How can an NSF-funded nanotechnology program help lead and nucleate the broader national nanotechnology infrastructure ecosystem?

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Mid-Atlantic Nanotechnology Hub

Penn
UNIVERSITY of PENNSYLVANIA

SINGH
Center for Nanotechnology

Community
College
of Philadelphia

NSF
National Nanotechnology
Coordinated Infrastructure

Gerald G. Lopez, Ph.D.
Director of Operations and Business Development /
Center Associate Director

Singh Center for Nanotechnology

- 11,000 ft^2 class 100/1000 nanofabrication facility
- 10,000 ft^2 imaging and characterization facilities

100+ Tools

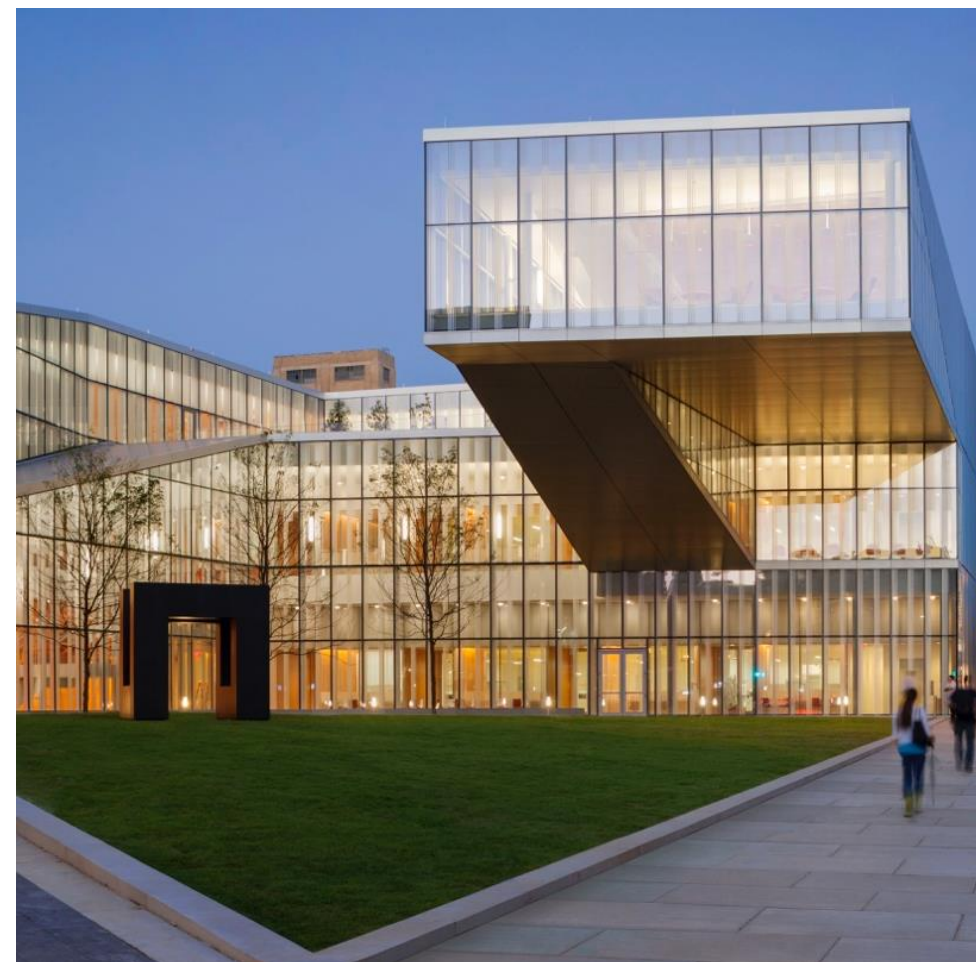| 15+	75+	9
Nanoscale Characterization Facility	Quattrone Nanofabrication Facility	Scanning and Local Probe Facility

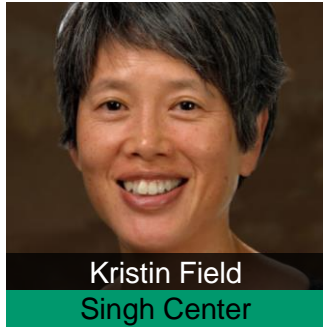National Nanotechnology Coordinated Infrastructure

