The Next DARPA Revolution: Integrated MicroSYSTEMS

Zachary J. Lemnios

Director, DARPA/MTO

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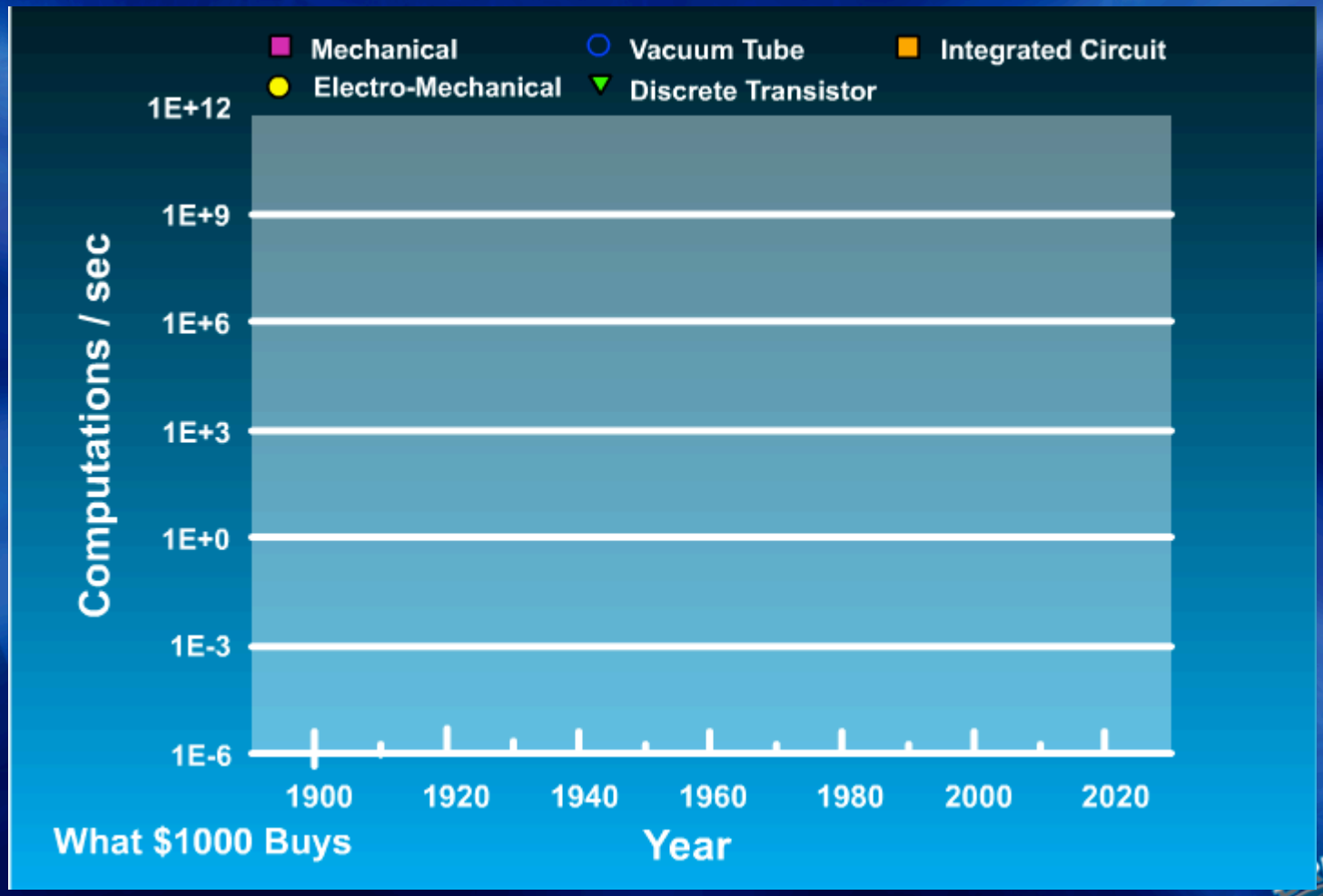
The Next Revolution: The Integrated Microsystem



