Introduction to Unlock Ideas 2023

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Lam RESEARCH

Lam Research

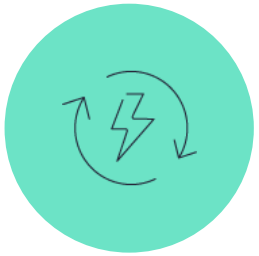
A global leader in wafer fabrication equipment and services since 1980

LAM RESEARCH

Our strengths set us apart

Collaboration

Together we're stronger and smarter



Innovation

We solve the unsolvable

Impact

We're a catalyst for global advancement

Recent awards and recognition

World's Most Admired Companies	**America's Most Responsible Companies**	**World's Top Female-Friendly Companies**
Fortune	Newsweek	Forbes
Best Places to Work for LGBTQ+ Equality	**100 Most Sustainable U.S. Companies**	**Dow Jones Sustainability Index North America**
Human Rights Campaign	Barron's	S&P Global

Employee count, revenue as of end-2021

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Our cutting-edge products and services

Deposition

Atomic layer deposition (ALD)

Chemical vapor deposition (CVD)

Plasma-enhanced CVD

High-density plasma CVD

Electrochemical deposition (ECD)

Etch

Atomic layer etch (ALE)

Reactive ion etch (RIE)

Deep RIE

Bevel etch

Strip & clean

Plasma resist strip

Plasma bevel clean

Wet clean/strip/etch

Service & support

Tool and maintenance automation

Data analysis/visualization

Advanced process and equipment control

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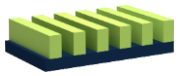
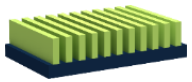
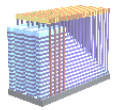
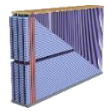
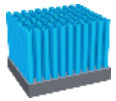
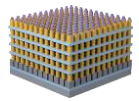
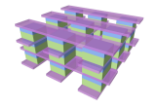
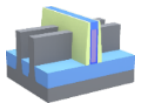
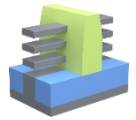
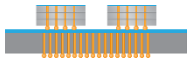
We focus on solutions for critical industry inflections

Patterning		Multiple patterning and EUV	▶	EUV with dry photoresist Additive Patterning	
3D NAND		3D NAND	▶	Stacked 3D NAND	
DRAM		DRAM	▶	3D DRAM	
New memory		Phase change memory XPoint and MRAM	▶	3D vertical New materials	
Transistor		FinFET	▶	Gate All Around	
RC management		Copper tungsten	▶	New integration New materials Barrierless	
Chip integration		Wafer-level packaging Through-silicon via	▶	Heterogeneous Integration	

