JUMP 2.0 SUPREME Annual Review – SRC Perspective
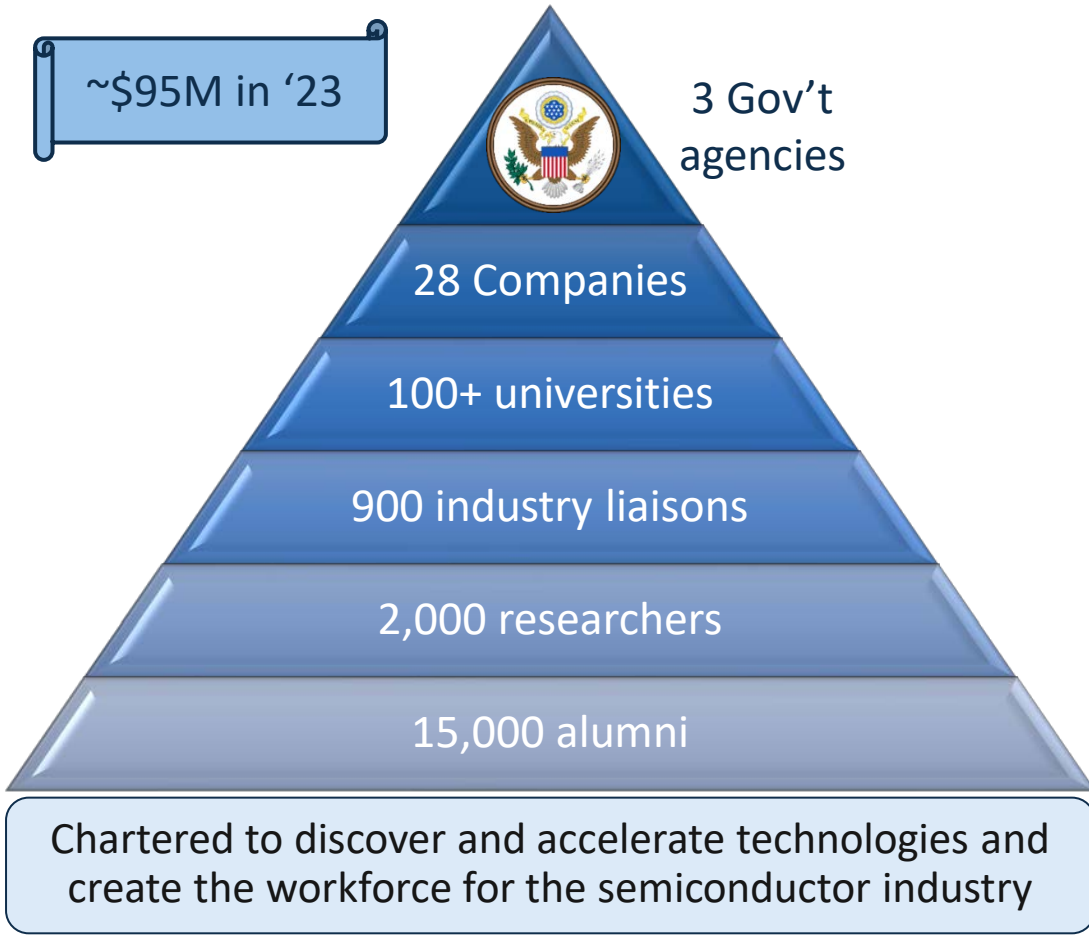
Aug 2-3, 2023
Cornell University

Roman Caudillo
JUMP 2.0 and JUMP Director

Exciting Times for the Semiconductor Industry!

