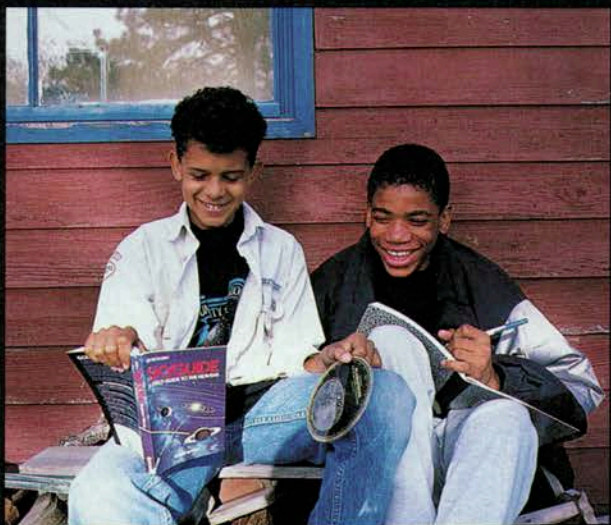


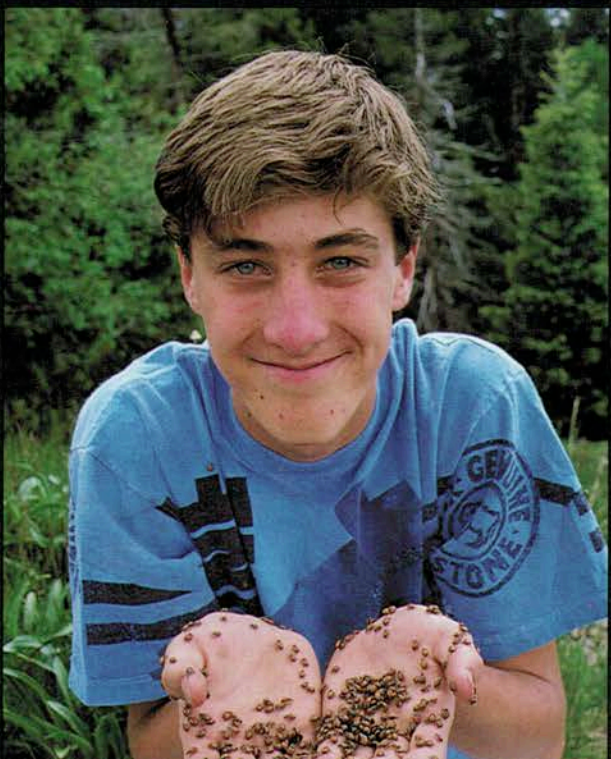


With Stars in Their Eyes

**This astronomy camp
for kids makes science
fun while breeding
intellectual curiosity**



**Text by Kathleen Walker
Photographs by J. Peter Mortimer**



Chad Joe has just seen the moon the way he always wanted to, right up close. The 13-year-old boy from Tucson looked through the eyepiece of the 60-inch telescope on Mount Lemmon, and there it was, as big as a world and golden with promise.

"It's a miracle," he says with the glow of that moon still on him. "I'd like to be up there, walking on the moon, kicking back on the moon."

Shawn Holder, 16, of Nicholasville, Kentucky, has a similar reaction to his turn at the huge telescope, his

(TOP) Astronomy camper Michelle Alvarado peers at the stars through the University of Arizona/NASA 60-inch telescope on Mount Lemmon.

(MIDDLE) Chris Cadle, left, and Chad Joe look over camp materials.

(LEFT) On Mount Lemmon, Jason Peipelman makes friends with a swarm of ladybugs.

(RIGHT) This image of the moon was captured through the finder of the 40-inch telescope on Mount Lemmon.



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excitement only slightly subdued by his drawl. "This is the most neat thing I've ever seen," he tells me.

Later, as I walk with Shawn through the cold June night on Mount Lemmon, the desert heat of Tucson only 90 minutes to the south, he looks up at the sky. It is black and deep, and the stars are like crystals.

Then, with that sweet naiveté of youth, he tells me, "This isn't like Kentucky."