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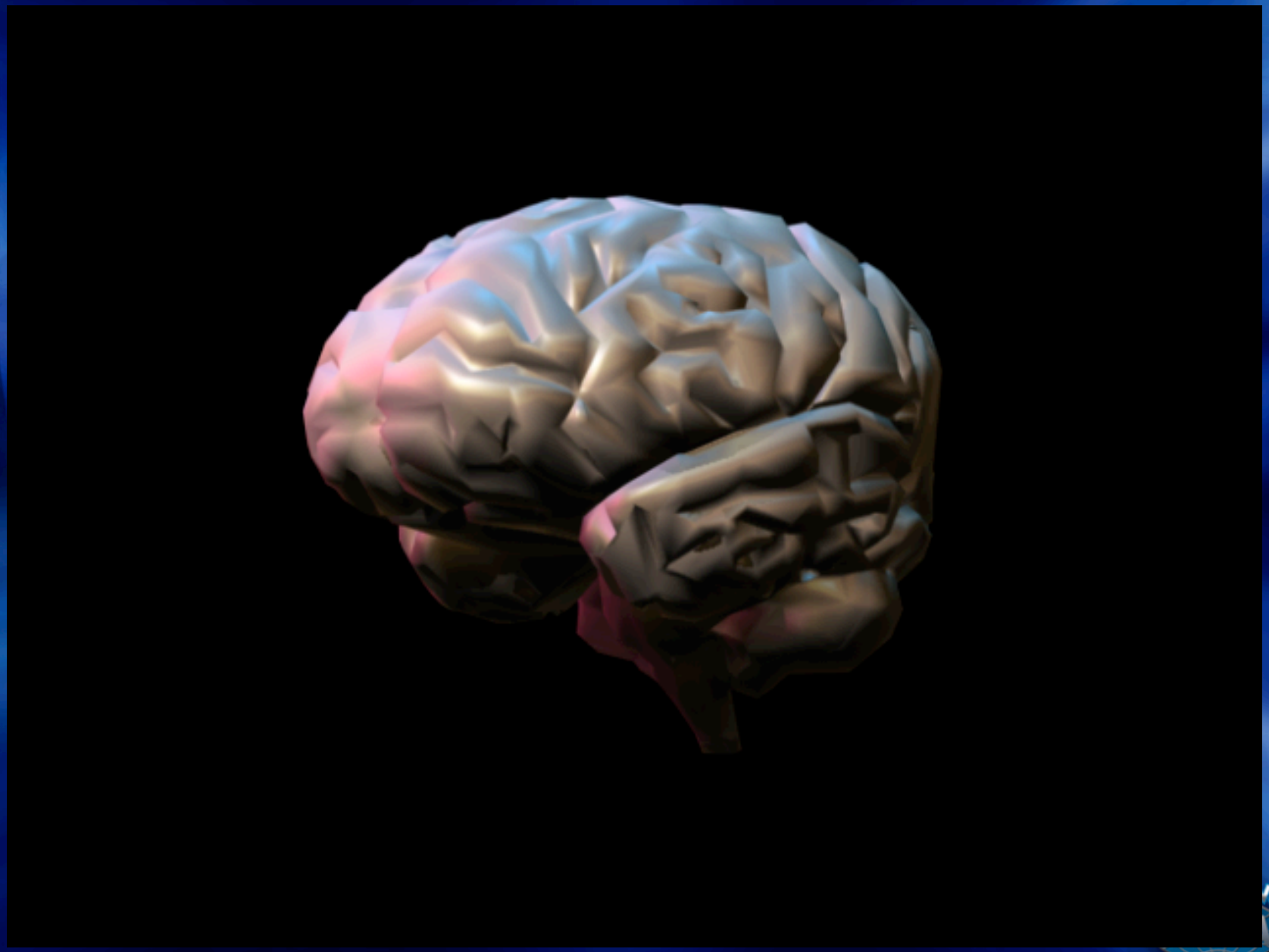

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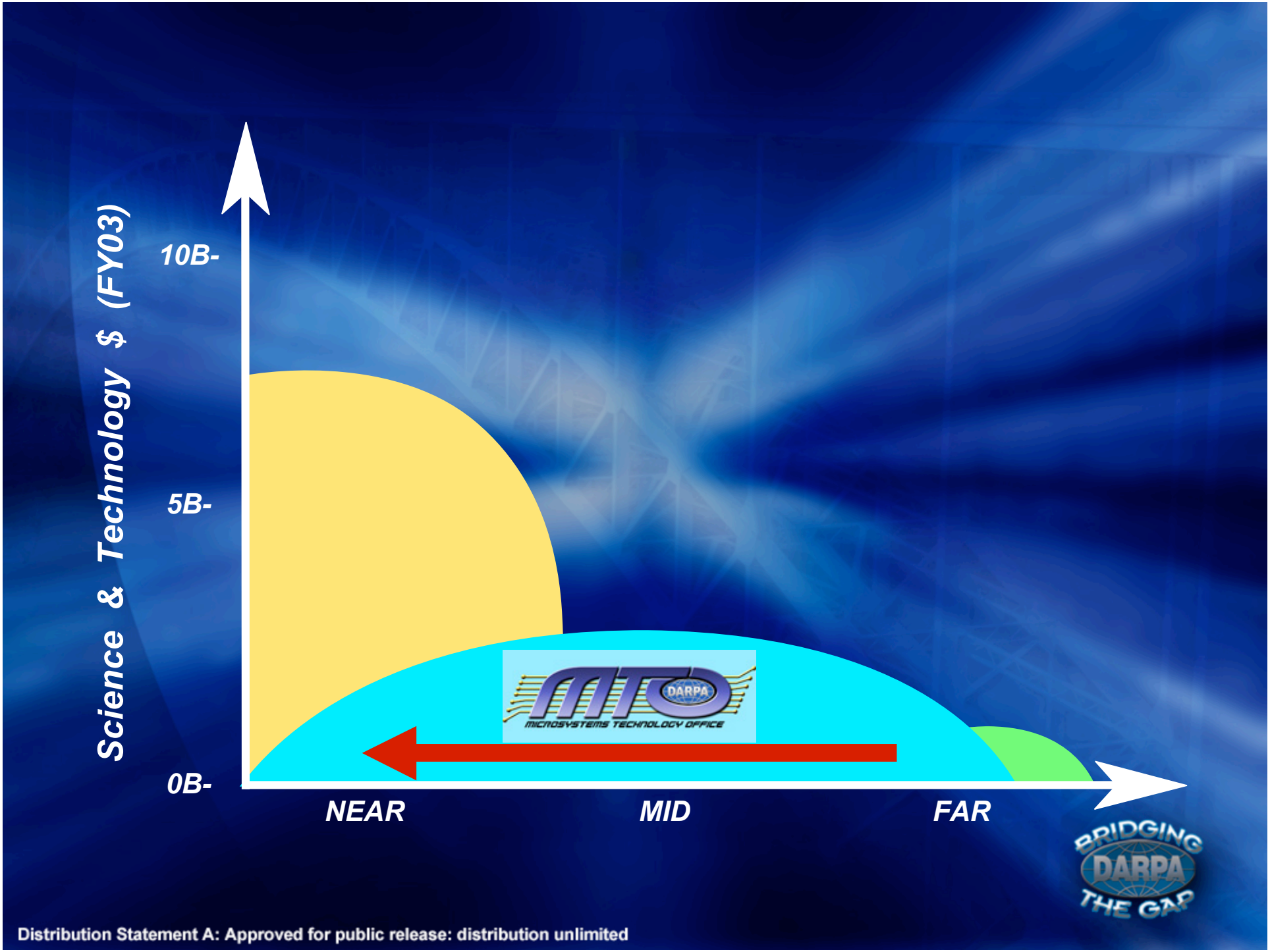

