



# Why Innovation & Entrepreneurship (I&E)?

- 2021 NNI Strategic Plan
  - **Goal 2: Promote commercialization of nanotechnology R&D**
- NNCI Quadrennial Review
- US, global entrepreneurship decline
- Successful node-level programs

*“innovative mechanisms to realize the transformational societal benefits that flow from faster commercialization of nanotechnologies”*

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The NNCI is full of innovators & entrepreneurs who happen to also be nanoscientists.

# I&E Working Group



Kevin Walsh  
KY Multiscale



Seema Thakral  
MiNIC



Andy Ligley  
MONT



Marcin Walkiewicz  
nano@stanford



Ray Tsui  
NCI-SW



Hanh Phan  
NNF



Karl F. Böhringer  
NNI



Yves Theriault  
SDNI



Ying Jia  
SHyNE



Kamran Mobarhan  
SHyNE



Sherine Obare  
SENIC

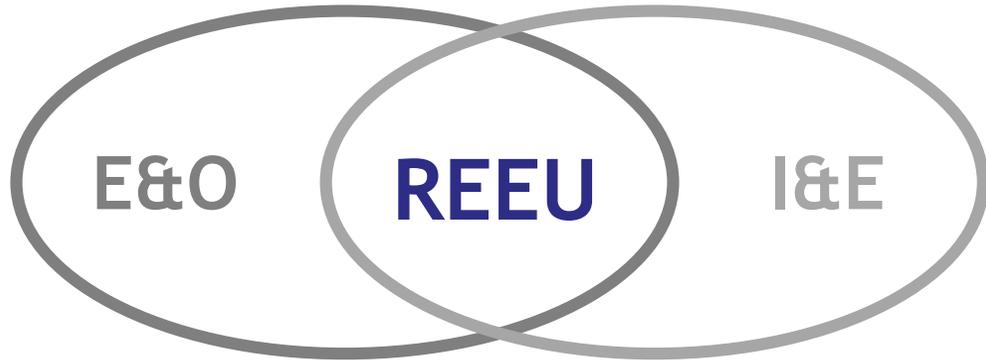


Matthew Hull  
NanoEarth

# NNCI I&E Core Program Elements

- Research and **ENTREPRENEURSHIP** Experience for Undergraduates (REEU)
- I&E Seminar Series
- NanoTechnology Entrepreneurship Challenge (NTEC)
  - NTEC Diversity Award
  - NTEC Accelerator Program
- Entrepreneurs-in-Residence (EiR)
- NNCI Innovator's Academy

# REEU Program



Research **AND** Entrepreneurship  
Experience for Undergraduates

- **Objective**

- Expose REU students to nano-enabled entrepreneurship opportunities linked to research

- **Flexible Options**

- Level 1: No/brief discussion of entrepreneurship
- Level 2: General/theme-focused (i.e., aligns with REU theme) entrepreneurship lecture and Q&A (~1 hr)
- Level 3: Visit/tour at nearby start-up facility (few hours)
- Level 4: Extended duration project (“I-Corps lite”)

- **June/July 2021 Deployment**

- Leslie/Quinn, SENIC
- 6/21, Yves Theriault, SDNI
- 6/23, Ana Maria Sanchez Galiano, KY Multiscale
- 6/30, Kristin Field, MANTH
- 7/21, Raymond Tsui, NCI-SW

