nano@stanford Site Presentation

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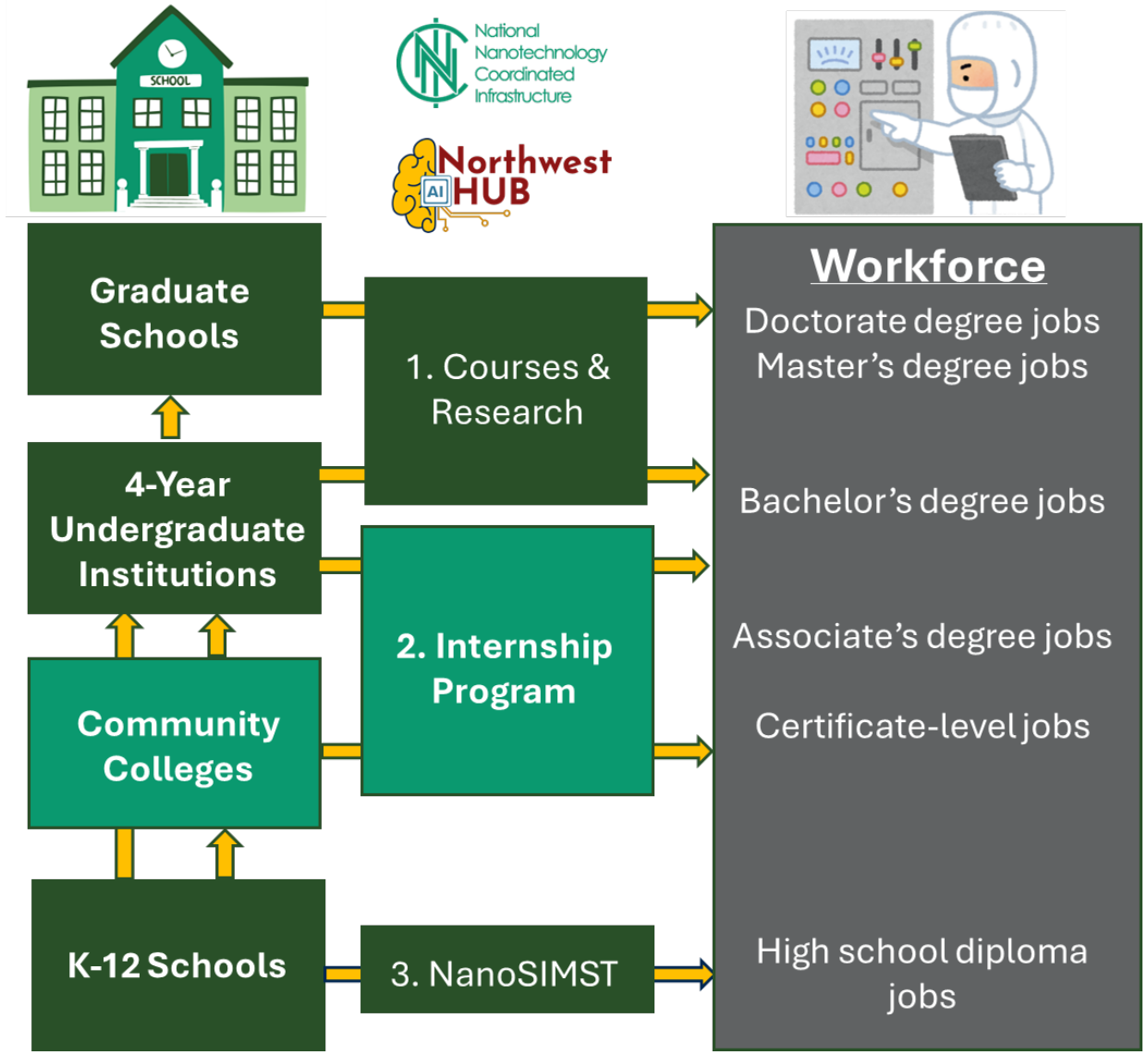
National Nanotechnology Coordinated Infrastructure

NSF

nano@stanford Workforce Development Programs



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Programs' Growth & Sustainability

E&O Programs

1. **NanoSIMST**
   - 11 ⟶ 53 teachers
   - 72 ⟶ 3900 students
   - Growth: adding virtual session, network involvement
   - Sustain: Commons funding, *but at minimal levels*

2. **Internships**
   - 3 ⟶ 31 students
   - Only 5 interns funded by NNCI
   - Growth: leadership & staff support
   - Sustain: Lab operations, ME Commons, + Intel funding, *but at minimal levels*

