

Lunar X Games

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The Sturgeon Moon of 2005. Credit: Darrell Spangler.

According to folklore, every full Moon has a special name. The Snow Moon comes in February, the snowiest month of the year. The Thunder Moon comes in July, the month of summer lightning. There are Wolf Moons, Strawberry Moons, Harvest Moons—each name evokes something nifty about its particular month.

Until August, that is. August has the Sturgeon Moon, named after a slimy, primeval fish. What happened? Long ago Native American tribes around the Great Lakes fished for sturgeon in August, and folklore did the rest.

Nothing against sturgeon, mind you, but it might be time for a change. How about the X-Moon?

In modern times, August is the month of the summer X Games, held this year in Los Angeles from August 3rd to 6th. X Games are the Olympics of extreme sports. Athletes race and do tricks on motorcycles, dirt bikes

and skateboards. A typical winning stunt is the Mulisha Twist, an off-axis 360-degree mid-air backflip on a motorcycle.

The Moon would be a great place for X Games. Don't laugh. NASA is returning to the Moon, and where people go—especially adventurous people—sports follow.



Moon tires for moon bikes.

The Moon's rugged terrain and low gravity are going to appeal to extreme athletes. Imagine what a Motocross Freestyler could do in $1/6$ g. He revs his engine, tears up the ramp and soars into the sky--6 times higher and 6 times farther than usual. That's Big Air.

Dirt bikers would love it, too. Lunar impact craters provide natural racing turns and jumps. And there's plenty of moondust to cushion a hard landing. Of course, the track would need to be six times bigger than Earth tracks. Otherwise, in $1/6$ g, the biker might fly right out of the park: video.

Some events like skateboarding or BMX jumping could be held indoors, inside pressurized domes. For those athletes, dress and equipment would

look Earth-normal.

Other events, like dirt biking, need to be outdoors. That's where the dirt is. Out there, the gear is going to be a little different.

Consider a lunar dirt bike. What would it look like?

Let's start with fenders: Dirt bikes on Earth often have no fenders at all. So what if a little bit of sand gets kicked up and onto the rider? No big deal. On the Moon, however, fenders will be crucial. The Moon is covered with dark, abrasive dust. Apollo astronauts quickly learned they didn't want to get this dust on their suits. Dust penetrated joints and seals, springing leaks. Dust scratched the visors of their helmets, making it difficult to see out. And worst of all (if you can imagine something worse than a leak), dust blackened their white suits, causing the suits to absorb sunlight and overheat on the Moon's 100+ degree C surface. So, lunar bikes will have not just fenders, but WIDE fenders to try to keep this dust problem under control.

Next, the wheels: Lunar terrain is both powdery and rough. To drive across this surface, Apollo moon buggies employed open-mesh, woven piano wire tires studded with titanium cleats. Moon bikes may use these, too. Ordinary air-filled tires are prone to leak in the lunar vacuum and they would be easily punctured by sharp moon rocks. Plus, who wants to waste air in a tire when you need all the air you can get just to breathe? Lightweight, tough piano wire tires don't need air, and they are proven performers on the Moon.

And the engines: There's no air on the Moon, so internal combustion engines won't work. Instead, motor bikes will be battery powered with electric motors like Apollo moon buggies. No gas caps on the Moon!

Finally, the ergonomics: Outdoor riders have to wear spacesuits with

thick gloves and boots. This will affect the ergonomic design of the bike. Buttons need to be oversized for fat fingers. Brake pedals will need to be sized and spaced correctly for moon boots. Seats will have to be shaped for the bottom of a spacesuit.

All in all, moon bikes will look a bit weird: woven piano wire tires, exaggerated fenders, oversized handles, and a wide seat for big space bottoms.

Oh, and they'll be very quiet. Rev the engine and ... well, that was no thrill at all!

The thrill comes in the jump—spinning gracefully through "the air" for what seems like eternity.

A perilous spray of moondust. Terrain hot enough to boil water. Breathtaking vacuum. What more could an X-athlete want?

Move over Sturgeon! The X-Moon is coming.

Source: by Dr. Tony Phillips, Science@NASA

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