# 2021 REEU Implementation



KY MULTISCALE



Yves Theriault  
SDNI



Ana S. Galiano  
KY Multiscale



Kristin Field  
MANTH



Ray Tsui  
NCI-SW



Leslie O'Neill  
SENIC



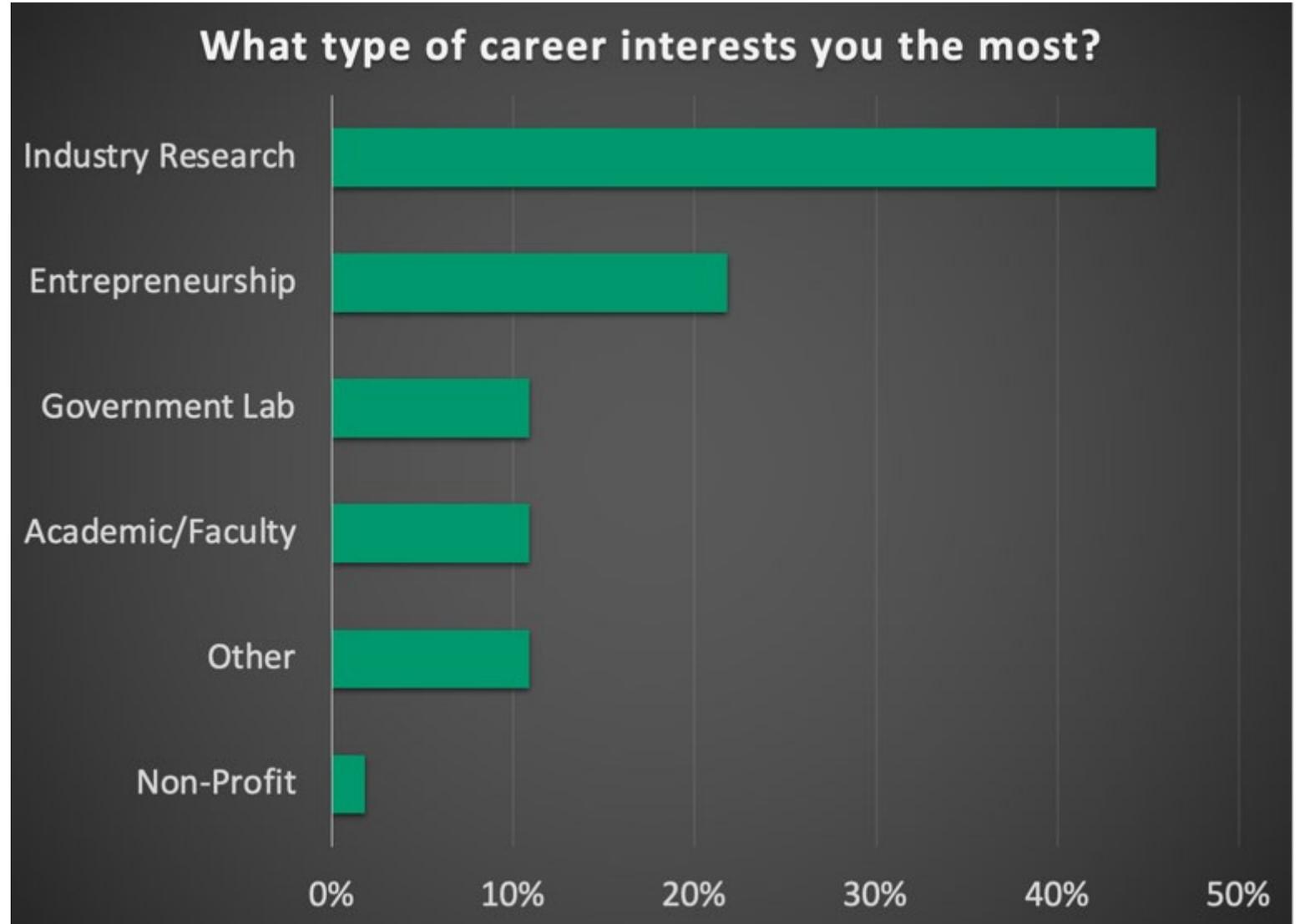
Quinn Spadola  
SENIC



# REEU Participant Feedback

Two thirds (67%) were interested in industry or entrepreneurship

