ASD 2026 Paper ASD1-TuM-4
Area Selective Deposition Workshop
March 29-April 1, 2026 | Albany, New York

AlixLabs

Leveraging Topographic Etch Selectivity: Atomic Layer Etch Pitch Splitting (APS™)

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Silicon 100
100 startups worth watching

AlixLabs AB

- Start-Up & Spin-Off from Lund University
- Founded in Lund, Sweden 2019

Managed by experts in the ALE and Semiconductor Equipment Industry

AlixLabs

Jonas Sundqvist, PhD

CEO & Co-founder

- Developed ALD and CVD processes since 1999
- Over 25 years of experience in semiconductor manufacturing
- Passionate entrepreneur who delivers on promises
- Strong network in the semiconductor market

Amin Karimi, PhD

CTO & Co-founder

- Driven to bridge fundamental research and industrial semiconductor applications
- Proven track record in leading R&D projects
- Expert in semiconductor devices, nanofabrication, and materials

Dmitry Suyatin, PhD

CSO & Co-founder

- Over 25 years of experience in advanced processing of nanostructures
- Author of more than 50 publications
- Well-known ALE expert in the ecosystem

Per-Anders Eriksson

Deputy CEO and COO

- Business Development
- Semiconductor Equipment industry

Peo Hansson

Advisor Semi Equipment

Gary Miner

Advisor Semi Equipment

Robert Cadman,

Advisor Business Development

Navigare Ventures FORWARD.one Industrifonden global brain

Dense Line Patterning as a Key Enabler of Moore’s Law

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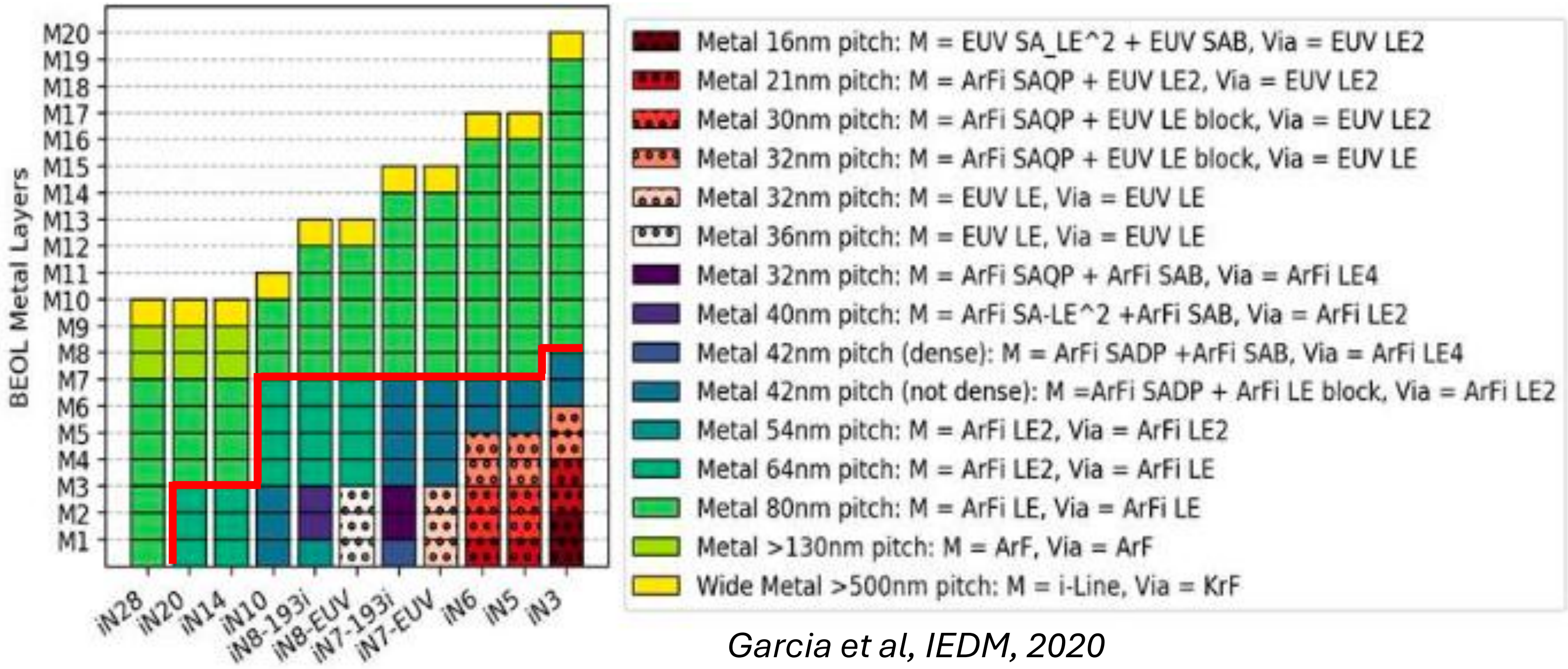
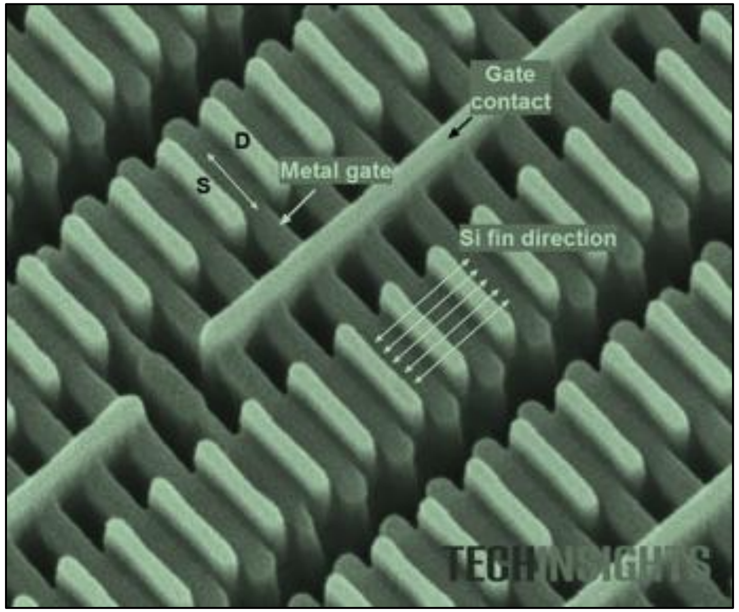
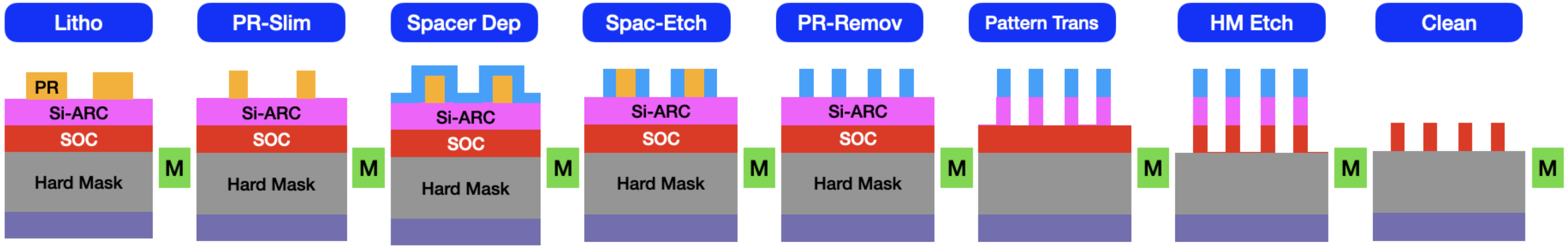
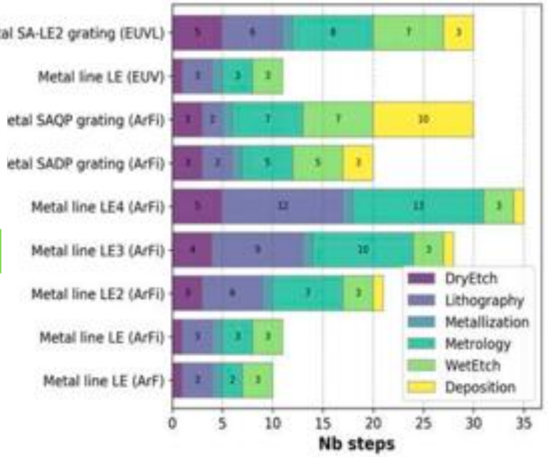