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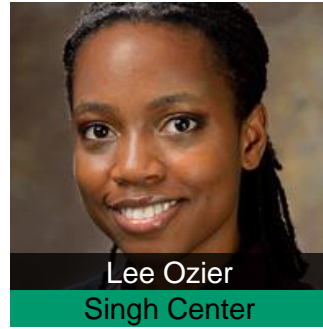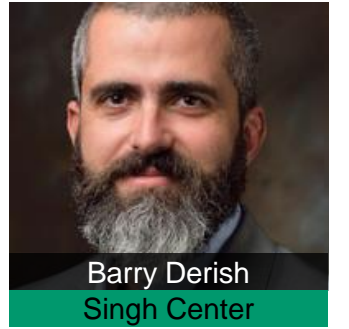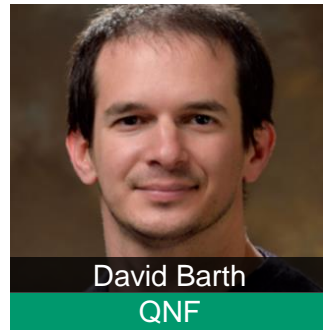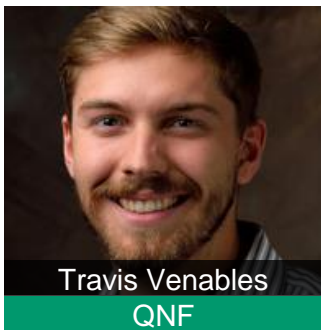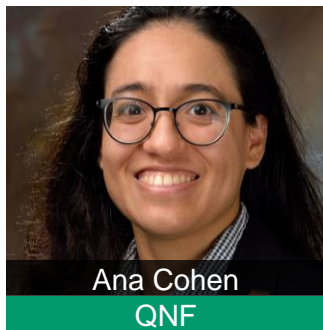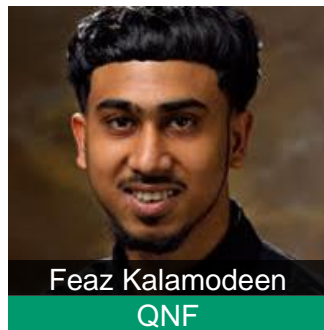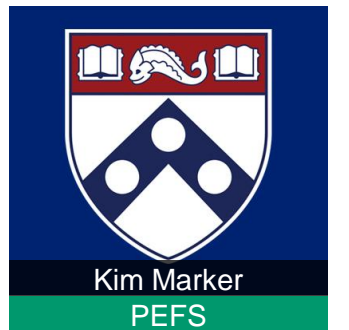|						
Mark Allen Singh Center	Gerald Lopez Singh Center	Pat Watson Singh Center	Kristin Field Singh Center	Gyuseok Kim Singh Center	Lee Ozier Singh Center	Barry Derish Singh Center
Doug Yates NCF	Jamie Ford NCF	Nicole Bohn NCF	Matt Brukman SLPF	Eric Johnston QNF	David Barth QNF	Kyle Keenan QNF
Sam Azadi QNF	Travis Venables QNF	David Jones QNF	Ana Cohen QNF	Feaz Kalamodeen QNF	Charlie Veith QNF	Kim Marker PEFS

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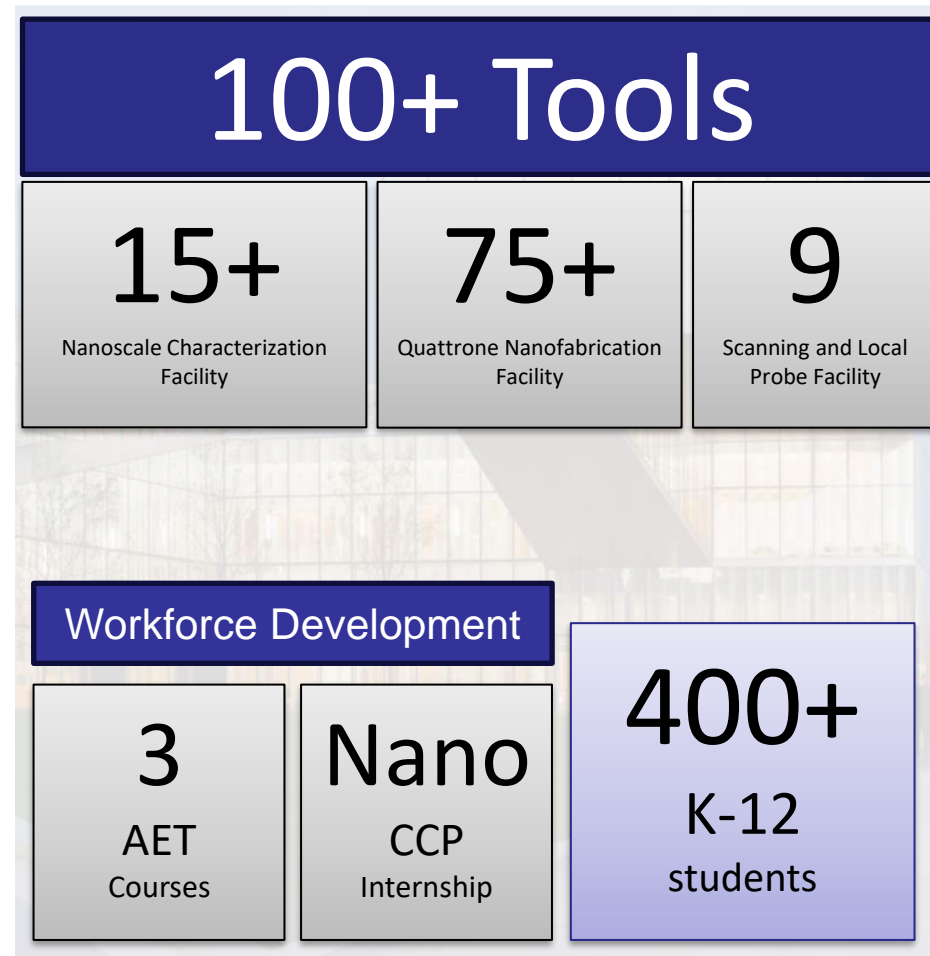
Community College of Philadelphia

