



# MANTH: Mid-Atlantic Nanotechnology Hub



An NSF-National Nanotechnology Coordinated Infrastructure Node  
Singh Center for Nanotechnology  
University of Pennsylvania



2016/17 NNCI Annual Meeting, Atlanta, GA, Jan 2017





## The MANTH Vision



- To be a catalytic force for nanotechnology in the industry-dense and academically-rich environment of the mid-Atlantic region in a centrally-located Philadelphia hub



- To achieve this vision by providing access to a state-of-the-art, shared user fabrication and characterization facility as well as the deep intellectual expertise of nanotechnology faculty



## The Singh Center's Purpose and Mission

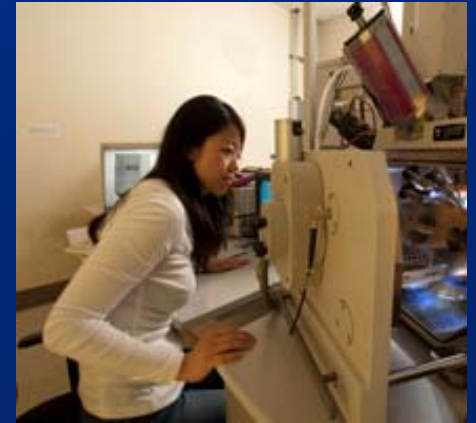
Opened in 2013, the Singh Center was designed to provide a place for researchers from academia, small and large companies, and government with open access to leading-edge fabrication and characterization tools, instrumentation, and expertise within all disciplines of nanoscale science, engineering and technology.

We are a 'maker space' for nanotechnologists that enables exploitation of fundamental advances in nanoscience to realize nanotech materials, devices and systems

Our Center is comprised of four core facilities

- The Quattrone Nanofabrication Facility
- The Property Measurement Facility
- The Scanning and Local Probe Facility
- The Nanoscale Characterization Facility

We have a professional staff of 14 with deep expertise in fabrication, process development, characterization, user interaction, and nano-related education



We act as an intellectual focus/hub for scientific discovery and solving nanotech problems