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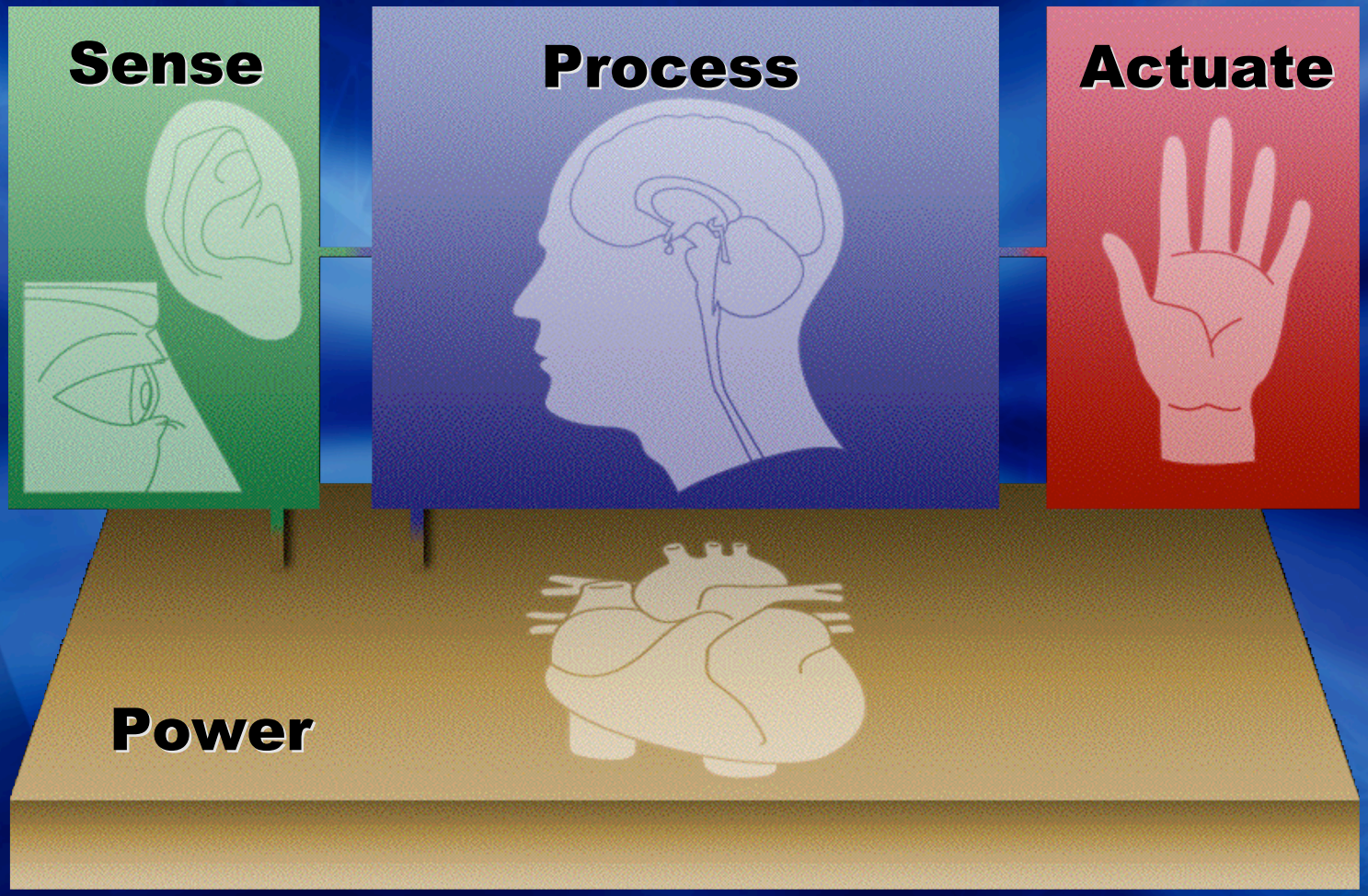
Microsystem Architecture



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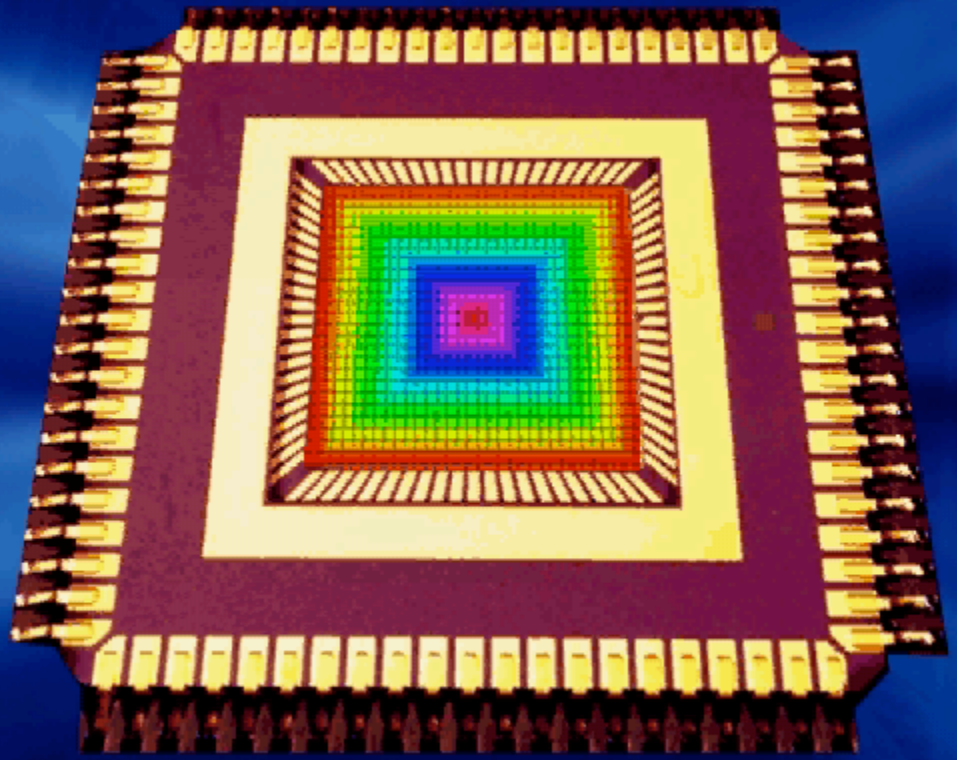
Adaptive Focal Plane Array