Garcia et al, IEDM, 2020

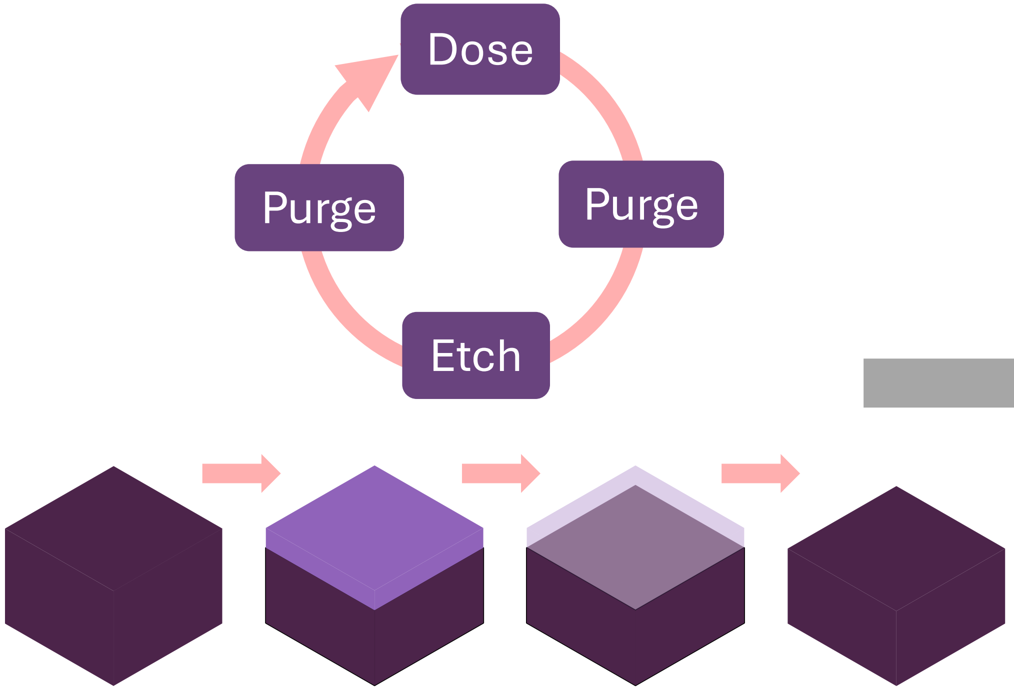


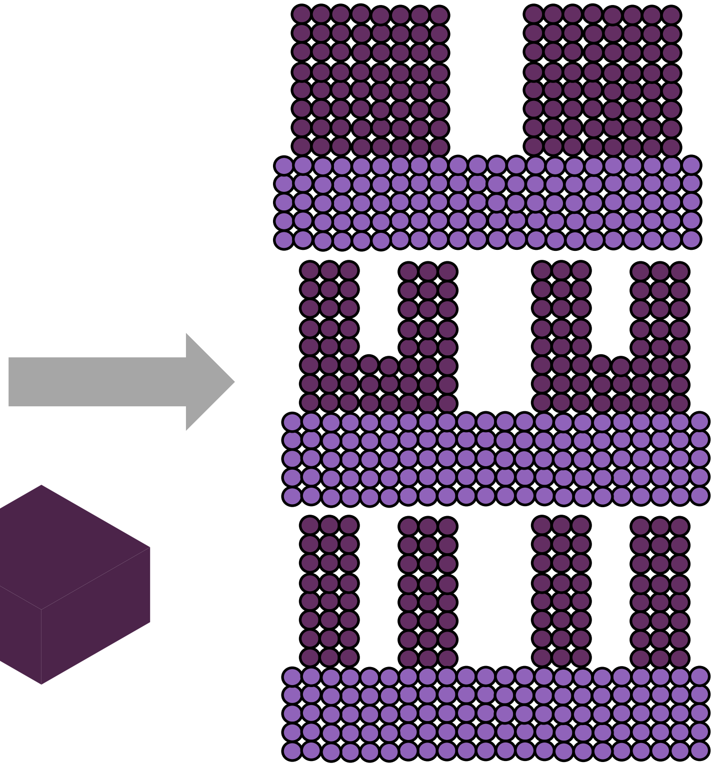


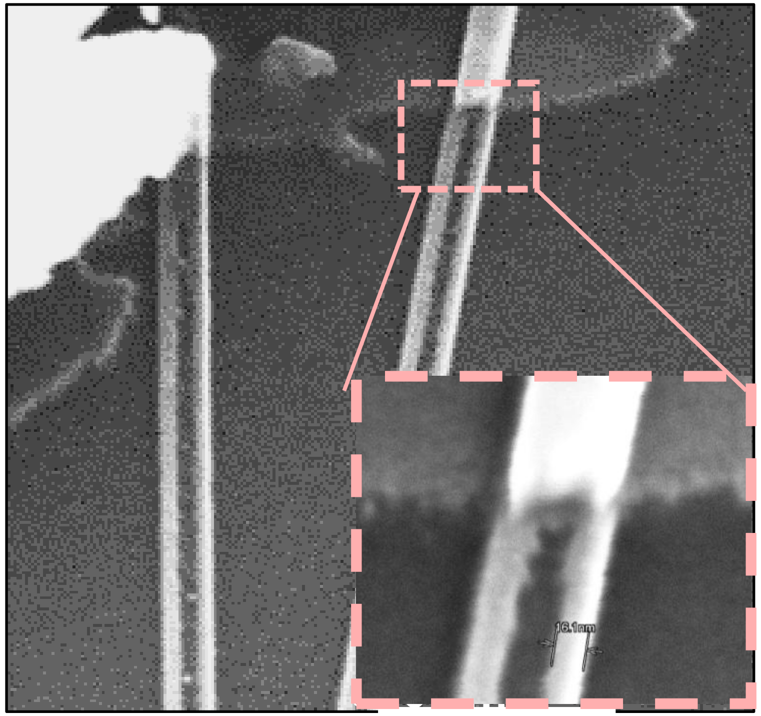
Nakayama et al., Proc. SPIE, 8327, 2012



Atomic Layer Etching Pitch Splitting (APS™)