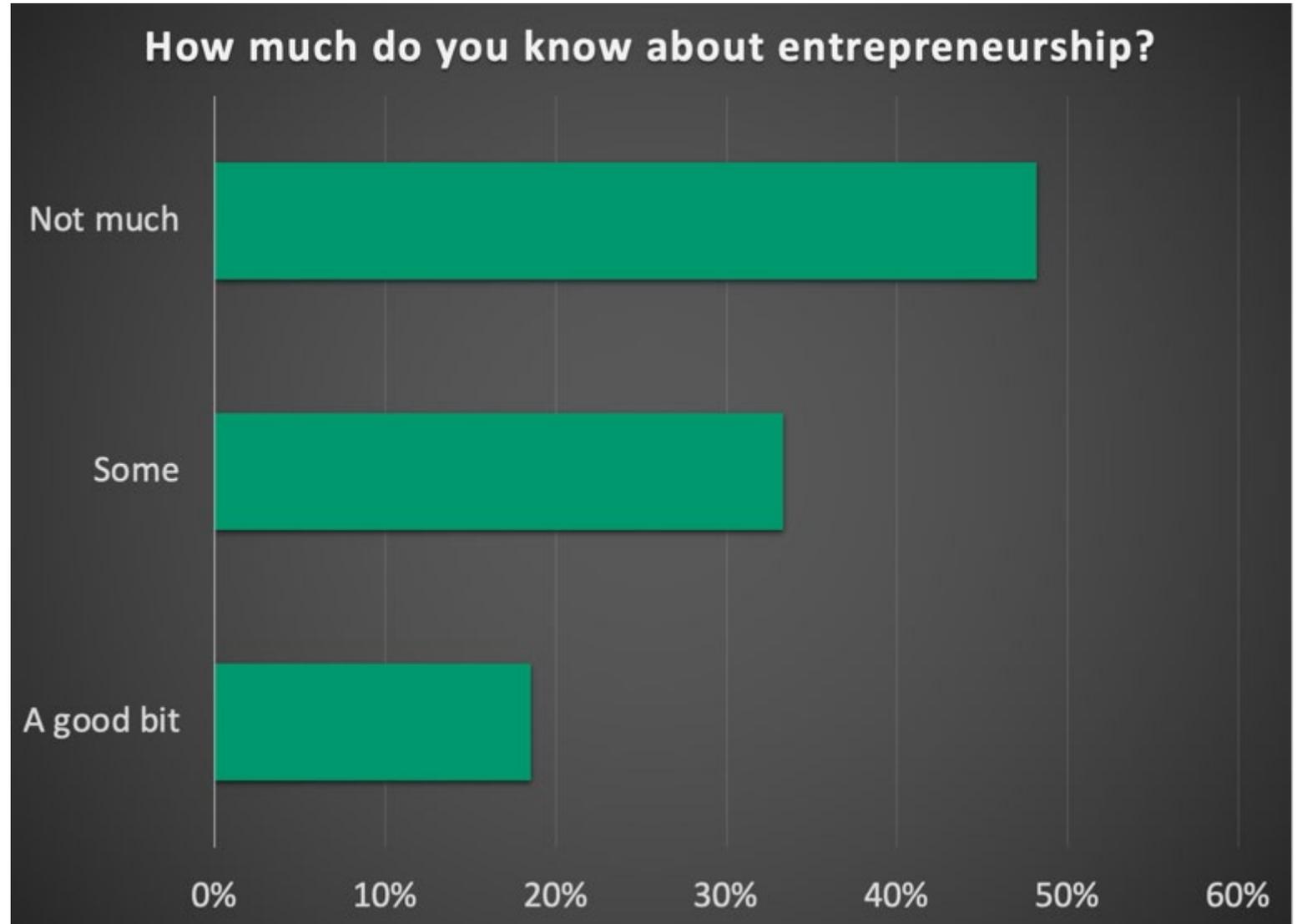
2x more favored entrepreneurship over an academic faculty career



# REEU Participant Feedback

Half claimed they don't know much about entrepreneurship

1 in 5 knew "a good bit" about entrepreneurship



# What comes to mind when you think of “entrepreneurship”?

Opinions varied...

