

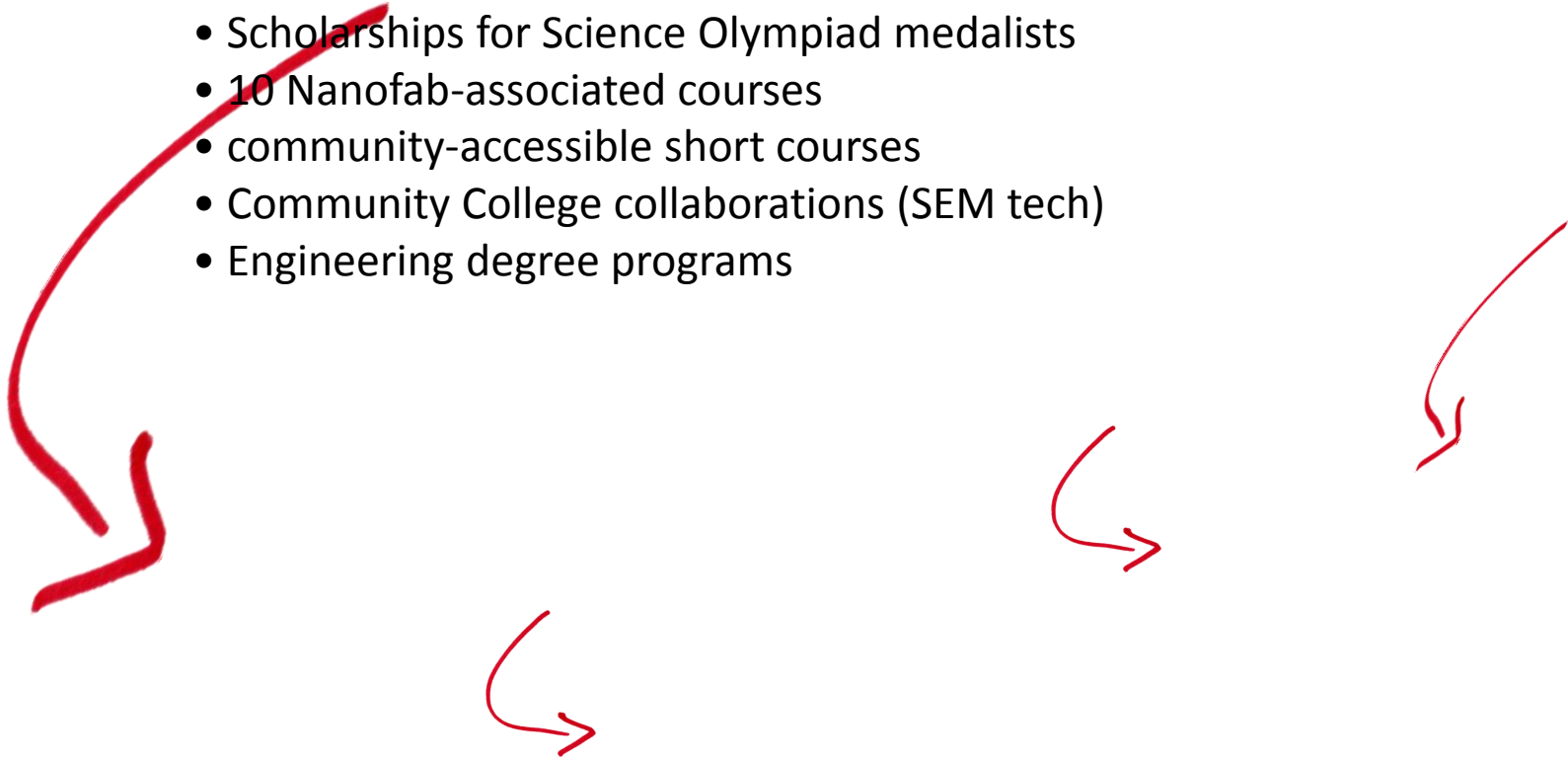
Collaborative Educational Opportunities

Jim Smith

University of Utah & Salt Lake
Community College

Utah's Nanotech Workforce Training Pipeline

- Scholarships for Science Olympiad medalists
- 10 Nanofab-associated courses
- community-accessible short courses
- Community College collaborations (SEM tech)
- Engineering degree programs