MANTH: Mid-Atlantic Nanotechnology Hub (Penn Singh Center + CCP)

Singh Center for Nanotechnology
- 11,000 ft2 (1021 m2) class 100/1000 cleanroom
- 10,000 ft2 (929 m2) imaging and characterization

Community College of Philadelphia (CCP)
- 19,000 students (41% African American, 16% Hispanic/Latino, 11% Asian, 23% White)
- Title III eligible institution: low-income student population
- The **School District of Philadelphia,** a Title I designated district where 75% of students are economically disadvantaged, is the largest feeder into the CCP.

100+ Tools

15+	75+	9
Nanoscale Characterization Facility	Quattrone Nanofabrication Facility	Scanning and Local Probe Facility

Workforce Development

3	Nano	400+
AET Courses	CCP Internship	K-12 students

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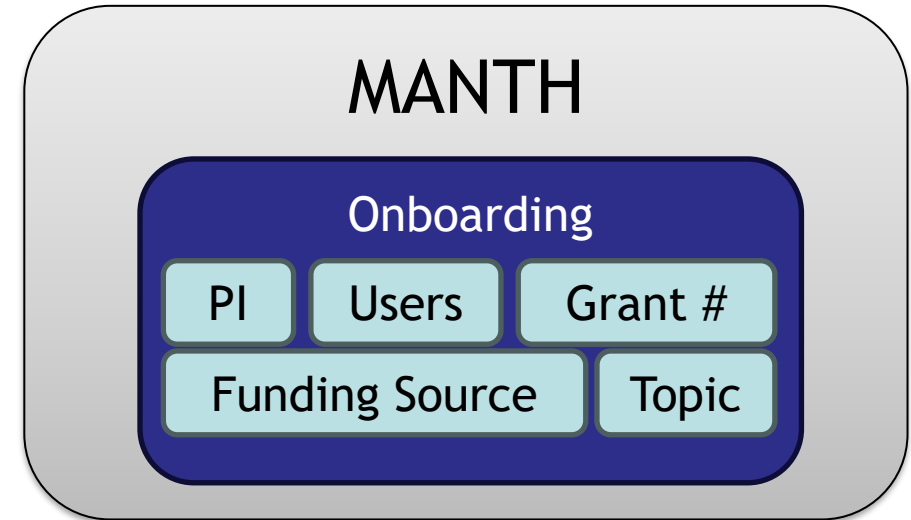
Opportunities in Operational Excellence