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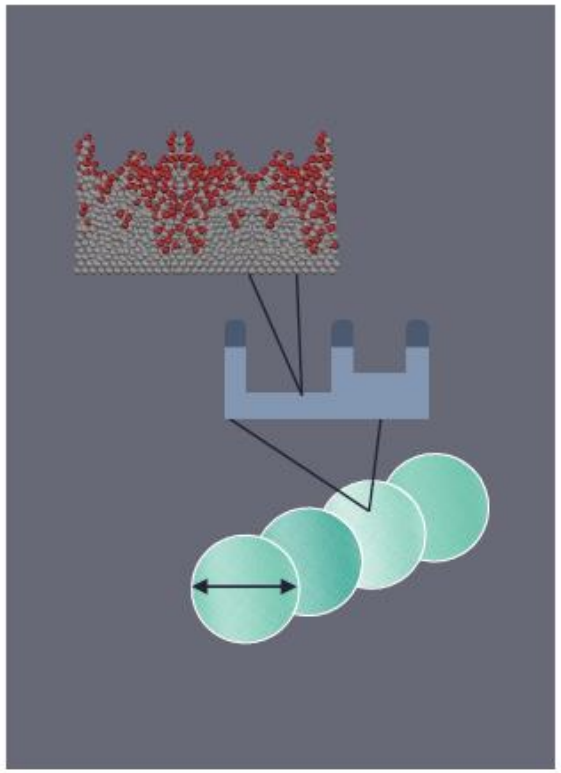
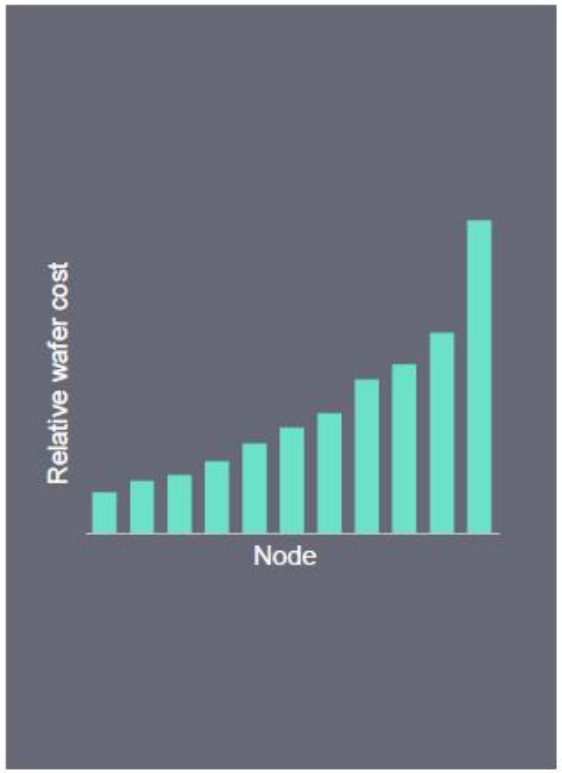
Seek novel ideas to address Grand Challenges – Key to success



Atomic-scale precision



Affordability

Sustainability

Speed to solution

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Advance our enabling technologies – Vectors of differentiation

On-Wafer Process

- Chemistry
- Chemical engineering
- Interactions
- Interfaces
- Materials

Sub-Systems

- Circular chemical mgmt
- Circular energy mgmt
- Circular water mgmt
- Materials
- Plasma technology
- Pressure control
- Temperature control

Software and Control

- Algorithms
- Analytics
- Computing
- Data management
- Modeling
- Networking
- Sensors
- Simulation
- Timing
- User experience

System

- Adaptivity
- Architecture
- Automation
- Manufacturability
- Reliability
- Mechatronics
- Self-awareness
- Self-maintenance
- Serviceability

