics* “This incredible book is *The Right Stuff* with afterburners. Intrepid designers and innovators risk their reputations. Gutsy test pilots risk their lives. Explorers push new boundaries of what so many once thought was impossible. All brought together by a real gravity-defying force, Peter Diamandis. *How to Make a Spaceship* is required reading for anyone who cares about space, aviation, and the future of flight.

•Captain Mark Kelly (USN, Ret.), former naval aviator, test pilot, and NASA astronaut “This outstanding and compelling book shows the power of one man’s vision, and the ability of small teams to accomplish extraordinary things. *How to Make a Spaceship* will inspire and guide you to take on your own Moonshot.

•Ray Kurzweil, Inventor, Author, Futurist and Chancellor, *Singularity University* “[An] engaging account of the race to get a rocket up to the Karman line without getting NASA involved....Just the thing for aspiring astronauts and rocketeers.

•Kirkus Reviews

Julian Guthrie is an award-winning journalist who spent twenty years at the *San Francisco Chronicle* and has been published by *The Wall Street Journal*, *Time*, *The Huffington Post*, and others. She is the author of *The Billionaire and the Mechanic*, a bestselling account of Oracle CEO Larry Ellison’s pursuit of the America’s Cup, and of *The Grace of Everyday Saints*, the story of the longest parish protest in Catholic America.

Wow, what a book! This IS going to be a go-to-reference for the first private manned spaceship, SpaceShipOne. Instead of the title being *How To Make a Spaceship* it could have been titled *How a Miracle Happened*. It is packed with so much detail and background story

on how the private sector was able to step onto hallowed ground in 2004 that was previously owned by large tax payer funded government programs. For those that don't know, SpaceShipOne is a spacecraft that completed the first manned private spaceflight in 2004. That same year, it won the US\$10 million Ansari X Prize. SpaceShipOne now hangs in the Smithsonian Institution's National Air and Space Museum in Washington D.C. SpaceShipOne was designed by Burt Rutan. And it was Burt Rutan's confident leadership, engineering prowess, creative genius, and simple wackiness that propelled Burt's small renegade team to achieve one of the biggest world news stories of that year. I know. I was part of that team. I joined Burt Rutan's Scaled Composites in 1988. I was hired in to be Scaled's first structural analyst using FEM (Finite Element Methods) which is an advanced way of computer simulating aerospace structures to determine stress and stiffness. By the time the SpaceShipOne program started, I was selected to be the structural lead. As deftly described in the book and the documentary "Black Sky", tension was at a level I had never experienced before on any Scaled Composites program. There was a general consensus that Burt had lost his marbles when he suggested to his small team of maybe 12 engineers that we could go from building subsonic propeller and jet aircraft to building a spacecraft that would go 3+ times the speed of sound and, oh yeah, go to suborbital space. But first, we would have to build the mothership, White Knight (WK), which will carry and launch SpaceShipOne at about 45,000 ft. Another benefit to a small team is that we were highly motivated to perform to the best of our abilities. This struck home one day when I saw the wife to one of SpaceShipOne's test pilots. I clearly understood that I did not want to face a day where I might have to tell her that her husband died because of a mistake I made. The SpaceShipOne team was close knit. Engineers are naturally skeptical since they clearly understand the risks. But Burt eventually won his team over by methodically describing how we would mitigate those risks by first building WK using the identical cabin design and most of the systems that SpaceShipOne would use. It was a BRILLIANT way to build confidence by continually testing identical hardware on the mothership, WK. Flight tests were equally well thought out by Burt. First flight tests were simply "captive carry" by carrying SpaceShipOne to altitude only. This was followed by drop tests allowing SpaceShipOne to simply glide back to landing and to test the unique feather deployment design. Eventually, flight tests were concluded with rocket powered flights that won the US\$10 million Ansari X Prize. The level of painstaking detailed research that Julian Guthrie put into writing this book is obvious to me as an "insider". I cannot find any errors or anything I would have changed.

And it filled in a lot of the missing background story that I did not know that ultimately led to our successful climax. Wonderful job Julian!!!

Think back to Alan Shepard, the first American in space, and imagine if someone had told you that a handful of civilians, without a dime of government funding, would loft two humans into space a scant 43 years later. Yet, spurred by a contest with a generous financial reward, a group headed by legendary aircraft designer Burt Rutan did just that. Especially notable is that the prize money didn't come close to covering their costs, and that's why their story is such a compelling one. The prize was the spark, but internal forces far more profound were driving these people, and it's the human story we get in this book. Read it, then go back and watch the footage of the two winning flights and the events leading up to them. You'll then have a deep and satisfying appreciation for this extraordinary achievement.

A great read, The story weaves together half a dozen character-driven threads. It's all about a cast of large characters: Peter Diamandis (the promoter), Burt Rutan (aeronautics prodigy), John Carmack (software genius), Erik Lindbergh (son of the great aviator), Michael Melvill and Brian Binnie (test pilots). The story brings to life the competition that led to the first reusable commercial suborbital spaceflights, My personal favorite is Burt Rutan. His creations have been amazingly innovative. One of my favorite scenes has Mike Melvill riding on top of the Rutan Raptor UAV prototype, flying it back to base like a some old-time cowboy. The book is packed with great stuff. The winning flights, of course, are the high points of the story. You've got to love the professionalism, determination, calm and expert piloting under pressure of both Melvill and Binnie. The Right Stuff indeed.

Julian Guthrie depicts an incredible story of mind over matter, one's dream to pursue his calling in life and capture a worldwide audience of aspiring creators. Innovators gathered to make the impossible possible and though its process inspire a generation of game changers, this book has already impacted myself and others around me to push the limits that much more and recognize that anything can be done. This copy belongs on every entrepreneur's book shelf as it relates to not only space traveling, but relates the heartaches of determination and tenacity fused with passion.

I love reading about people who take action, believe in their dreams and succeed in spite of insurmountable odds. The author creates a story that encompasses this event from conception

through success and provides details of how it all happened. I never realized how many people it took to create the XPRIZE and to get the first privately owned craft to space. This is truly an inspiring story. The author has done a very good job of presenting the story in an easy to read book that keeps your interest throughout. I highly recommend this book and look forward to reading the author's other books.

I am a teenager who loves to make things, and I am now telling all of my friends to read this book. I love how Burt Rutan would never make things that anyone else wanted him to make but instead made things from his own imagination. He refused to follow someone else's rules, and ended up changing the rules. I also really like Peter Diamandis, especially the kid Peter Diamandis. He hoarded explosives and all sorts of chemicals to make his own rockets and engines. He flew rockets (also of his own design) whenever he could. When he grew up, or at least was in college, he kept building things - like the zero gravity machine at MIT. Another super cool person in the book is the pilot Mike Melvill, who is more daring than a lot of superheroes. He flew this little rocket to space, when he was 63. He's one of my heroes now. I read this book in two days - all 400-plus pages. Now I'm going to go out and build my own cool stuff.

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