



Semiconductor  
Research  
Corporation

# SRC GRC Project Leader Onboarding Webinar March 25<sup>th</sup>, 2024



# Meet the Research Management Team



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# SRC's Three Pillars for Semiconductors' "Roaring 20s"

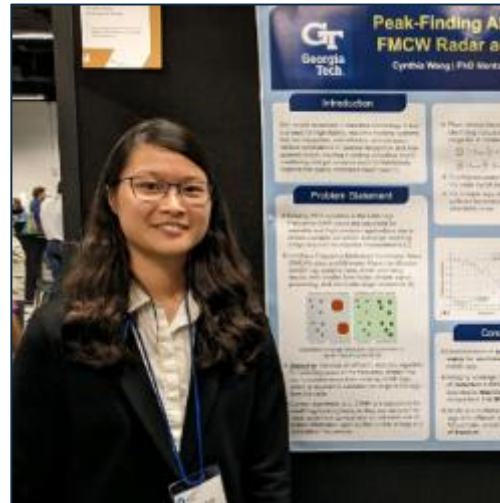
## Prosperity



Jan 2021  
2030 Decadal Plan for Semiconductors  
**3x↑ in Annual Funding**  
Oct 2023  
Roadmap for Microelectronics and Advanced Packaging (MAPT)

[www.src.org/about/nist-mapt-roadmap](http://www.src.org/about/nist-mapt-roadmap)

## The People

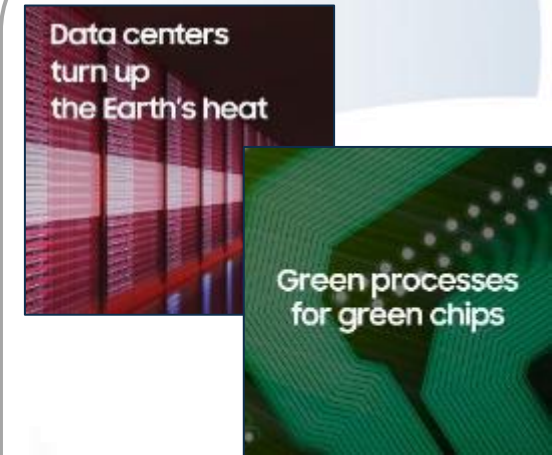


Apr 2021  
Broadening Participation Pledge  
**3x↑ Scholar Pipeline** (AA-PostDoc)  
Greater Diversity, Equity, & Inclusion  
Ignite passion for Semi in US  
Workforce Advisory Board (WAB)

[www.src.org/about/broadening-participation/](http://www.src.org/about/broadening-participation/)

## The Planet

*Images from Samsung*



Oct 2021  
Commitment to Sustainability  
Green Materials & Processes  
Energy Efficient ICT Systems  
**Win Hearts & Minds of Next Gen Innovators**

<https://www.src.org/about/sustainability/>

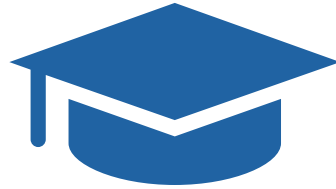
**Since Spring-2022, SRC has used these 3 criteria to drive all new investments**



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# Principal Investigator Expectations

# Pillar Science, Scholar Recruitment, Liaison Calls & Payments



## Project Management

**All project leaders and participants should log into Pillar Science and keep the project updated.**

<https://app.pillar.science/news>

Project leaders manage their own teams of academics.

Industry will join as liaisons to interact on your project.

## Identify Research Scholar (s)

Assign research scholars within 90 days of project start date. Inform SRC if no scholar is identified with an anticipate date of appointment.

**SRC may withhold payments if no scholar is assigned.**

**Add scholars to research team and appropriate project in Pillar Science** – [guidelines](#)

[2030 Broadening Participation Pledge](#)

## Schedule Liaison Call

Schedule regular calls with industry liaisons at every 4 to 8 weeks cadence, initiated by the university.

Scholar participation is encouraged.

**The university researchers own the interaction format and frequency of these meetings.**

## Regular invoicing

Invoice on regular basis: monthly is preferred

Excess money (calendar year) is considered profit and taxable!

