

# *Board of Trustees Meeting*

April 5, 2024



# *Purdue Computes*

Computing  
Departments

Physical Artificial  
Intelligence

Semiconductors

Quantum

# *CS and ECE Strengthening Computing*

## **Faculty**

New heads in CS and ECE

Joint search in computing resulting in stronger, deeper pool of candidates — deep in recruitment phase

CS head participation in ENG meetings

5 faculty earn NSF CAREER Awards in computing (4 in CS, 1 in CE)



## **Research**

CERIAS 25th Annual Research Symposium

Quantum science and engineering seed grant program — \$50K grants to develop collaborative teams

Joint graduate showcase and recruiting



## **Students**

Development of joint projects in EPICS and VIP, current participation of CS students in VIP teams

Joint software engineering professional master's program (online and Indy)



# *CS and ECE Computing Student Impact*

## Team JARVIS

CS undergrad leads team of CS and ENG students to finals at NASA SUITS Challenge in Houston (May). Uses AR to design spacesuit interfaces for future Artemis missions.



## Robotics and Intelligent Systems Expo

Led by ECE undergrad, will offer robotics demonstrations, presentations and opportunities to network with emerging engineering talent and current experts in AI and robotics.



## Catapult Hackathon

Led by the ML@Purdue (CS group) and Purdue Founders, the hackathon will offer several challenges around the theme of business and AI.



# *Institute for Physical AI (IPAI)*

Bytes of AI meet Atoms of what we grow, what we make, and what we move

## Building out the IPAI team:

- Highly qualified pool for the IPAI director search
  - Candidates from national labs, National Institutes of Health, industry and academia
- Launched interdisciplinary IPAI postdoctoral research program, supported by the Office of Research and Lilly Endowment
- Preston Smith hired as associate director for computing infrastructure

# ***Purdue Institute for Physical AI (IPAI)***

## **Panels and workshops attract many partners**

- Shaping AI in the Physical World
  - Amazon, Argonne National Laboratory, Caterpillar and Southwest Airlines
- Reimagining partnerships between universities and the national laboratories
  - Los Alamos National Lab
- Robotics and Intelligent Systems (RISE) Expo
  - Autonomous Robotics Club and Institute for Control, Optimization and Networks

## **Large research proposals are being submitted**

- National Science Foundation AI Institute (\$20M)
- National Science Foundation Expeditions in Computing (\$15M)
- Office of Naval Research smart simulations and manipulating AI agents (\$4.1M)

# ***Semiconductors @ Purdue***

Four components:



Goals:

- Help the U.S. address its semiconductor challenge
- Bring more semiconductor industry and R&D to Indiana
- Enhance Purdue's educational and research missions

Lilly Endowment grant:

- \$25M to support semiconductor talent and economic development and research and innovation

## **Talent development:**

- Launched SDP, nation's most ambitious workforce development program, with a five-year goal to increase by 5X the number of graduates prepared for semiconductor careers.

## **Economic development:**

- MediaTek opens first Midwest office on Purdue campus.
- SkyWater announces plans for presence at Purdue.