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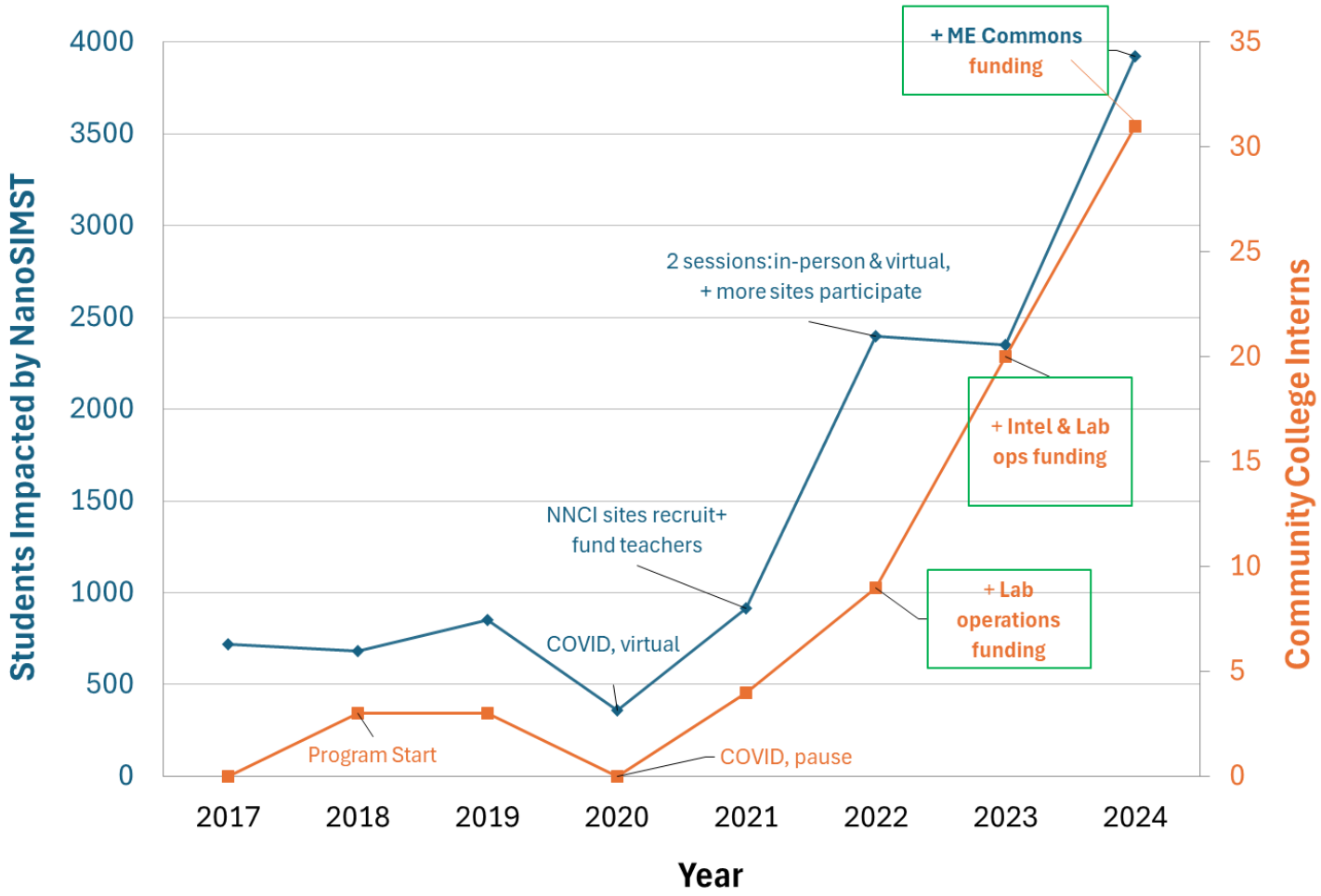
Growth/Sustainability of NanoSIMST and Intern Programs



nano@stanford Community College Engagement

Visits/Tours

- **190 students, 6 visits (year 9)**
  - Career panels
  - Facility tours
  - Tool demos
  - Hands-on activities
  - Research talks
- **Inspire interest in nano**
- **Recruit new interns**

Foothill/DeAnza visit to nano@stanford

Tabletop SEM

Career Panel

Internships

- **In high demand!**
  - 200 applicants for 10 spots
- **31 interns in year 9**
  - Only 5 funded by NNCI
- ***Supports lab operations***
  - Process monitoring
  - Maintenance
  - Training users
  - Lab support projects
- **Learn theory at weekly process clinics**

Interns meeting Intel exec.