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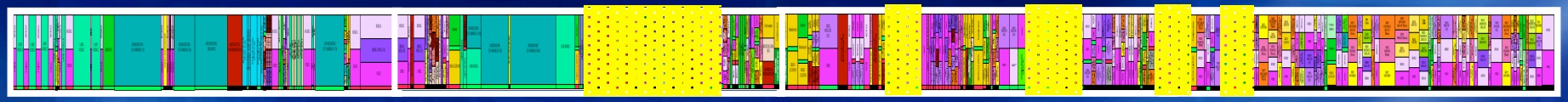
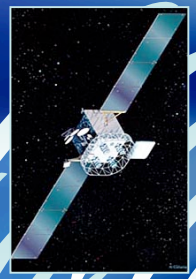
Flexible Receiver



30 MHz 300 MHz 3 GHz 30 GHz 300 GHz

ACN

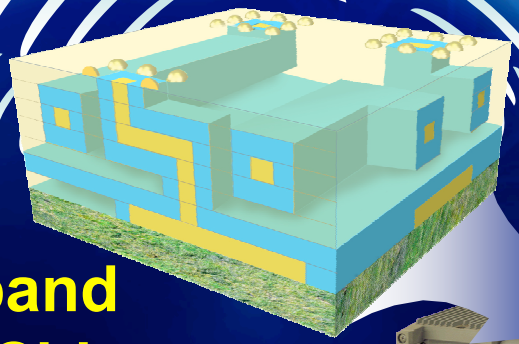
GBS



DSCS

MILSTAR

Gap Filler



3D Multiband Receiver Chip

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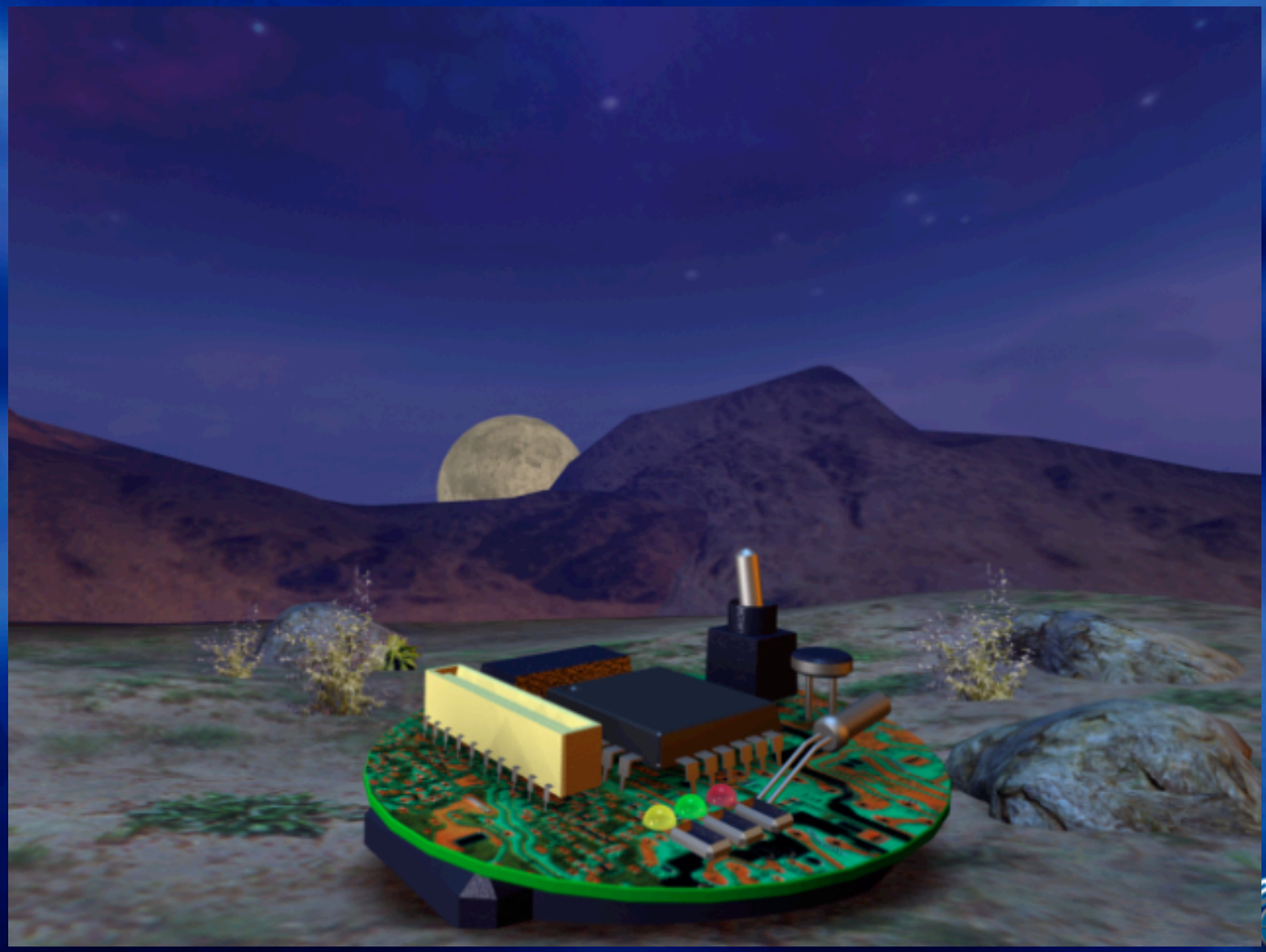
Intelligent Radio Frequency Identification (RFID)