Favorable: *creative, charismatic, innovation*

Unfavorable: *stress, difficult, conartist*

People: *Musk, Peter Thiel, Tai Lopez*



# I&E Seminar Series

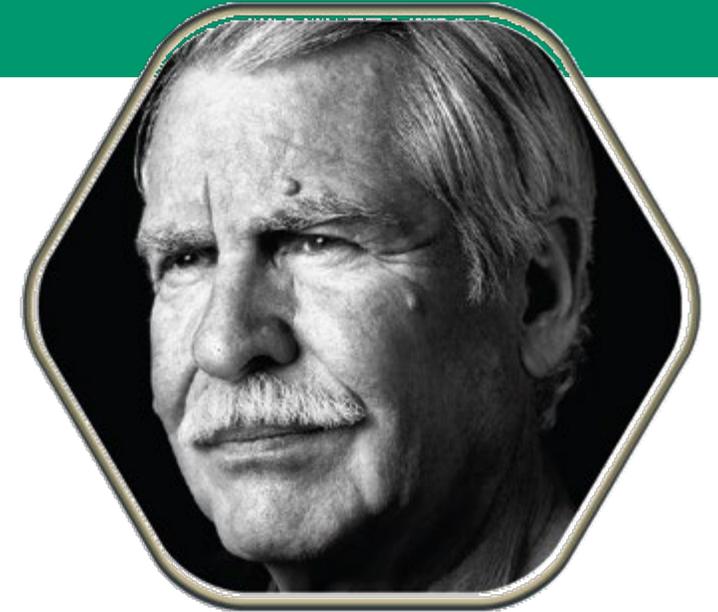
- Objective
  - Engage specifically with industry, innovators, entrepreneurs to recruit users, address real-world challenges
- NNCI-wide I&E Seminars
  - Relevance across nodes
  - Elevate message of an impactful I&E story/collaboration/trend/opportunity
  - Hosted by nodes
  - Promoted by CO

# NNCI Seminar Series: 2021 I&E Speakers

Kurt Petersen, PhD | Member of the Silicon Valley Band of Angels

## What Investors are Looking for in Early Stage Start-up Companies

Hosted by Karl F. Böhringer | NNI  
*October 28, 2021*



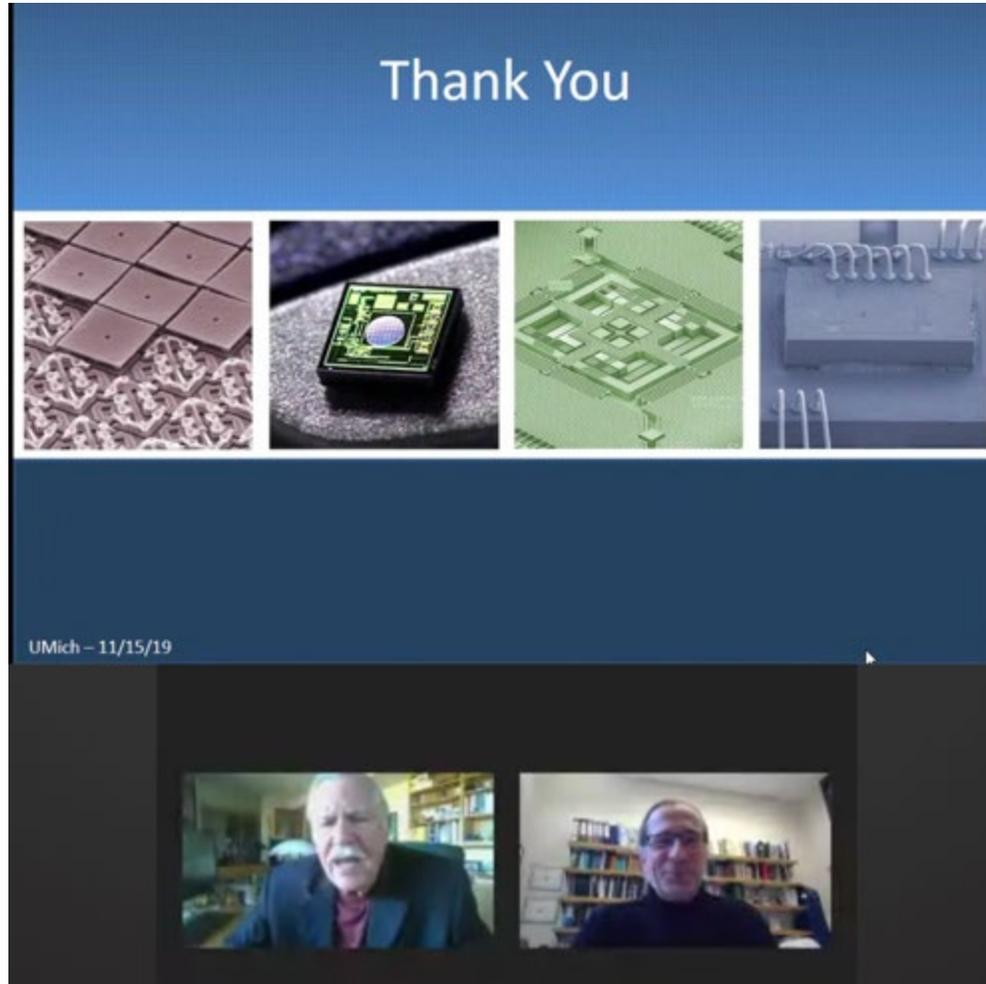
Terrance Barkan | Executive Director, The Graphene Council