Lab support project

Discussing WFD in Washington

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Intern Projects That Support the Facilities

Pocket Wafer Fabrication

Fabricated ~125 pocket wafers as a new lab supply for users to purchase

- Convenient resource for chip processing
- Saves lithography & etch time

Oxide Wafer Preparation

Prepared >100 wafers with 100nm oxide thickness for internal users

- Ready-to-go substrate for many processes
- Efficient: saves users time with fewer process steps
- Related process data helps users hit their own target thicknesses

Other Projects

1. **Collaborating with a SLAC intern to develop a TiN ALD process for quantum computing research**
2. ALD film surface roughness
3. Developing a sharable process for micropillar fabrication

SLAC NATIONAL ACCELERATOR LABORATORY

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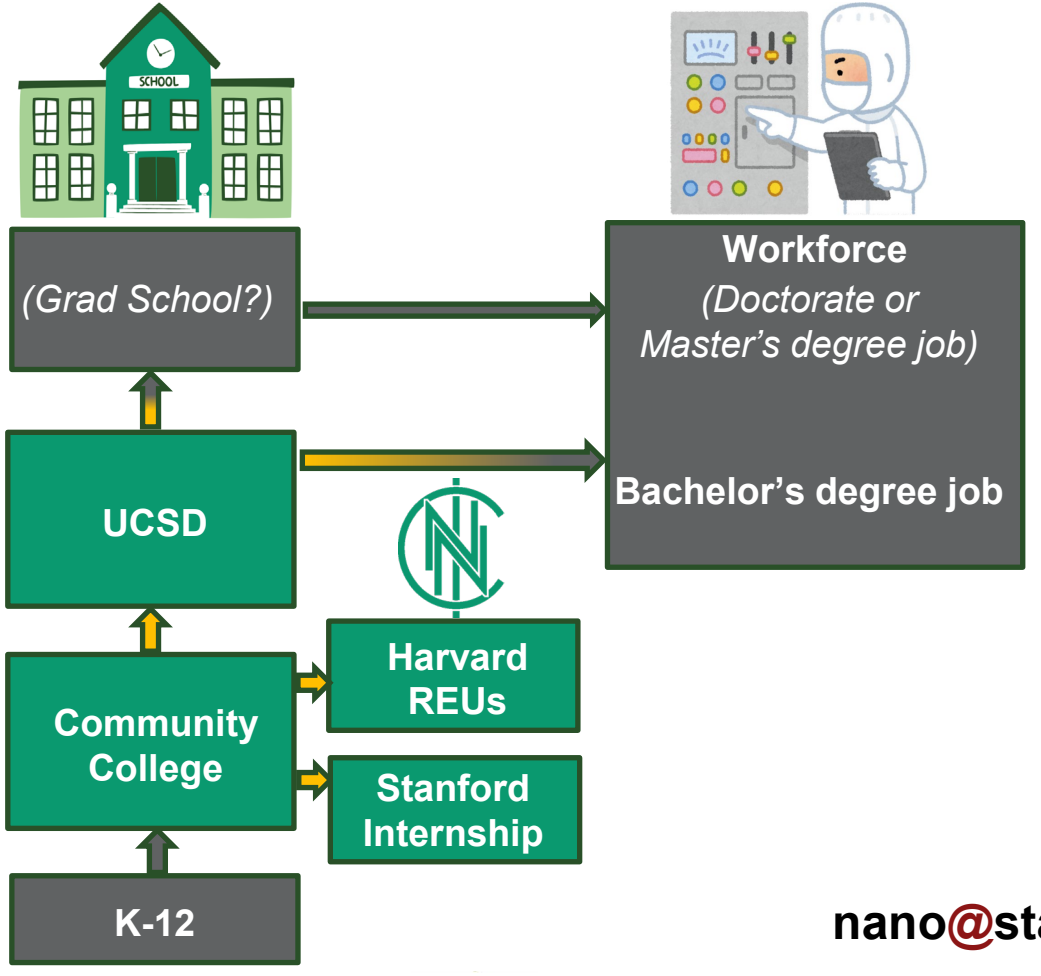
NNCI Network and Community Colleges

nano@stanford Intern Story

- **Al Enriquez joined us as an intern in 2022**
- **He experienced 2 REUs at Harvard (2023 & 2024)**
- **In Fall 2024, he transferred to UCSD!**