Atomic Layer Etching (ALE):
Surface control using self-limiting chemistries

Atomic Layer Etch Pitch Splitting (APS™):
First demonstration in 2016* on GaP Nanowires on Si

** D. Suyatin et al., 16th Int. Conf. on ALD, Dublin, Ireland, July 2016*

APS™: – Simplifying advanced patterning
– Reducing cost & complexity

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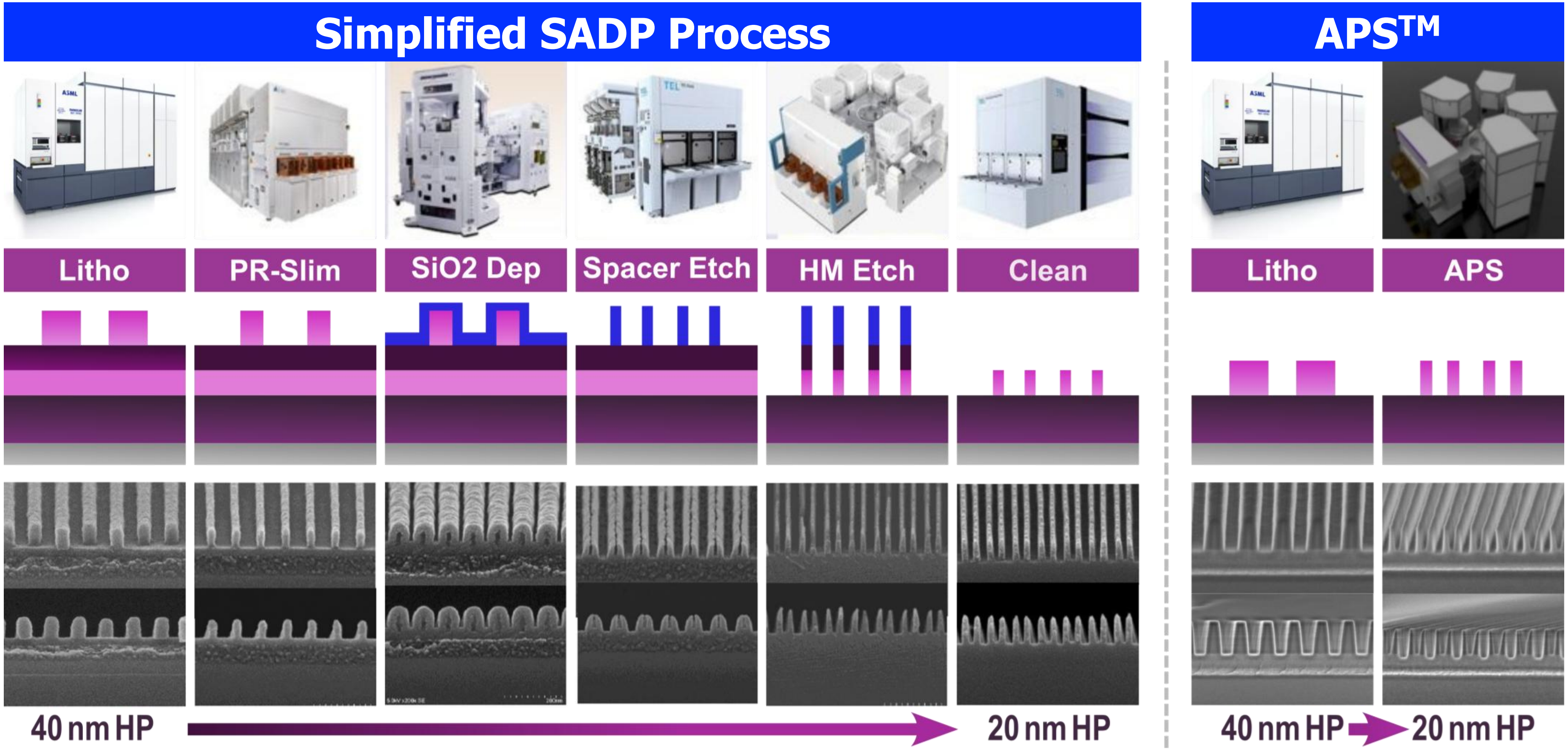
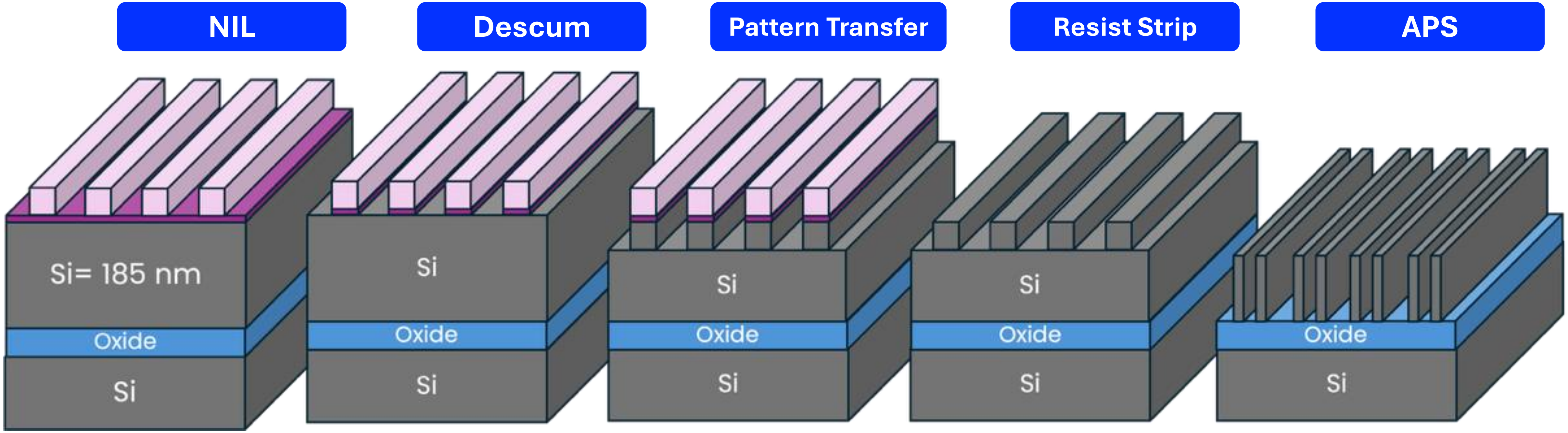
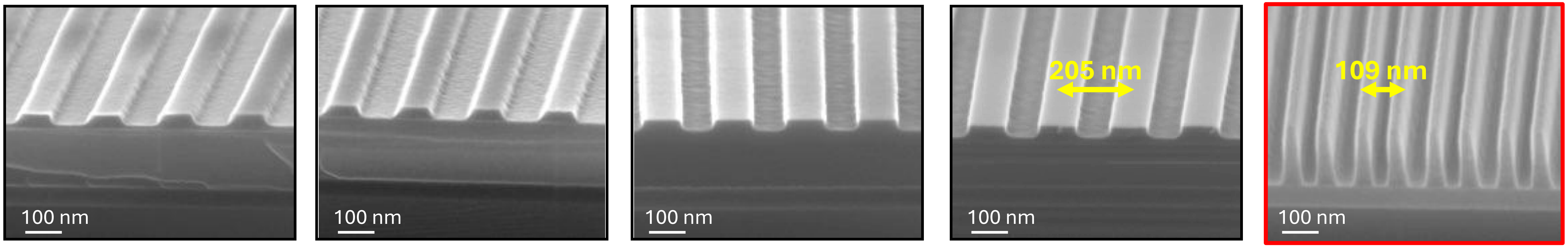