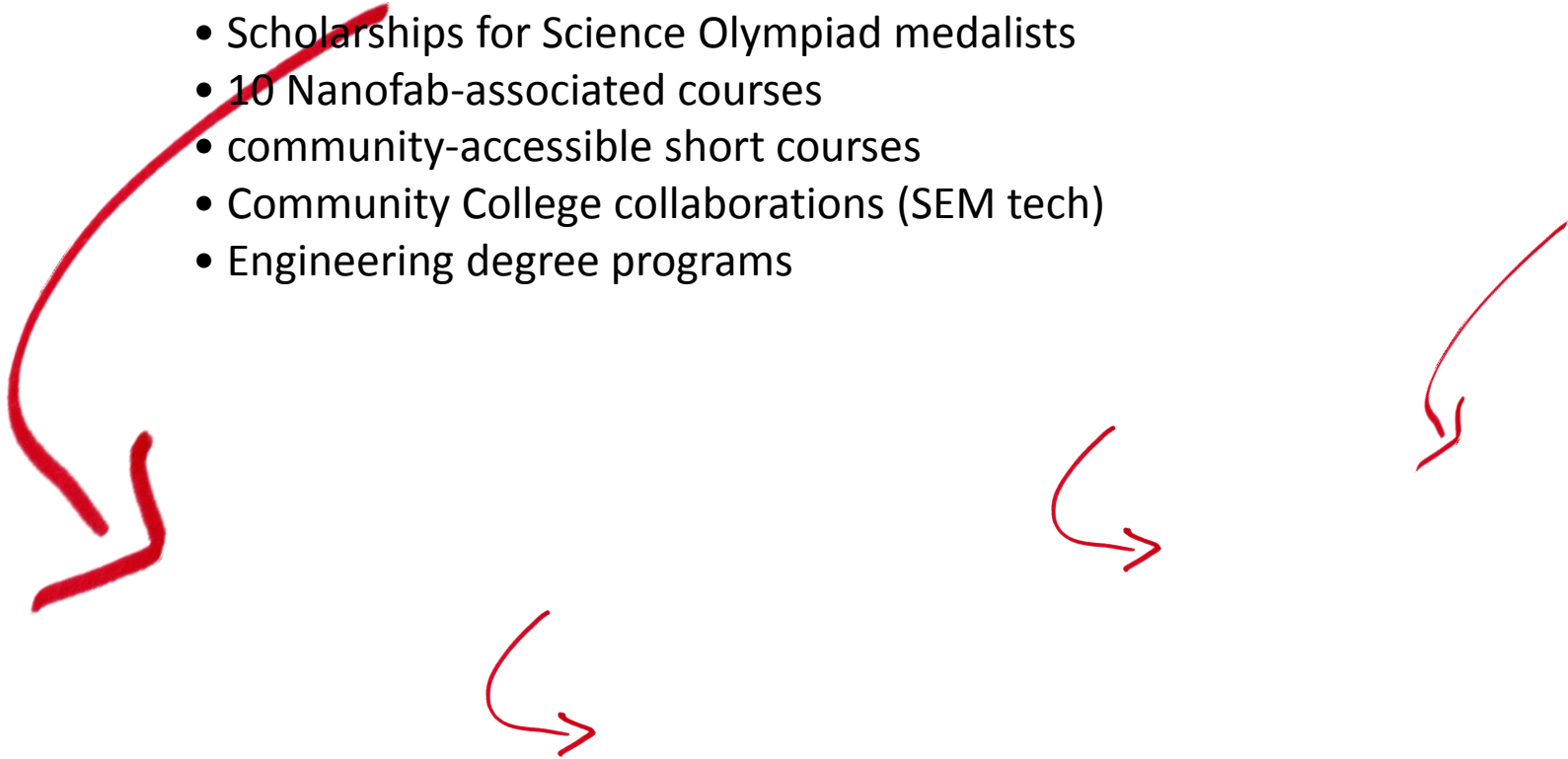


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Enthusiastic middle school