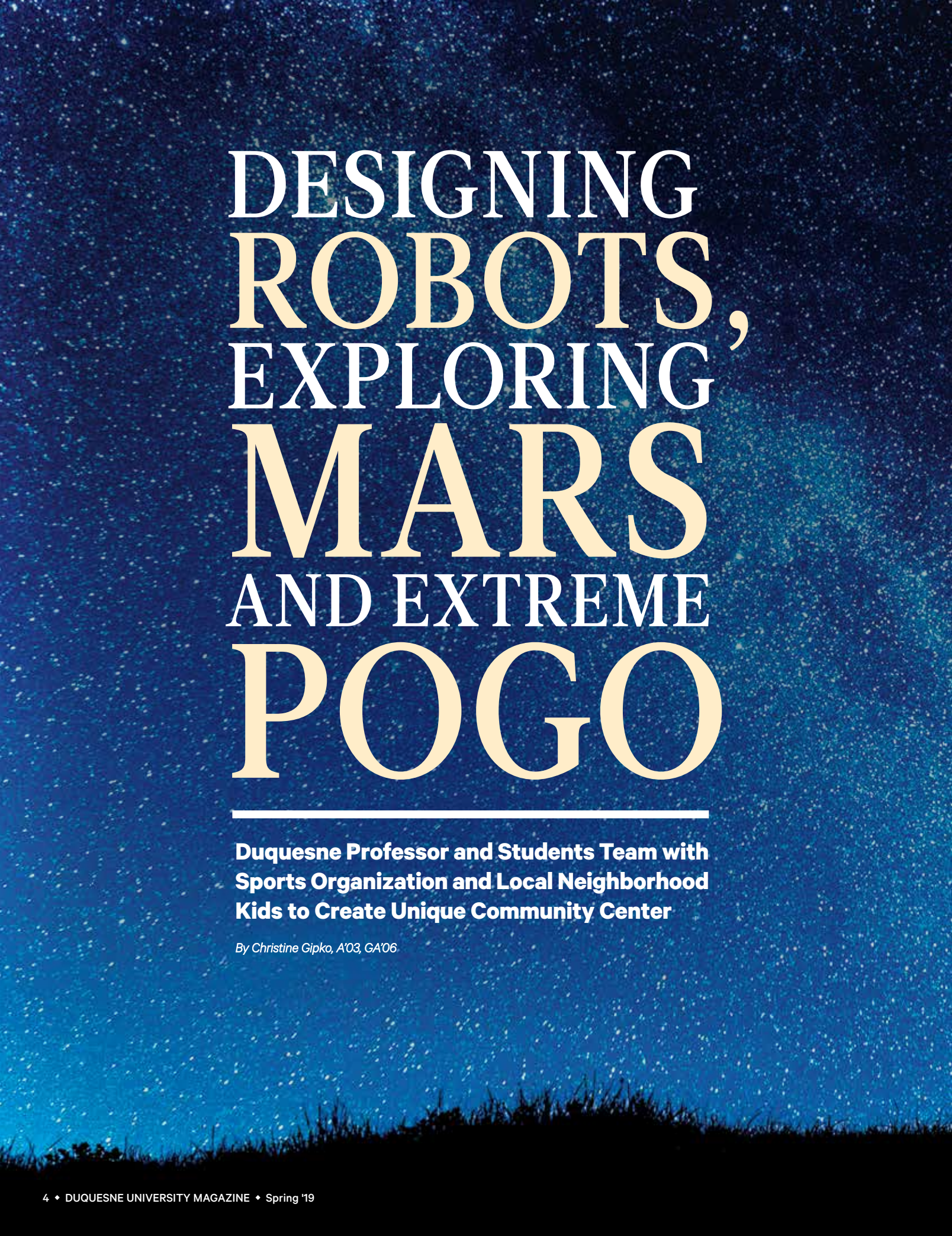
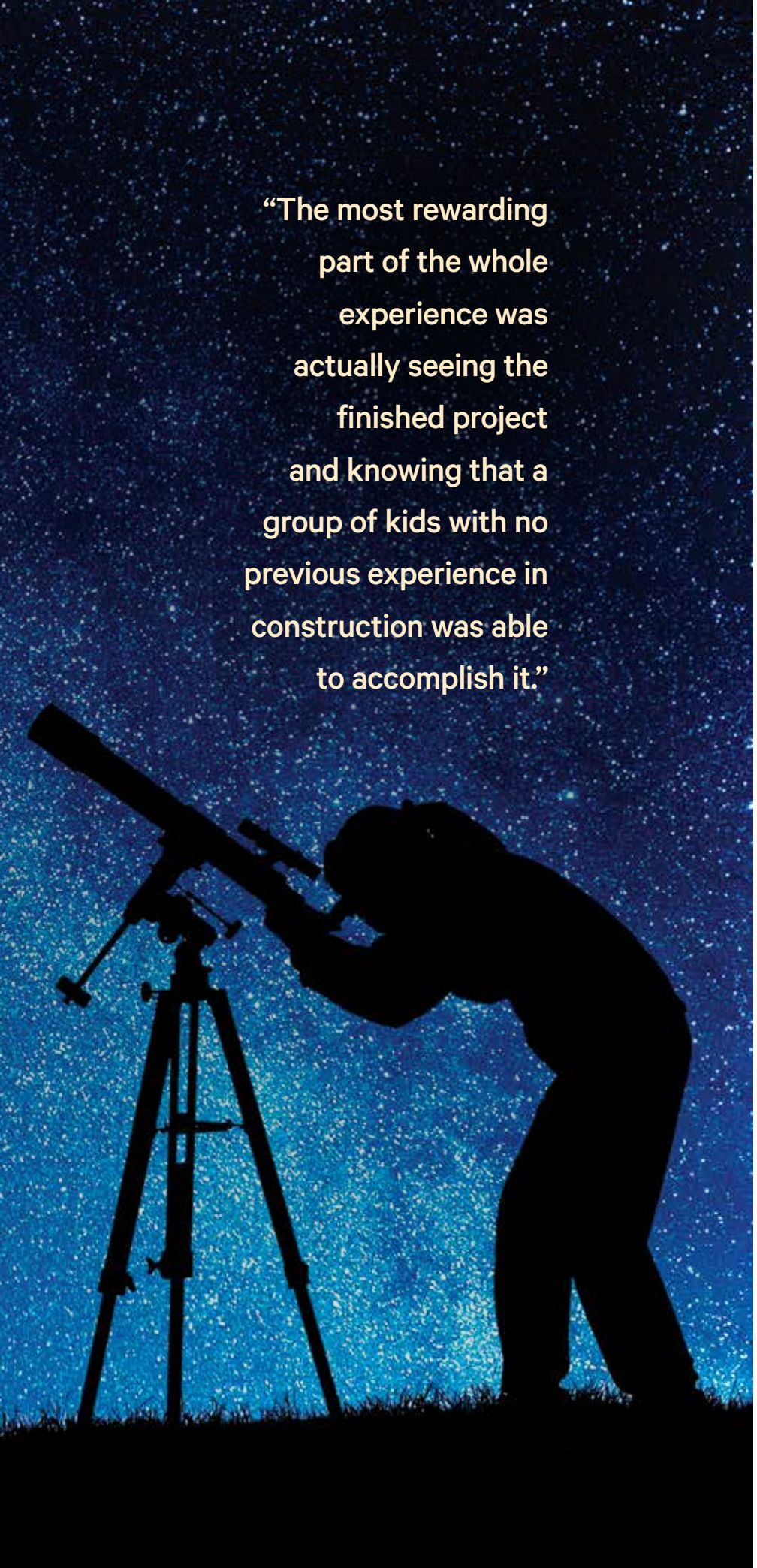