National Nanotechnology  
Coordinated Infrastructure

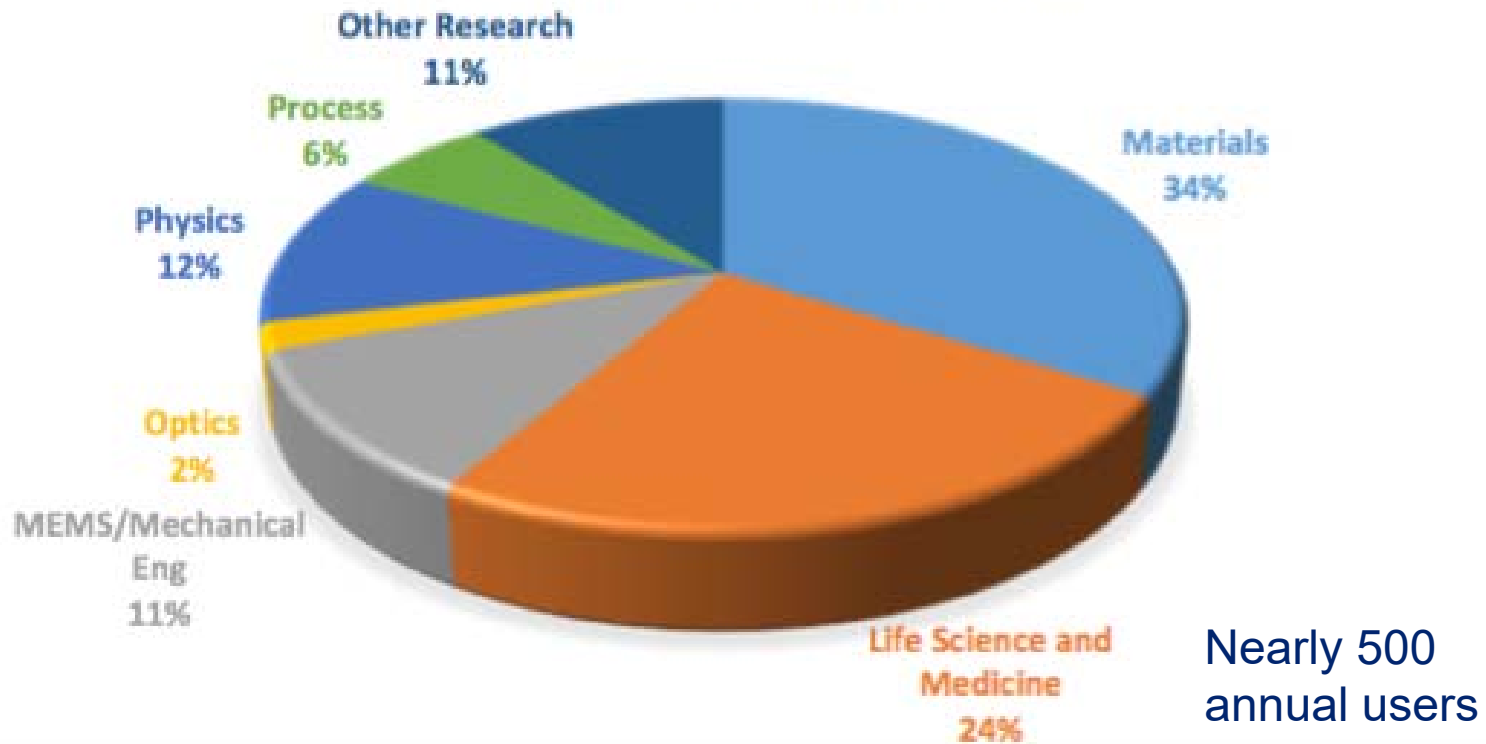
## A Few Singh Center Nano Focus Areas

- Nanodevices and systems from soft materials
- Nanomedical devices and systems
- Devices exploiting beyond-silicon materials systems, including low-dimensional materials
- MEMS and NEMS
- Microfluidics
- Nanophotonics and nanoelectronics
- Scanning-probe-enabled investigations and devices



## Snapshot Of Our User Base

### DISCIPLINARY BREAKDOWN OF SINGH USERS OCTOBER 2015 - JUNE 2016





## Our Annual Report



## 2015-2016 Singh Center for Nanotechnology

Download a copy from: <https://goo.gl/JLJbP6>

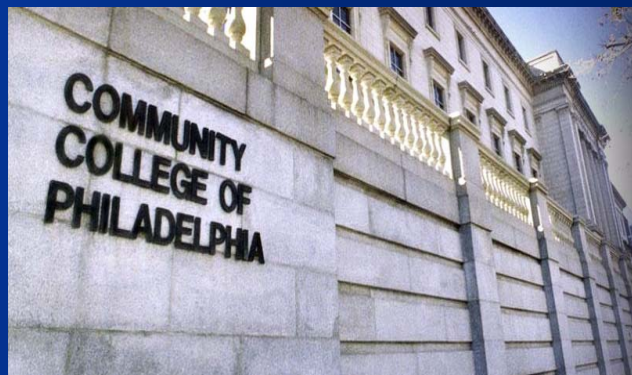




## Nano-technician Training Program – Needs Analysis

New program – partner with Community College of Philadelphia – Nanotechnology Technician Certificate

- Provide workforce training for CCP students (~6 courses, associates-degree level) – vocational focus (not pre-nano/pre-engineering academic prep)
- Motivation: provide work opportunities/training for CCP students; provide employee pipeline for Philadelphia/Southern NJ/DE-area companies needing technicians (pre-Bachelor's level)



## A few MANTH initiatives – 2015/2016

### Seed Grant Competition:

- Five projects
- Focus on new users, external users
- Funds for use in the Singh facilities

### Fermento

Fermento employs microfluidic technology to revolutionize the beer industry.

### Low-Cost Microfluidic Flow Cytometer for Portable Automated Biolab

An automated microfluidic flow cytometer chip into a networked desktop biolab.

### NanoSense – Graphene Based Water Contamination Testing

NanoSense is a concept for a novel graphene biosensor for drinking water contamination testing.

### Amsterdam Fluidics

We encapsulate drugs using a bottom-up rather than top-down approach.

### Sweatsmart

Sweatsmart is a non-invasive sensor that can measure glucose, dehydration and lactate levels in real-time, all from your sweat.

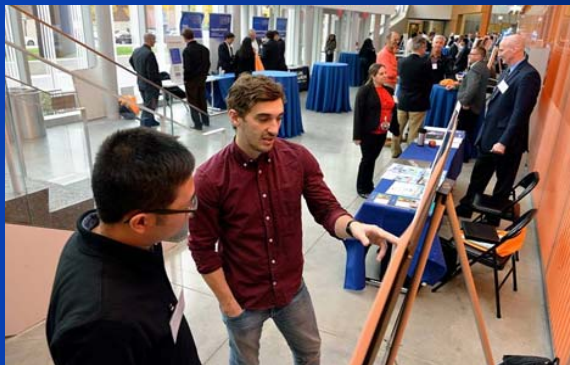




# A few MANTH initiatives – 2015/2016

## SINGH Nano Week

- Day 1 – User Day
- Day 2 – Nanomedical Day
- Day 3 – Outreach Day
- Day 4 – Nano Innovation Day



**SINGH**  
Center for Nanotechnology

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Solutions for Innovation

Search ...