- APS™ simplifies pitch splitting with a single-step process, reducing cost, complexity, and environmental impact compared to SADP, which requires multiple deposition and etching steps
- APS™ enables higher yield, lower CAPEX/OPEX, and scalability to sub-2nm nodes

APS^{TM} on NIL-Defined SOI Wafer

AlixLabs





APS™ on NIL-Defined SOI Wafer

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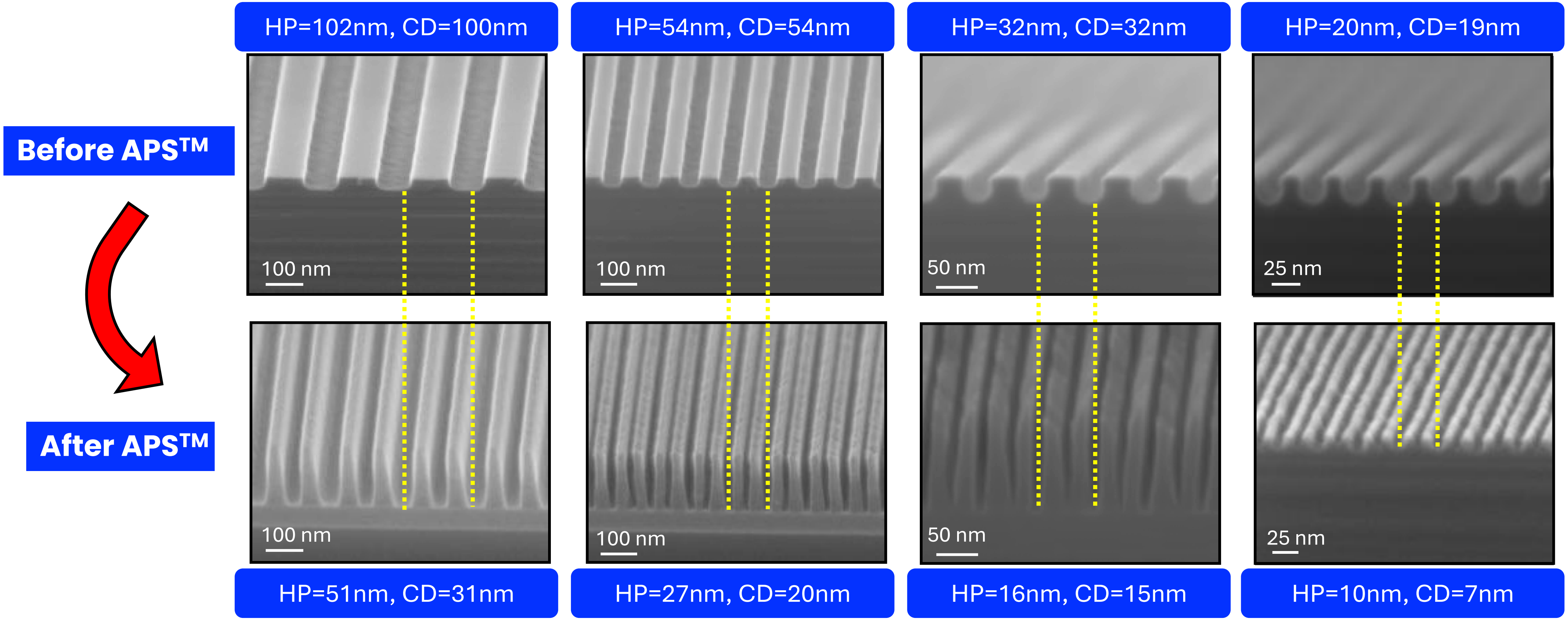


