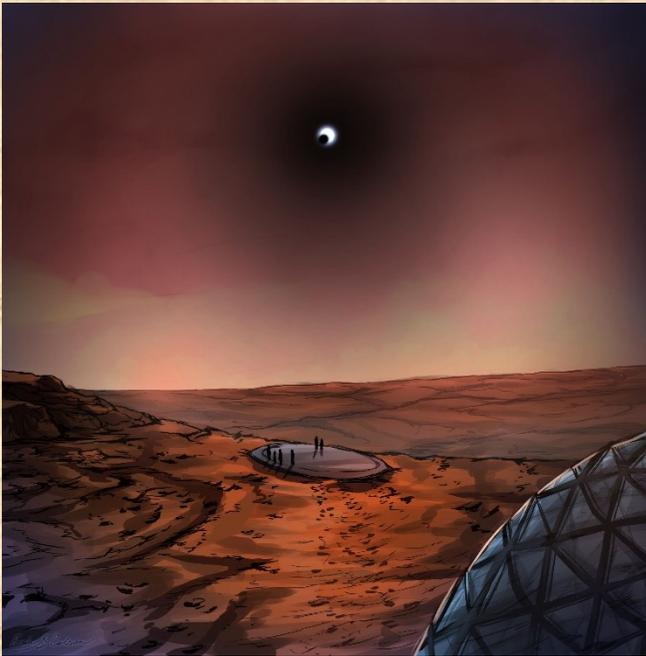


You need a buddy to get outside the West Valles Marineris Dome, and Demetrius is having some problems in that area. Will he be able to make his first excursion outside the dome in time to watch the transit of Phobos?

Standing in the Shadow of Phobos

by

Mary Alexandra Agner



Demetrius jumped onto his sister's bed, bouncing twice. He reached up to take down her wire-suspended reproduction of some old Earth building. It was the perfect place for his handmade model of Jupiter.

He eyed the distance between wire and doorway: his

calculations said four more centimeters to the left would be more accurate but Ann was going to be home soon from school. This would have to do.

He threaded the wire through the loop on Jupiter's north pole and tied it off. He frowned as Jupiter hung slightly sideways.

He heard the front door shut. Demetrius hopped to the floor and ran out of his sister's room, closing the door behind him.

Ann came down the hall. "Hey, junior astronomer, how was school?"

There'd been an essay but at least Teacher Anton had let him write about astronomy: tomorrow Phobos would pass directly in front of the Sun. He'd put in a paragraph about how he was celebrating his birthday by going out to watch the transit. It would be his first time outside the dome.

"Just school." Demetrius shrugged. "Will you be my Buddy so I can go out for the transit tomorrow?" None of his

friends were interested and a sister for a Buddy was better than no Buddy at all.

"Maybe—" Ann reached past him for her door then stopped. She turned back to her brother. "Why are you standing here?"

Before he could answer, Ann threw the door open. "Demetrius!" She stood in the doorway, glaring back at him. Over her shoulder, Demetrius saw Jupiter hanging half-cocked.

Ann walked in, reached up, and grabbed his planet, tugging it down. Demetrius winced as the upper atmosphere tore away into filmy strands. So inaccurate. Ann shook his model—pale white and beige against her brown skin—right in his face.

"Why's this in my room?" Ann lowered her voice but it didn't matter since their parents were still at work. Mom had a surface expedition this afternoon and Dad was always doing some low-gravity plant thing.

"I built a model of the solar system. Mom said I could put the Sun in the living room. And because of where Jupiter is in its orbit now—"

"My room."

Demetrius nodded. Ann began to look resigned. Then her eyes widened. "What else did you do while you were in here?"

Demetrius glanced at her desk, giving himself away.

"My diary!" Ann screeched.

"You shouldn't use a paper one. Dad said paper is expensive—" But, Demetrius thought, much much easier to read without anyone noticing.

Ann advanced. "I'm going to get you!"

Demetrius took off running and Jupiter, propelled in a parabolic trajectory by Ann's anger, missed him, falling gently under Martian gravity to the hallway floor.