Spending must occur within contract period

**Invoicing expected to be at or above 95% invoiced at end of each contract period**

Final invoice within 60 days after project ends. No cost extensions (NCE) are not allowed.



# Annual Reviews and Deliverables



## Key Performance Indicators (KPI)

**Key Performance Indicator (KPI) scorecard to be completed annually for your research project.**

Self-evaluate the progress of your project based on the categories on the scorecard. The scorecard is due 1 month prior to the annual review.

To assist with completing the KPI scorecard SRC has made and [informational video](#)



## In Person Annual Reviews

In person attendance at the annual reviews is required to present your work. The presentation should contain information and [follow format](#). We encourage you to have your student(s) co-present.

**The annual review is the basis for contract renewals.** If you do not attend this could negatively impact your project's rating, which may lead to the project not being renewed.



**Submit deliverables on time: even 1 day is too late!**

System will flag delinquencies

**Late deliverables will stop invoices being paid and can jeopardize future funding**

Contact SRC if there are issues with getting deliverables on time

# Publications and Patents



**Pre-publication drafts with Supporting Data (see next slide for guidance) must be deposited at SRC > 60 days before published**

Best practice: deposit draft to SRC website when submitting to journal/conference (also thesis)

Update the draft on the SRC website with final paper after acceptance (select submit a new version)

**Acknowledgement of SRC funding must be added to all publications**

At minimum, the acknowledgement should read: “This work was supported in part by Semiconductor Research Corporation (SRC).”

**Patents**

Don't forget patents, submit disclosures to SRC if applicable. If approved, SRC does support and pay for the filing for your university, <https://www.src.org/about/contracts-ip/#ip>.

**Open source Software Delivery**

If open source delivery is approved for software from your project, then SRC prefers MIT Licensing, <https://tlo.mit.edu/learn-about-intellectual-property/software-and-open-source-licensing>. If your university uses something else, please discuss with your research director first to ensure it meets SRC standards.

# Guidance for Depositing Supporting Code and Data with Pre-Publications

As part of our move to Pillar Science, there is the ability to collect not just the pre-publications PDF's but also arbitrary file formats (.mp4, .ppt, etc.) as well. This new capability enables a new way for SRC programs to facilitate technology transfer to our sponsors.

Going forward, we will be requiring that all code and supporting data below a certain size threshold to reproduce a pre-publication also be uploaded to Pillar Science.

•SRC's reasons for doing this are:

1. **To more fully document the research output of our programs to demonstrate to our sponsors the breadth and depth of the funded work**
2. The full value of code and data is not often found with its original author but when used across a wider scientific community like our sponsors
3. By having better data and code visibility in our programs, our sponsors will have a better understanding how to connect with researchers

Historically, there has been concern amongst researchers that the code and the data are not "camera ready" for distribution at the pre-publication state.

**While these concerns are valid, perfect is the enemy of accomplishment.**

- SRC seeks to obtain a snapshot of your code at the state it was in when you submitted your publication to the SRC repository.
- If your code and data are not in a state that you would want to post on an open code repository like GitHub, that is acceptable. Our sponsors employ trained professionals who have the experience to handle and interpret idiosyncratic legacy code and documentation.
- SRC would also like the data collected and used to generate publications to be submitted to Pillar Science as well.
- Preferably in a single compressed file in an open format marked with the publication's name followed by data so that it read like this, "[Publication Name]\_data.ZIP".**

The submission of data to SRC is a direct ask, although it is a right granted by terms of the sponsored research agreement.

- Contained within that compressed file should be the data used to generate figures, any code developed for that publication as well as any experimental data acquired if the file size is below 10 Mb.**
- If the data file is in a proprietary file format as often happens with analytical instruments, please convert it to an open format before uploading
- If you are not able to convert from proprietary file format to an open file format, please include it in the compressed data file anyway.
- If the data was acquired from an open depository like the UCI Machine Learning Repository, a notification of that along with a dated weblink in a .txt file should be included.





# Research Management Collaboration Site



## One-stop shop

Keep all your communications, data, and methods secure and readily available without having to change programs.



## Improve Reproducibility

Keep the dots connected and organized to ensure the quality, reproducibility, and reliability of your research.



## Increased Communication

Easily share your research with your colleagues, collaborators or clients, by reducing emails.