kids (Utah Science Olympiad)
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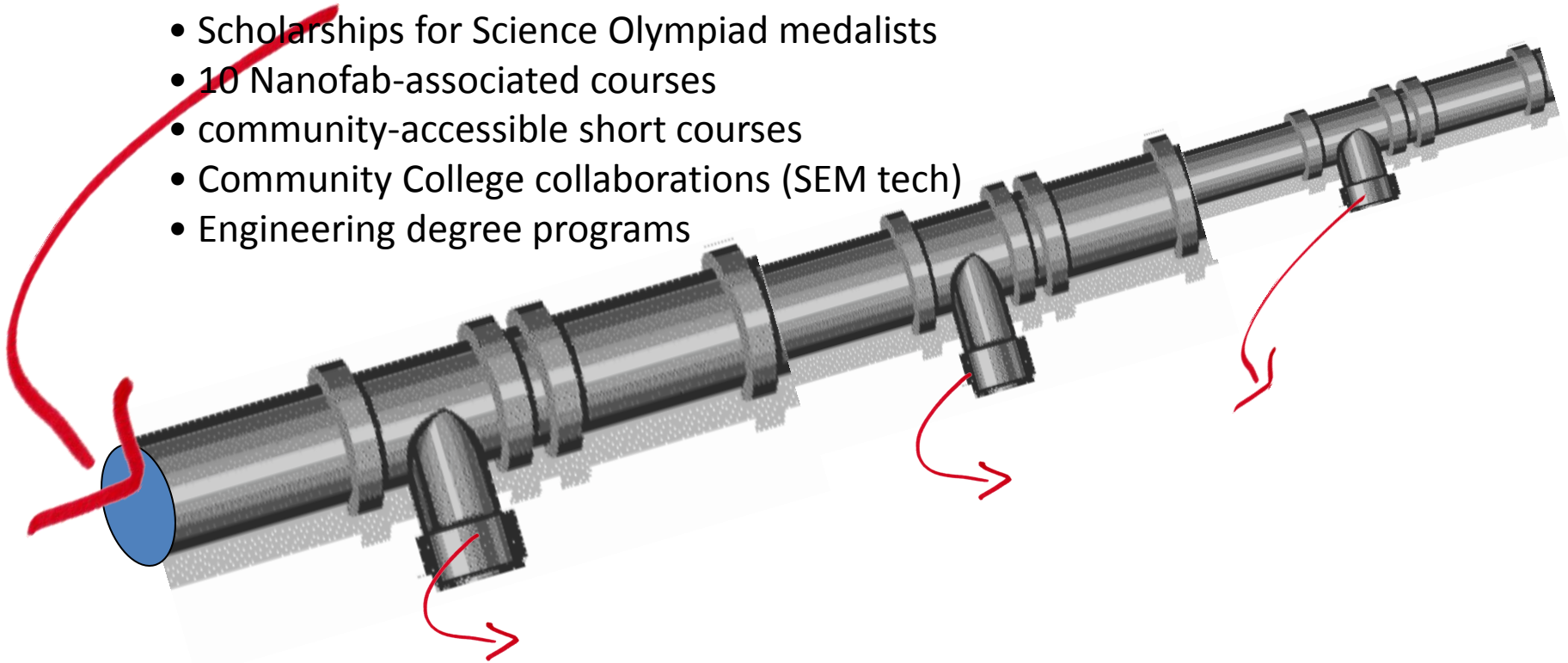


