

Astronomy[®]

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EVERYTHING WE KNOW ABOUT

THE SUN

PLUS:

THE
STARMUS
FESTIVAL
ROCKS
SLOVAKIA

WEBB
UNLOCKS
STARBIRTH
IN SERPENS

BEHIND
THE SCENES
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WHAT
CAUSES
RAINBOWS
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MOONBOWS?

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MODEL ROCKETRY takes off in OREGON

The high desert offers the perfect launch pad for amateur rocketry enthusiasts.

BY LUCAS MARTIN; PHOTOS BY INGRID MARTIN



THE COMMUNITY OF BROTHERS is a place that seems to have slipped the passage of time. Located in central Oregon's arid landscape, it was once a stagecoach stopover for migrants bound for the Willamette Valley. The town eventually became one of the few to host a filling station in this great expanse, but today, the pumps stand empty.

Other than a clutch of prefab homes, a freshly painted historic schoolhouse, and a post office, the only indications of extant population are the pit toilets and picnic tables of the Brothers Oasis Rest Area. The view here is the same as from anywhere in Brothers: sage, greasewood, and cheatgrass spread to the horizon.

But look to the southwest on the right afternoon and you may see a

← FAR LEFT: A weathercocked rocket corrects course after launch.

surprise: the unmistakable snarl of rockets, trailing smoke as they streak across the sky.

Rockets in flight

Thanks to the nonprofit, member-based organization OregonRocketry, Brothers has found a new purpose as one of America's preeminent high-power rocket launch sites. OregonRocketry purchased the land in coyote country to create a mecca for amateur rocketry, and has a waiver from the Federal Aviation Administration to launch rockets nearly 20,500 feet (6,248 meters) into the air at any time. With approval, they can increase that height further, launching over 36,000 feet (10,973 m) above ground level. There are few places in the U.S. where amateur rocketeers regularly reach such altitudes.

"We get those high waivers because we're so remote; how high we can fly is dependent on our proximity to things like highways and occupied buildings," explains Robert Braibish, the equipment director of OregonRocketry.

To get to the launch site, a visitor must take a dirt access road 5 miles (8 km) south from Highway 20 to an area of rolling scrub land. OregonRocketry members were already fanned out among the sage, antennas and GPS receivers aloft, when my wife and I arrived to



↑ The rocket launch site is 5 miles southwest of Brothers, Oregon, far from any cities.

ASTRONOMY: ROEN KELLY

↓ Rockets are lined up at the OregonRocketry organization's launch site in Brothers.

Rocketober 2021. This was the club's largest launch of the year, and drought-induced fire hazard had closed the site all summer. Members were eager to fly.

I had never attended a rocket launch before, and anticipated something similar

to an especially technical fireworks show. This was no fireworks show, though; it was far more visceral. Countdowns were quick and staccato, like drumrolls over the loudspeaker, punctuated by the trumpet screech of launch. Again and again, 200 pairs of eyes followed smoke trails into the bright glare of the Sun, just able to catch the puff of gunpowder and flash of parachute that signaled a successful flight before returning to level to witness yet another fiery launch.

Safety first

There were five designated launch areas, or cells: one each for low- and mid-power rockets with five launch pads apiece, roughly 120 feet (37 m) from the tailgate line of tents and trailers and RVs; two for high-power rockets, with another five pads each, an additional 60 feet (18 m) out; and the last for the largest rockets allowed at the site, 900 feet (274 m) behind the line of people, cresting above the crowd atop a nearby butte.

Rocket motors are classified by their total energy. "Each designation doubles the total energy of the previous one, so a B is twice as powerful as an A, and C twice as powerful as B," Braibish explains.



Most model rockets run from Class A through E. High-power motors start at Class H and require federal certification to purchase. OregonRocketry regularly launches O-class rockets at Brothers, and though we didn't witness any of those, the handful of M- and N-class launches we saw mingled both awe and terror in my gut.

"We like to treat these things like weapons," Braibish says — and the club's procedures reflect that attitude. During a midmorning break, members registered a dizzying variety of rockets with the Range Safety Officer (RSO), the resident expert on rocket construction and site conditions. Each registration required a conference; some rocketeers left their slump-shouldered and frowning.

"The RSO is able to look at a rocket and ask: Have you connected all the parts? How is the motor built? How did you attach these fins? Is this the first flight? They ask all the questions that are relevant to ensuring a safe flight, which is obviously our highest priority," Braibish says.

Steady winds blew from the south both days of Rocketober, and one of the prevailing safety concerns involved weathercocking, an unwanted phenomenon that rocketeers try — and only sometimes manage — to mitigate. A rocket's fins stabilize its trajectory once in flight, but under the wrong conditions, they can divert it away from its intended direction. Wind currents blowing at ground level can catch fins at the moment of ignition, tilting the rocket's nose windward as it takes off. If high-altitude currents



↑ Gary Leach prepares his Aerotech ARCAS rocket for an early morning launch.

maintain the force of those nearer the ground, the rocket tends to correct course. If not, it continues on its weathercocked trajectory, blasting off in occasionally nerve-wracking deviations from plumb.