## Protect Your Research Data

Increase your research data protection by ensuring it is always safe from prying eyes with the End-to-End Encryption technology.



## Automatic Back-ups on All Devices

Connect all your research data sources: computers, instruments, software apps or database to automatically back up all your team's data.



## Access Your Research Data

Access your data whenever you need it while keeping it safe on your servers or in your secured cloud.



## Streamline and Manage Your Work

Plan your workflow and make sure you and your teams always know the next steps.



## Optimize Performance

Measure your project's progression, find bottlenecks and improve your processes.



## Monitor Your Research

Use dashboards to monitor all your key indicators to ensure that you stay on track.

# Pillar Science Common Issues & Links for Academics

- There are lots of help articles in Pillar Science which can help answer these questions.



- Here's an article about logging into Pillar Science
  - <https://semiconductorresearchcorporation.zendesk.com/hc/en-us/articles/11198322803099-How-To-Login-to-Pillar-with-SRC-org-Credentials>
- Here's an article about update your profile in Pillar Science
  - <https://semiconductorresearchcorporation.zendesk.com/hc/en-us/articles/10330492961563-How-to-Edit-Your-Profile>
- Here's an article about adding students, administrators, or other academics to your project
  - <https://semiconductorresearchcorporation.zendesk.com/hc/en-us/articles/10330872380187-How-to-add-Students-Admins-or-other-Academics-to-Your-Project>
- Here's an article about submitting projects results and deliverables
  - <https://semiconductorresearchcorporation.zendesk.com/hc/en-us/articles/11213311626139-How-to-Submit-Project-Results-previously-known-as-publications->
- SRC hosted a live demonstration for academics on January 31, 2023, and the recording is available
  - <https://semiconductorresearchcorporation.zendesk.com/hc/en-us/articles/12543067480091-Pillar-Science-Demonstration-for-Academics-Video-Recording->



# Resources that Help Academics Evaluate, Adopt, and Amplify Emerging Member Solutions

## Member Resources

- SRC has collected information members provide for the academic community, including education, design, and prototyping
- SRC researchers and students are encouraged to take advantage of these resources in their research and education activities
- Link to the resources:  
<https://www.src.org/program/grc/guide/researcher/guidelines/>

### Member Resources

SRC has collected information members provide for the academic community, including education, design, and prototyping. SRC researchers and students are encouraged to take advantage of these resources in their research and education activities

#### Intel

- Intel Open Data Center Diagnostic Project
- Intel Academic Compute Resource Environment (ACE)
- Intel Academic Program for oneAPI

#### Analog Devices

- Active Learning Program
- ADALM-SR1 Hardware
- ADALM-SR1 Switching Regulator Active Learning Module

#### ARM

##### ARM Academic Access ARM Education

- ARM University Program Education Kits
- ARM Education Online Courses
- ARM Education Textbooks and Reference Books

#### Texas Instruments

Specific tutorial and curriculum for universities include:

- Texas Instruments University Program
- TI Robotics System Learning Kit
- TI Power Management Lab Kit
- TI Experimental Power Electronics Reference and Curriculum
- TI Precision Labs

#### IBM

- IBM tutorial and curriculum for universities
- IBM Skills Academy
- IBM + Coursera
- IBM PhD Fellowship Program
- IBM Quantum Computing - student opportunities
- IBM AI Hardware

#### NXP

- Rapid IoT Prototyping Kit

#### Siemens

- EDA Academic Products

#### Qualcomm

- University Relations Program



A Siemens Business



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**INFORMATION**  
About SRC  
News  
Contact  
FAQs  
Privacy Policy  
Members & Partners  
Contracts & IP  
Management Charts  
Corporate Annual Reports

**FOR MEMBERS**  
My Company @ SRC  
Liaisons

**SRC VALUE**  
Awards Programs  
Patents  
Recruiter Guide  
SRC Timeline

**ACADEMIA**  
Researcher Resources  
Funding Opportunities  
Career Opportunities  
Participating Universities  
Education Alliance