- NIST: NEMO / Nexus LIMS

Opportunities in Operational Excellence

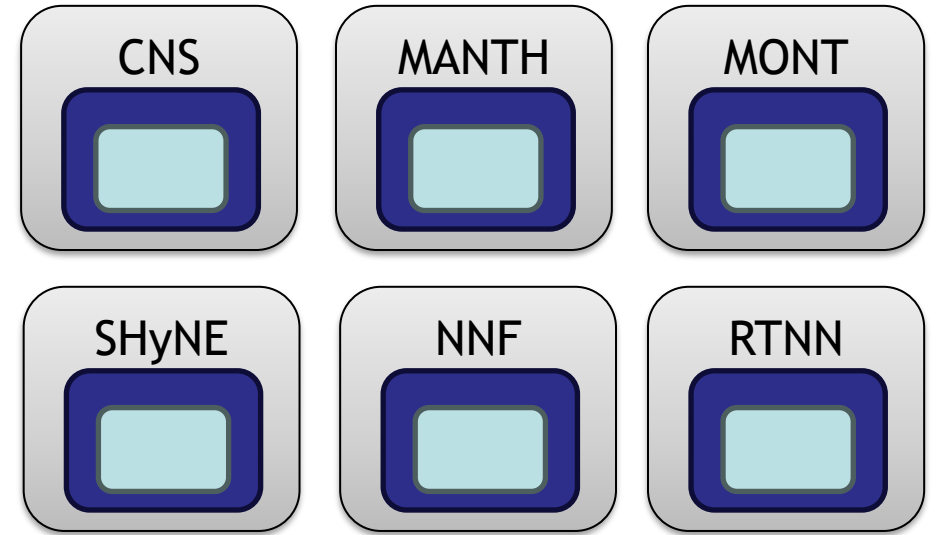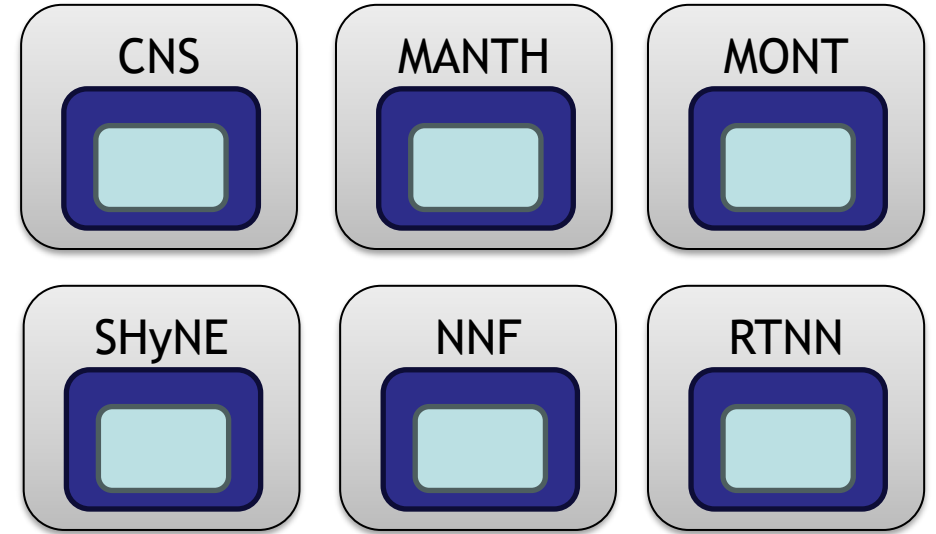- NIST: NEMO / Nexus LIMS

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Opportunities in Operational Excellence

- NIST: NEMO / Nexus LIMS

- Establish an NNCI Central Registry

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Establish an NNCI Central Registry

- New NNCI users register through a central national portal as part of each node's onboarding process
- Enable user awareness and accountability
- Operational Continuity
- On-demand Snapshot of the Network's Impact