Center for Nanoscale Systems, Harvard University FAS • SEAS

sdni San Diego Nanotechnology Infrastructure



Fabrication of Epsilon-near-zero Metamaterial with Anomalous Refraction

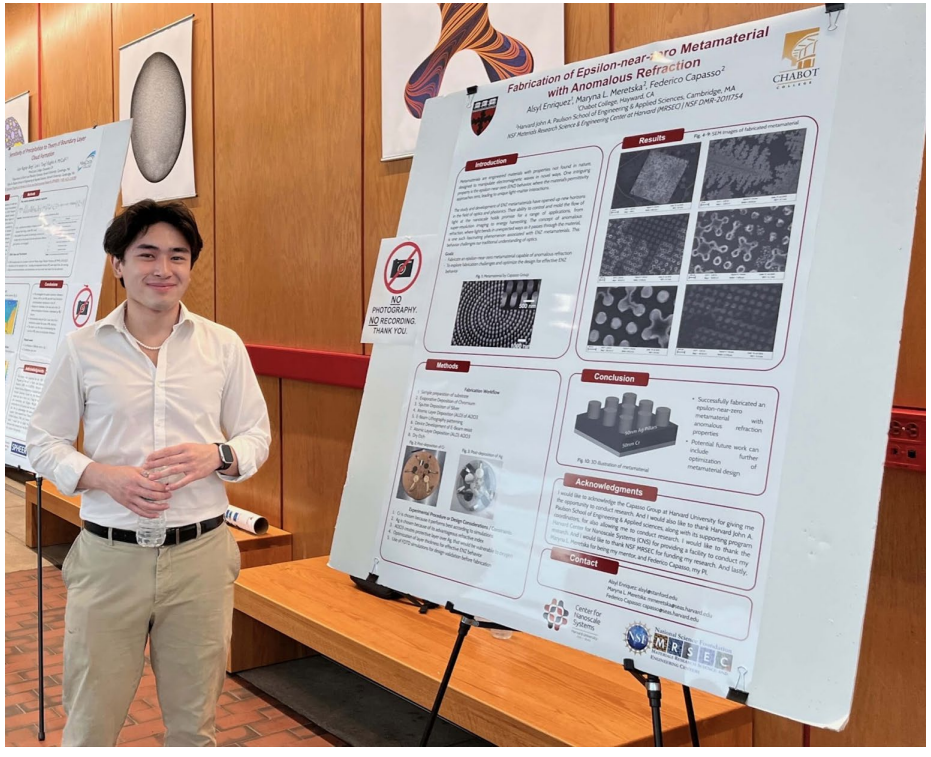
Alsyl Enriquez[1], Maryna L. Meretska[2], Federico Capasso[2]

[1]Chabot College, Hayward, CA

[2]Harvard John A. Paulson School of Engineering & Applied Sciences, Cambridge, MA

NSF Materials Research Science & Engineering Center at Harvard (MRSEC) | NSF DMR-2011754

CHABOT COLLEGE



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Networks and Community College Engagement: ME Commons

Technician Training Working Group

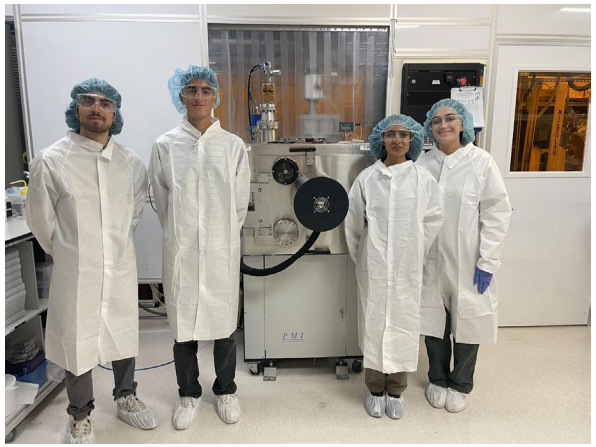
- 6 intern/research assistant programs
- 15 members
- Amplify the intern experience
- Share resources, best practices & new ideas

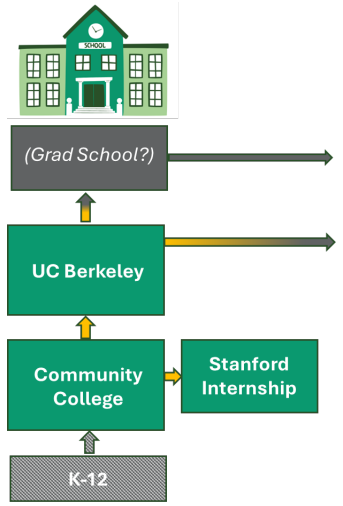
Shared Opportunities for Interns

1. Industry engagement
   - Collective approach saves time & resources

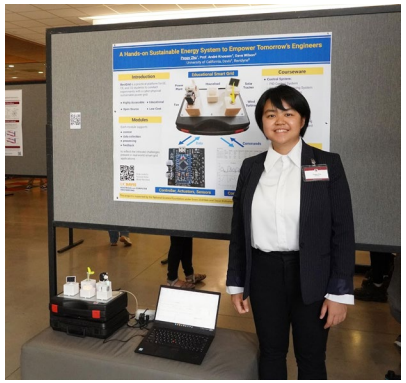
Western Digital

2. Intern-intern networking
   - Facility visits
   - nano@stanford Open House
   - ME Commons Meetings
3. Microcredentialling (in progress)





