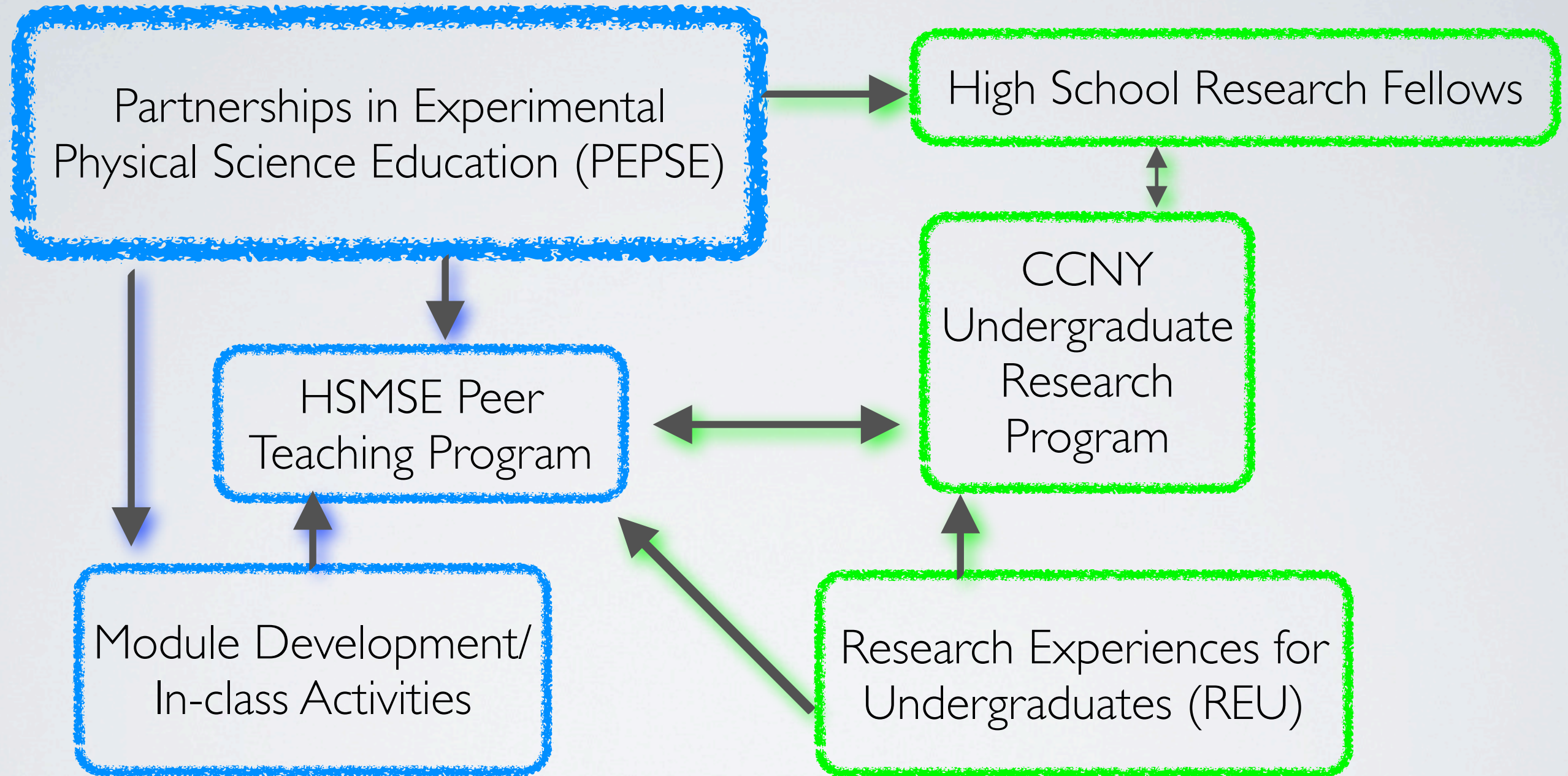




# LOCALIZING OUTREACH: OUR APPROACH TO FIND EDUCATIONAL PARTNERS IN AN URBAN ENVIRONMENT

Raymond Tu  
CCNY - 16 September 2013

In the Classroom → In the Lab



INTEGRATION





# IN THE CLASSROOM

PREM activities in area high schools



# PEPSE

Partnerships in Experimental  
Physical Science Education



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# PARTICIPANTS

PREM Faculty & HS Chemistry/Physics Teachers

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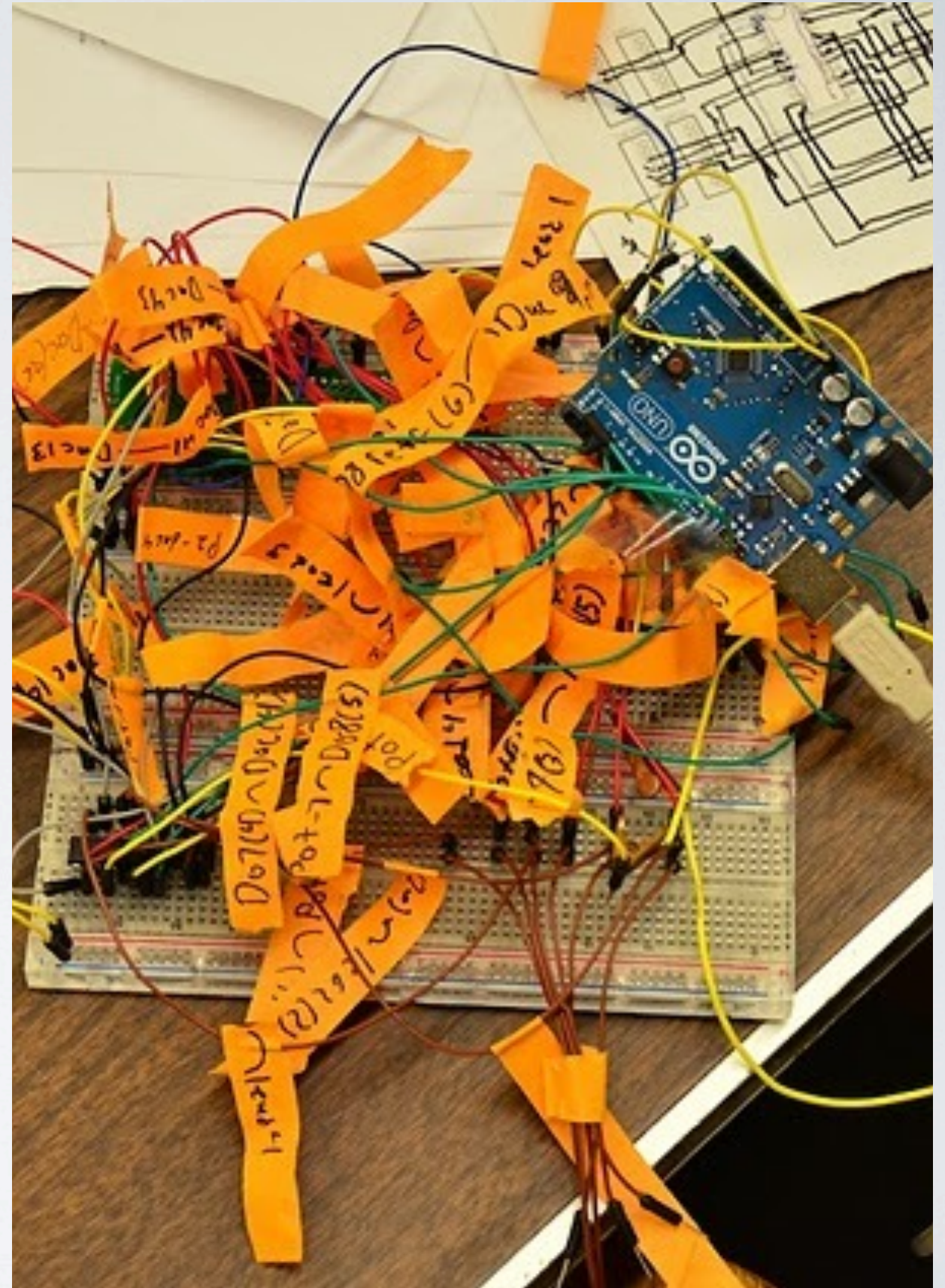