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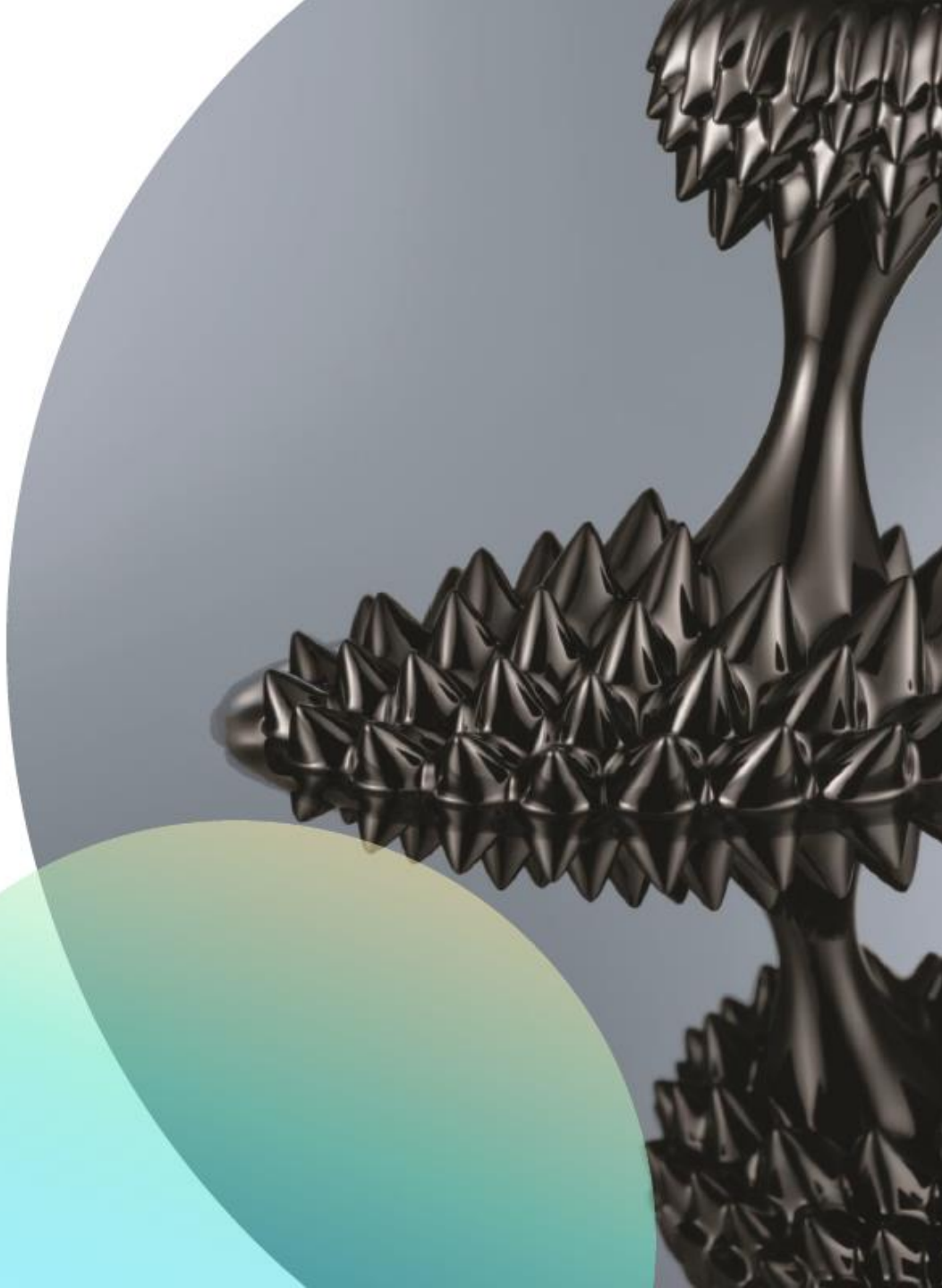
Unlock Ideas call for proposals opens March 20, 2023

Lam's academic research programs play a key role in driving innovation, providing insights on emerging technologies, and connecting with faculty and students.

Unlock Ideas is an annual call for proposals, sponsored by the Office of the CTO, to fund academic research collaborations on novel or disruptive ideas. We provide winning proposals with a monetary donation of US$50,000 to a university partner for testing the idea.

Submit your proposal during March 20 – April 28, 2023 to impact Lam's future!
https://thepoint.lamrc.net/dept/octo/Universities/Pages/unlockideas.aspx



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Unlock Ideas program overview

Research proposals should:

- Encourage testing of novel or disruptive ideas for grand challenges
- Support fundamental research on emerging technologies
- Apply to our hardware, systems, software and controls, materials or processes
- Partner with a university professor and relate to their current research focus
- Connect Lam to faculty expertise and/or academic resources that increase our speed to solution
- Involve non-proprietary research and have no restrictions to intellectual property or technical publications

Proposals will be ranked on degree of innovation, potential for industry impact and quality of proposal

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Timelines of Unlock Ideas 2023

Milestones	Schedule
Open for submissions	**Mar 20th**
Early draft submission to Lam Research Taiwan *(by professors)*	**Apr 7th**
Final submission to Lam Research Headquarters *(by Lam engineering experts)*	**Apr 28th**
Award announcement	**Jul 28th**

For further inquiries, pls contact Lam Research Taiwan representatives:

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