# DESIGNING ROBOTS, EXPLORING MARS AND EXTREME POGO

**Duquesne Professor and Students Team with Sports Organization and Local Neighborhood Kids to Create Unique Community Center**

*By Christine Gipko, A'03, GA'06*




Why just reach for the stars when you can build a telescope and see them up close? This hands-on spirit is the driving force behind Pittsburgh Learning Commons (PLC) and Community Forge, sister organizations co-founded by Dr. Patrick Cooper, assistant professor of theoretical physics at Duquesne University.

At the heart of both organizations is creating educational opportunities for youth through community partnerships, including some out-of-this-world chances to explore the universe without ever leaving Pittsburgh. The soul of both organizations is a giant old school—the former Johnston Elementary school in Pittsburgh's Wilkinsburg neighborhood—which is undergoing a rebirth through the hard work of Duquesne students and neighborhood kids. In an unexpected twist, extreme pogo enthusiasts are helping as well.

## Finding a Home

Having a permanent community space was key for the work of PLC, but settling in the former school wasn't a given, as the building's size and outdoor space were at once intimidating and intriguing.

"It was a huge brick building, completely abandoned, and we thought, OK, this is a little bit more than we originally imagined—we had imagined a couple rooms—but maybe there is a really interesting project here," Cooper says.

"Schools are an epicenter of social life in a lot of communities—they bring the parents together through the children coming together, they're polling locations, they're where people have practices—and there's an element of a school closing down that is an entire community losing its beating heart. So we wondered, could we buy this school and maintain it as the community asset it once was?"

The short answer was yes, but they couldn't do it alone. Fortunately, in 2016 PLC found a partner in Xpogo, an extreme pogo company whose

Dr. Patrick Cooper, assistant professor of theoretical physics, and Duquesne student Sean Vinsick led a team of local youth in reconstructing a 600-pound telescope on the roof of Community Forge in Wilkinsburg.

**Organizations Receive Grant for STEAM-Inspired Play Space**

In late 2018, the Kids Play Everywhere Grant Challenge awarded Community Forge and Pittsburgh Learning Commons (PLC) a $30,000 grant. Sponsored by Keurig, Dr Pepper and KaBOOM!, a national nonprofit that emphasizes the importance of active play in children's lives, the design competition asked local organizations to submit new ideas for engaging, accessible play spaces.