Dad passed Ann the dinner rolls then turned to Demetrius. "How's the studying going, son?" The smile on his dad's face was bright against his black skin. Demetrius wouldn't admit it, but he imagined Earth sunlight felt like Dad's smile. Both his parents had been born there but

Demetrius and Ann had spent all their lives in the West Valles Marineris Dome.

He swallowed a bite of his dad's latest attempt at a homegrown Martian salad. "I have the test tomorrow."

"And then it's your birthday eclipse," Mom put in, her pink skin creasing when she smiled.

Demetrius said, "It's actually called a transit, Mom—"

"Keep your transits out of my room—" Ann began.

"Just a minute," Mom said, motioning Ann to wait, "I want to hear."

Demetrius said, "Both eclipses and transits have three parts: a watcher and one astronomical body passing in front of the other—from the watcher's point of view." Demetrius held up his hands, moving one in front of the other. "But with eclipses, it's more about the shadow."

"Go on," Mom said, still listening.

"Let's say I'm the watcher, on Earth, and a solar eclipse happens. The Moon—that's one astronomical body—

passes in front of the Sun—that's the second body—and the Moon's shadow falls on Earth where I'm watching."

"You watch too much," Ann said with a huff. She turned to her dad. "Aren't you going to punish him for sneaking into my room?"

"Let your brother finish, Ann," Dad said quietly. Ann rolled her eyes.

"A transit happens when the astronomical body in front is smaller than the other, from the point of view of the watcher." Demetrius pulled his closer hand into a fist and smiled. "Transits are pretty special because you get to see both of the objects at the same time. And, you get to sort of feel how the entire universe is moving, when you watch a moon cross over the disk of the Sun." He wondered, were they going to laugh at him?

"So why do you need to be outside?" Ann asked. She had stopped, her fork only halfway to her mouth; Demetrius thought she'd actually been listening to him.

"It's okay if you just watch it from inside the Atrium again—" That was Overprotective Mom.

"But this is the first time I'm old enough to be outside the dome!" Demetrius had spent all year counting the days.

"Unless you don't pass the Surface Hazards test," Ann teased. That was the sister Demetrius expected.

"Ann," Dad said, his voice a warning.

Ann looked down and stabbed her fork into the green leaves.

Everyone Make Up Mom said, "Ann, honey, maybe you could go with your brother tomorrow?"

"I'm *not* going to be stuck with the junior astronaut. Not after what he did to my room today." Shaking her head, Ann left the table.

"Dad," Demetrius asked, "Can't you come with me?"

His dad sighed, then reached out and put his hand on Demetrius' shoulder. "Son, unfortunately there's a big meeting in the lab at eclipse time."

Demetrius whispered, "Transit, not eclipse," but his shoulders slumped. He turned to his mom.

"I'm sorry, Demetrius." She blushed. "But I'll already be outside. My team is on the surface tomorrow making measurements all day." She paused. "How about you help me with dishes and then I'll quiz you on sandstorm safety?"



The next morning, Demetrius sat in the living room balling and tossing the crumpled wrapping plastic from his birthday presents.

Today he was going to go outside the dome. He was going to stand on the surface of Mars. He was going to watch Phobos transit in front of the Sun, like he'd done every birthday since he could remember. But today, because he would be outside the dome, he was certain he would be able to feel a moment when everything was moving. He shivered in anticipation.

But to do that, he had to pass the Surface Hazards test. He brought up the tutorial on his tablet. He stared at the first question. It was about the polar geysers—many clicks south of the dome so there's no way he'd ever walk there by mistake—but he'd studied so he tapped the right answer and was rewarded with the screen blinking green.

What do you do in case of comm loss? Check with your Buddy, then head toward the dome. Tap. Blinking green screen.

When your suit indicates a high level of cosmic radiation? Check with your Buddy on their situation, run the diagnostic on the suit sensors, head toward the dome. Tap. Blinking green screen.

In case of an approaching sandstorm? Shelter in place with your Buddy. How close do you need to stay to your Buddy? How do you rate your Buddy after an expedition? Tap, tap, tap. All green.

What do you do when you want to see the transit but your family won't go with you?

Demetrius laughed out loud. You get yourself a Buddy, obviously.

He swiped off the tutorial and switched to the dome's social channels. There was already one for the transit but it didn't have a whole lot of comments. He typed rapidly, asking if anyone wanted to view it together.

