

A Different Kind of January Getaway



Engineering outreach in the Alaskan bush

by Peter Dunn
October 24, 2012

When the temperature reached -52 in Alaska, the travelers had to wait to fly to their next stop. They included (from left) ASRA workshop veterans Kieran O'Neil, Anastasia Brease, and Sara Falcone '15, plus Sara's father, Joe Falcone '77.



Early in her freshman year, Sara Falcone '15 told her advisor, Ed Moriarty '76, that she wanted to use engineering to improve living standards in the



Alaskan bush, the remote areas of her home state not connected by roads.



Moriarty, a technical instructor at MIT's Edgerton Center, conducts educational outreach efforts in those parts. He replied, "If you're thinking about working in the bush, you should spend some time there when the weather's not nice."



A few months later, in January 2012, they were off on an excursion that took Falcone, Moriarty, and Falcone's mathematician father, Joseph Falcone '77, on a weeklong circuit of Anchorage and the remote towns of Takotna and McGrath. At each stop they engaged groups of primary- and secondary-school students with playful, collaborative engineering-oriented projects. The voyagers also fulfilled the not-nice-weather requirement: temperatures of -52 °F left them "weathered in."

Falcone, now a sophomore majoring in mechanical engineering, first experienced life in the bush at 14, when



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she spent a month at an isolated fishing camp. “There were only about 40 people, no cell phones, no plumbing,” she recalls. “In many places in Alaska, the outside world seems so foreign; it’s pretty rough out there, and I felt I’d like to do something to help.”

In high school, Falcone deepened her interest in the rural Alaskan lifestyle when she took



Sara Falcone '15, Kieran O'Neil, and Anastasia Brease work on a remote-operated vehicle during a 2008 ASRA workshop.

Moriarty’s engineering workshop at the Alaska Summer Research Academy (ASRA), a two-week program run by Jeff Drake ’75 at the University of Alaska Fairbanks. Drake, Moriarty’s former MIT roommate, also went on the January trip and arranged trip funding from the New York Life Foundation.

“That ASRA workshop was the first time I ever created anything,” recalls - Falcone. “I’d dreamed of designs, for new kinds of cabins and better ways of doing things, but never built anything. Electricity was completely foreign to me, but Ed just said, ‘It’s easy—wire these up,’ and walked away. Ed doesn’t instruct you at all, but he ends up helping you more than you’ll ever know. It was life-changing. I definitely wouldn’t be at MIT if it weren’t for meeting him.”

Moriarty brought that hands-on approach on the road in January. “Ed brought suitcases of stuff from his lab — little physics toys, things that make you think,” says Falcone. “The first day, he had us unpacking and saw a kid who didn’t seem interested. He said, ‘Hey, let’s assemble this wind tunnel and put a miniature snow machine inside.’”

As smoke passing through the tunnel illustrated the way air travels around a moving snow machine, “that shy kid

who didn't want to be in school was fascinated," Falcone says. "Soon there was a group watching. When the kids saw how fast the air moves over the windshield, they said, 'That makes total sense! When I put my head up over the windshield I get frostbite!'"

One popular project was a small wood-and-plastic assembly housing red, green, and blue LEDs, which introduces students to soldering and assembling electronics into a working system. The completed light source lets them experiment with diffraction and other physical phenomena, but it also creates beautiful, glowing patterns, reminiscent of the northern lights—



Ed Moriarty '76 boasts a frosty beard as he comes in from the cold in Alaska.

and this simple beauty is central to the educational process.

“All humans respond to art,” notes Moriarty, who likes to speak of STEAM education (for science, technology, engineering, art, and mathematics) rather than STEM. “The goal is to get kids engaged with passion and joy. You don’t start with the rigor. Rigor is your friend when you’re trying to do something really well, but it’s not the way to introduce the subject—it’s like introducing music with scales.”

Moriarty’s programs in the bush, at the Edgerton Center, and across the country reflect an engineering learning model in which empowerment is more important than content. “You make things, you work in teams, you fail and learn to do better the next time,” he explains.

Back at MIT, Falcone connected several students from the January trip to the Media Lab and other Institute resources. She assisted at an ASRA program in Fairbanks last July, but

most of her summer was spent working at a company that designs mechanical systems for inexpensive prebuilt, energy-efficient houses for Alaska's North Slope. "It's pretty interesting," she says. Now she's considering adding an architecture major to her engineering studies to boost her design skills.

Resources

Interested in STEM education in your area? Sign up for the MIT Alumni Association's STEM Network:

alum.mit.edu/volunteering/VolunteerTools/K12Toolkit/

See more of Moriarty's photos and videos: <http://bit.ly/mitalaskaoutreach>

Outstanding Volunteers Honored

At the Alumni Leadership Conference at MIT in September, these exceptional alumni were recognized for their many years of service to the Institute and the Alumni Association.

Bronze Beaver Award

Highest Association honor for

individuals

Douglas
G. Bailey
'72, SM
'74, ME
'75
Bailey,
who led
his class
to record-
breaking
reunion
gifts and
the



creation of a president's discretionary fund, recently chaired the Annual Fund Board and serves as chair of the Corporation Development Committee's Metro New York region.

Charles W. Johnson, BE '55

Johnson has been an extraordinary educational counselor and one of the most active alumni in the Midwest; he has served on visiting committees, and his philanthropy includes funding a chair in electrical engineering.

Philip C.
Kwok '61
Kwok's



leadership is crucial to MIT's activity in
East Asia, particularly in China. He

serves on the MIT Sloan Asian Executive Board and has helped make the MIT Club of Hong Kong one of the strongest clubs in Asia.

Harold E. Lobdell '17 Distinguished Service Award

Outstanding service in alumni relations

Stephen D. Baker '84, MArch '88

James S. Banks '76

Mohamed T. Chikhaoui '66

Paul A. Gluck '68

Lina Janavicius Morales '82, SM '84

John A. Wilkens, PhD '77

Lucile S. Wilkens, PhD '77

Dean Zeilon '55

Henry B. Kane '24 Award

Exceptional service in fund-raising

Christine Chu '88

George B. Morgan '20 Award

Sustained excellence in Educational Council activity

Aaron L. Brody '51, PhD '57

Riad J. Bsaibes '91
Eric Gold '83
Janet E. Mertz '71
Karina C. O'Malley '91
Harrison E. Rowe '48, SM '50, ScD '53
Steven W. Swibel '68
Mawuli I. Tse '90, SM '92

Great Dome Award

*Distinguished service by alumni
organizations*

Alpha Chi Omega 25th Anniversary
Celebration Committee
MIT Class of 1956 55th Reunion
Committee
MIT Class of 1986 25th Reunion
Committee
MIT Club of Beijing
MIT Crew Alumni Association
MIT Sloan Club of Boston

**Honorary Membership in the Alumni
Association**

*Outstanding service to the Association
or the Institute*

Edmund Bertschinger, MIT Physics
Department head

Daniel T. Langdale, former financial-aid staff member and associate director of admissions for international students

Jane Pappalardo, member, Council of the Arts at MIT and Visiting Committee for Music and Theatre Arts; spouse of MIT Corporation member Neil Pappalardo '64

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