# Reminder: Send News Items to SRC

<https://www.src.org/newsroom/newsletter/>

- Send noteworthy events and announcements that you and your team are involved to SRC
- Send this information on a monthly basis using the link <https://www.src.org/newsroom/submit/>. We use what we can in our SRC newsletter and monthly emails to the Advisory Board and liaisons
  - Best Paper Awards (who, award, title of piece, where, when and photos of students/faculty)
  - Papers, posters presentations, and/or conference talks
  - Professional Recognition Awards: IEEE, teaching awards, etc.
  - Professional activities such as workshops, tutorials, and invited talks
- All submissions must have a web link (URL) to the award, paper, etc.
  - If you have your own website that contains information pertaining to your research, share the link with SRC as well



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**SUBSCRIBE**

Share your news

Please share any awards, publications, academic appointments, conference presentations, or any other news that you would like to share with the SRC community. We want to celebrate you!

**SUBMIT A NEWS STORY** \* For possible inclusion in Connections Newsletter

**SUBMIT CONFERENCE NEWS** \* For possible inclusion in SRC Meet Up

Online Archive, beginning April 2023

PDF Archive, prior to April 2023

2023

March 2023

February 2023

January 2023





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# Scholar Expectations and Opportunities to Network with Industry

# Scholar Expectations

- **Scholar Profile** – Scholars should register for an account on the SRC website, <https://www.src.org/app/account/register/step/1/>
  - The profile should be maintained in Pillar Science as current as possible.
- **Resume** - Should be uploaded to Pillar and updated as necessary. There are opportunities for internships and full-time hiring from across SRC's members.
- **SRC Scholars program**: Scholars are encouraged to create a LinkedIn account and add “SRC Research Scholars” as experience, <https://www.src.org/student-center/handbook/linkedin/> . This is useful to connect with industry and job recruiting opportunities.
- **TECHCON** – All scholars are eligible to submit an abstract. However, Scholars in their second year (or later) of graduate studies are required to submit an abstract to the SRC TECHCON conference per the stated deadline for that calendar year. (Conference held in Sept.)
- **Annual Review** - Scholars are encouraged to present a student poster and co-present with principal investigator.

# TECHCON 2024

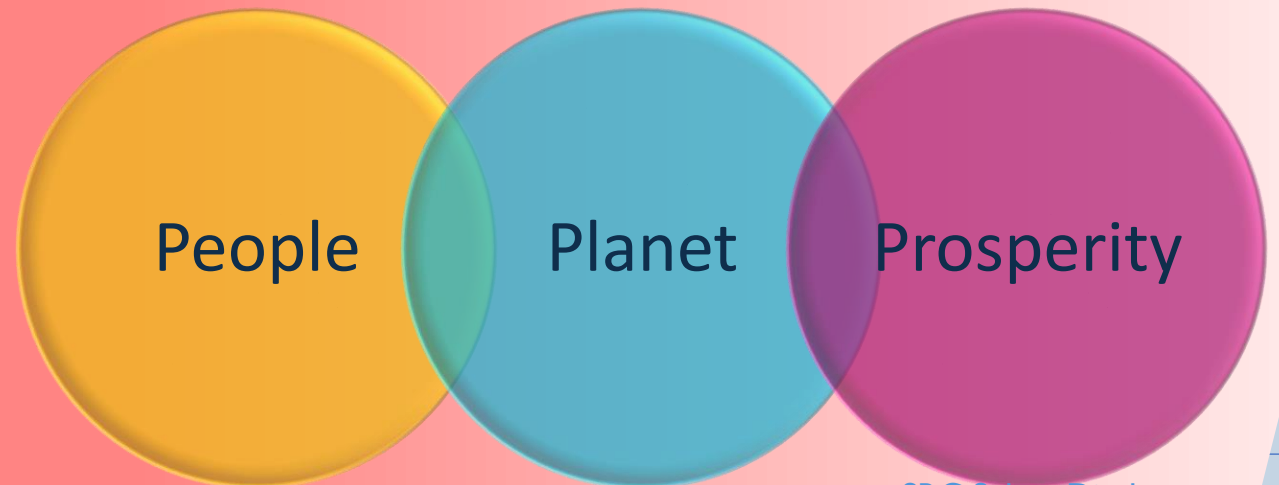
September 8-10, 2024  
Renaissance Austin Hotel  
Austin, Texas



[Event Details on SRC.org](#)

SRC members engage with 180+ Research Scholars, spanning BS, MS, PhD, and postdoc levels, through technical talks and immersive poster sessions. With an ideal student-SRC member ratio, TECHCON offers a unique environment for building lasting connections.