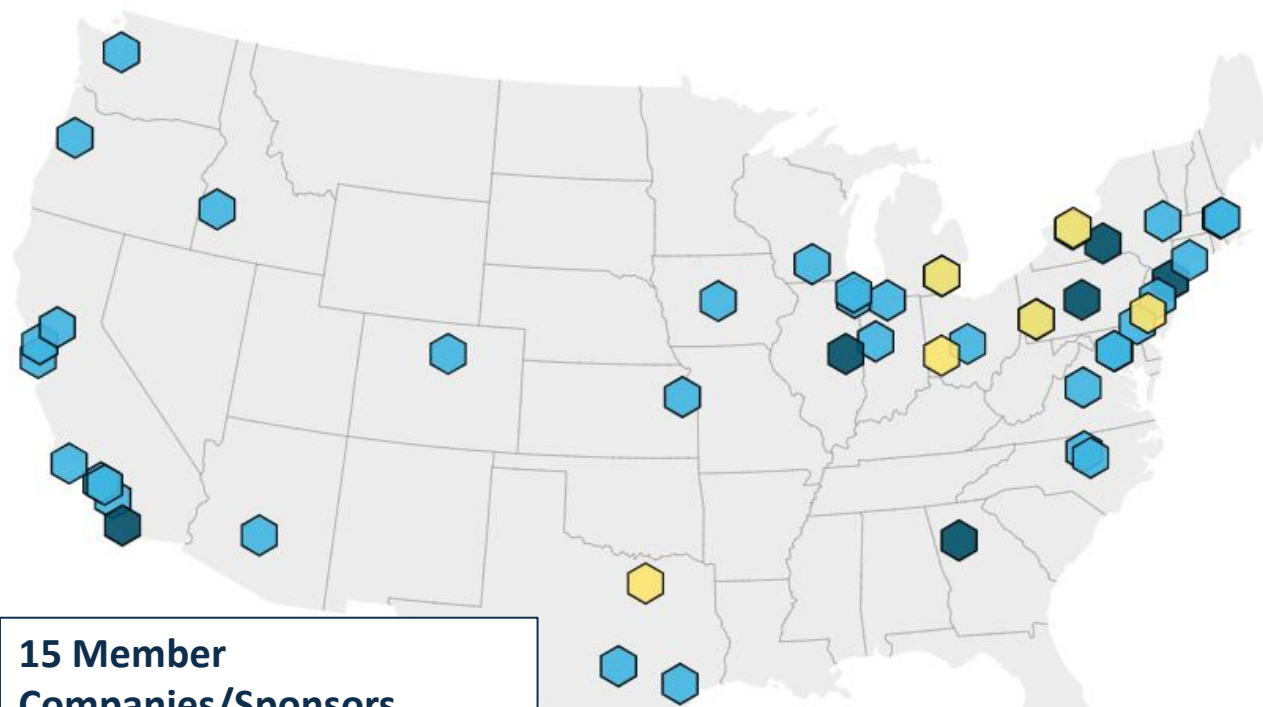# What is SRC? - A Premier Global Microelectronics Consortium

~$95M in '23

3 Gov't agencies

28 Companies

100+ universities

900 industry liaisons

2,000 researchers

15,000 alumni

Chartered to discover and accelerate technologies and create the workforce for the semiconductor industry

DARPA · NSF · NIST

AMD · ANALOG DEVICES · APPLIED MATERIALS · arm · ASM INTERNATIONAL

BOEING · Chemonics · EMD ELECTRONICS · GlobalFoundries

HRL LABORATORIES · IBM · intel · LOCKHEED MARTIN · MEDIATEK

Micron · MUBADALA · NORTHROP GRUMMAN · NXP · QORVO

QUALCOMM · Raytheon Technologies · SAMSUNG · SIEMENS · SK hynix

TEL · TEXAS INSTRUMENTS · tsmc · Veeco

JUMP 2.0 Center Network ($331M over 5 years)

SRCco Investments with DARPA and NSF

- 🔵 JUMP 2.0 🔷 JUMP 2.0 - Lead 🟡 REU

15 Member Companies/Sponsors
141 Faculty (42 Universities)
23 States and the District of Columbia

Huili (Grace) Xing
Cornell

Tomas Palacios
MIT

Theme 7 – High-Performance Energy-Efficient Devices for Digital & Analog Applications

SUPREME (Cornell)

University centers co-sponsored by DARPA and industry

1. **CoCoSys:** Cognition
2. **CUbiC:** Communications and connectivity
3. **CogniSense:** Intelligent sensing to action
4. **ACE:** Systems and architectures for distributed compute
5. **PRISM:** Intelligent memory and storage
6. **CHIMES:** Advanced monolithic and heterogeneous integration
7. **SUPREME:** High-performance energy-efficient devices for digital and analog applications

42 Participating Universities

ASU	U Delaware
Colorado Boulder	U Illinois at Chicago
Columbia	U Kansas Lawrence
Cornell	U Maryland College Park
Duke	U Michigan Ann Arbor
Ohio State	U Washington Seattle
Georgia Tech	U Wisconsin Madison
GWU	UC Berkeley
Iowa State	UC Davis
MIT	UC San Diego
Notre Dame	**UC Santa Barbara**
Oregon State	UC Irvine
Penn State	UC San Diego
Princeton	UCLA
Purdue	UIUC
Rice University	USC
RIT	**UT Austin**
RPI	UVA
Stanford	**Yale**
CMU	**Boise State**
North Carolina State U.	**Northwestern**