# ACTIVITIES

Deconvoluting the research  
endeavor

# OUTCOME

Getting 'new' modes of  
interaction

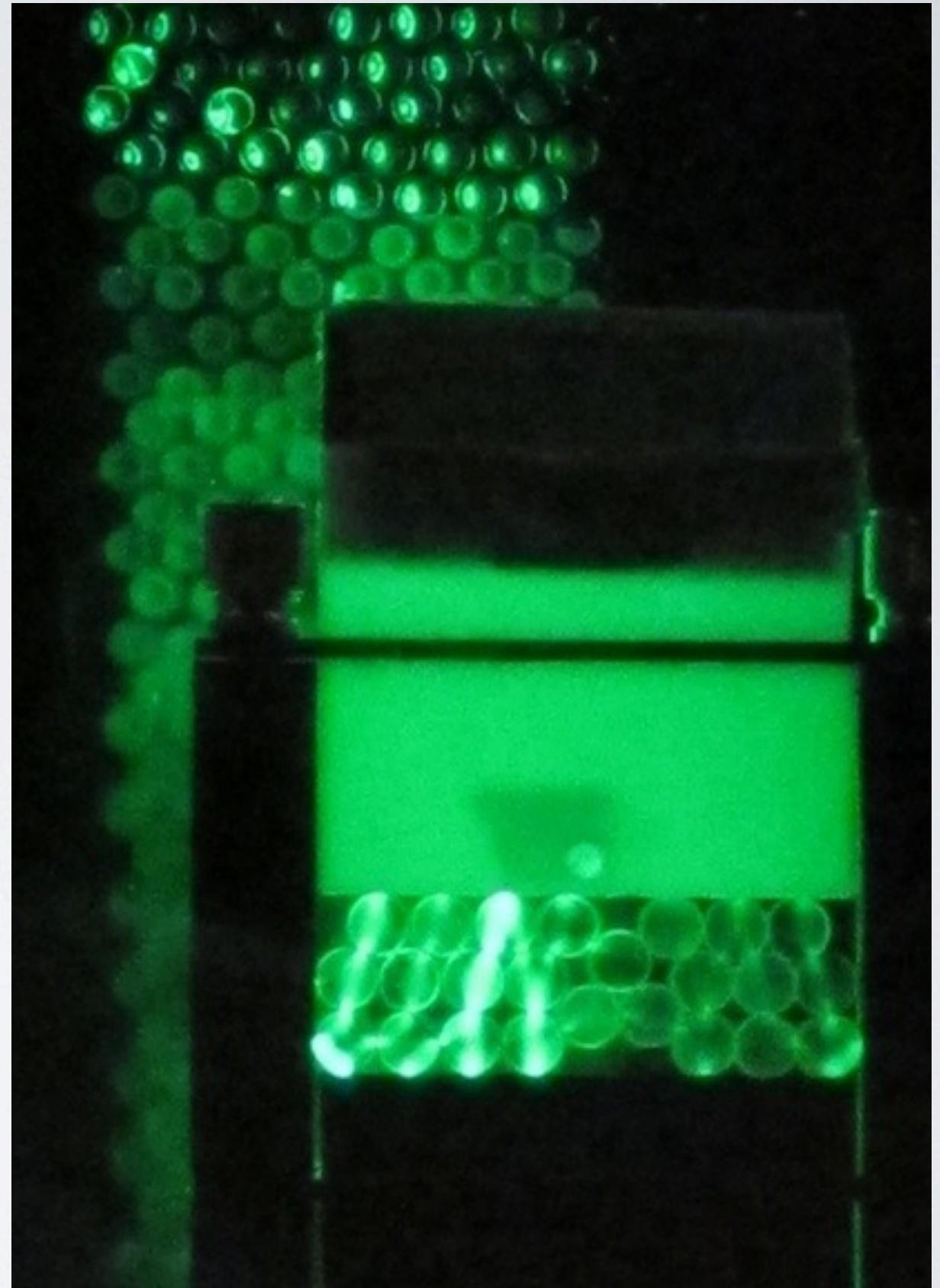


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# ACTIVITIES

Mark Shattuck - Jamming  
Particulates

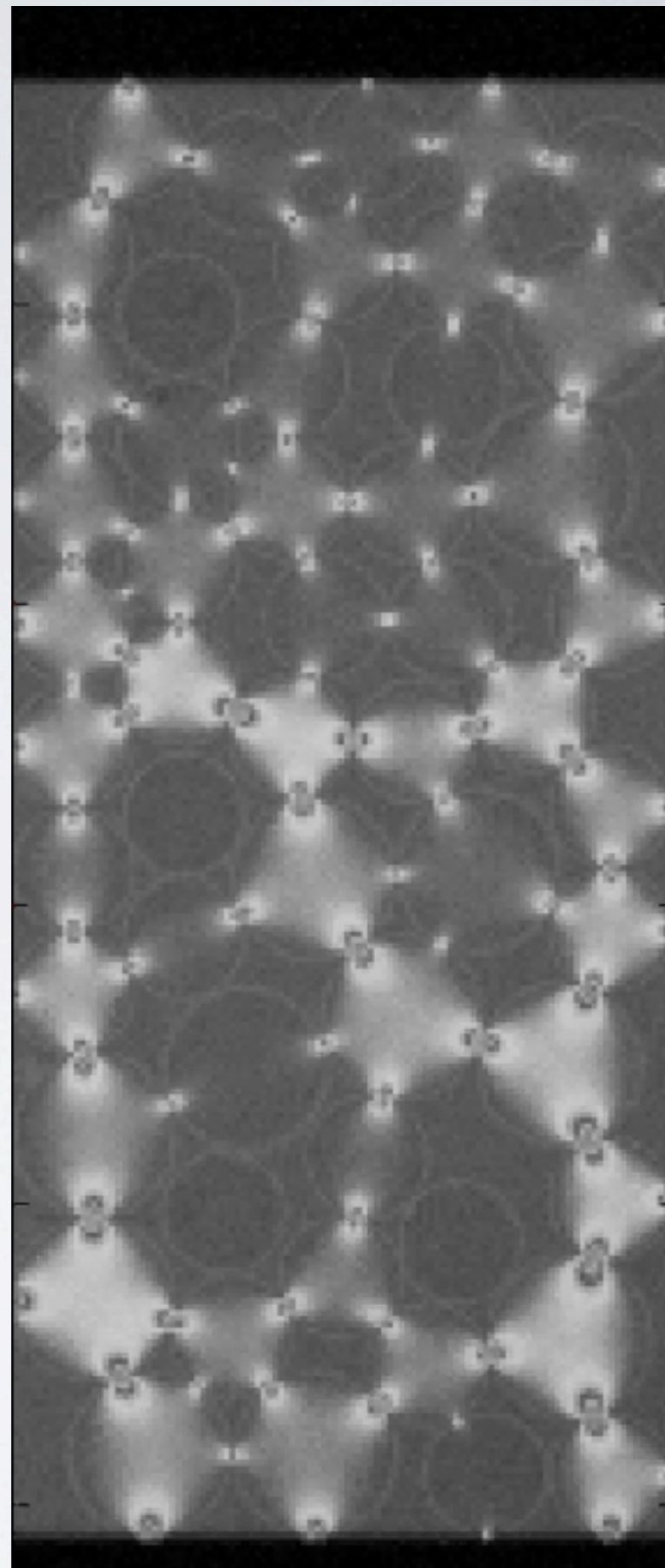


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# ACTIVITIES

## **New Phenomena -** Granular Materials



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# ACTIVITIES

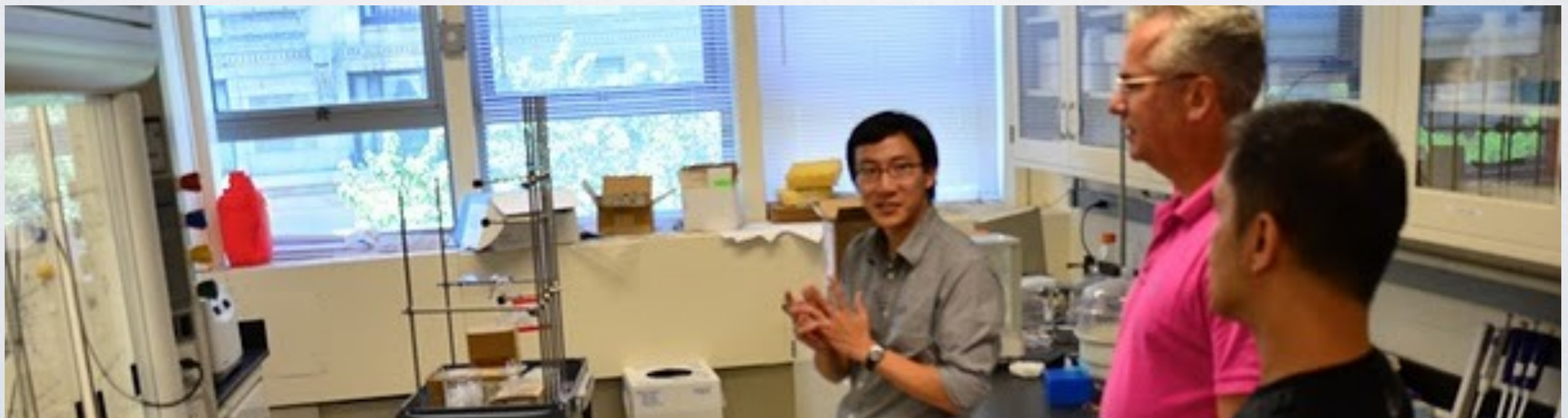
## **New Tools** - AFM

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# “NEW” RULES