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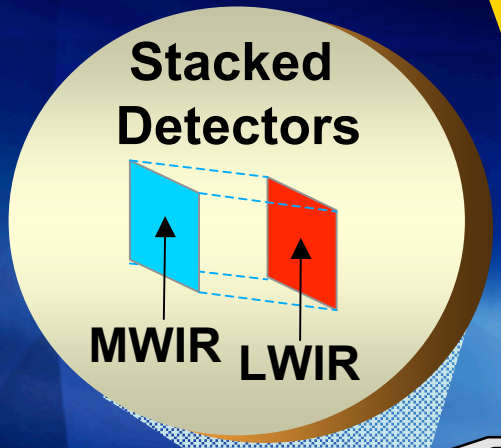
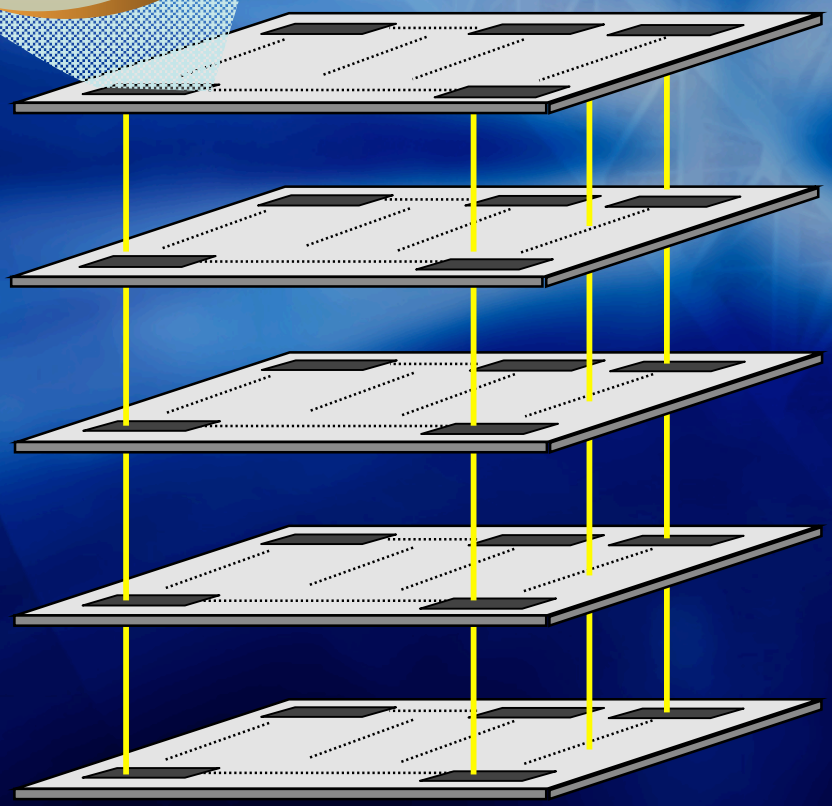
Vertical Interconnected Sensor Arrays





IR detector array

Preamplifier, Digitize MSB

Mixed Signal Layer

LSB ADC

DSP

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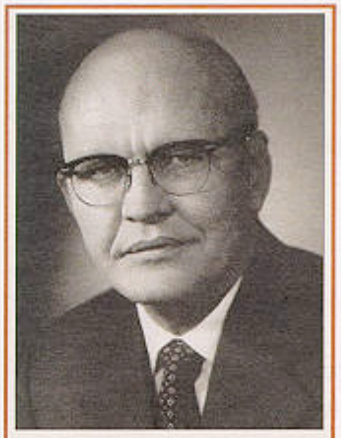
Invention of the Integrated Circuit in 1958

Kilby Wins the Nobel

Integrated circuit inventor honored 40 years later

BY HEIDI ELLIOTT

Inventor. Patent holder. Distinguished professor. And, now, Jack Kilby can add Nobel Laureate to the list of his accomplishments.



Kilby in 1958, the year he invented the world's first integrated circuit while working at Texas Instruments.

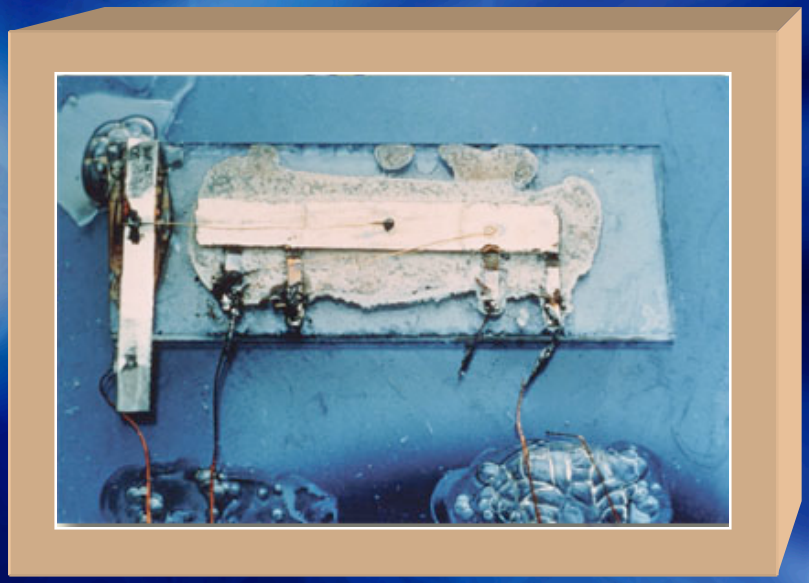
Last week the Royal Swedish Academy of Sciences announced that Kilby would share half of this year's Nobel Prize in Physics for his part in the invention of the integrated circuit.