Networking events include a lively student party, CareerConnections, and a reception banquet with awards honoring industry and academic excellence, hosted in a diverse, inclusive, and safe environment.



Member Registration available June 2024

[SRC Select Disclosure](#)



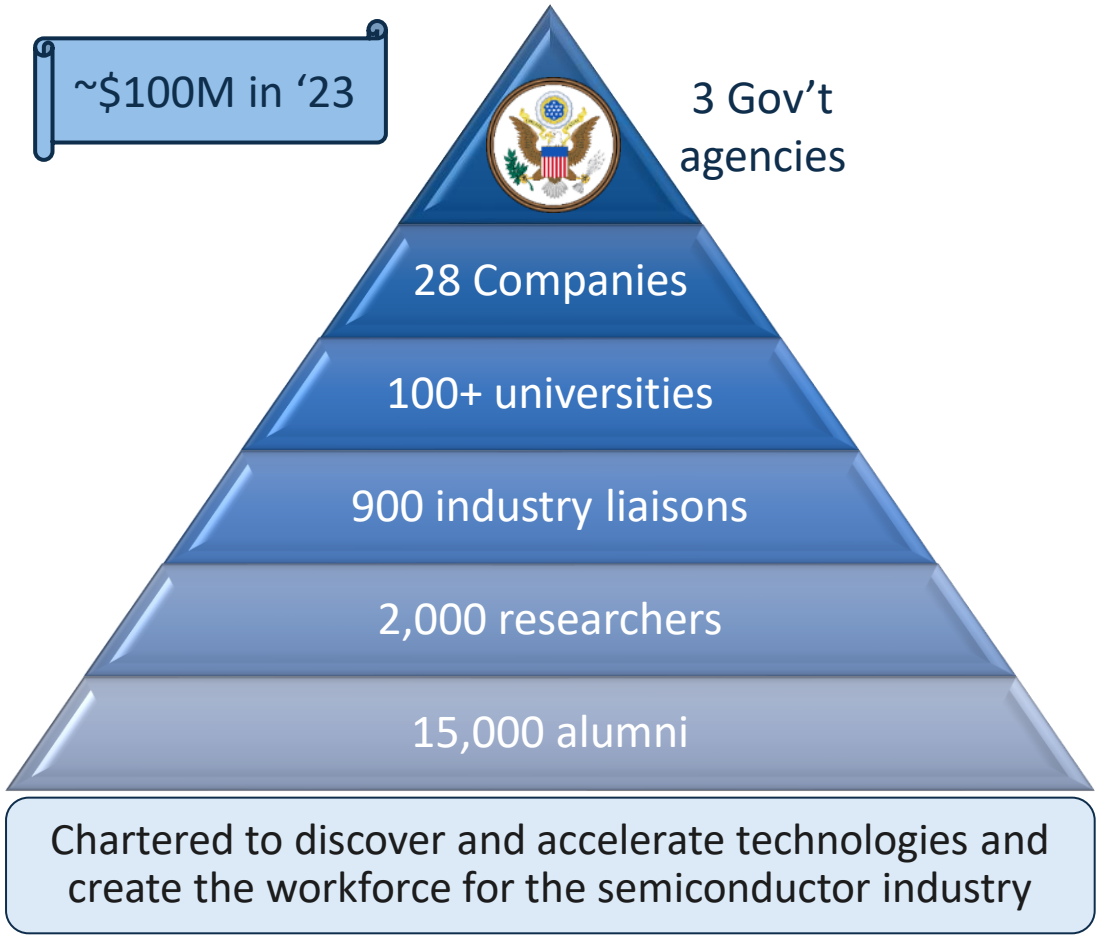
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# Supplemental Slides