1. Better advertising of programs
2. More flexibility of tools in the classroom
3. More structure – leave open ended questions for lab
4. More partnerships – fewer modules
5. Less assessment and more participation





# HSMSE PEER TEACHING

Principles of Engineering -  
Thermodynamics and Transport



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# OBJECTIVES

1. Forge partnerships with NYC schools
2. Peer interactions to engage HS students
3. Teaching opportunity & service learning for UG students
4. Expose HS students to Chemical Engineering and Material Science
5. Reinforce UG classroom learning

**In the Classroom**

In the Lab





# PARTICIPANTS

CCNY Undergraduates & HSMSE POE Students

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# ACTIVITIES

- Spring (April) - Recruitment & Interview
- Summer (May - August) - Lesson Planning and Module Preparation
- Fall (September - December) - Classroom Acclimation
- Winter Session (January) - Teaching

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# ACTIVITIES

Teaching at HSMSE

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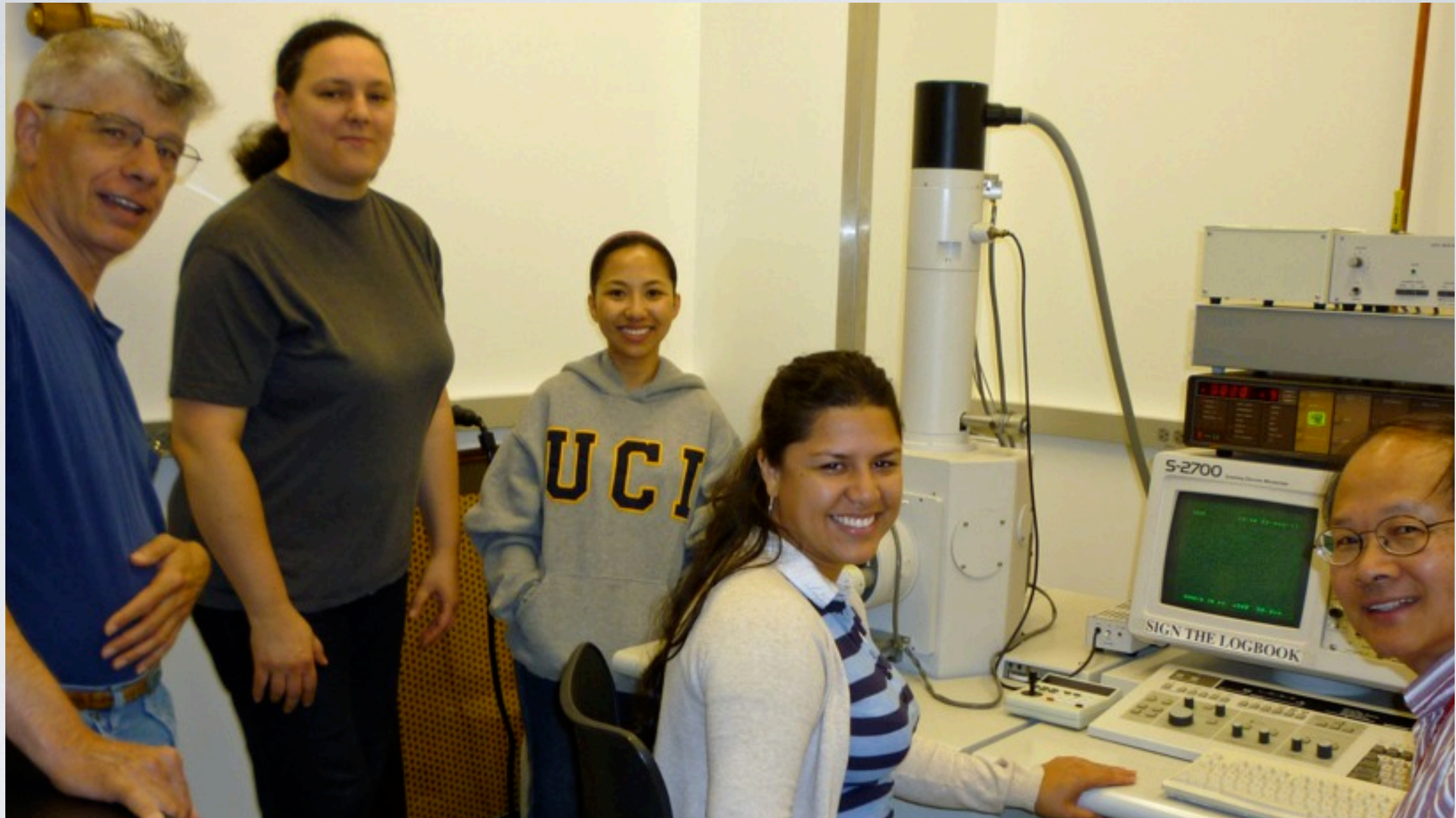