## 2D Advanced Materials and US National Priorities

*May 27, 2021*



# From the NNCI Seminar Series...



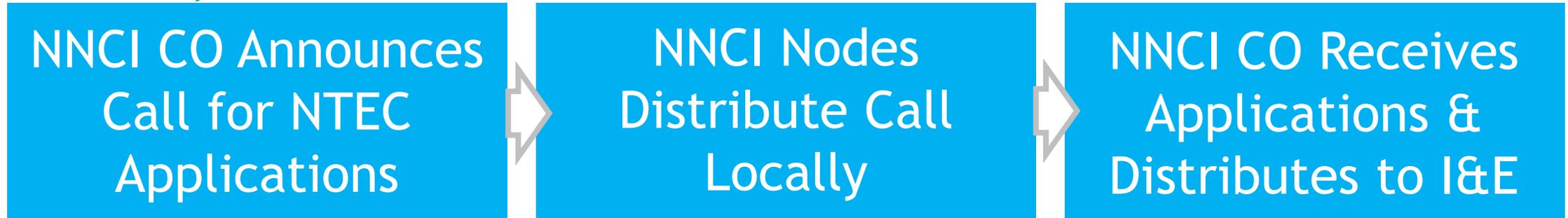
- KP: *“the most investible start-ups are resourceful and will find a way” [and many use university labs/fabs and accelerators]*
- KP: *“nothing is more convincing than an entrepreneur who knows their market”*
- KP: *“Many experienced entrepreneurs enjoy mentoring new start-ups”*
- Guest: *“I read that women make up 50% of entrepreneurs but receive 2% of [venture capital] funding. Is that reasonably accurate? What can female entrepreneurs do differently?”*

- Promote student-led entrepreneurship across NNCI nodes
- Flexible support mechanisms to maximize node engagement
  - In-kind instrument time
  - Direct funding (e.g., \$500 per team for instrument time, materials)
  - Diversity Award (encourage participation from underrepresented groups, minorities)
  - Voluntary participation in 7-week virtual NTEC Accelerator Program
- Opportunity to:
  - Explore nano-enabled technologies for sustainable solutions
  - Learn and “practice” entrepreneurship
  - Transition ideas beyond the lab
  - Fail safely, learn from mistakes
  - Connect NNCI nodes in the spirit of friendly I&E competition