JUMP 2.0, Annual Review Dates

Center	Dates	Location
COCOSYS	May 16-17, 2023	Atlanta, Georgia Tech
CUBIC	June 27-28, 2023	NYC, Columbia
SUPREME	**August 2-3, 2023**	**Ithaca, Cornell University**
CHIMES	September 5-6, 2023	State College, Penn State
ACE	October 4-5, 2023	Urbana, UIUC
COGNISENSE	October 11-12, 2023	Atlanta, Georgia Tech
PRISM	November 8-9, 2023	La Jolla, UCSD

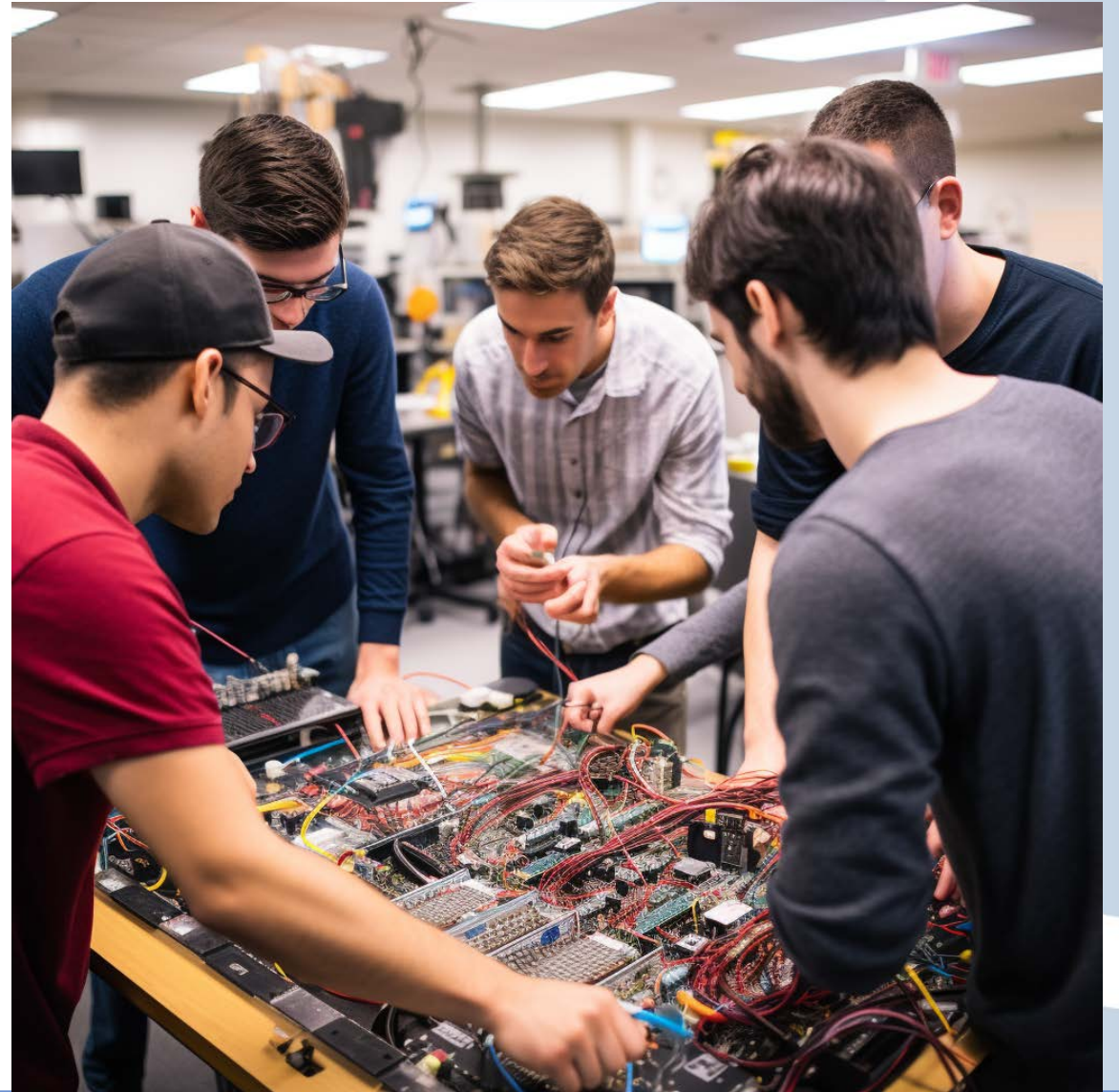**SAB Caucus will be in person immediately following each Annual Center Review**

SRC

Imagining a great 2-day Annual Review

Midjourney prompt:
A semiconductor research center for energy-efficient devices

Re-Imagining a great 2-day Annual Review

Midjourney prompt:
A semiconductor research conference with students leading the way to a more energy-efficient computing future!