# ACTIVITIES

## Pop-pop boats

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# IN THE LAB

Getting students involved in the “discovery” process



# HIGH SCHOOL RESEARCH FELLOWS



In the Classroom

**In the Lab**



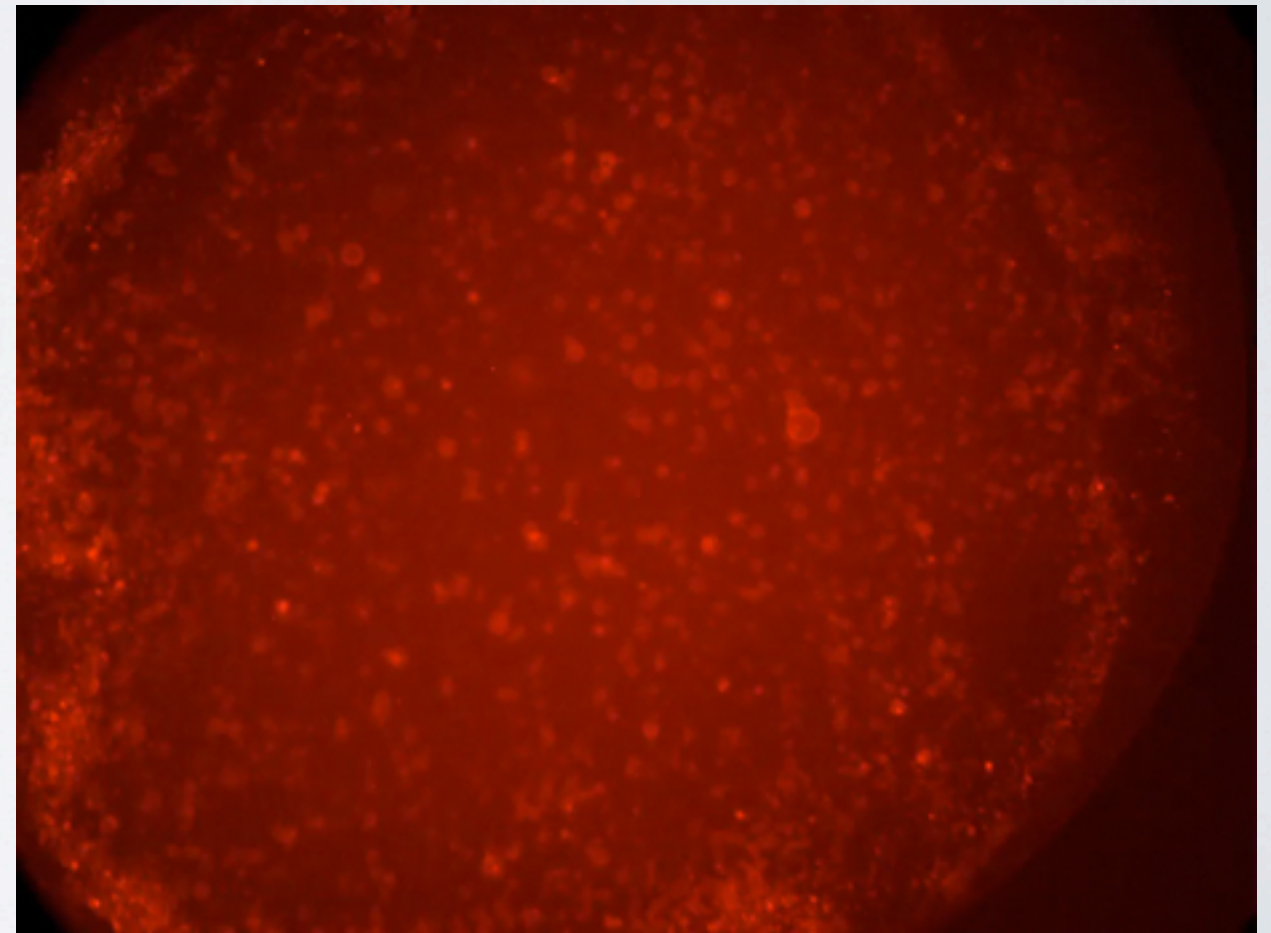
# DANIEL DONENFELD

- “The dynamics of emulsion separation”
- Intel Semi-finalist



## Lessons Learned:

- “Buy In” from Grad Students
- Culture of mentorship
- Engagement through independence