# 2022 NNCI NTEC Roll-Out Planning

ANNOUNCE: January 10<sup>th</sup>

DUE: February 11<sup>th</sup>) National Inventor's Day



Applications to I&E WG

REVIEW: February 18<sup>th</sup>

NODE'S FINAL SAY: March 1<sup>st</sup>



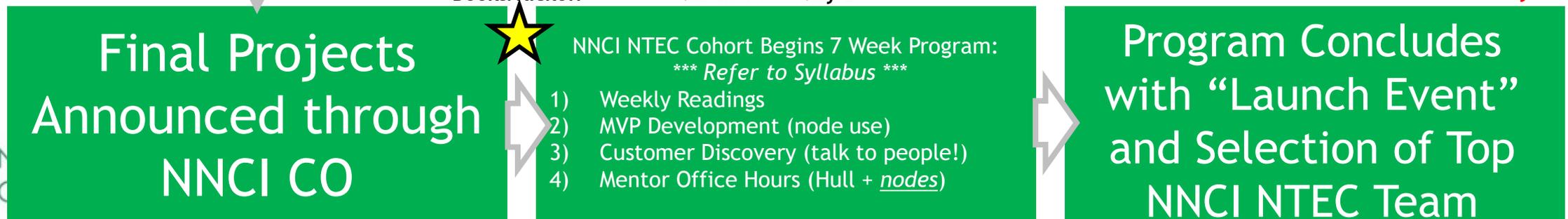
Selected NTEC Projects

March 7<sup>th</sup>

Books/Kickoff

March 14<sup>th</sup> - May 2<sup>nd</sup>

END: May 2<sup>nd</sup>



# Entrepreneurs-in-Residence

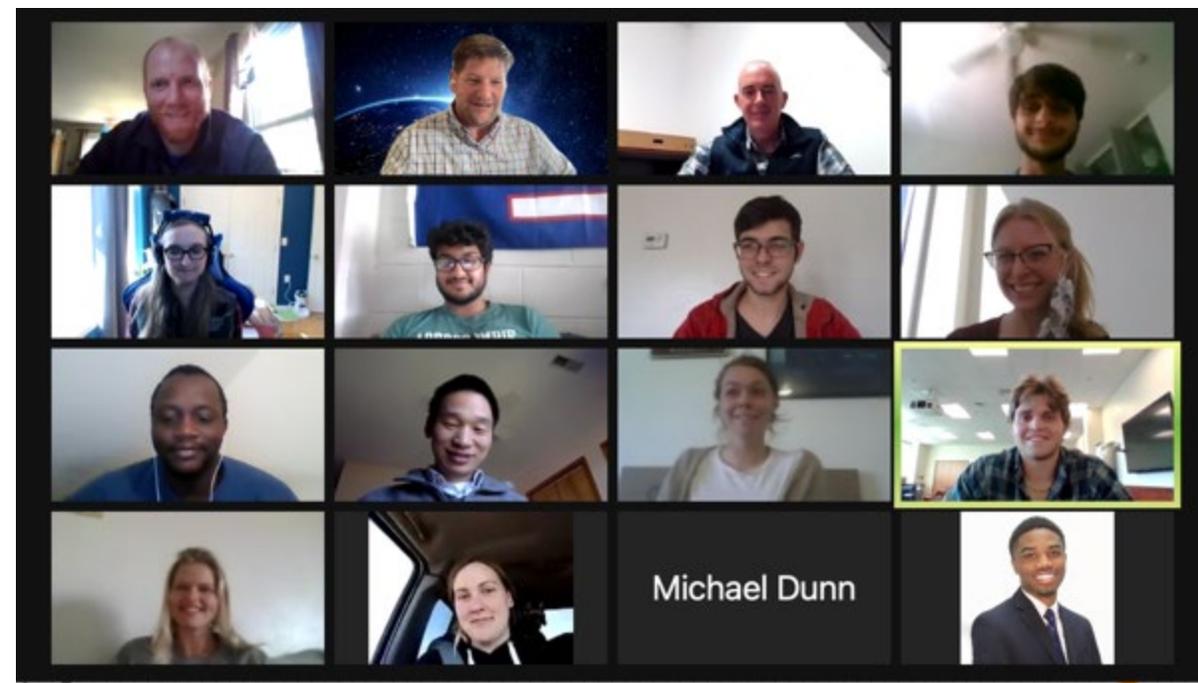
KP: *“Many experienced entrepreneurs enjoy mentoring new start-ups”*

- Local entrepreneurs willing to engage with your node to help mentor student and/or faculty entrepreneurs
- Role
  - A conduit to local I&E resources
  - An educator who helps promote I&E awareness
  - Sounding board for I&E ideas
- Characteristics of an E-i-R
  - A “mentor mentality”
  - Already associated with your program? A faculty member? A user?
  - Connected to local I&E resources, startup hubs
  - Could be volunteer, part of assigned duties, or compensated

# Stretch Goal: NNCI Innovator's Academy

- Scale availability of NNCI I&E resources more broadly
- Collection of I&E education & training resources from across the NNCI
- Certificate program for training nano-savvy innovators, entrepreneurs

# Innovation & Entrepreneurship (I&E) Report



MANTH REEU Poll 2021

NanoEarth NTEC 2021 Cohort

“It’s really important that we do train the new generation of chemists to be thinking about the entrepreneurial and sustainability aspects of their work.”

— *Angela Wilson, chemist, Michigan State University, and president-elect, ACS*

Matthew Hull, PhD  
NNCI AD, Innovation & Entrepreneurship  
Contact: [mahull@vt.edu](mailto:mahull@vt.edu)