

# Microelectronics, MEMS/NEMS

## 2018-2022 Microsystems Technology Roadmap, June 2018 Canada's National Design Network



Technologies	2018	2019	2020	2021	2022
<ul style="list-style-type: none"> <li>Baseline CMOS technologies 350,180,130,65,28nm</li> </ul>	Baseline CMOS technologies 350,180,130,65,28 nm will continue to be in the offering				
<ul style="list-style-type: none"> <li>CMOS flavors (HV, BCD, SOI)</li> </ul>	✓ Additional Flavors: SiGe; Imaging (CIS), Low Power	<ul style="list-style-type: none"> <li>CMOS integrated Non-Volatile Memory (ReRAM variations)</li> </ul>	<ul style="list-style-type: none"> <li>130nm SiGe with Opto</li> </ul>		
<ul style="list-style-type: none"> <li>Advanced CMOS</li> <li>Compound Semiconductor</li> <li>Heterogeneous Integration</li> </ul>	✓ CMOS Interposer	<ul style="list-style-type: none"> <li>☆ 22nm SOI</li> <li>☆ GaN (power switching)</li> </ul>	<ul style="list-style-type: none"> <li>☆ Photonics and uE co-design flow</li> <li>☆ Advanced materials and processes for 2.5D Heterogenous Integration</li> </ul>	<ul style="list-style-type: none"> <li>GAA/Nanowires</li> </ul>	
<ul style="list-style-type: none"> <li>CAD Methodologies (Circuit/Device Modeling &amp; Simulation)</li> </ul>	✓ FinFET Simulation Modeling	<ul style="list-style-type: none"> <li>Package PDK (Advanced CMOS)</li> <li>☆ CMOS Wafer post-processing (integration/ packaging)</li> </ul>	<ul style="list-style-type: none"> <li>☆ non-VonNeumann architecture modeling</li> </ul>		
<ul style="list-style-type: none"> <li>New and Emerging</li> </ul>	☆ Josephson junction circuit	<ul style="list-style-type: none"> <li>☆ Cryogenic CMOS</li> </ul>	<ul style="list-style-type: none"> <li>Graphene Coatings</li> <li>Terahertz communication (systems)</li> </ul>		<ul style="list-style-type: none"> <li>Heat dissipation (microfluidics)</li> <li>Cryogenic Memory</li> </ul>
<ul style="list-style-type: none"> <li>MEMS technologies (Application-specific)</li> </ul>	☆ MEMS pressure sensors	<ul style="list-style-type: none"> <li>MEMS on LTCC</li> </ul>	<ul style="list-style-type: none"> <li>RF MEMS (optical communications)</li> </ul>		<ul style="list-style-type: none"> <li>Low actuation voltage devices</li> </ul>
<ul style="list-style-type: none"> <li>Heterogeneous integration/ Packaging (MEMS, Photonics / Interposer)</li> </ul>		<ul style="list-style-type: none"> <li>✓ Integrated CMOS / MEMS</li> <li>CMUT on CMOS</li> </ul>		<ul style="list-style-type: none"> <li>Graphene-enabled MEMS</li> </ul>	
	2018	2019	2020	2021	2022

The Microsystems Technology Roadmap has 5 segments:

Microelectronics/MEMS/NEMS, Photonics, Embedded Systems, Packaging and Multi-scale Integration, and Nanofabrication Labs.

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✓	Key technology feature of a planned Product or Service; Development activities are underway and/or supply chain is available.
☆	CMC is seeking collaborators, suppliers to deliver capability.
•	Anticipated technology feature based on roadmap sources.