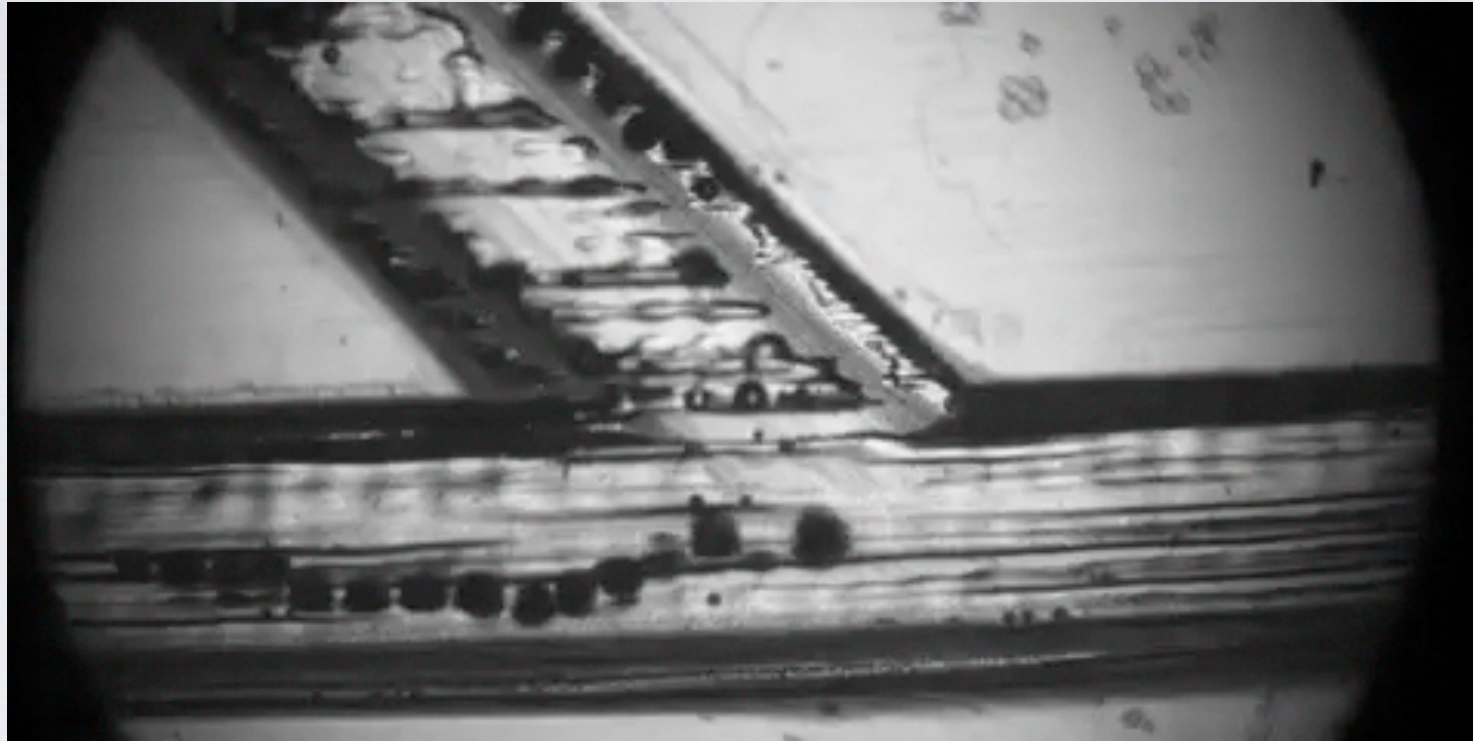


In the Classroom

**In the Lab**



# YOARIS & LUIS (ELLIS ACADEMY)



- “Droplet dynamics in acute geometries”
- NYCSEF finalists

## Lessons Learned:

- Selling Engineering/Science is about engagement
- Faculty participation requires proselytizing