# Who We Are: Premier Global Microelectronics Consortium

~\$100M in '23



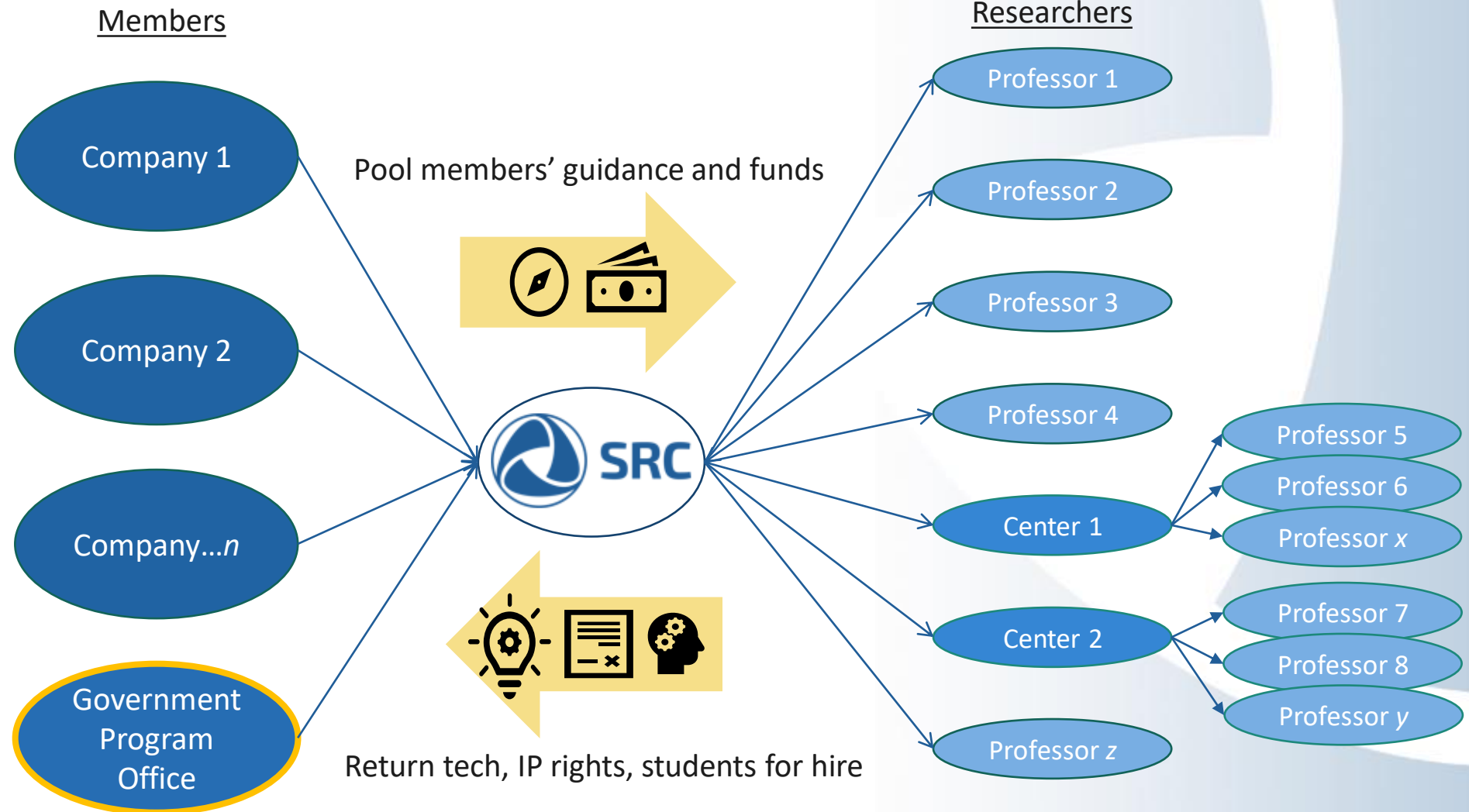
Members are large companies across the supply chain

# What We Do: Manage Collaborative R&D Programs

SRC manages research programs on behalf of members;

- Recruit members
- Run solicitations
- Manage performance
- Ensures tech transfer to members

In-house Contracting, Legal, Event Production, Billing, MarCom, web portal, etc.



SRC members jointly define research needs, fund selected projects, and reap the rewards  
PI will directly engage with experts and conduct research relevant to industry applications

# After Winning a SRC Research Contract: SRC Intellectual Property Requirements

**SRC desires to protect intellectual property rights vesting in you and your University emanating from sponsored research. In return for sponsoring the research, SRC receives certain Intellectual Property (IP) rights.** The primary goal of [SRC's IP policy](#) is to provide Members and Participants freedom to practice results of the sponsored research. SRC's Science Directors and industry representatives assist researchers in the identification of inventions that may be formally protected.