No, it isn't. It may not be like any other place or any other experience on the good green Earth. It is the end of Day 4 at the Beginning Astronomy Camp sponsored by the University of Arizona Alumni Association.

Twenty-one children, young men and women, ranging in age from 11 to 17, have come to this mountain from around the country: from California, Nebraska, Washington, from the cities and towns of Arizona, from urban and rural homes. Some have a long-standing interest in astronomy, others have little knowledge of the heavens. They have been sent here by parents and grandparents, by teachers and counselors who have either seen the stars in their young eyes or hope to put some there.

For one week in summer, they eat, drink, work, sleep, and dream like astronomers. They put in full nights and catch up on sleep later. They travel from the campus of the University of Arizona in Tucson to the observatories of Kitt Peak to the southwest and to the telescopes atop Mount Lemmon to the north.

With them every step of the way, leading them up and down the paths astronomers have walked for decades, is Don McCarthy, camp director.

He tells them, "You're going to learn by doing it. We're going to put you in the position where you have to work together with other people, like scientists do."

McCarthy well knows the working methods of a scientist. He holds a Ph.D. in astronomy, is an associate astronomer at the University of Arizona, and is in charge of that institution's 99-inch telescope on Kitt Peak. In 1977 he was a finalist in the initial selection of space-shuttle astronauts, held back from a flight into history because he wears glasses.

"Extreme disappointment," he says of that cut. "But we're exploring in different ways here."

For five summers McCarthy has directed both beginning and advanced astronomy camps. He develops the projects the campers work on, like the photography of the planets through the telescopes on Mount Lemmon. He gives lectures and demonstrations, and he oversees games that turn imperceptibly into lessons.

"I'm pretty good at explaining things to kids, and I enjoy being around them," says McCarthy. "It seems like a natural sort of thing for me to do."

The scientific facilities of southern Arizona have opened their doors to this guru of astronomy and his band of campers. They are given access to equipment — and the time to use it — that would be the envy of amateur and professional astronomers alike.

On Kitt Peak they cram into the control room of the National Radio Astronomy Observatory. Scientists break from their work at the computers to show the campers how they position the great white dish.

There is a trip into the bowels of the Mayall four-meter telescope, then a climb across its catwalks. Here, in a structure so massive it shrinks a human being into insignificance, Becky Fox, a 14-year-old camper from Phoenix, states firmly, "I'd love to use this one of these days." No one laughs. She just might.

In Tucson the campers use the 21-inch and eight-inch telescopes of Steward Observatory on the UofA campus. They are given almost carte blanche at the nearby Flandrau Science Center and Planetarium, that jewel box of hands-on exhibits and advanced technology.

On Mount Lemmon they move into the astronomers' dormitories for a four-day stay. They work in research teams, plotting their own use of the telescopes. They stay under the mushroomlike domes until the need for sleep or the light of a new day intrudes.

"These kids wear me out," Diana Johnson admits. She is one of the graduate students chosen by McCarthy to be a counselor. These young men and women, who are moving into their own careers in astronomy or teaching, are expected to be with the campers 24 hours a day. The counselors are expected to work with them, direct them, talk with them, listen to them, and care for them. They are also expected to be — and they know it — role models.

"It's fun being able to teach kids this age that you don't have to be some nerdy person to like what you're doing, especially in science," says Johnson.