In the Classroom

**In the Lab**

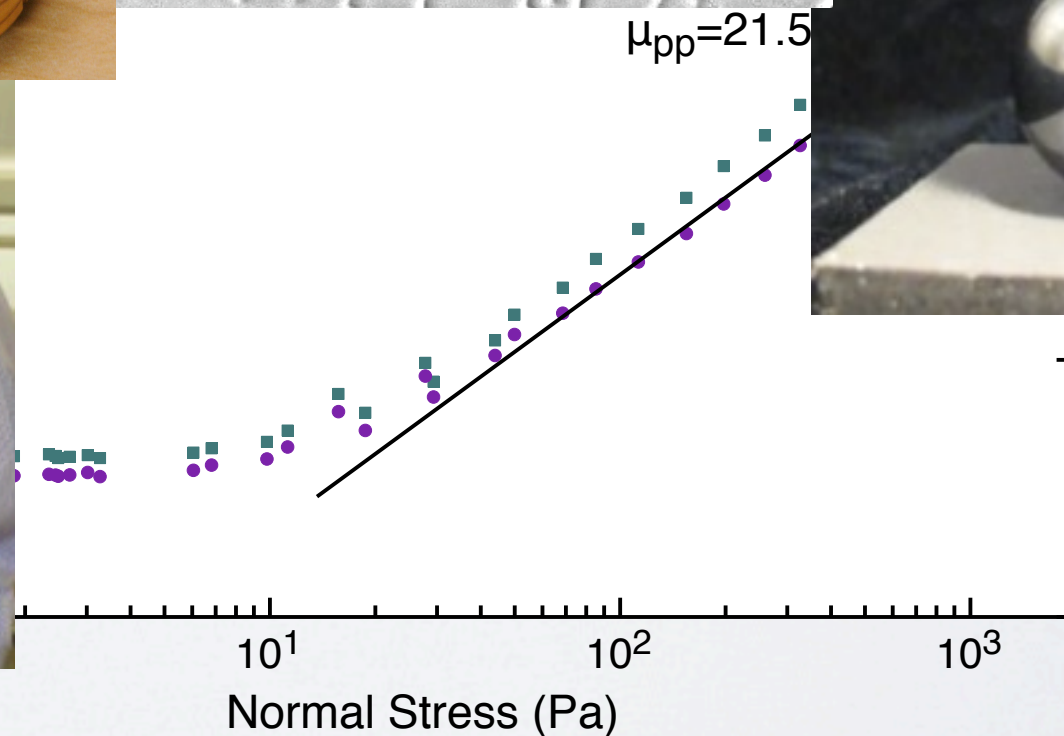
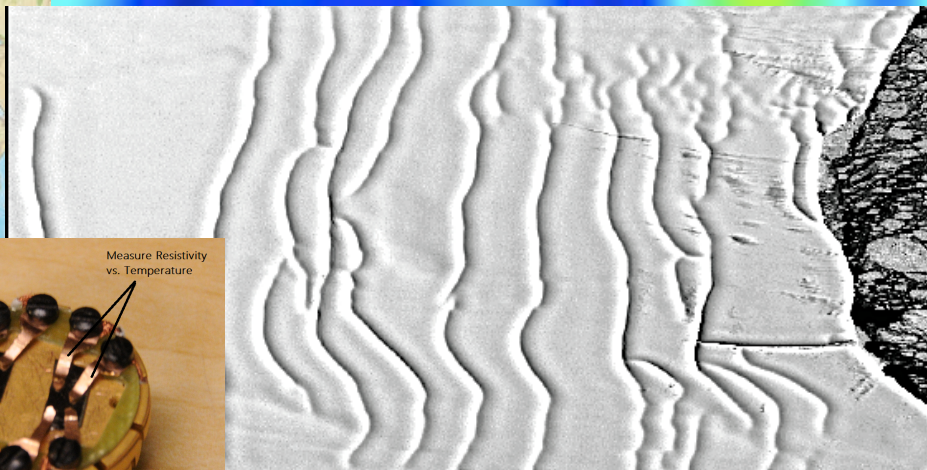
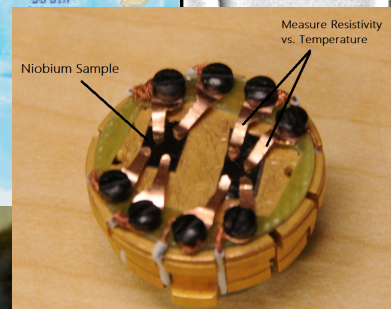
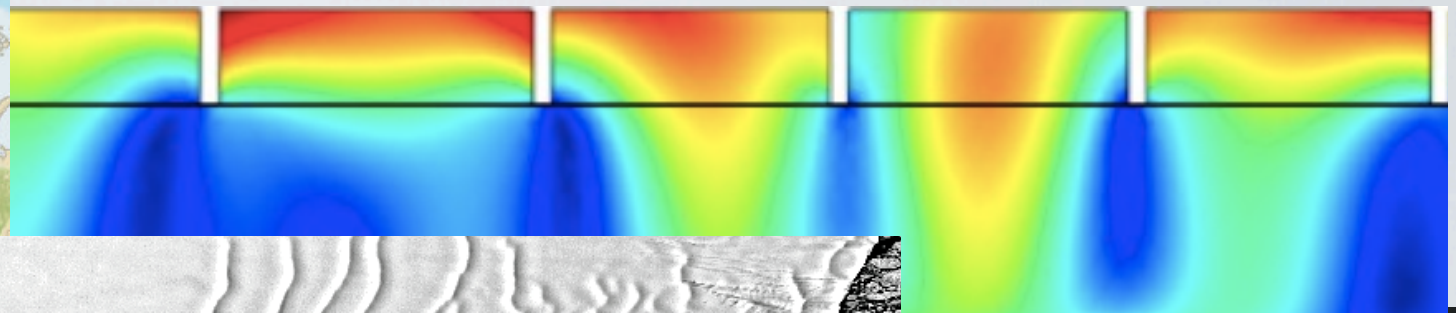
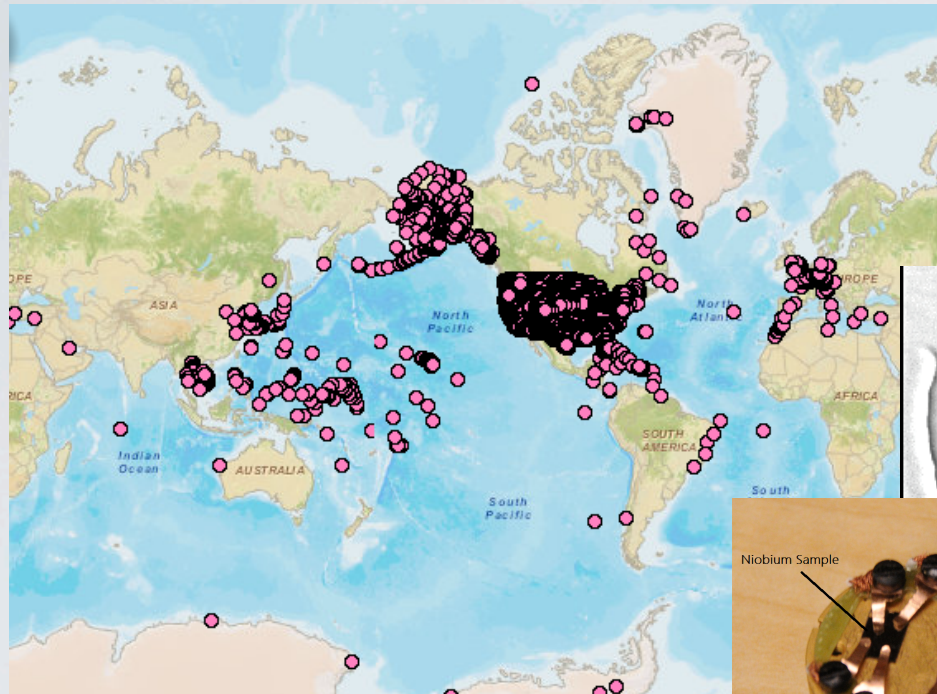




