

# Karen Miel

University at Buffalo  
Department of Engineering Education  
140 Capen Hall, Buffalo, NY 14260-5030

Karenmie@buffalo.edu  
781-879-7917

## EDUCATION

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Ph.D., Education: Science Education 2021  
Tufts University, Medford, MA

M.S., Elementary Education 1996  
Wheelock University, Boston, MA

B.S., Plant Sciences 1993  
Cornell University, Ithaca, NY

## PROFESSIONAL APPOINTMENTS

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**Research Scientist** 2021-Present  
University at Buffalo, Buffalo, NY

## RESEARCH EXPERIENCE

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**Graduate Research Assistant**  
Role Models in Elementary Engineering Education 2017-2021  
STOMP: Interactions and Impacts 2015-2017  
Center for Engineering Education and Outreach, Tufts University  
PI: Merredith Portsmore

## EDUCATIONAL LEADERSHIP AND ADVANCEMENT

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**Grant Writer** 2014-2015  
Health Connected, Redwood City, CA

**Grant Writer** 2012-2014  
**Director of Research and Innovation** 2011-2012  
**Director of Strategic Initiatives** 2008-2011  
CuriOdyssey, San Mateo, CA

**Education Director** 2002-2008  
Palo Alto Junior Museum and Zoo, Palo Alto, CA

## GRANT WRITING

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**Research Grants**  
Lead author, Role Models in Elementary Engineering Education \$1,200,317  
NSF DRL-1657509 (Tufts University, 2017, PI: Merredith Portsmore)

### General Operating Grants

Co-authored grants to support capital campaign and annual fundraising for CuriOdyssey and Health Connected. Major awards include:

Capital campaign	\$1,000,000
General operating support	\$100,000
Science outreach	\$50,000

### TEACHING EXPERIENCE

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<b>Lecturer – ENE 130: Teaching and Learning in Engineering</b> Tufts University, Medford, MA	2019
<b>Mathematics Teacher – Grades 7-8</b> North Star Academy, Redwood City, CA	2000-2001
<b>Teacher – Grades 2-3</b> White Oaks School, San Carlos, CA	1997-2000
<b>Teacher – Grade 3</b> James Flood Science and Technology Magnet School, East Palo Alto, CA	1996-1997
<b>Science Educator</b> Museum of Science, Boston, MA	1993-1996

### PUBLICATIONS

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**Miel, K.**, Swanson, R.D., Portsmore, M., Moison, E.A., Paul, K.M., Kim, J., Maltese, A.V. (Under review). Characterizing engineering outreach educators' talk moves: An exploratory framework.

Paul, K., **Miel, K.**, Portsmore, M., Maltese, A., and Kim, J. (2021). Students' perceptions of engineering outreach educators: Building relationships and fostering agency in outreach. American Society of Engineering Education Annual Conference, San Diego, CA.

Moison, E., **Miel, K.**, Portsmore, M., Paul, K., Kim, J., and Maltese, A. (2020). Characterizing engineering outreach ambassadors' teaching moves during engineering design activities. American Society of Engineering Education Annual Conference, Montreal, Canada.

Hoch, A., **Miel, K.**, Portsmore, M., and Swanson, R. (2020). "Because I'm not always constantly getting everything right": Gender differences in engineering identity formation in elementary students. American Society of Engineering Education Annual Conference, Montreal, Canada.

**Miel, K.**, Moison, E., Portsmore, M., Paul, K., Kim, J., and Maltese, A. (2020). Characterizing the teaching moves of engineering outreach ambassadors. National Association for Research in Science Teaching Annual Conference, Portland, OR. (Conference canceled)

**Miel, K.**, Portsmore, M., Fuller, E., Paul, K., Sung, E., and Maltese, A. (2019). "Maybe if I put my mind to it": Fifth-graders' receptivity to pursuing engineering careers. American Society of Engineering Education Annual Conference, Tampa, FL.

Batrouny, N., **Miel, K.**, and Wendell, K. (2019). Elementary students' disciplinary talk in a classroom with an explicit engineering decision-making scaffold. American Society of Engineering Education Annual Conference, Tampa, FL.

Portsmore, M., Maltese, A., **Miel, K.**, and Paul, K. (2019). Exploring the impact of university role models on elementary students. American Society of Engineering Education Annual Conference, Tampa, FL.

Paul, K., Sung, E., Maltese, A., **Miel, K.**, and Portsmore, M. (2019). Development of a Create-a-LEGO-Engineer activity to examine students' engineering identity. American Society of Engineering Education Annual Conference, Tampa, FL.

Paul, K., Sung, E., Maltese, A., **Miel, K.**, and Portsmore, M. (2019). Development of an engineering identity and career aspirations survey for use with elementary students. American Society of Engineering Education Annual Conference, Tampa, FL.

Paul, K., Maltese, A., Portsmore, M., and **Miel, K.** (2019). Development of a survey to measure engineering identity and career aspirations in elementary students. National Association of Research in Science Teaching Annual Conference, Baltimore, MD.

Paul, K., Maltese, A., **Miel, K.**, and Portsmore, M. (2019). Development of a survey instrument to measure engineering identity components in elementary students. American Educational Research Association Annual Conference, Toronto, Canada.

**Miel, K.**, Portsmore, M., Maltese, A., and Paul, K. (2018). Examining the interactions related to role modeling in an elementary outreach program. American Society of Engineering Education Annual Conference, Salt Lake City, UT.

**Miel, K.** (2017). Positioning and engagement of an elementary student in an engineering activity. Learning Sciences Graduate Student Conference, Bloomington, IN.

## **CONFERENCE ACTIVITY**

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### **Papers Presented**

Moison, E., **Miel, K.**, Portsmore, M., Paul, K., Kim, J., and Maltese, A. (2020). Characterizing engineering outreach ambassadors' teaching moves during engineering design activities. American Society of Engineering Education Annual Conference, Virtual.

**Miel, K.**, Portsmore, M., Fuller, E., Paul, K., Sung, E., and Maltese, A. (2019). "Maybe if I put my mind to it": Fifth-graders' receptivity to pursuing engineering careers. American Society of Engineering Education Annual Conference, Tampa, FL.

### **Sessions Moderated**

Program Evaluation Studies (2018). American Society of Engineering Education Annual Conference, Salt Lake City, UT.

### **Workshops Presented**

**Miel, K.** and Oosterman, C. (2011). Exuberant Exploration: Creating a Strong Preschool Science Program. National Science Teachers Association National Conference, San Francisco, CA.

**Miel, K.** and Oosterman, C. (2011). Flutter and Float. National Science Teachers Association National Conference, San Francisco, CA.

**Miel, K.** and Oosterman, C. (2011). Ten Science Investigations for under \$10. National Science Teachers Association National Conference, San Francisco, CA.

**Miel, K.** (2011). Everyday Science. Cañada College Early Childhood Educator Conference, Redwood City, CA.

### **INVITED LECTURES**

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**Miel, K.** (2010). Everyday Science. Cañada College, Redwood City, CA.

**Miel, K.** (2010, 2011, 2012). Kickoff to Kindergarten Science Series. Workshop series presented to parents, preschool teachers, and kindergarten teachers as part of First 5 San Mateo's kindergarten readiness initiative, San Mateo, CA.

**Miel, K.** and Swanson, R. (2006). Hands-on Science in the Elementary Classroom. Mills College, Oakland, CA.