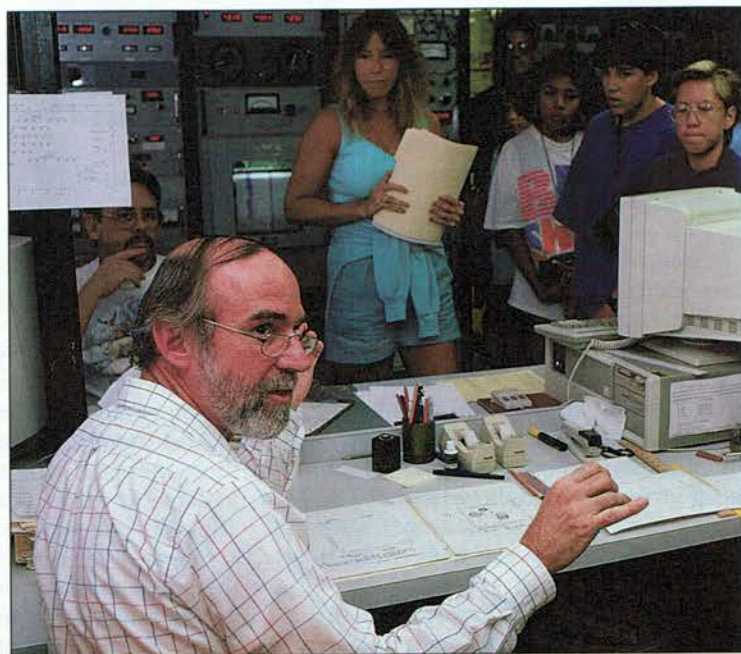
While adults may cringe at the thought that students interested in science and math are still labeled as being somehow different, McCarthy knows it happens. He says, "I've seen gals and guys who deliberately got bad grades so that they would fit into certain groups."

Not at this camp. Here excellence is supported, intellectual curiosity is fed. Yes, they are still children, young people who break happily for a volleyball contest





(LEFT) Campers gather on the floor below the control center of the 4-meter Mayall telescope at Kitt Peak National Observatory. (TOP) On the Papago Indian Reservation, home of the Tohono O'odham, the Kitt Peak observatory houses the world's largest collection of telescopes.

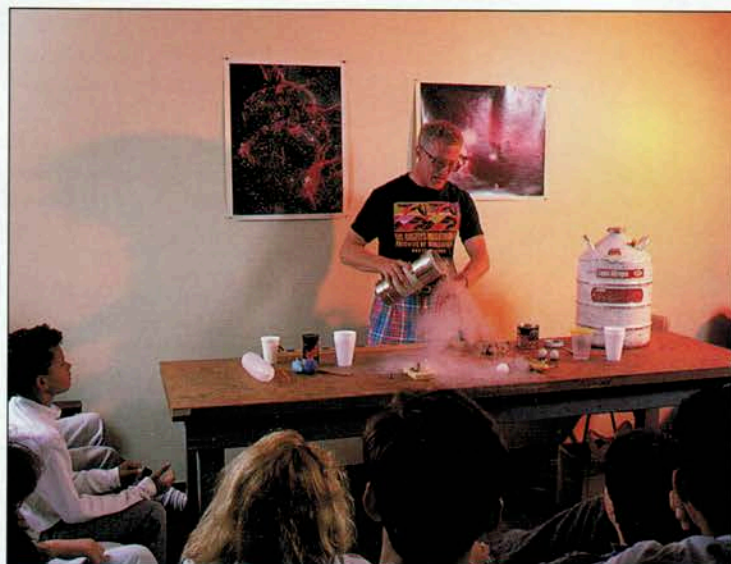


(ABOVE, LEFT) Christina Vitale, left, and Michelle Alvarado study the astrophotography display in the visitors gallery of Kitt Peak's Mayall telescope. (ABOVE) Dr. Robert Brown, assistant director of the National Radio Astronomy Observatory at Kitt Peak, talks with campers.



(ABOVE) Marian Toro, who for years gazed at the stars from the roof of her home on the Papago reserve, listens as camp director Don McCarthy talks about the opportunity to use the 60-inch University of Arizona/NASA telescope.

(RIGHT, TOP) After the campers select materials they'd use to build a space ship to go to Saturn, McCarthy uses liquid



nitrogen to demonstrate what would happen to some of those items in the cold temperatures they would encounter.

(ABOVE) Tysen Gamble, left foreground, and Becky Fox examine the control panel of Mount Lemmon's 60-inch telescope. In a few hours, the youngsters will join the other campers, working on astronomy projects they created.

or a game of pool in the rec room at Mount Lemmon. They still take long walks through the pines with new friends. They poke in the grass, wondering why every ladybug in the world seems to have chosen this high place as its home. But, when McCarthy brings in the big guns, the guest speakers who can show them what it means to be smart and creative in today's world, the youngsters' attention is riveted again.