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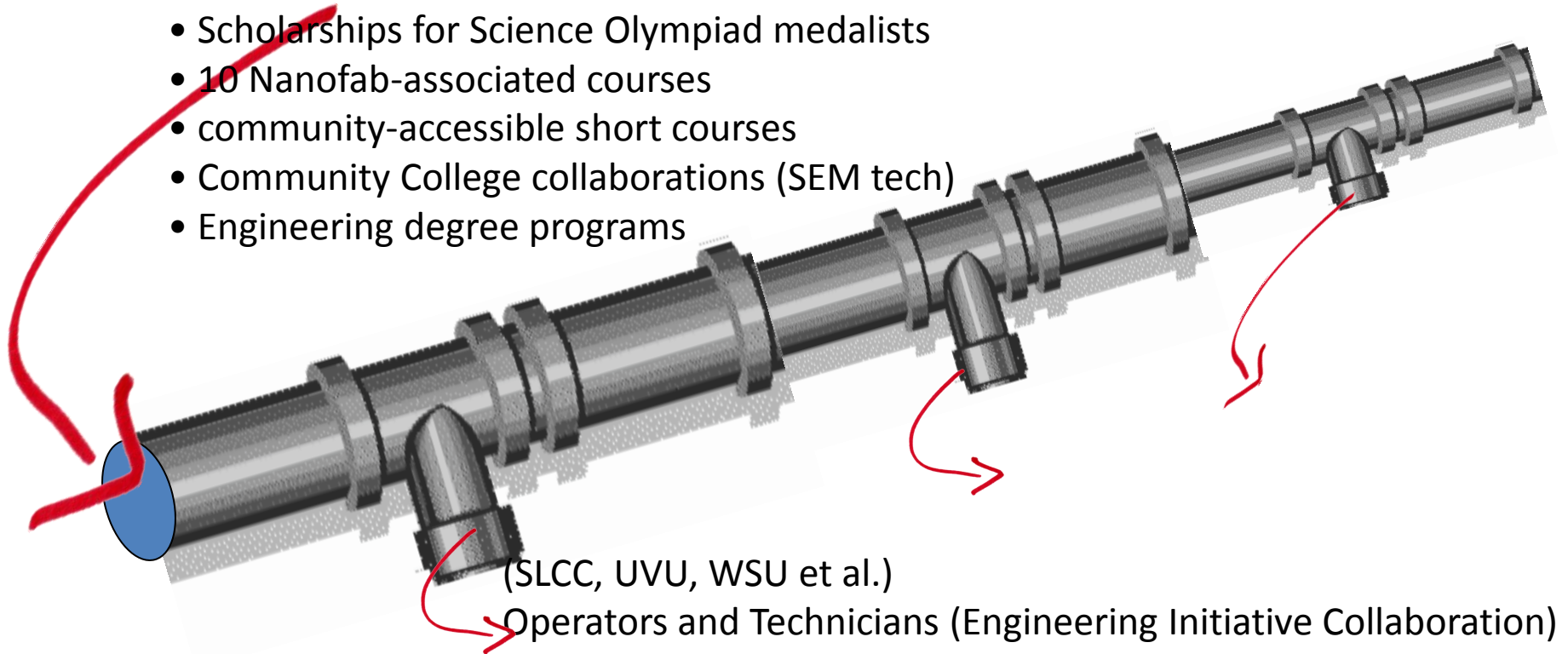


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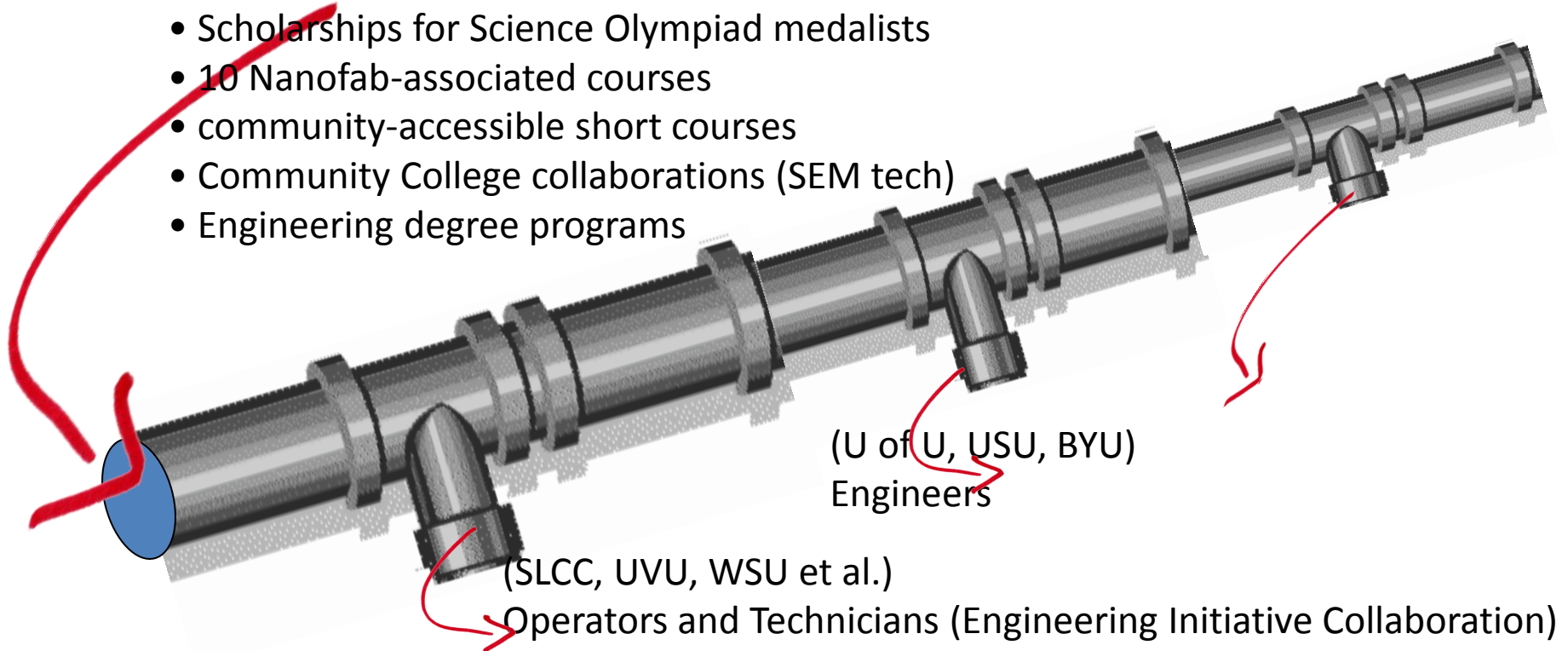