Before APS™

After APS™

HP=102nm, CD=100nm

HP=54nm, CD=54nm

HP=32nm, CD=32nm

HP=20nm, CD=19nm

HP=51nm, CD=31nm

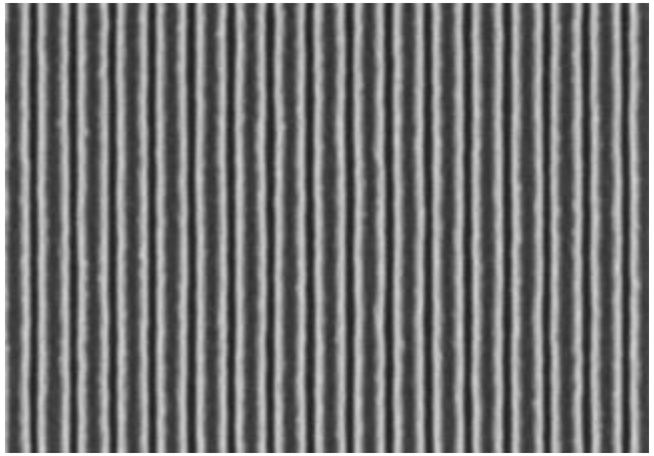
HP=27nm, CD=20nm

HP=16nm, CD=15nm

HP=10nm, CD=7nm

APS^{TM} in Bulk Silicon vs Low and high NA EUVL in Resist

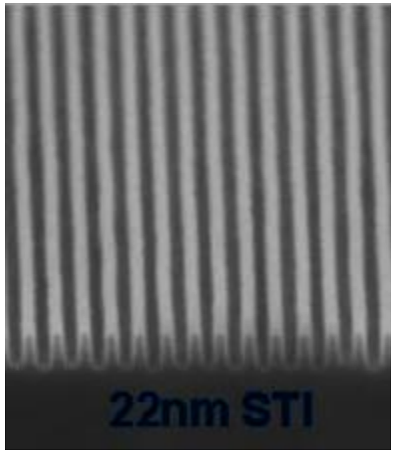
NIL + APS^{TM}



CD	10 nm
Half Pitch	12.5 nm
LWR	2.2 nm
Material	Si

This work

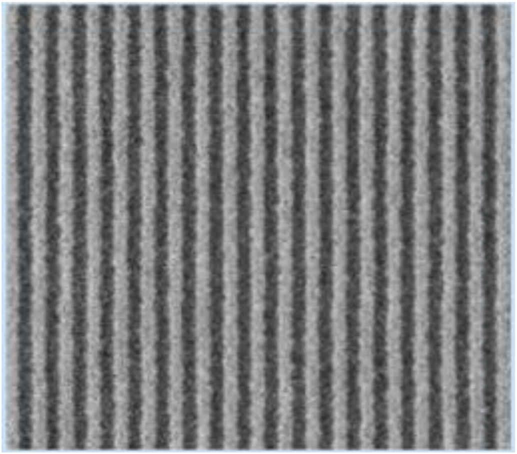
ArF-i + SADP



CD	20 nm
Half Pitch	22 nm
LWR	2.5 nm
Material	Si

Proc. SPIE, 69244E-12008

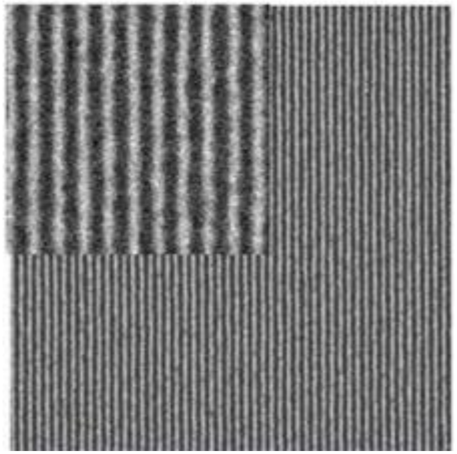