## **Research and Innovation:**

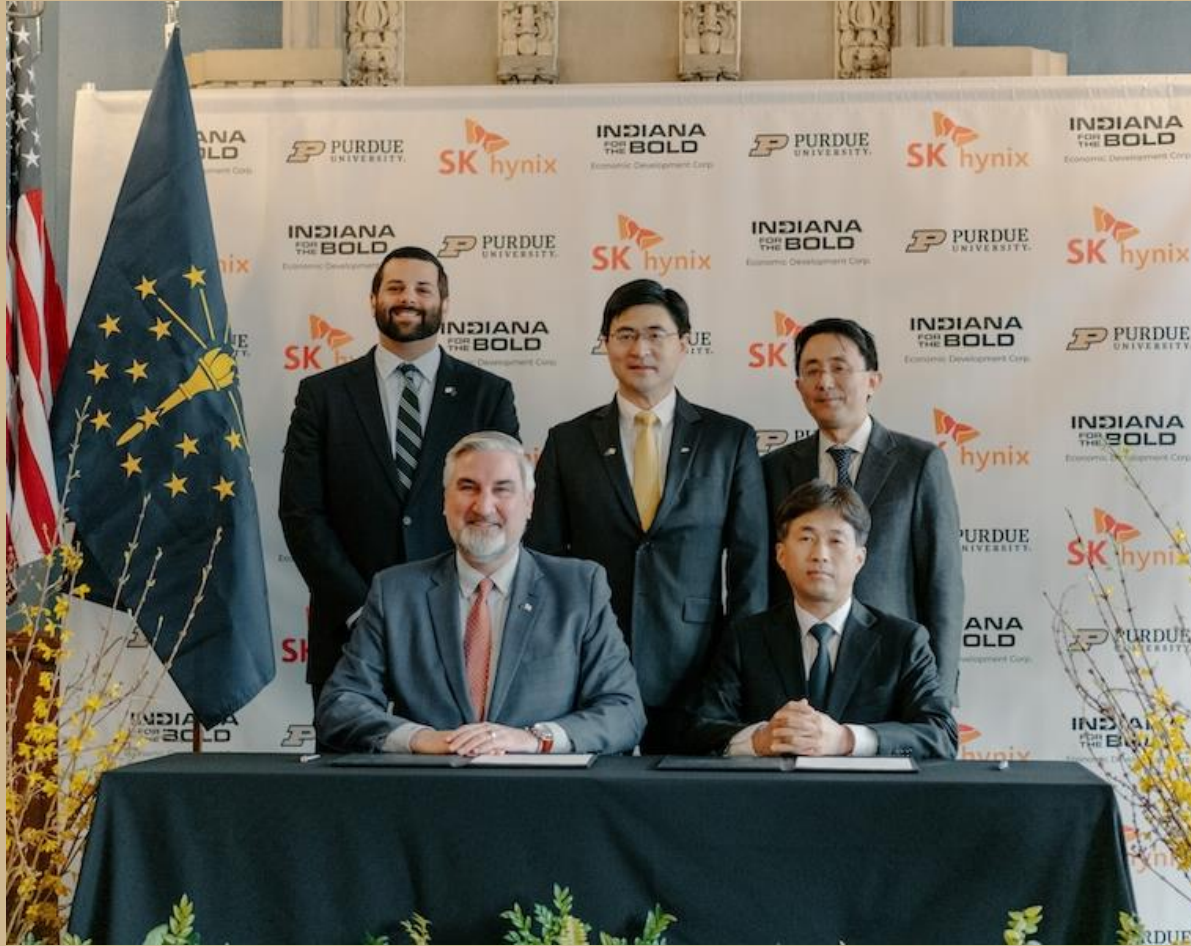
- \$33M Silicon Crossroads: Indiana awarded 1 of 8 innovation hubs with Purdue as lead university.
- Atalla Institute for Advanced System Integration and Packaging launched.
- imec-Indiana launched.
- \$49M of upgrades to Birck Center initiated.

## **Leadership:**

- Major on-campus events (IR, Semiconductor Week, etc.).
- High-profile events in Washington, D.C.
- Global partnerships with Japan, Taiwan, India and Europe.



# *Semiconductors @ Purdue: What's Next*





# Major Quantum Initiatives

## Quantum Science Center

- One of five DOE-funded quantum centers
- Purdue is core partner (led by ORNL)
- Supports 14 faculty and 30-plus students and postdocs
- Purdue leads workforce development efforts (hosts annual quantum summer school)



## Center for Quantum Technologies

- First NSF-funded Industry/University Cooperative Research Center (IUCRC) focused on quantum
- Purdue is lead site (IU and Notre Dame are partners)
- 10 industry and government members (includes Lilly, Cummins, AFRL, Quantum Corridor)



## Quantum Faculty Hiring

- Joint effort between CoE and CoS, and five departments (ECE, Phys, Chem, Math, CS)
- Will hire 5-10 new faculty members
- Also added MDH and continue to recruit these



College of Science



College of Engineering

# *Purdue Quantum Science and Engineering Institute*



Purdue Quantum Science  
and Engineering Institute

CHICAGO  
QUANTUM  
EXCHANGE



PQSEI supports the previously mentioned initiatives and several other major efforts:

- Chicago Quantum Exchange: Leading hub for advancing the science and engineering of quantum information — Purdue was recently invited to join.
- Midwest Quantum Collaboratory: Partnership with Michigan and Michigan State to foster collaboration among member universities.
- Quantum Collaborative: Connects top institutions and industry to drive U.S. quantum advantage.
- Quantum Economic Development Consortium: Purdue is a founding member. Has over 200 leading quantum industrial members.
- 60 PQSEI-affiliated faculty members across CoE and CoS from 10 departments.