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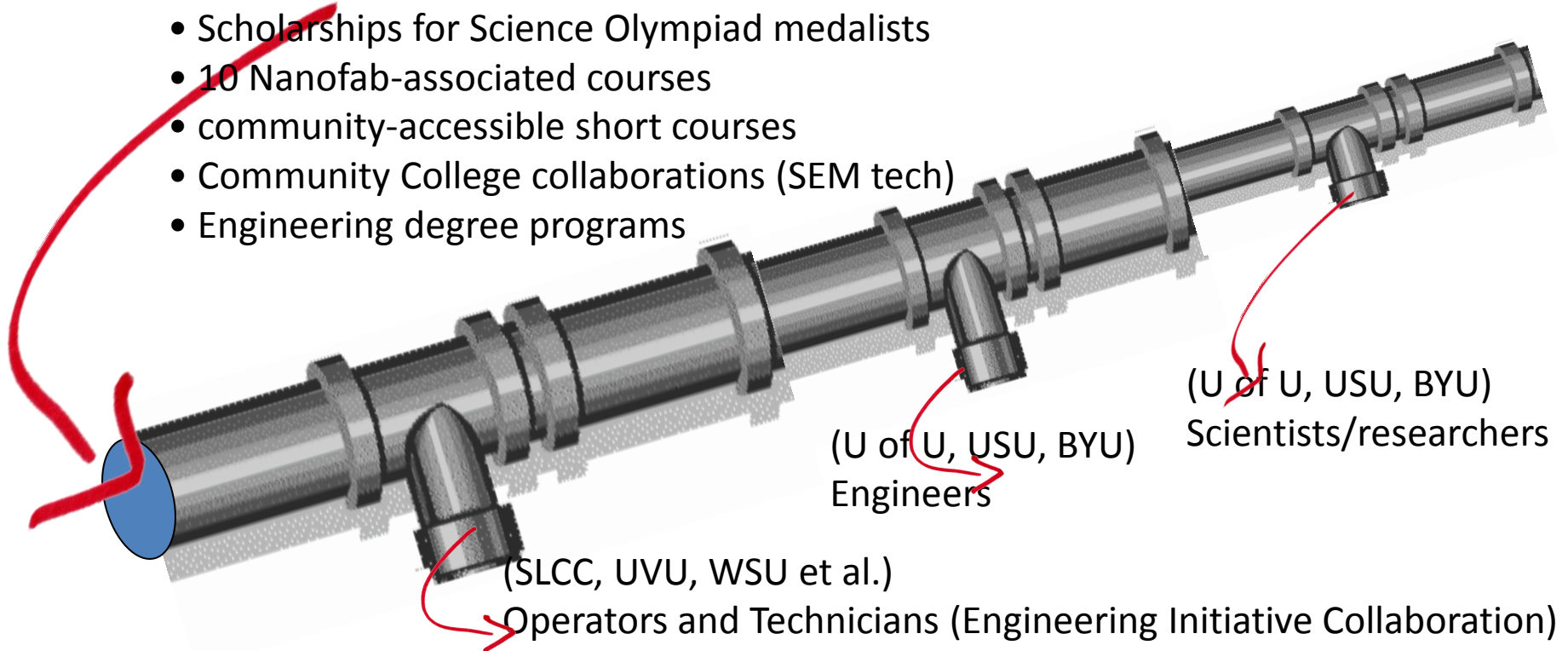


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Nanotechnology and Microscopy Certificates of Proficiency

**Certificate of Proficiency
in Nanotechnology**





NEW!