Kilby shares the prize, worth nearly $1 million, with Zhores I. Alferov of the A.F. Ioffe Physico-Technical Institute, St. Petersburg, Russia, and Herbert Kroemer of the University of California at Santa Barbara, Calif., who were cited for developing semiconductor heterostructures used in high-speed and opto-electronics.

"Jack S. Kilby is being rewarded for his part in the invention and development of the integrated circuit, the chip. Through this invention microelectronics has grown to become the basis of all modern technology," said the Royal Swedish Academy of Sciences in announcing the Nobel prizes in Physics.

"Examples are powerful computers and processors, which collect and process data and control everything from washing machines and cars to space probes and medical diagnostic equipment such as computer tomographs and magnetic-resonance cameras. The microchip has also led to our environment being flooded with small electronic apparatuses, anything from electronic watches and television games to minicalculators and personal computers."

Born in 1923, Kilby joined Texas Instruments Inc. in 1958 as an engineer, having earned a bachelor's degree in electrical engineering from the University of Illinois and a master's degree in electrical engineering from the University of Wisconsin. On Sept. 12, 1958, he successfully demonstrated the first electronic circuit that



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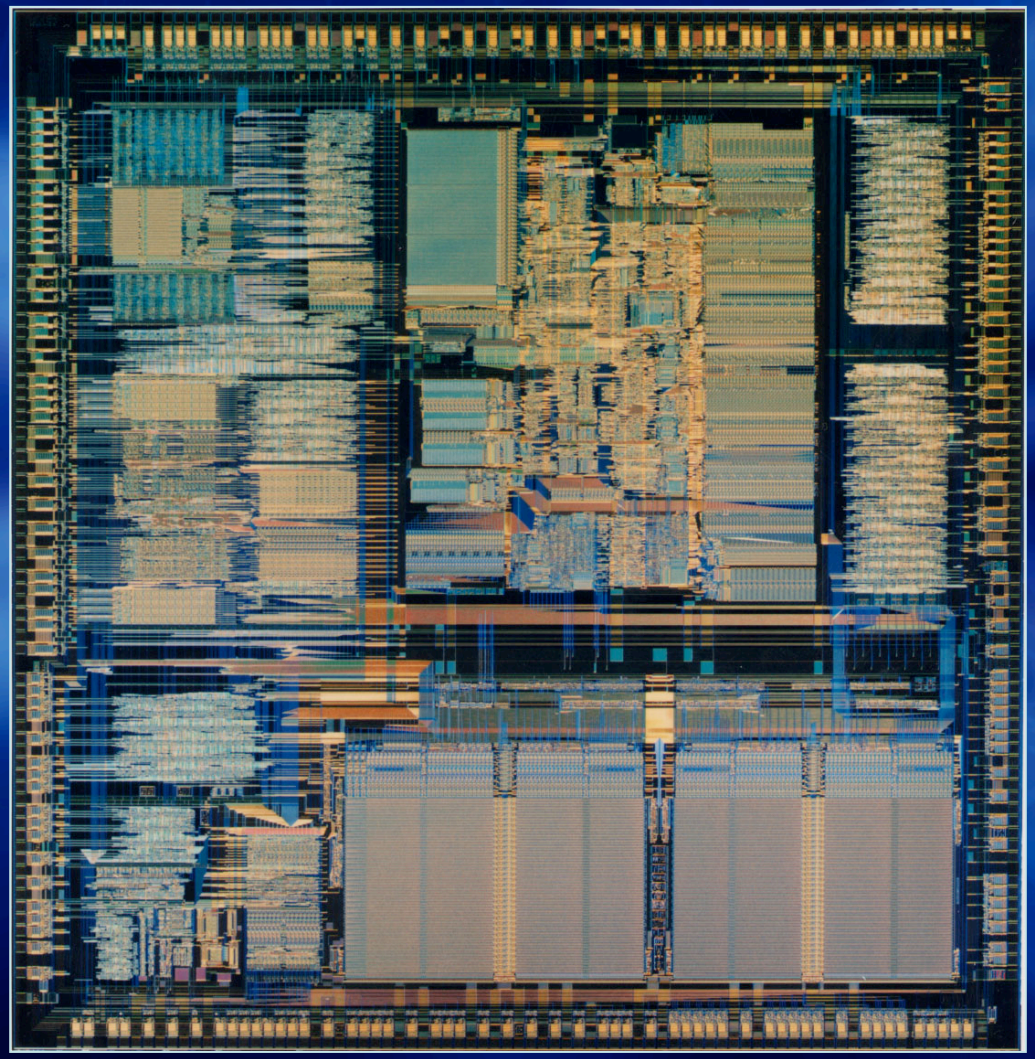
VLSI transition



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MIMIC Program to Consumer Electronics