The sponsored research agreement (SRA) provides for IP license rights, which are sublicensed to Members and Participants. The license grant is worldwide, non-exclusive, non-transferrable, royalty free and includes the right to make, have made, use, or sell inventions, and to prepare software derivative works. In addition, SRC retains an option to negotiate an exclusive license. The University retains ownership of the IP and is free to license the IP to companies that are not SRC Members or Participants, subject to SRC's option for an exclusive license.

This license includes all IP that can be protected by patent, copyright, or other form of protection, including inventions, works of authorship, and mask works.



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# Research Agenda

# GRC Programs Solicitation for Research is Described and Guided by

## Five Seismic Shifts Described in Decadal Plan for Semiconductors

- 
**Smart Sensing**
  - Fundamental breakthroughs in analog hardware are required to generate smarter world-machine interfaces that can sense, perceive, and reason.** Investment throughout this decade to pursue analog-to-information compression/reduction with a practical compression/reduction ratio of  $10^5:1$  for practical use of information more analogous to the human brain.
- 
**Memory & Storage**
  - The growth of memory demands will outstrip global silicon supply, presenting opportunities for radically new memory and storage solutions.** Investment throughout this decade to develop emerging memories/memory fabrics with  $>10-100X$  density and energy efficiency improvement for each level of the memory hierarchy. Discover new storage systems and storage technologies with  $>100x$  storage density capability.
- 
**Communication**
  - Always-available communication requires new research directions that address the imbalance of communication capacity vs. data-generation rates.** Investment throughout this decade for communication enabling data movement of 100-1000 zettabyte/year at the peak rate of 1Tbps@  $<0.1nJ/bit$ . Develop intelligent and agile networks that effectively utilize bandwidth to maximize network capacity.
- 
**Security**
  - Breakthroughs in hardware research are needed to address emerging security challenges in highly interconnected systems and AI.** Investment throughout this decade for privacy and security hardware advances that keep pace with new technology threats and use cases (e.g., trustworthy AI systems, secure hardware platforms, and emerging postquantum and distributed cryptographic algorithms).
- 
**Energy Efficiency**
  - Ever-rising energy demand for computing vs. global energy production is creating new risk, and new computing paradigms offer opportunities to dramatically improve energy efficiency.** Investment throughout this decade to discover computing paradigms/architectures with a radically new computing trajectory demonstrating  $>1,000,000x$  improvement in energy efficiency.



