Engineering a Passion

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Outline

- About me
  - Passions, Timeline, Research

- Thoughts on STEM
  - Education and Career Preparation

- Group Exercise
  - STEM in Sports Engineering

- Wrap Up
  - Discussion and Questions
Nadine’s passions

Family

Triathlon

Trail Running

Yoga Teacher

Hiking/Travel

Singing
Nadine’s locations

**Born:**
Rochester, NY

**University:**
Pittsburgh, PA

**Internship:**
Murray Hill, NJ

**Work:**
Cleveland, OH

**Graduate School:**
Hattiesburg, MS

**Internship:**
Atlanta, GA

**Internship:**
Geelong, Australia

**Internship:**
Herzogenaurach, Germany
Professional Timeline

- Byron-Bergen High School
  - 2000

- Carnegie Mellon University
  - B.S., Materials Engineering
  - B.S., Biomedical Engineering
  - 2005
  - 2006

- Bell Laboratories
  - Internship: Bell Labs
  - 2007

- University of Rochester
  - Internship: University of Rochester
  - 2008

- Georgia Institute of Technology
  - Internship: Georgia Tech
  - 2008
Professional Timeline

2008
Finance Supervisor, Accounts Receivable

2010
International Conference United Kingdom

2014
4 ½ month exchange Australia

2015
PhD Defense (Oct)

2016
6 month internship Germany

Senior Engineer, Tactical Optics
Connecting High School to STEM Success

- Motivated by Passion and/or Need

Family
- Triathlon
- Trail Running
- Yoga Teacher
- Hiking/Travel
- Singing
Connecting High School to STEM Success

- Motivated by Passion and/or Need

- “Fundamental Concepts” are a real thing
  - …But difficult to predict which ones will be used (or when)

- Role models and mentors improve self-confidence

- Exposure should be frequent, hands-on, and motivated by passion/need
Exercise: Find the STEM

Studying the sports or defense equipment provided, identify:

- **High School subjects** or **fundamental concepts** critical to its development,

- Relevant **college majors** that a student would pursue to work on the item, or

- **STEM careers** that contribute to the item’s availability.
PhD Research: Running Shoes/Injuries

**Human**
- Muscle contractions
- Biomechanics

**Interface**
- Develop Test Protocol
- Traditional/Minimalist
- Interactions with Human Running

**Material**
- Molecular-level Degradation
Repetitive Impacts

Solvents/Chemicals

Outer Shell Material Degradation

Understanding material-level degradation & helmet impact performance

Weathering & Time

Helmet Reconditioning
Gentex: Ballistic Helmet System

**Visor**
- Optics
- Ballistics
- Aesthetics
- Anti-Fog
- Sun & Laser Protection

**Helmet**
- Ballistics
- Weight
- Aesthetics
- Comfort
Resources

**Pathways to Science**
Science, Technology, Engineering, and Mathematics

**Why I Become a Science Coach?**

1. **It's Easy**
   Being a Science Coach invites the AACT teacher member to identify specific science-related projects and questions for a chemist. There is no need to document visits, activities, or donation expenses.

2. **Science Education Financial Help**
   The American Chemical Society donates $500 to participating schools in Science Coaches to enhance science education.

3. **It's Credible**
   Support from the American Chemical Society provides chemists with credibility to educators. With support from an established organization, school administration is more likely to pursue a chemist's offer to volunteer.

**HIGH SCHOOL CHEMISTRY TEACHER PROGRAM**
Philadelphia, PA
August 21 - 25, 2016

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A RESOURCE OF THE SOCIETY FOR SCIENCE & THE PUBLIC
Thank you!