The landscape here challenges rocketeers in a way others don't. Though popular imagination focuses on the inferno of launch and elegance of ascent, rocketeers are equally concerned once a rocket reaches apogee — the point of maximum height above Earth. Gunpowder charges split the rocket soon after it begins descent, releasing a parachute or series of parachutes. It slows first to 50 feet (15 m) per second then to 25 feet

(7.6 m) per second, gyrating across the blue sky before crumpling into the sage. That's when the fun begins.

"Our site on a map looks kind of flat, but in reality, it's not," says Jack Caynon, the current president of OregonRocketry, who has flown at Brothers since 2005. "You think your rocket's in that flat area over there when actually it's in a crevasse. Sighting along the sagebrush is difficult because there's a thousand of them and one looks just like another."

To make recovery easier, Caynon uses an onboard radio tracker. "By sweeping the antenna, I can pinpoint the direction of the rocket. It takes me 10 or 20 minutes maybe to get to the rocket, but I find it without fail."

Not all recoveries go so smoothly. Over the course of a windy October day, I watched half a dozen rocketeers return to camp emptyhanded, kicking dust and cursing deceptive sightlines or faulty transmitters. I witnessed a dozen more bearing crippled rockets. Parachutes didn't deploy in time or at all, and months of work culminated in crash landings on high-desert hardpan.

But the biggest danger at Rocketober, lurking between the thirsty sage, is fire. Between the use of highly combustible materials and an ignition source, the hobby can lead to dangerous consequences.

"Fire has become the No. 1 concern out here over the past five years. We've been here 20 years or so, and even five years ago we launched throughout the



↑ Chuck and Karen Fauser search late-season sage for their rocket using a handheld radio antenna.

summer, no problem,” says Gary Goncher, a former president of OregonRocketry. “But we don’t launch in July, August, or September anymore.”

The club is proactive about fire safety — they keep a water truck and several dozen extinguishers nearby during launches. Equipment is maintained and stored by the local Rangeland Fire Protection Association (RFPA), a volunteer group that works with federal agencies to suppress and respond to wildfires.

“We’ve become very active in our local RFPA. About 20 rocketeers are actually

Flying toward the future

Amateur rocketry in America’s high desert is an expression of both our enigmatic past and our technological, heat-ridden future.

The rocketeers carefully follow launch rituals before experiencing the ecstasy of apogee and the agony of recovery. Hearts quicken as eyes turn skyward, hands ubiquitously raised to brows, warding off midday desert sunlight. After the parachutes deploy, rocketeers wander the withered sage with errant sunspots still swirling in their eyes, and antennas aloft.

Rockets are a symbol of modernity,

“Fire has become the No. 1 concern out here over the past five years.”



members now, and I think we outnumber the locals,” Goncher says.

A learning experience

Goncher served as RSO the second day of Rocketober, and he had his hands full. Because Brothers is one of the country’s premier sites for high-power rocketry, college students from across the Northwest flock here to get certified with the National Association of Rocketry before competing in the annual intercollegiate Spaceport America Cup in New Mexico. They come in fresh-faced droves, draped in school colors and determined to push the boundaries.

“Sometimes students want to be so spectacular, and to do things off the wall, but they don’t need to,” Caynon explains. “But the Blue Origin and SpaceX people show up to a banquet [after the Spaceport America Cup]. They’re looking for people who can think outside of the box and solve problems on the fly.”

The names of private space agencies rang from every tongue with a talismanic quality out on the steppe. “As a society, we’re starting to get to a point where rocketry seems the next step,” Braibish says. “You see where things are going with SpaceX and Blue Origin; there is obviously going to be an increase in demand for that kind of engineering and that type of student.”

and of our new gilded Space Age. But while a ticket on a SpaceX or Blue Origin ride remains out of reach for all but the ultra-wealthy, amateur rocketry evokes a vision of the future where anyone can be a citizen rocket scientist and explore their environment.

Caynon says the amateur rocket community is eager to work with students or researchers to put their expertise to scientific use. “We can launch several types of packages for scientific purposes on our rockets, like how to measure the ozone or monitor sunspot activity, and we can run the same types of sounding rocket experiments as NASA,” he says. “Maybe college students have come up with a CanSat” — a miniature satellite-style payload small enough to fit in a Coke can — “and they just need someone to fly it for them. Our guys would be happy to do that, and I think both students and rocketeers would learn something.”

So while some of the young scientists getting certified at Rocketober may one day settle Mars for Musk or build space casinos for Bezos, it may be the planet Earth that is the true beneficiary of these wild-eyed rocketeers roaming the high desert. ♪

Lucas Martin is a freelance writer working out of Oregon, with a focus on astronomy and the high desert.