The tablet began pinging almost immediately. Five people saying they wanted to go. Then another. Demetrius stared at their names, not recognizing any of them. Swiping their comments for info showed most of them to be high schoolers or college students. More pings.

The tablet screen flashed. Someone had formed a new group to view the transit together and invited him. He looked at the message and saw the group's moderator was Teacher Toni; she was much more interested in science than Teacher Anton. He stabbed the invite to accept.

He still needed a Buddy, though. Demetrius scrolled through the list of names as people accepted invites to the group viewing. He recognized some of the family names. A Larry Hernandez wanted to go. Hernandez? Juan's older brother. Juan was ok, Demetrius thought, even if he liked music more than science.

But Demetrius laughed out loud when he realized school wasn't the only place he'd heard that name recently: Larry H was in his sister's diary. Now he could go outside for the transit *and* get back at Ann for not helping him in the first place.



Demetrius was checking the last of the environment suit's fasteners when Ann came home from classes.

"You passed?" she asked.

Demetrius shrugged.

"Where are you going?"

Demetrius stepped back, grinning. "Out for some quality time with your boyfriend." He took off through the front door, jogging.

Ann squeaked then chased him all the way to the main air lock, stopping short when she saw the group of people already there. "What's all this?"

Demetrius picked up one of the suit helmets from the common locker and ran his fingers over it checking for defects. "None of you wanted to come with me but there are lots of other astronomers in the dome, so I asked around."

Ann looked sheepish. "I'm sorry, junior astronaut—" She held up her hands to shake away the words. "I didn't mean that—"

"I'm not a baby. I'm thirteen and I'm going out to the surface to see Phobos."

"Yeah, I know, I'm sorry I haven't been treating you more like a grown-up." Avoiding his eyes, Ann looked around again at the crowd. "That's Larry H! He's hot basalt!"

"He likes astronomy." Demetrius stuck out his tongue at his sister. "And you like him."

Ann looked at the crowd for a moment, then turned to Demetrius and smiled. So fake, he thought. "Of course I'll go with you, Demetrius."

"Too late," he said, triumphantly. "I've already got a Buddy."



Demetrius couldn't feel or hear the crunch of the Martian surface under his foot when he took his first step out of the airlock, but he looked down to watch the small cloud of dust rise and settle. *That's my footprint!*

Near the dome there was little to trip over, but he checked carefully before walking with Larry to the Park, a flat spot free of debris half a kilometer from the main door where the viewing group had agreed to meet. Teacher Toni was there already—she was easy to spot because of her height—with three other viewers. Artificial seats were arranged in a small arc but Demetrius stood, spinning around slowly to see every bit of the view. Larry stopped next to him. Without the windowpanes of the Atrium to interrupt, Demetrius felt as expansive as the wide red Martian sky surrounding him. He held out his hand to touch the horizon.

Demetrius checked again that Larry hadn't left—"verify the proximity of his Buddy" like the rules said—then flipped the helmet visor into polarized mode. He looked up. The suit countdown said he had nearly a minute to wait so it was just the bright disk of the sun. The creases of the suit squeezed against his skin. His neck bent back into a crick.

The sun's crisp circle of light hung motionless in the sky. As the uneven edges of Phobos began biting into it, he heard Larry and some of the others whooping over the comm channel. Demetrius smiled but didn't look away. Phobos was a smudge, then a finger-shaped blot, altering

the Sun's outline. The moon was 9300 kilometers away, covering the Sun 228,000,000 kilometers away, but Demetrius held his breath anyway, caught up in the conjunction. As Phobos swept across the Sun, he felt a moment of vertigo, as though he were swinging through space along with Phobos, as Mars rotated. Bull's eye, Phobos dead center of the bright ring for barely a millisecond. Then the moon moved on, sweeping its shadow across the Martian surface. *What a birthday present I've given myself*, he thought. Demetrius inhaled deeply, then joined in the cheering over the comm channel.



Mary Alexandra Agner writes of dead women, telescopes, and secrets. Her poetry, stories, and nonfiction have appeared in The Cascadia Subduction Zone, Shenandoah, and Sky & Telescope, respectively. She can be found online at <http://www.pantoum.org>.

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