Sometimes Reality is still better than AI

Agenda – Day 1

Don't miss opportunities to connect with SUPREME students!

Wednesday, August 2

Time	Location	Session	Presenter
8:00 - 8:30 am	Atrium	Registration Continental Breakfast (Cornell Catering)	
Session 1 – Welcome and Center Overview			
8:30 - 8:35 am	Phillips 101	Welcome and Logistics	
8:35 - 8:45 am		JUMP 2.0 Director's Perspective	Roman Caudillo (SRC)
8:45 - 8:55 am		DARPA's Perspective	Jason Woo/Dev Palmer (DARPA)
8:55 - 9:05 am		Welcome Remarks	Krystyn Van Vlieth (VP for Research and Innovation Cornell)
9:05 - 9:20 am		SUPREME Center Overview	Grace Xing (Cornell)
9:20 - 9:25 am		Session Q&A	
9:25 - 9:50 am	Duffield Atrium	*Morning Break – Refreshed Beverages*	
Session 2 – Thrust 1: Digital & Analog			
9:50 - 10:00 am	Phillips 101	Thrust 1: Digital & Analog Overview	Debdeep Jena (Cornell)
10:00 - 10:15 am		GaN-Based Devices	Debdeep Jena (Cornell)
10:15 - 10:30 am		2D Devices	Eric Pop (Stanford)
10:30 - 10:55 am		Is the Future 2D?	Carl Naylor (Intel)
10:55 - 11:10 am		Session Q&A	
11:10 - 11:25 am		Lightning Round Thrust 1 Posters	SUPREME Students
11:25 - 11:55 pm	Duffield Atrium	Student Poster Session - *Industry Members Only*	SUPREME Students
11:55 - 12:25 pm		Student Poster Session - *Open*	
12:15 - 1:00 pm		*Lunch (Cornell Catering)*	
Session 3 – Thrust 2: Memory & Applications			
1:00 - 1:10 pm	Phillips 101	Thrust 2: Memory & Applications Overview	Asif Khan (Georgia Tech)
1:10 - 1:25 pm		Oxides	Asif Khan (Georgia Tech)
1:25 - 1:40 pm		Spin-Based Devices	Dan Ralph (Cornell)
1:40 - 1:55 pm		Benchmarking	Mike Niemier (Notre Dame)
1:55 - 2:10 pm		Session Q&A	
2:10 - 2:25 pm		Lightning Round Thrust 2 Posters	SUPREME Students
2:25 - 2:55 pm	Duffield Atrium	Student Poster Session Thrust 2 - *Industry Members Only*	SUPREME Students
2:55 - 3:25 pm		Student Poster Session Thrust 2 - *Open*	
3:00 - 3:40 pm		*Afternoon Break – Light Snacks*	

Agenda – Day 1

Don't miss opportunities to connect with SUPREME students!

Session 4 – Thrust 3: Interconnects & Metrology			
3:40 - 3:50 pm	Phillips 101	Thrust 3: Interconnects & Metrology Overview	Farhan Rana (Cornell)
3:50 - 4:05 pm		Optical Interconnects	Farhan Rana (Cornell)
4:05 - 4:20 pm		Electrical Interconnects	Daniel Call (RPI)
4:20 - 4:30 pm		Session Q&A	
4:30 - 4:45 pm		Lightning Round Thrust 3 Posters	SUPREME Students
4:45 - 5:15 pm	Duffield Atrium	Student Poster Session Thrust 3 - *Industry Members Only*	SUPREME Students
5:15 - 5:45 pm		Student Poster Session Thrust 3 - *Open*	
5:45 - 6:30 pm	Phillips 101	Industry and Student Networking and Q&A Moderator: Roman Caudillo (SRC) **Panel Members:** Global Foundries: Bill Taylor TSMC: Carlos Diaz Raytheon: Mike Burkland IBM: Ching-Tzu Chen (Remote) Intel: Carl Naylor Samsung: Woo-Bin	SURPEME Students + SRC + SAB + Liaisons No PIs!
6:15 - 9:00 pm	*Duffield Atrium*	Dinner	

Plus 1 Additional Poster Session on Day 2
And
Best Lightning Talks of the Session Award Ceremony on Day 2
Industry, don't forget to vote!

Questions?