Astronomer David Levy stops by for a chat on how one might go about discovering a comet. He should know. He has discovered 17 of them. Kim Poor makes the trip, too. He is an artist who creates airbrushed visions of space based on scientific knowledge. At the UofA there is a lecture by Dr. John Robson, professor

emeritus of physics, on color and how the eyes can be fooled. He says of the campers who have sat before him, "Generally, they're more interested and get more involved than an older group."

And there are those other scientists, those men and women who always seem to have an extra few minutes to spend with this living collection of T-shirts and running shoes that has found its way to the inner sanctums of their observatories.

The attention given these campers is priceless. It has to be. The astronomy camps are run close to the bone. If McCarthy had to pay everyone for the time they put in, he couldn't do it. "We wouldn't exist," he says.

Even with the support of the alumni association, with the access offered by

Flandrau, Steward Observatory, Kitt Peak National Observatory, and Mount Lemmon Observatory, the money is tight. There are dorm fees, facility-use fees. There are notebooks to buy, pens, flashlights, all the paraphernalia for the projects. There also is that 1,500 pounds of food that must be purchased to feed the campers.

The cost to attend the astronomy camp is \$485, all inclusive. Scholarships are available, full and partial. Some come from the NASA Space Grant Consortium and others from adults who have had their own camping experience with McCarthy.

Two or three times a year, he leads an adult astronomy camp, a weekend miniversion of the summer camps. Here, too, the campers come from around the

country and are enjoying either their first taste of astronomy or exploring a lifetime passion. The graduates of the adult camps have shown a likable tendency to pass on the experience to the younger generation.

"Historically, the adults turn around and give scholarship money for the kids to come," says McCarthy. He tells a story about the man from Illinois who went back home and told his school district, "I want to send a kid to this camp. Can you recommend somebody?"

That is the kind of unflinching support McCarthy would like given to other educational endeavors, as well as his own, and particularly in the area of science. "There are not enough people doing this kind of thing," he says. "And I think society is taking a short-term view. You don't train scientists and engineers overnight. It takes a generation."

And Don McCarthy has just one week in June.

So it's off to build rocket ships out of cardboard, construct race cars out of wood blocks, and learn Newton's Laws of Motion while you're doing it. It is up the mountains, across the desert. It is a nap in the back of a moving van, a night spent gazing upward, a day listening and learning, and always, laughing. It is eight days of on-the-run science.

At their graduation ceremonies, when the campers gather for the last time, McCarthy tells them he hopes they now have an understanding of our planet and how it fits into the universe. And, he adds, "I hope you asked the question of how you fit in."

Some will be back. They will sign up for next year's advanced camp. Others will choose to attend the UofA and select astronomy as their major. Still others may never be involved in astronomy as a vocation but will cherish it as a hobby.

Then there is the camper like Marian Toro. She may be one who takes that shuttle trip into space that McCarthy missed. It is on the land of her people, the Tohono O'odham, that the observatories of Kitt Peak were built. She lives below the peak in the desert town of Sells. By age 16 she had spent a childhood of nights perched on the rooftop of her family home, gazing upward.

"I wonder if there's anything out there," she says. "I say to myself, I belong out there."

For one week in June, she and 20 other young men and women made a voyage to that sky. They found it "neat" and "a miracle" and filled with stars that match the ones in their eyes. ■