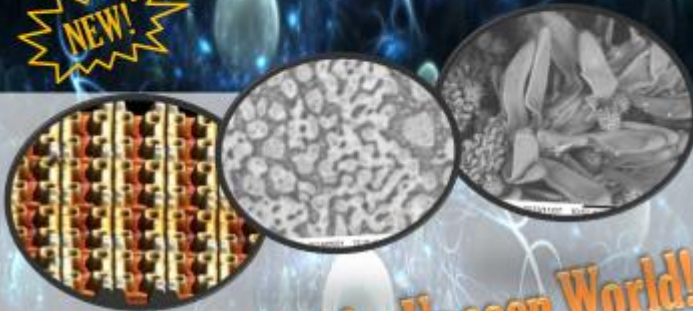
**Exploring the Vast World
of Small Things**



If you have questions regarding this program,
contact
Dr. Wesley C. Sanders
(wesley.sanders@slcc.edu),
Dr. James S. Smith (jim.smith@slcc.edu),
Devan Church (801) 957-4978, or go to
<http://www.slcc.edu/engineering/degrees.aspx>


Salt Lake Community College  School of SME 

**Certificate of Proficiency
in Microscopy**





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Explore the Unseen World!



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Salt Lake Community College  School of SME 

Public Short Courses



Medical Device Manufacturing/Engineering Summer Workshop

Sensor Nanofabrication Workshop

Many modern medical devices contain a nanotechnology element whether it is a sensor, transducer or processor. Nanoscale manufacturing processes involve controlling matter on the molecular and atomic level with some of the most stringent tolerances and controls. This workshop will center on the student manufacturing and characterization of two devices, a MEMS microheater and a MEMS pressure sensor similar to that utilized in current products.

Engineering faculty instructed 20-hrs of hands-on activities!



Session & Time: 6 students total per session

1. June 15-19, 8 am-12 pm or 1 pm-5 pm

3. July 13-17, 8 am-12 pm or 1 pm-5 pm

Location: Nanofab Lab at University of Utah

Enroll Today!



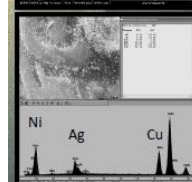
RSVP:

<http://tinyurl.com/MDSW2015>

Contact:

Kasey Schuster

Kasey.schuster@slcc.edu



Scanning Electron Microscopy and Microanalysis (EDS) Hands-on Six-Week Short Course

SEM/EDS: July 6, 13, 20, 27 and Aug 3

EBSD: Aug 10

Cost: \$385 (commercial: \$770) for the whole course

Module 1. Basic SEM and EDS Analysis (\$320 university; commercial \$640): This is a practical short course in Scanning Electron Microscopy. The focus of the course will be on providing an applied understanding of basic theory of electron microscopy and microanalysis, while training students on the use of the FEI Quanta 600 and hi-res imaging in the FEI Helios Nanolab 650. (NOTE: The hi-res imaging lab in the the Helios does not constitute full training on FIB. A one-on-one training is still necessary to use the FIB for liftouts and TEM sample preparation.)

Consists of four (4) 1-hour long lectures and five (5) 2-hour labs TBD over a five week period.

Module 2. EBSD Analysis (\$65 university; \$130 commercial): Electron backscatter diffraction analysis allows for texture and grain structure studies on thin films and polished surfaces. This module will provide fundamental concepts of EBSD and training on basic operation and data analysis using the EDAX OIM system. Consists of one (1) 1-hour lecture and one (1) 2-hour lab

Prof. Ian Harvey: irharvey@eng.utah.edu
Dr. Brian Van Devener: bvande@chem.utah.edu
Dr. Randy Polson: rcp7@utah.edu
Dr. Paulo Perez: jperez@eng.utah.edu

