

## GLOSSARY

**AGC** = Apollo Guidance Computer

**Baikonur Cosmodrome** = Soviet launch site, not really in the city of Baikonur but, possibly in an attempt to deceive the U.S., built roughly 200 miles southwest in Tyuratam

**Buck Rogers** = A comic strip space adventurer from the 1920s

**CAPCOM** = Capsule Communicator = an astronaut at Mission Control who relayed information and instructions to the astronauts in space

**CSM** = Command and Service Module (Apollo)

**Direct Ascent** = a rejected lunar landing mode where all the equipment and all the astronauts go directly to the moon, and almost everything (all the astronauts, at least!) comes back

**DSKY** = the DiSplay and KeYboard for the AGC—Apollo astronauts liked this interface

**EOR** = Earth Orbit Rendezvous = a rejected lunar landing mode in which you assemble a spacecraft in Earth orbit before sending it to the moon

**Equigravisphere** = the point where the Earth's and the moon's gravity balance out

**EVA** = extravehicular activity = spacewalking

**FIDO** = Flight Dynamics Officer, responsible for the flight path of spacecraft

**Flight** = Flight Director = leader of the flight control team, which for Apollo missions included CAPCOM, FIDO, GUIDO, INCO, NETWORK, RETRO and more

**Flight Operations Manual** = the instructions for operating a spacecraft, including both normal ("nominal") and emergency situations

**Frau im Mond** = "Woman in the Moon" in German = a 1929 movie for which Hermann Oberth, Wernher von Braun's mentor, helped create the special effects

**GET** = Ground Elapsed Time = time since liftoff

**Gimbal** = a device used to move the rocket engines to keep a spacecraft pointed in the right direction—also used by astronauts as a verb to indicate what the device does

**GUIDO** = Guidance Officer = responsible for monitoring navigation systems, such as the AGC

**Gulag** = ГУЛАГ = Russian acronym for "The Chief Administration of Corrective Labor Camps and Colonies" = Soviet forced labor prisons

**Handheld Maneuvering Unit** = a device for moving around during an EVA—also called the Zot gun

**Isaac Newton** = a scientist (1643-1727) who discovered the basic laws of motion for bodies in space

**LEM** = LM = Lunar (Excursion) Module

**LOI** = Lunar Orbit Insertion = the rocket burn that puts a spacecraft into orbit around the moon

**LOR** = Lunar Orbit Rendezvous = the lunar landing mode for Apollo—and what the Soviets would have used as well, had they made it that far

**LOS** = Loss of Signal = temporary (you hope!) gap in communications while the moon, or the Earth, is in between the spacecraft and Mission Control

## GLOSSARY (Cont'd)

- NACA** = National Advisory Committee for Aeronautics—the government agency that was folded into NASA in 1958
- O<sub>2</sub>** = oxygen
- OMNI** = omni-directional antenna = used by the CSM to stay in touch with Earth while in Earth orbit, and then as a backup when near the moon
- Orthographic projection** = a method used by engineers for representing 3-D objects in 2-D
- P-51** = the P-51 Mustang = the most successful Allied fighter plane from World War II—it was still used by some air forces in the 1980s, and a famous sports car is named after it
- Pogo** = bouncing motion—like a pogo stick—in a rocket during liftoff
- Poyekhali** = Поехали = “Let’s go” in Russian
- Retro-package/retro-rockets** = a system used for slowing spacecraft down for re-entry into Earth’s atmosphere
- Soyuz** = Союз = “union” in Russian = the successor spacecraft to the Voskhod series, and what the Soviets hoped would land on the moon
- Sputnik** = Спутник = “satellite” in Russian = the first artificial, earth orbiting, satellite
- TEI** = Trans-Earth Injection = heading back home!
- TLI** = Trans-Lunar Injection = going to the moon!
- T-minus** = “Time minus” = the time before launch—first used in the movie *Frau im Mond*
- Voskhod** = Восход = “rising” in Russian = the successor spacecraft the Vostok series, which Alexei Leonov flew during the first spacewalk
- Vostok** = Восток = “east” in Russian = the Soviet program for human spaceflight which put Yuri Gagarin into orbit
- Zero-g** = freefall, where you don’t feel the effect of gravity (or the push of a rocket motor, which can feel a whole lot like gravity...and then some!)
- Zond** = Зонд = “probe” in Russian

## AUTHOR and ILLUSTRATORS

**Jim Ottaviani** started writing graphic novels about science in 1997, including stories about physics, stage magic, and paleontology. *T-Minus* is his eighth book, and the second with art by Zander Cannon and Kevin Cannon. He used to work as a nuclear engineer, but now, in addition to being an author he’s also a librarian living in Ann Arbor, Michigan.

**Zander Cannon** and **Kevin Cannon** (no relation) have worked together since 2004, illustrating such books as *Bone Sharps, Cowboys, and Thunder Lizards* by Jim Ottaviani and *The Stuff of Life* by Mark Schultz. Zander earned two Eisner awards for his work on the *Top Ten* series with Alan Moore and Gene Ha. Both Cannons reside in Minneapolis.