## Singh Nano Week

Where Nanotechnology Meets Innovation

October 24 – 27, 2016

Singh Center for Nanotechnology  
University of Pennsylvania  
3205 Walnut Street  
Philadelphia, PA 19104  
Phone: 215-573-5069

### Speaker Highlights



**J. Alexander Liddle, Ph.D.**  
Nanofabrication Research Group,  
Deputy Director (Acting)  
Center for Nanoscale Science and  
Technology  
National Institute of Standards and

Technology



**Piotr Grodzinski, Ph.D.**  
Director of the Office of  
Nanotechnology Research, National  
Cancer Institute



**Linh Le**  
Founder and CEO, Flextrapower

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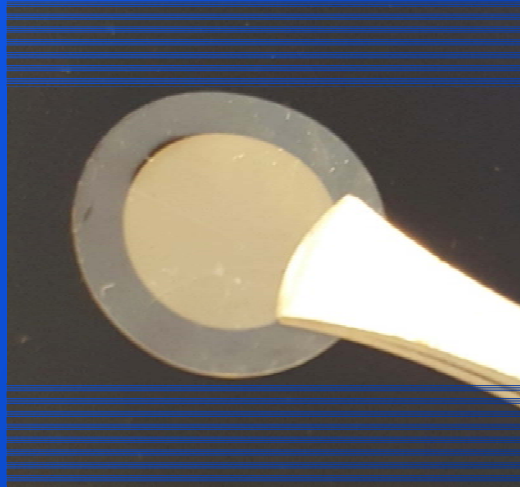
WYATT  
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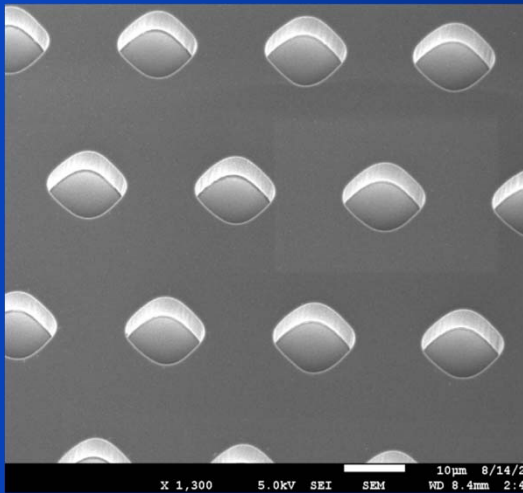
STARTUP  
PHL

**National Nanotechnology  
Coordinated Infrastructure**

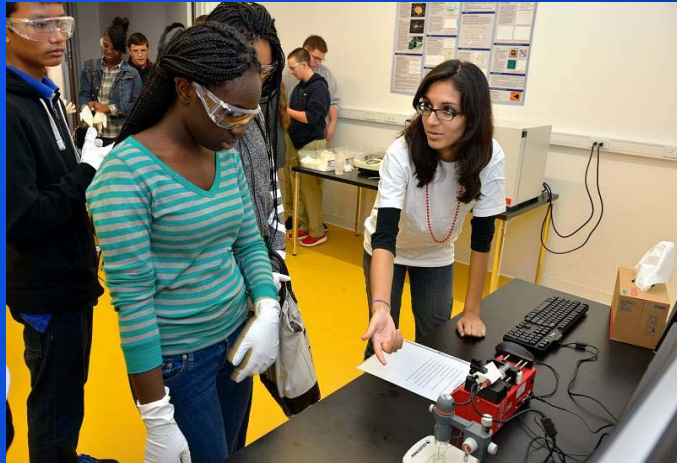
# Nano Medical Day



- Applications at the intersection of nanotechnology and medicine are one of the fastest growing interest areas in nanotechnology
- Keynote address from Piotr Grodzinski, NCI
- Highlighted discussion areas include how nanotechnology is changing medicine, technology transfer, regulatory issues, and presentations from industry at the nanotech/medical interface