Additional Reading: For more about the stars, we recommend *Discover Arizona's*

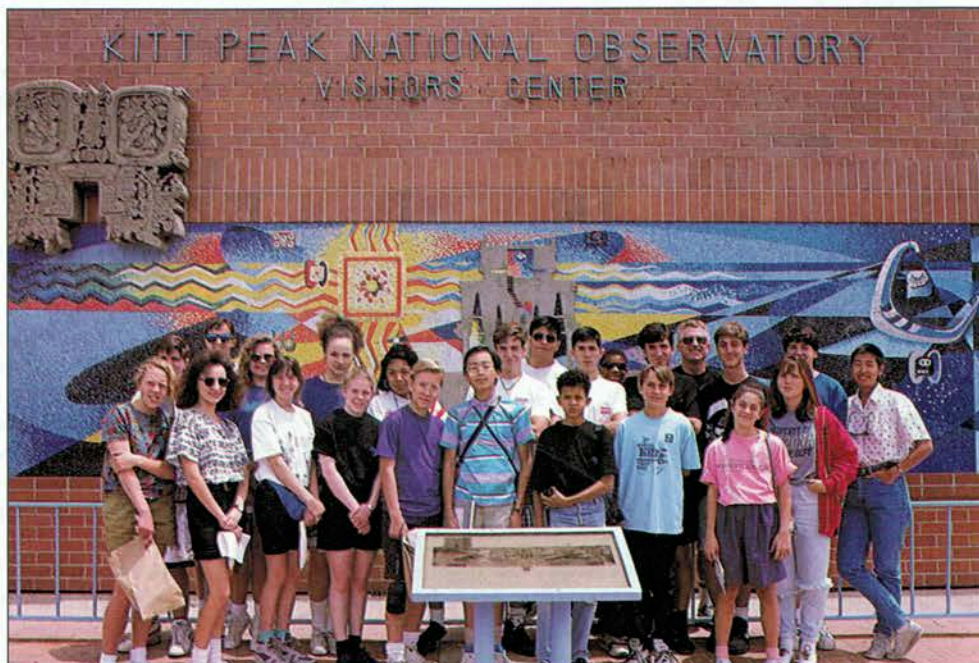
Night Sky, an *Arizona Highways* softcover book (\$8.50) by noted sky photographer Frank Zullo. Useful for beginning or advanced amateur astronomers throughout the country, the book features an informative text, 50 full-color photographs, easy-to-use astronomical maps, and instructions for taking night-sky photos. To order, telephone *Arizona Highways* toll-free

at 1 (800) 543-5432. In the Phoenix area, call 258-1000.

Kathleen Walker says that despite spending a week in the company of professional and amateur astronomers, she still believes there is a man in the moon.

J. Peter Mortimer has been fascinated by celestial objects since he studied astronomy at Arizona State University a decade ago.

WHEN YOU GO



Getting there: Kitt Peak National Observatory is 1 1/2 hours southwest of Tucson on State Route 386. Flandrau Science Center and Planetarium in Tucson is on the University of Arizona campus at the corner of University Boulevard and "the mall," or Cherry Boulevard.

What to see and do: Kitt Peak is open 9:00 A.M. to 4:00 P.M. daily, except major holidays; in summer, the gift shop and museum are closed Mondays. Take a self-guided tour or join a guided tour at 11:00 A.M., 1:00 P.M., 2:30 P.M. Observatory is handicapped-accessible, but it is necessary to climb stairs to the telescopes. Open to the public are the McMath solar telescope, the Mayall four-meter telescope, a 2.1-meter telescope, and the Burrell-Schmidt telescope. For more information, call (602) 322-3426.

At Flandrau, view the sky through the 16-inch telescope, available to the public Tuesday through Saturday. Planetarium shows and movies as well as laser shows are available afternoons and

(ABOVE) The campers and their mentors assemble to begin a day-long tour of the telescopes on Kitt Peak.

evenings. The theater, exhibits, and rest rooms are handicapped-accessible. For more information, call (602) 621-4515.

Other activities for astronomers: Smithsonian Institution Whipple Observatory tour of the Multiple Mirror Telescope on Mount Hopkins in the Santa Rita Mountains, one hour south of Tucson. For directions and information on tours and ticket costs, call (602) 670-5707.

"Star Parties" are organized by the Tucson Amateur Astronomy Association. Group members supply the telescopes and the expertise for group stargazing. Most activities are handicapped-accessible. The annual Grand Canyon star party will be held June 12 to 19 at the South Rim, near the Yavapai Museum. There is no admission charge. For information, call (602) 293-2855.

For information on beginning, advanced, and adult astronomy camps, call the UofA Alumni Association at (602) 621-5233.