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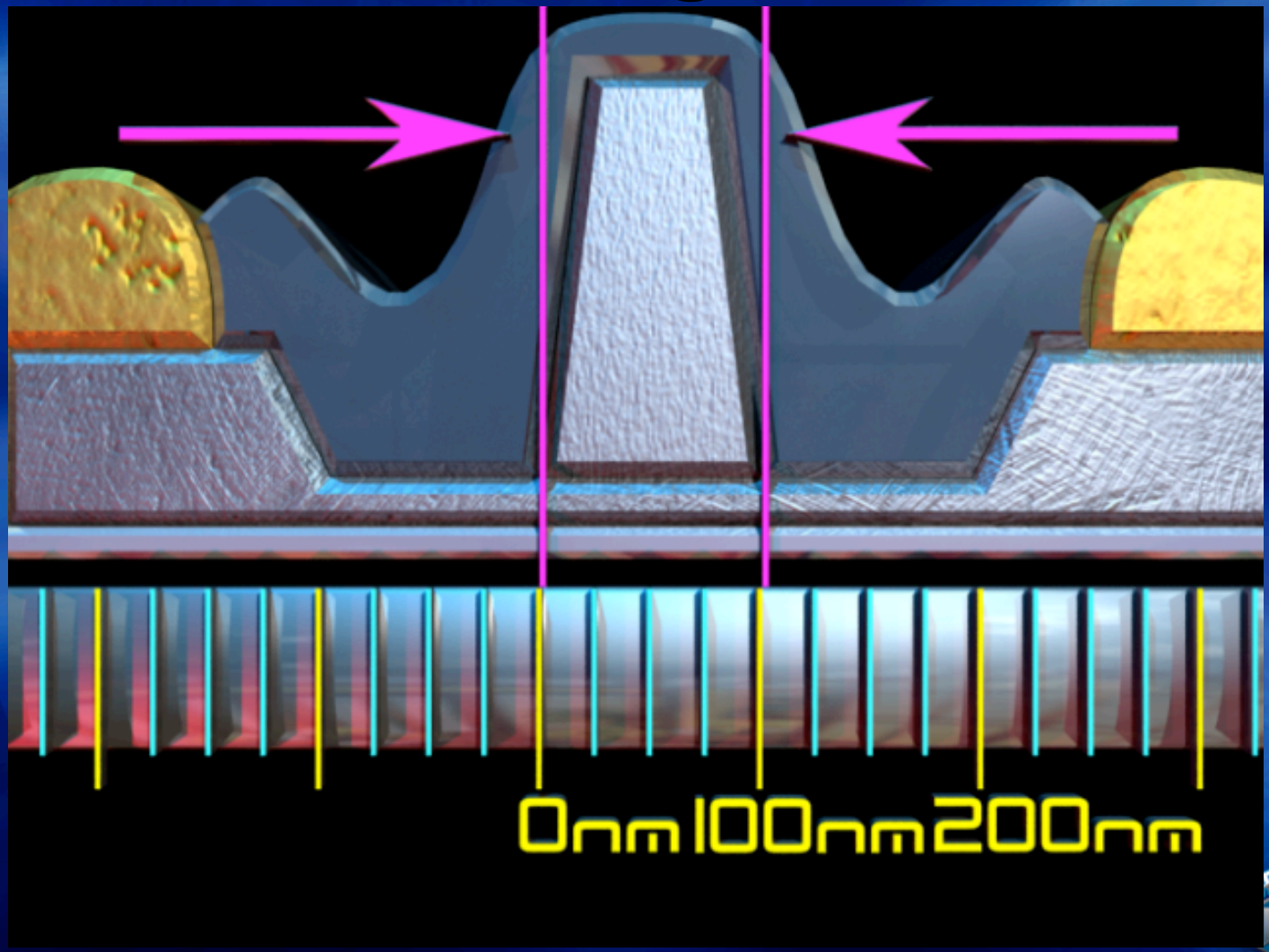
Pushing the Limits of Scaling and Integration



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Microsystems for Spectral Exploitation and Sensor Dominance

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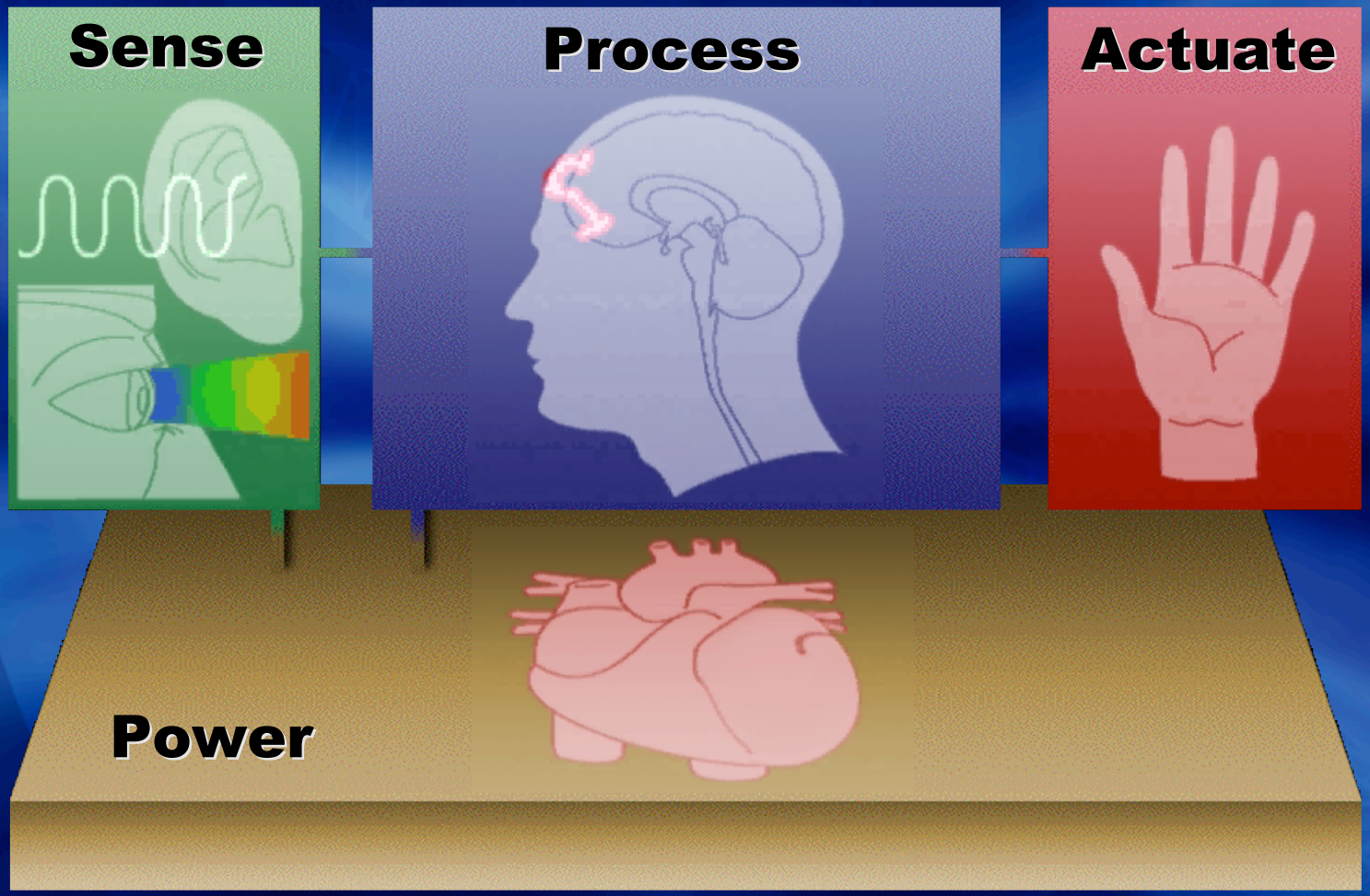
Microsystem Architecture