<https://www.src.org/about/decadal-plan/>

## 11 Chapters in MAPT Roadmap



<https://srcmapt.org/wp-content/uploads/2024/01/SRC-MAPT-Roadmap-2023-v2.pdf> 21

# Global Research Collaboration (GRC) Programs

<https://www.src.org/program/grc/>

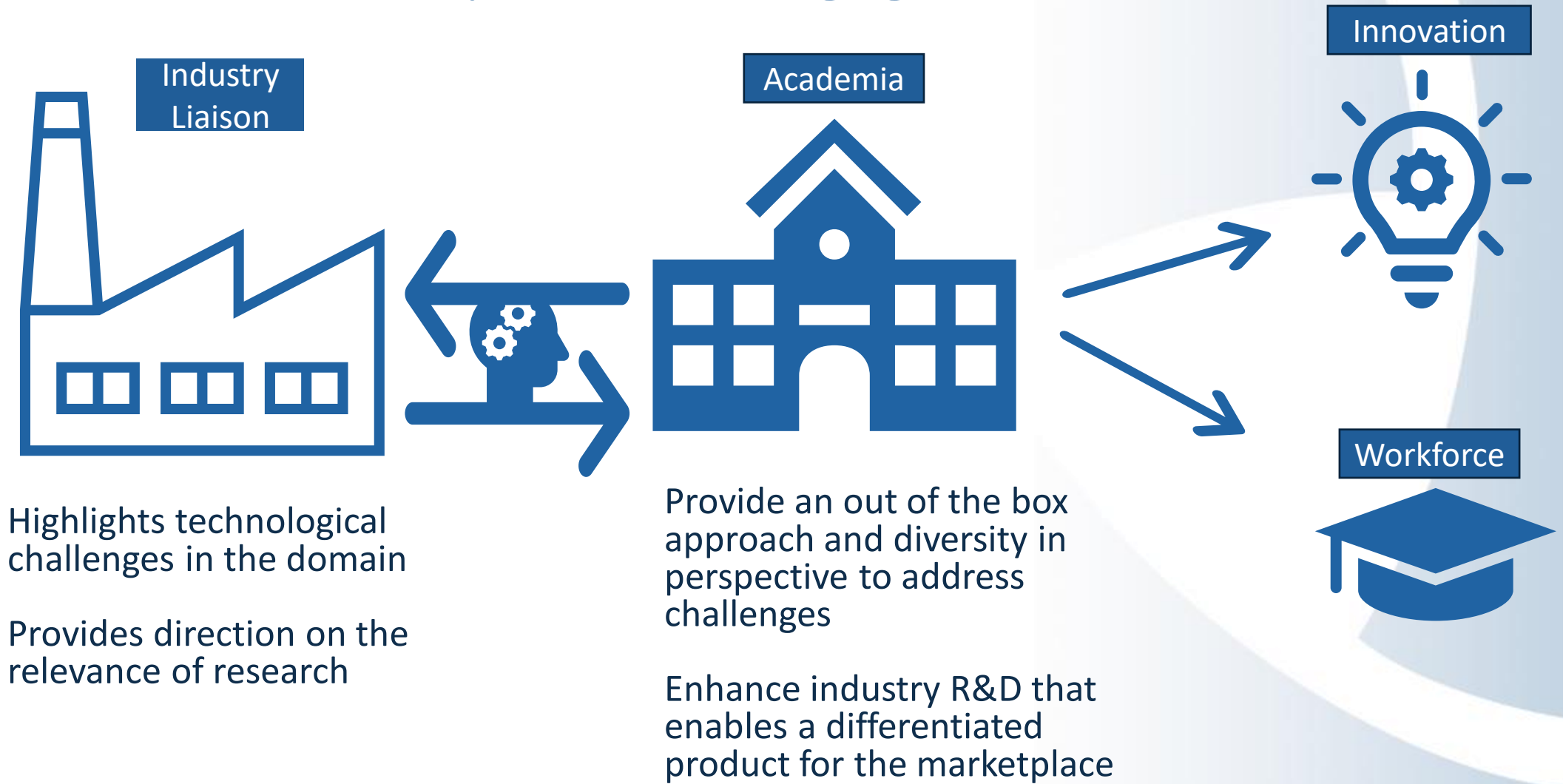
1. Analog/mixed-signal circuits, systems, and devices (AMS-CSD)
2. AI hardware (AIHW)
3. Computer-aided design and test (CADT)
4. Environment, Safety, and Health (ESH)
5. Hardware Security (HWS)
6. Logic and memory devices (LMD)
7. Nanomanufacturing materials and processes (NMP)
8. Packaging (PKG)



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# Value in Engagement

# Academia and Industry Liaison Engagement





# Researcher Own Industry Interactions

- **Setup Regular Liaison Calls & Student Participation**
  - Requires researcher-liaison calls every 4 to 8 weeks for GRC projects.
  - The university researchers own the interaction format and frequency of these meetings based on the feedback from the liaisons



**Project leader should encourage students to present results in these meetings**



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# Showcase the Research

# Key Performance Indicators (KPI) Process To Capture Technology Transfer



Great tool for the PI to showcase their research and scholar development to industry

# Evidence of Success: 40 Years of Technology & Workforce

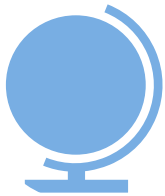
## Historic Model



\$2.2B of collaborative research



700+ patents issued from 2,000 research projects



15,000 SRC sponsored students at 250 universities globally



## Providing critical technology

- Nanosheets for GAA transistors
- FinFET
- High K Dielectrics
- Cu interconnect
- MRAM
- Scalable FLASH Memory
- Simulation, verification tools
- CMOS mm wave circuit design
- Quality and cost of testing
- Many more!

Chartered to discover and defining the future's technologies and create the workforce critical for the success of semiconductor industry