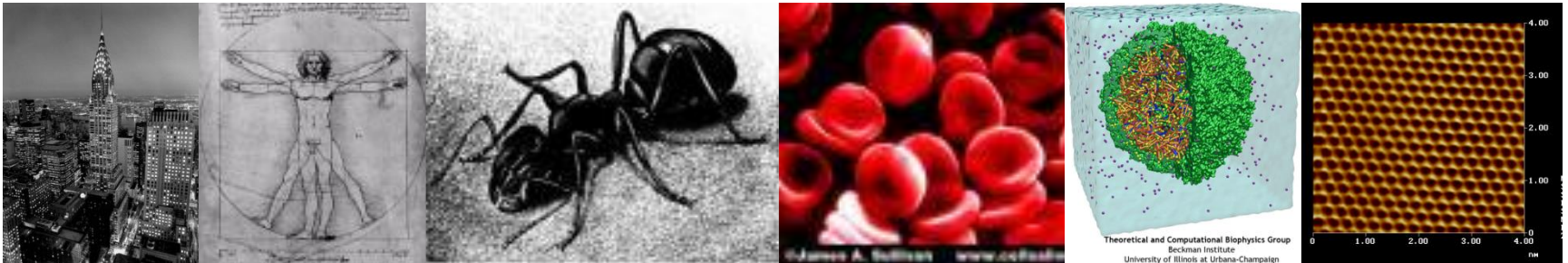
The Need for nano-Scale Curriculum

20th century engineering



Educational void

21st century engineering



Length Scale



10^3 m

10^1 m

10^{-1} m

10^{-3} m

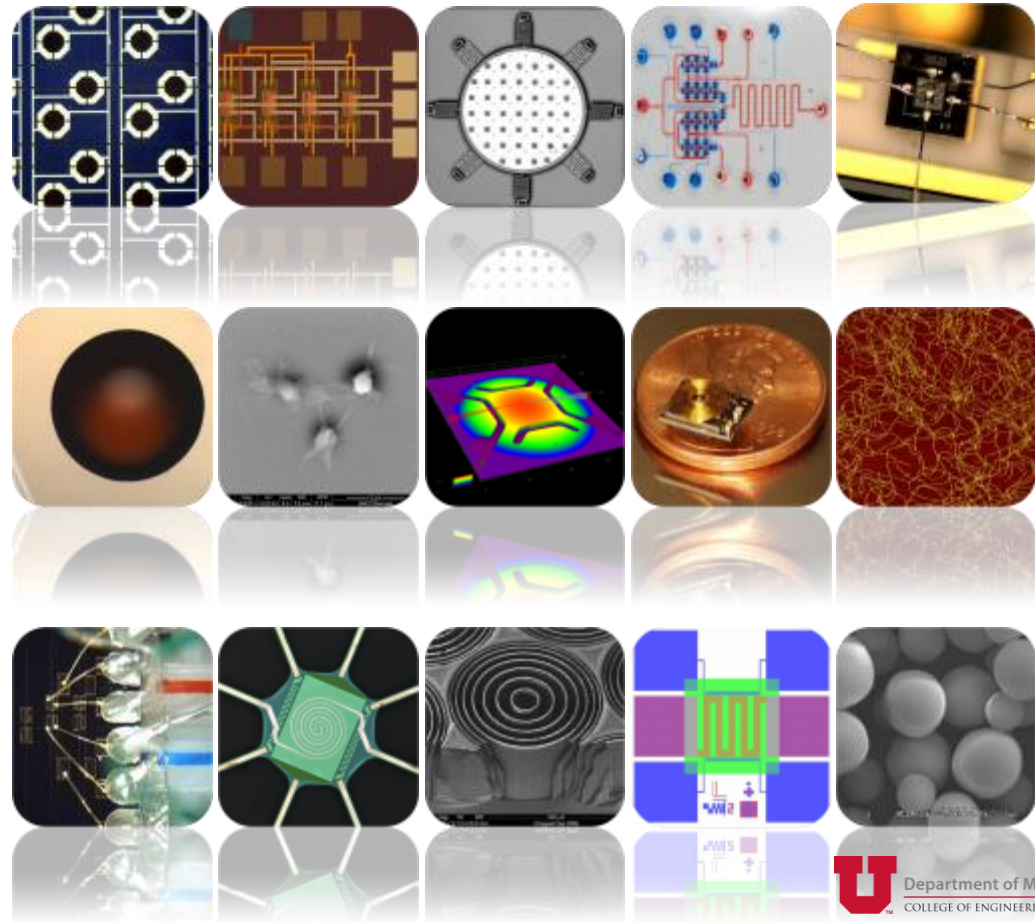
10^{-5} m

10^{-7} m

10^{-9} m

Engineering at the boundaries of disciplines

- micro/nanoscale Science & Engineering is inherently multidisciplinary
 - ECE
 - MSE
 - ChemE
 - MechE
 - BioE
 - Physics
 - Chemistry
 - Biology



Possible Collaborations

- Internships
- Workshops
- Curriculum Direction
- Workforce Development