Intern alumni, now students at Berkeley, toured Berkeley labs



Stanford, Berkeley, UC Davis, SJSU interns presented at Stanford

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Northwest AI HUB

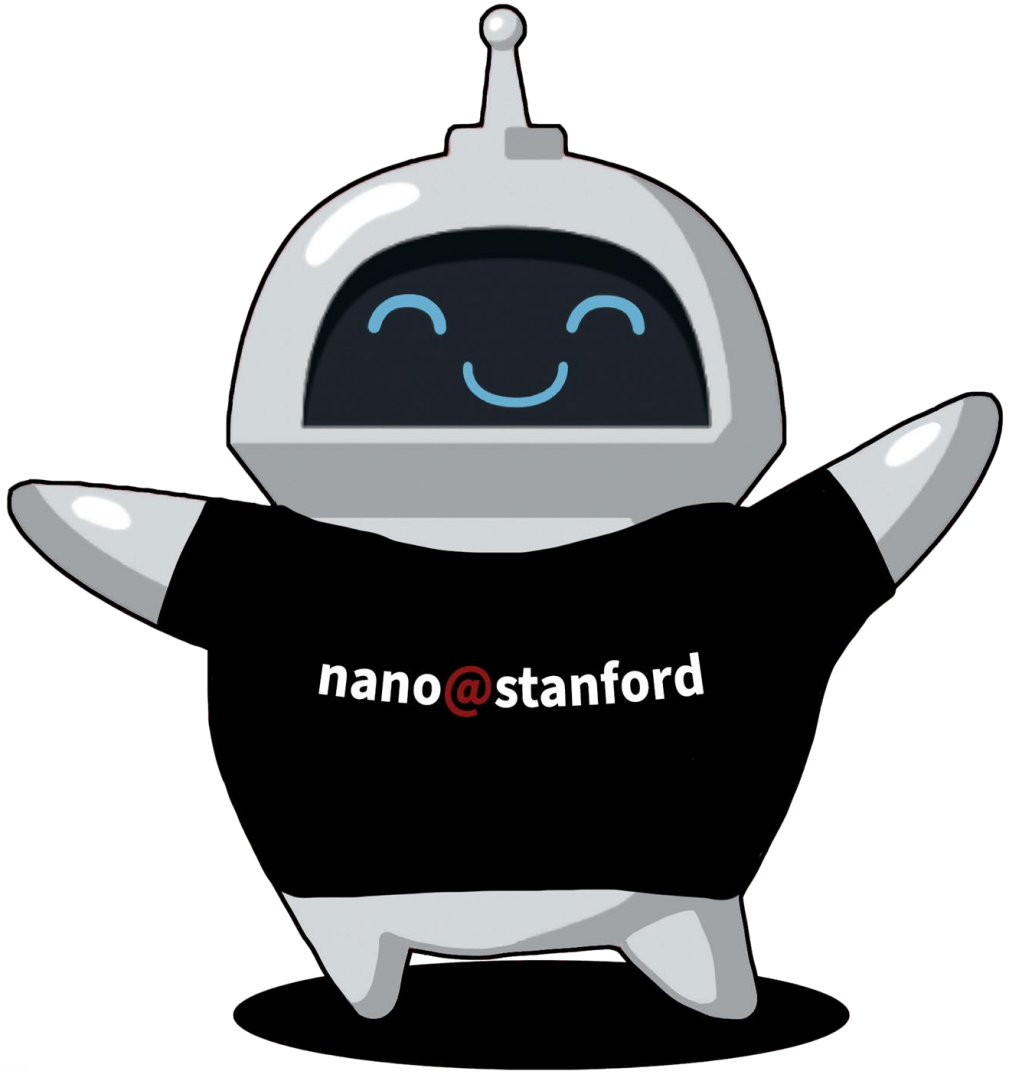
Conclusion

- NNCI facilities can train interns while gaining operations and user support

- Internship programs can be sustained at a minimal level through
  - Lab operations budget
  - CHIPS Act related funding for workforce development
  - Industry support

- Networks can enhance the intern experience:
  - Cross-site opportunities
  - Efficiency through shared resources
  - Collective industry engagement
  - Driving new initiatives through teamwork

Thank You!



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