# REU @ U CHICAGO



# REU PROJECTS



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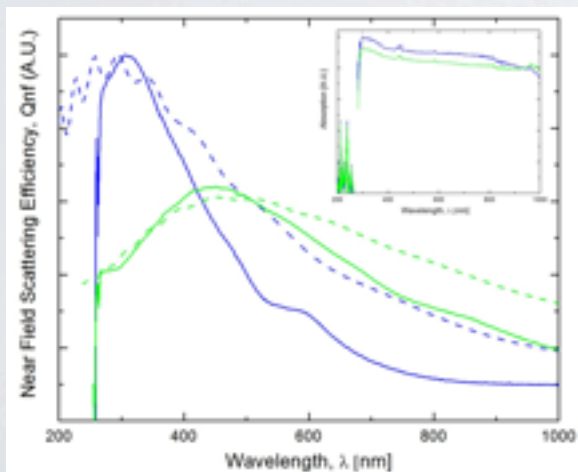
**In the Lab**



# DANE CHRISTIE

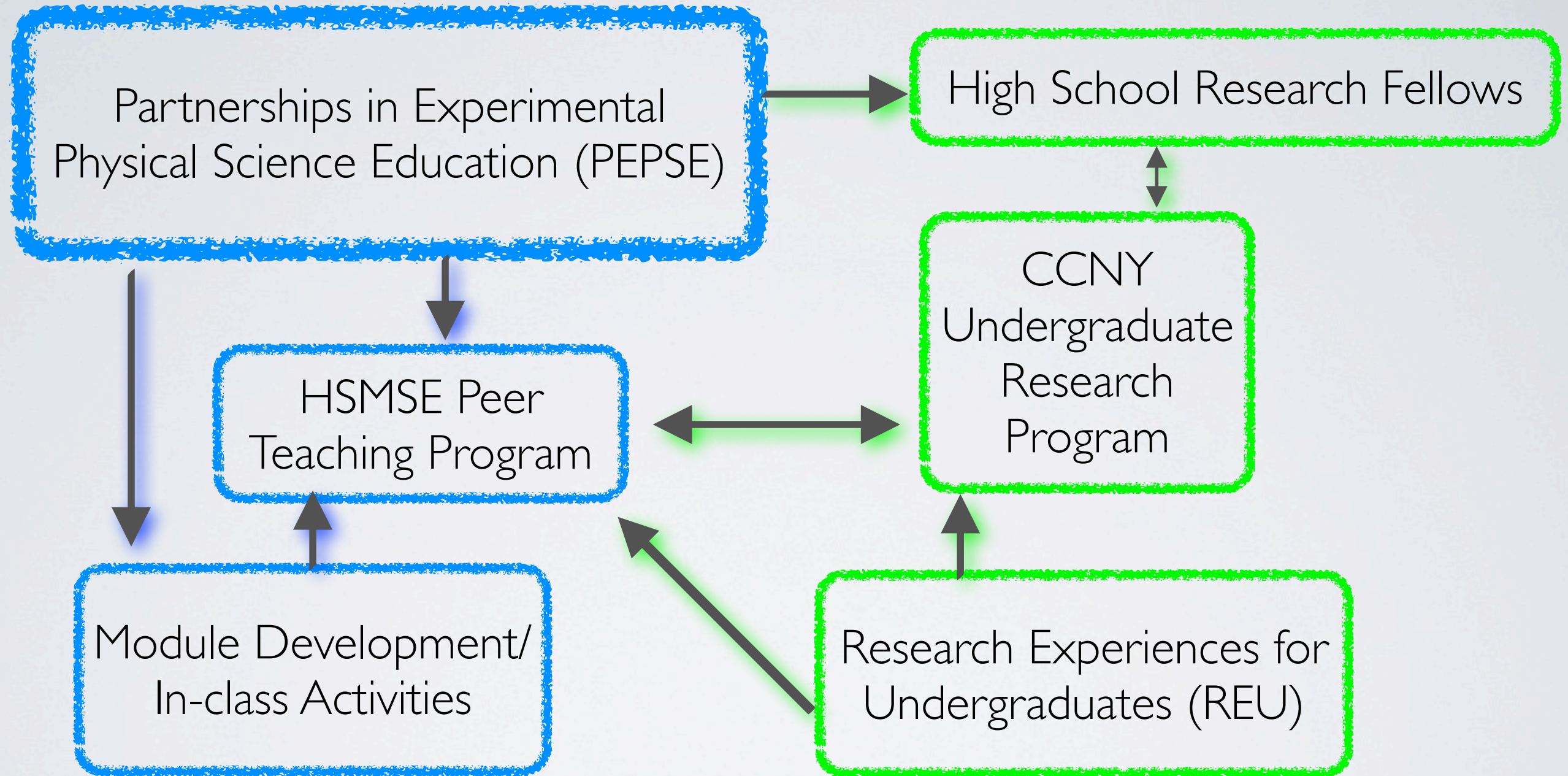


- High School in Jamaica
- Baseball player in Dominican Republic
- Signed on with Toronto Bluejays, Canada
- Associate degree from Hostos CC
- Transfer to CCNY
- PREM summer REU program
- PREM research scholar
- 2013 NSF Graduate Fellow
- Princeton ChE PhD program





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OUTREACH INTEGRATION



# WHAT'S NEXT?

- More Implementation
- Broader participation
- Sustainable partners
- More peer-teaching
- More faculty participation