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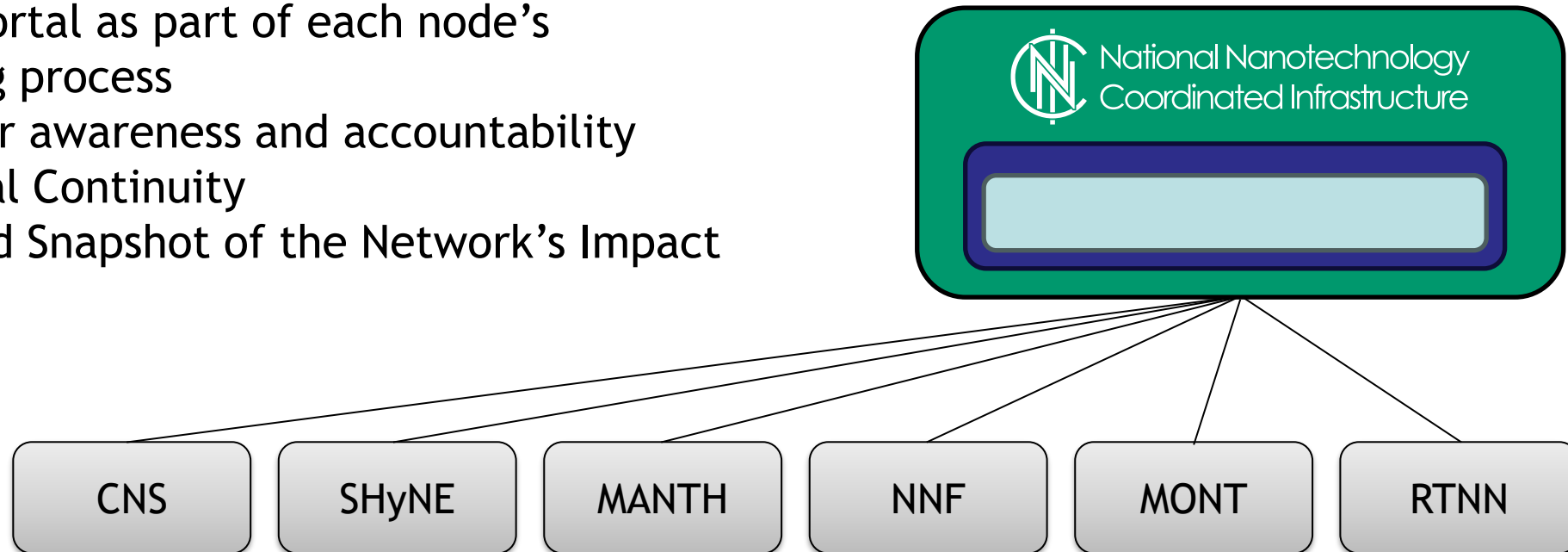

National Nanotechnology Coordinated Infrastructure

Lab Info. Management System (LIMS)

How can an NSF-funded nanotechnology program help lead and nucleate the broader national nanotechnology infrastructure ecosystem?

Onboarding Funnel

National Nanotechnology Coordinated Infrastructure

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25,000 SBIR Proposals

Onboarding Funnel

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25,000 SBIR Proposals

Onboarding Funnel

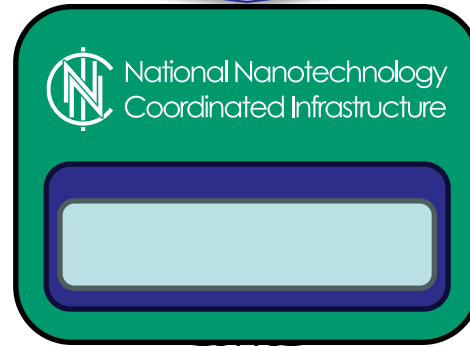National Nanotechnology Coordinated Infrastructure

Lab Info. Management System (LIMS)

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40,000 NSF Proposals

Onboarding Funnel

National Nanotechnology Coordinated Infrastructure
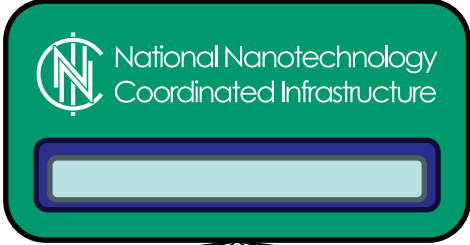
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National Nanotechnology Coordinated Infrastructure

Establish an NNCI Central Registry

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Lab Info. Management System (LIMS)

12k K-12 institutions → **9M** K12 students → **500** colleges & universities → **2.4M** undergraduates
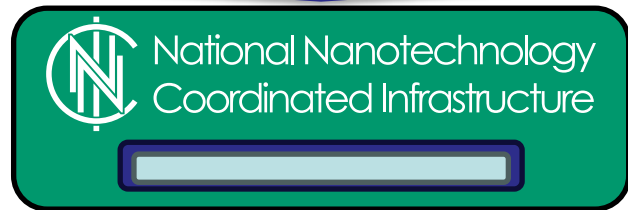
Workforce Pipeline

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Onboarding Funnel

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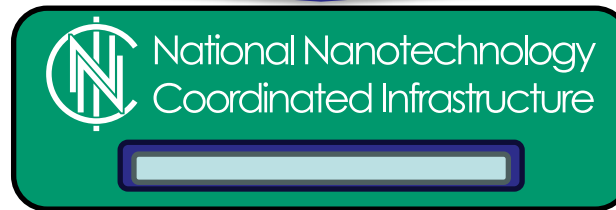- On-demand Snapshot of the Network's Impact

Lab Info. Management System (LIMS)

Broaden Partnerships
(for workforce development + awareness)
- Government: state / local
- Academia: school districts, vocational, IHE
- Industry: employment / innovation pipelines