Community Forge and PLC's winning project, "Number Mountain," is a math-themed playground that will promote STEAM learning and encourage unstructured play. Duquesne students Sean Vinsick and Liz Mannion were instrumental in designing and building the playground, which incorporated ideas from the PLC after-school program's students.

founders also wanted to headquarter in Pittsburgh.

"Xpogo loved the 60-foot atrium and outdoor space but didn't need the classrooms," Cooper explains. "And PLC wanted to do civic and educational work, creating a kind of community center by renting out the classrooms to organizations that provided services to people in various ways."

Together they formed Community Forge, LLC, to purchase and begin renovating the building. Within a year, nearly all of the rentable space was filled. One of the corner classrooms on the main floor is occupied by PLC, whose robust educational programming has included a grant-funded Mars space camp that immersed local 12-year-olds in the experience of building and using a Mars rover.

"We separated the kids into three teams: astrobiology, astrophysics and astroengineering. Engineering built the rover robot, biology did all the experiments the robot was going to use to find life, and the physics team designed all the physics systems for how the rover would do things like generate energy and launch in the air," Cooper says, noting the teams had an added challenge of regularly communicating with each other to identify constraints, challenges and solutions. "Within a week, they were soldering solar panels together, making robots and programming."

Can see as far as four moons of Jupiter

Built by local youth construction team

Total height of telescope: 8 feet

At the same time, Cooper was mentoring a student construction team from the Wilkinsburg Youth Project, which connects teens looking for summer employment to local organizations that pay for the students' assistance on various projects. Cooper assigned his team a task that might seem unusual anywhere else but made perfect sense at Community Forge: build an observatory—including a 600-pound telescope—on the roof.

## How Do You Move a 600-Pound Telescope?

The giant Newtonian reflector telescope—the same type Isaac Newton used—was generously donated by a member of Pittsburgh's Amateur Astronomers Association in the fall of 2016; and getting it to Community Forge was no small feat. The telescope's size was an obvious challenge, and moving it involved lots of literal and figurative heavy lifting. From carefully disassembling the telescope and transporting it to Community Forge to reassembling and building housing for it, the project took several months and required a group effort by Cooper, the Wilkinsburg Youth Project team, and Duquesne student volunteers, family members and friends.

"A lot of people in the Pittsburgh community wanted this telescope, but when they realized it was eight feet long, 600 pounds and mounted into a cement casing, they changed their minds," Cooper explains. "Fortunately, some of my students and their friends and family volunteered to help."

The following summer, Cooper and his Wilkinsburg Youth Project team co-led by Duquesne students, reassembled and mounted the telescope, then built a removable 10-foot shed that pulls away when the telescope is in use.

Sean Vinsick, one of Cooper's Physics 1 students, helped to renovate Community Forge and was a lead for the telescope project.

"Most of our challenges involved moving the heavy stuff," Vinsick says. "Getting the telescope on the roof took every set of hands available to carry it up four flights of stairs and then across the roof."

But for him, the hard work was well worth it.

"The most rewarding part of the whole experience was actually seeing the finished project and knowing that a group of kids with no previous experience in construction was able to accomplish it," he says.

While the telescope is certainly the observatory's largest piece of equipment, it's not the only one. Additional equipment donations have included smaller refracting telescopes, tripod binoculars and a Dobson telescope. Cooper hopes to grow the observatory and already has the next telescope project in mind.

"The man who originally built and donated the large telescope was in the process of putting a motor on it. This is an equatorial reflecting telescope, so it's not very difficult to provide a small torque on one of the axes of the mount that actually rotates with the rotation of the Earth. Without the motor, whatever faraway object you're pointing at will come into frame and then go out of frame because the Earth is spinning," Cooper says. "I'd love to find funding for the necessary equipment and, as a science project with some youth in Wilkinsburg, add a micro-controlled Arduino powering a little stepper motor to the telescope."

The observatory project was partially funded by a grant from Duquesne's Bayer School of Natural and Environmental Sciences; and several other Pittsburgh universities have been instrumental in supporting PLC and Community Forge.

Cooper is particularly moved by his students' volunteer efforts, and he sees their willingness to help as an example of Duquesne's mission at work.

"Community Forge is not too close to campus and sometimes the work we need to do is arduous, so I am especially impressed by their willingness to travel and give up weekends for that. They just want to help out, which is great," Cooper says. "Duquesne's mission clearly shows when so many of the students have that mindset."◆

### How You Can Get Involved

In addition to Pittsburgh Learning Commons' (PLC) summer camps and educational programming, Community Forge houses a small business incubator, an artist residency program, musical and theatre performances, and more. As new and growing community organizations, they welcome support from institutions and individuals.

"We have places and projects to fit just about anyone who wants to help," says Patrick Cooper, PLC and Community Forge co-founder and assistant professor of theoretical physics at Duquesne. "If you want to see more Wilkinsburg-native entrepreneurs starting businesses in Wilkinsburg, for example, you could contribute to the Community Forge Small Business Development program. Or if you want to support STEM education, you could help to provide equipment for PLC's summer programs. There are lots of ways to get involved."

Learn more at **www.forge.community** and **www.pghlearn.org**.