basic arithmetic in my head when I’m up there.”

The enormous tanks—23 feet wide and more than 16 feet high—are the same kind of tanks used by Midwestern farmers to irrigate their fields. A military contractor who manufactures “light-tight” tents for soldiers in hostile territory makes the tanks’ hemispherical domes.

Local workers assembled the tank array, and then made 4,000 trips by truck up and down the mountain to haul the water to fill them—a volume of 55 million liters, or the equivalent of a soda can’s worth of water for each person living in Mexico.

The tanks sample the air shower particles at ground level. There are about 100 million particles in a cascade at its peak. The number of particles decreases as the cascade descends.

“It’s like a pancake of high-energy particles that moves toward the ground,” BenZvi says. When the particles hit the ground, they move through the tanks—and when high-energy particles move through water, they produce ultraviolet light, known as the Cherenkov effect. The photosensors in the tank record the ultraviolet light. And from the pattern of times that the sensors in each tank are triggered, scientists can reconstruct the direction of the particle pancake.

The data they collect may also shed some light, as it were, on dark matter.

“There is very strong evidence, from all kinds of measurements in astrophysics, that there is something called dark matter,” BenZvi says. “But it’s not clear what it is. We think it’s a fundamental particle or particles.”

But scientists don’t know how massive it is or what its interactions are. “So it’s entirely possible that some of the gamma rays and cosmic rays that we see are actually not produced by neutron stars and supernovae and things like that—they’re actually produced when clumps of dark matter interact and decay. That’s the idea,” he says.

When anomalies are found in astrophysical data, scientists consider whether the source of the anomaly is a mistake in their model or the influence of dark matter.

“And that’s kind of the name of the game,” says BenZvi. “It’s a tough game, as you can imagine. It’s sort of like the joke about ‘unknown unknowns’—you don’t know what you’re not modeling.”

Telescopes offer another way to measure gamma rays. But they have a narrow field of view, taking in only a few degrees of the sky at a time. HAWC records information from two-thirds of the sky every 24 hours.

“Over the course of one day, we can see essentially the entire northern hemisphere,” says BenZvi, noting that the methods are complementary. “We’ve made the bet on more coverage, less sensitivity; they make the bet on more sensitivity, less coverage. If you have both types of instruments running, you can look for unexpected things.”

Scientists are now processing their first year’s worth of data from HAWC, which they began taking in only a few degrees of the sky at a time. HAWC records information from two-thirds of the sky at a time. HAWC records information from two-thirds of the sky at a time. HAWC records information from two-thirds of the sky at a time.

In May, the University is hosting the Rochester–St Andrews Conference on Older Scots Literature and Culture. The gathering draws specialists from the United States, Canada, and Europe to share papers on 14th- to 16th-century literature in Older Scots, the descendant of Old English that was used in medieval and early modern Scotland.

Rhiannon Purdie of the University of St Andrews in Fife, Scotland, who is visiting the University’s Robbins Library as a Fulbright Scottish Studies Scholar, and Thomas Hahn, professor of English, organized the event. Papers examine early literary and political texts, historiography, and language and ethnicity, among other subjects.

The Robbins Library is home to the Middle English Texts Series, sponsored by the Consortium for the Teaching of the Middle Ages. Among the nearly 100 volumes published, the series has made available, in digital and hard copy, a number of Older Scots writings and more are in production, helping to make Older Scots literature more accessible to teachers and students around the world.

More information about the conference is on its website: Olderscots.com.

—Kathleen McGarvey

**CONVENING SCOTS:** Scholars are gathering at Robbins Library to discuss texts written in Older Scots, a descendant of northern Old English that was used in medieval and early modern Scotland.

**Brushing Up on Older Scots**

Scholars discuss the literature of medieval and early modern Scotland.

Feeling like a cummerwarld, or even a dowbart, because your Older Scots vocabulary is a bit rusty? Fear not: you needn’t be looking glaikit for long.

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**Meet a Few Terms from Older Scots . . .**

cummerwarld: n. useless person (i.e., “encumber-world”)
dowbart: n. dimwit
dreich: adj. tedious, dreary; (of weather) grey and miserable
feeling like a dowbart? Fear not: you needn’t be looking glaikit for long.
dowbart: n. dimwit
glaikit: n. useless person
maggil, maggle: v. to spoil
maggilit: n. adj. mangled, ruined
maggilit: adj. mangled, ruined
nipcaik: n. misère
quean: n. wench
skaldit skaitbird: n. scabby scavenger
skamelas: n. parasite
slawys: n. fellow, guy
walidrag: n. waster
walidrag: n. waster

Still common in modern usage.

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