Low NA EUVL



CD	12.7 nm
Half Pitch	12 nm
LWR	1.7 nm
Material	Resist

EUVL Symposium, 11854-11 2021

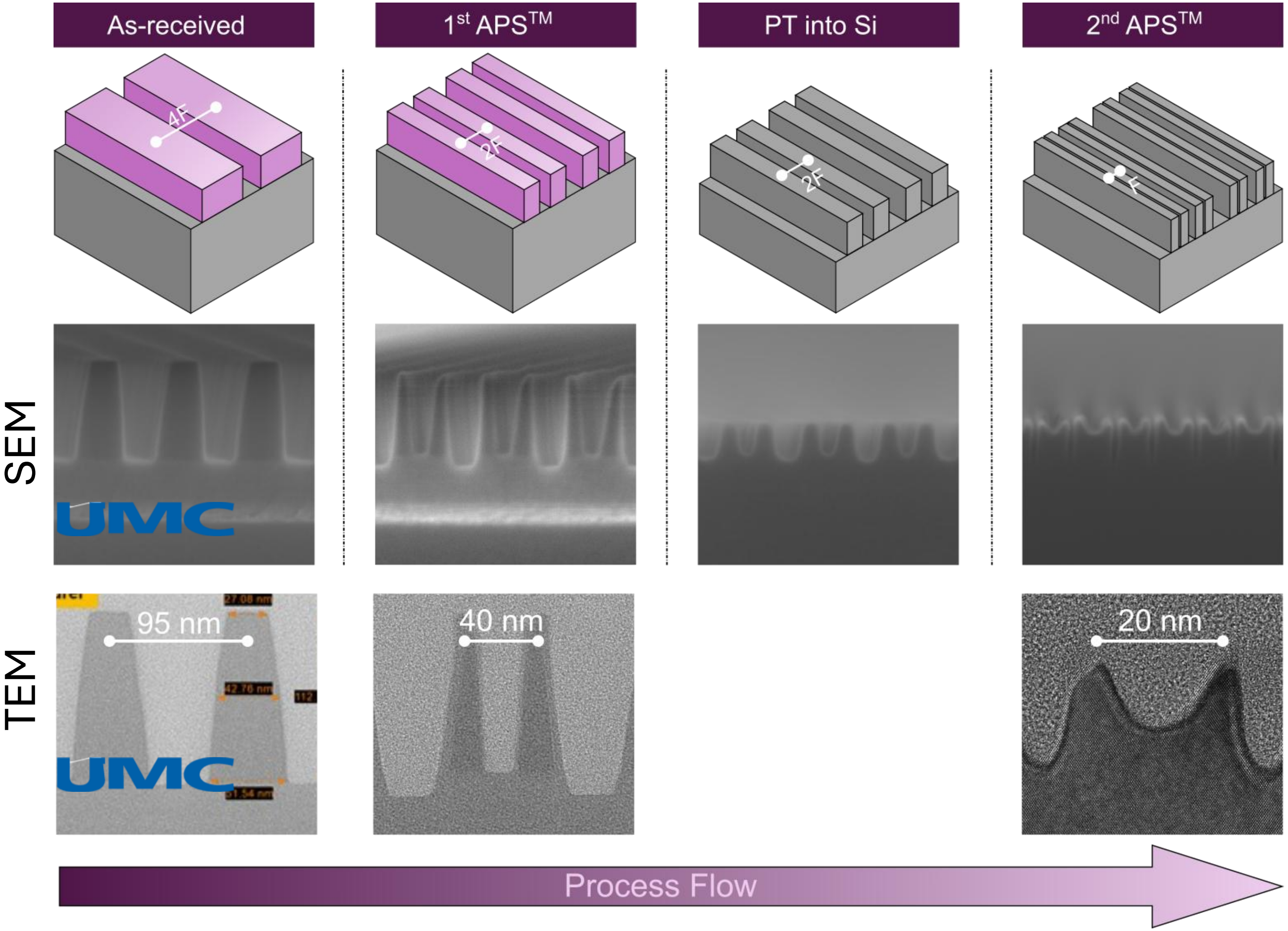
High NA EUVL

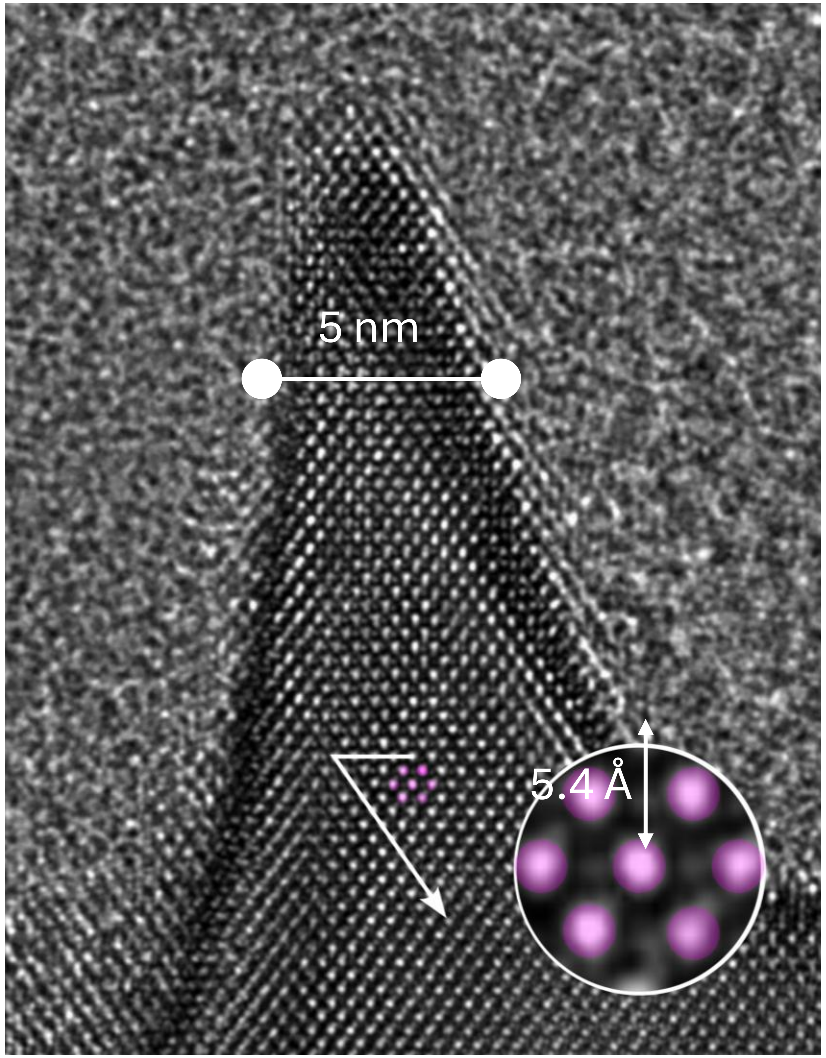


CD	6.6 nm
Half Pitch	8 nm
LWR	2.4 nm
Material	Resist

Source: Imec

Simplifying Quadruple Patterning by APS™





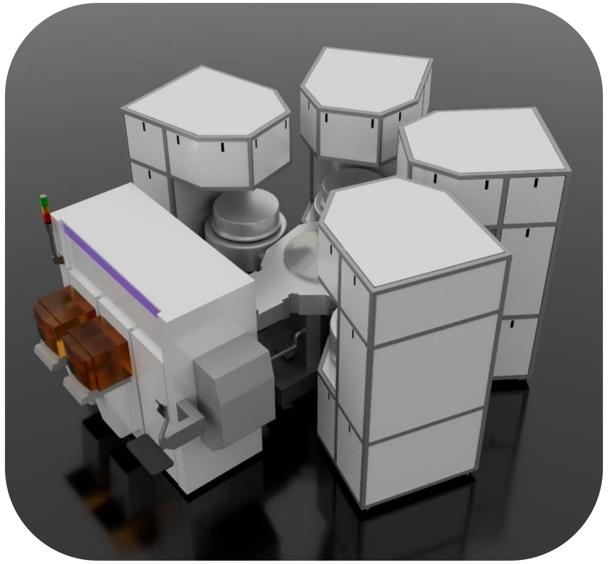
AlixLabs APS™ & 300 mm ALE Equipment

Alpha APS™ Tool in AlixLabs Clean Room, Lund HQ

Alpha APS tool manufactured and operational in the AlixLabs Cleanroom in Lund, Sweden since 4Q/2024

First of a kind 300 mm APS tool for APS™ development and customer demonstrations

AlixLabs Beta APS™ System Coming 4Q2026



Concluding Remarks

AlixLabs

Costs and complexity in advanced nodes are largely driven by complex patterning processes

APS™ offers a new approach of advancing process nodes without investing in new lithography

APS™ can reduce cost and complexity while improving yield when compared to SADP and SAQP

AlixLabs strives to make fabrication more sustainable

Join us today for a more sustainable future !

AlixLabs

Let’s connect

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