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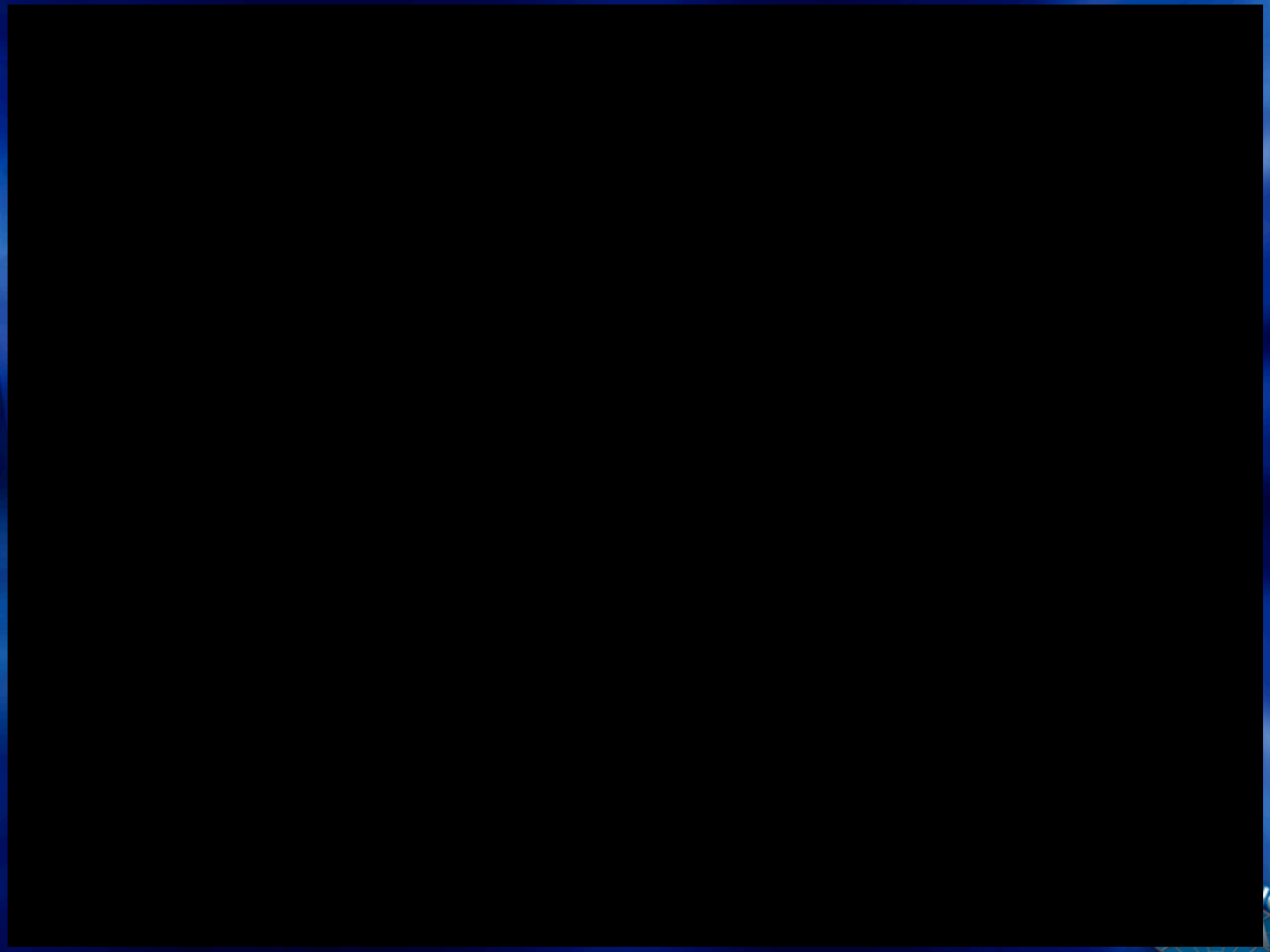

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LEVERAGE PERFORMANCE AT LIMITS OF SCALING AND INTEGRATION

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EXPLOIT UNTAPPED REGIONS OF THE SPECTRUM

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LEVERAGE PERFORMANCE AT LIMITS OF SCALING AND INTEGRATION

EXPLOIT UNTAPPED REGIONS OF THE SPECTRUM

INTERACT INTELLIGENTLY WITH THEIR ENVIRONMENT

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30 second intro will be provided on BETA Tape

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Consumer Electronics

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PM Montage will be provided on BETA Tape

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Ending will be provided on BETA Tape

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