PK-12 STEM
Research Original Interventions
Research-Based Outreach

New Faculty Orientation – August 16, 2017
PK-12 Research-Based Outreach

**VAST: Viterbi Adopt-a-School / Adopt-a-Teacher**

Katie Mills
VAST Manager

Maja Matarić, VAST Lead

Gigi Ragusa, VAST K-12 STEM Education Researcher

Darin Gray, Student Affairs’ STEM Educational Outreach Programs
PK-12 Research-Based *Intervention*

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*USC Viterbi School of Engineering*
Local Schools:
- Low income
- Low resources
- 98% under-represented minorities
- USC Family of Schools & NAI
- VAST: >200 schools
PK-12 Research-Based Outreach

**VAST**: Viterbi Adopt-a-School / Adopt-a-Teacher

**Broader Impacts**

Helps Local Students / Schools

USC Viterbi
School of Engineering

University of Southern California
Four USC Viterbi Professors Win 2017 NSF CAREER Awards

Felipe de Barros, a civil and environmental engineer, Han Wang, an electrical engineer and Ilias Diakonikolas and Wyatt Lloyd, both computer scientists, win the National Science Foundation’s top honor for junior faculty
VAST: Viterbi Adopt-a-School / Adopt-a-Teacher
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Professor Shen Helps Bring Biotech to Boyle Heights

Click Here to Know More
USC Viterbi Professors Partner with K-12 Schools Throughout the Southland

Katie Mills / May 25, 2017 / Blog

Instagram helps students communicate their understanding of nanoparticles when USC Viterbi School of Engineering Professor Eun Ji Chung comes to 32nd Street LAUSD/USC Media Arts & Engineering Magnet School. Partnering with teacher Riann Lawrence, Dr. Chung engages middle schoolers in how she uses nanoparticles in her biomedical engineering research into revolutionary types of medicine. When the new mass spectrometer arrives this fall at Huntington Park Institute of Applied Medicine, Chemical Engineering Professor Nicholas Graham will advise teachers how to use it in their labs and lesson plans; he will also bring their students to USC to show how he uses such methods in his cancer research. Building a wind tunnel and then testing 3-D printed designs within it for aerodynamic efficiency are what Professor Mitul Luhar offers to the STEM Academy of Hollywood, supporting Principal Paul Hirsch’s addition of aerospace engineering to his school’s college and career pathways.

nanopeek
Thirty-Second Street Usc Performing Arts 

nanopeek Professor Chung teaches students there are approximately 10,000 nanometers in a single strand of hair.
#nanopeek #USC #chunglab
PK-12 STEM Research-Based Outreach

Good place to start Broader Impacts

STEM Spotlight on Dept
Robotics Open House
SHINE Summer HS Research
CS@SC Summer Camps
Robotics & Coding Academy
Code Dojo
PK-12 STEM Research-Based Outreach

Pipeline of events to engage schools & students in research:

Faculty can contribute Broader Impacts through events

>28,000 students

Tentative months for 2018 Spotlights

Student Affairs’ STEM Outreach programs (MESA, FIRST Robotics, Discover Engineering, etc.)
PK-12 STEM Research-Based Outreach

Oct 12, 2017
STEM Spotlight
AME
Profs. McArthur, Oberai, Pahlevan

Dec 2017
Code Dojo

Summer 2018:
SHINE, RET
Discover Engineering, CS@SC Camps

April 2018
Robotics Annual
STEM Spotlight CEE
Prof. McCurry

February 2018
EngX (Prof. Armani)
STEM Spotlight EE

>28,000 students

SHINE:
6/18 – 8/3, 2018

Prof. McCurry

Profs. Gilbert, Toutios, Jovanovic

USC Viterbi
School of Engineering
University of Southern California
VAST: Viterbi Adopt-a-School / Adopt-a-Teacher

USC Viterbi NSF Research Experience for Teachers (Profs. Matarić and Ragusa)
• STEM teachers in faculty labs (5 wks)
• Lesson Plans – Common Core

USC Viterbi Summer High School Intensive in Next-Generation Engineering
• Top-performing high school students
• 7 weeks in faculty labs; Ph.D. student mentors

+ Prof. Ragusa’s STEM Academy: Community College Students
VAST works with faculty to create custom multi-year partnerships with schools for Early Career & other NSF Grants.
## VAST: Viterbi Adopt-a-School / Adopt-a-Teacher

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Tag into VAST Event</td>
<td>Identify possible partner school for lab tour or speak/judge</td>
<td>Develop relationship with the partner school</td>
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<tr>
<td>Speak/Judge RET or SHINE</td>
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### During the year you submit CAREER proposal:
- **Fall**: Brainstorm, VAST identifies partner possibilities, meet principal
- **Spring**: Interaction with partner (lab tour, meet faculty, etc.)
- **May**: Ask for a letter of collaboration

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**USC Viterbi**
School of Engineering

University of Southern California
<table>
<thead>
<tr>
<th>Year Range</th>
<th>Description</th>
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<tbody>
<tr>
<td>2019-2020</td>
<td>Computational PI partners w/ math or physics teacher – “externship”</td>
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<td>2020-2021</td>
<td>Host/judge at USC a math challenge based on externship with partner school (assess)</td>
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<tr>
<td>2021-2022</td>
<td>Teacher partner “externship” evolves into new challenges or new lesson plans (assess)</td>
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<td>2022-2023</td>
<td>Regional math challenge at USC based on externship (assess)</td>
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<tr>
<td>2023-2024</td>
<td>Regional math challenge at USC based on externship – distribute materials (assess)</td>
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