# Nano Outreach Day

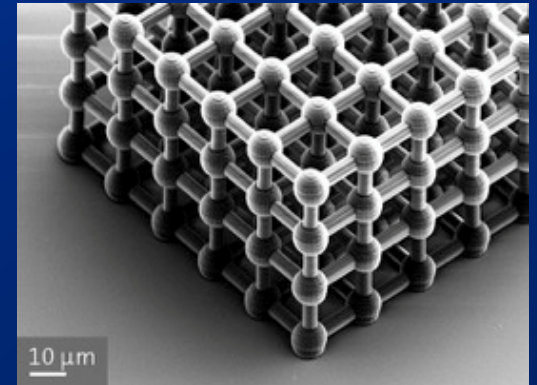


- High school classes, undergraduate and graduate students, postdocs and faculty from the Philadelphia region participate in exhibits, demonstrations, tours, posters and talks in the area of nanotechnology.
- Activities include hands-on nanoscale fabrication and characterization, laboratory tours, running a science fair for students from local high schools



# Nanovation Day

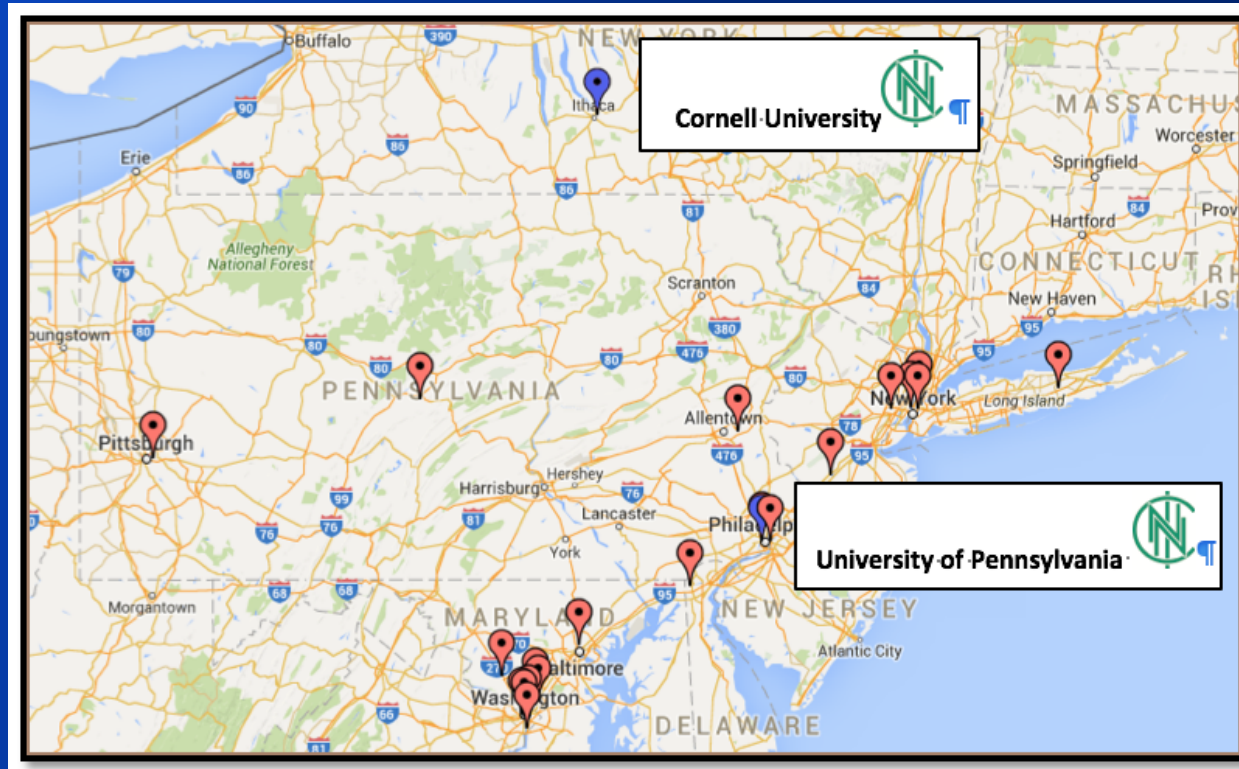
- Presentations from industry that are performing projects at the forefront of nanotechnology
- Discussions of the startup scene in the mid-Atlantic region and
- Government programs and city-wide resources, maker spaces, and commercialization programs (including Penn programs) to assist in commercialization
- Meet venture capitalists with interest in investing in nanotechnology efforts



## A few MANTH initiatives – 2015/2016

### Mid-Atlantic Clean Room Managers Meeting

- Clean room managers in the mid-Atlantic region
- 20 university and government facilities, and 45 staff members, represented
- Goal: Networking at the regional level and leveraging one another's capabilities to strengthen the NNCI's presence in this technically rich area.



## A few MANTH initiatives – 2015/2016

- Visits from galactic dignitaries

