

# Evolusi Teknologi Prosesor Intel: Dari 4004 hingga Generasi Modern

This presentation explores Intel's processor journey, from the first 4004 to today's advanced chips.



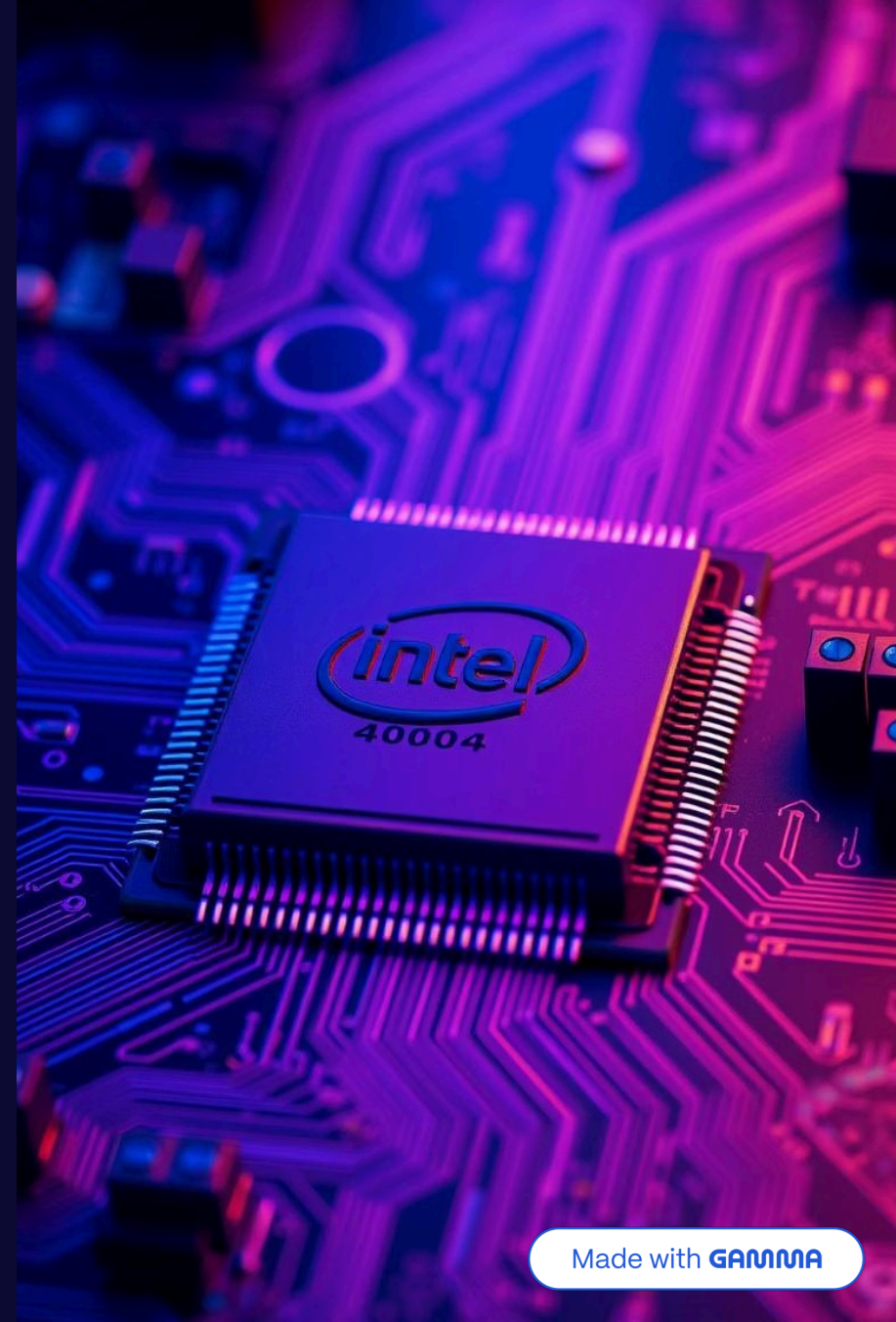
# Introduction to Intel's Microprocessor Revolution

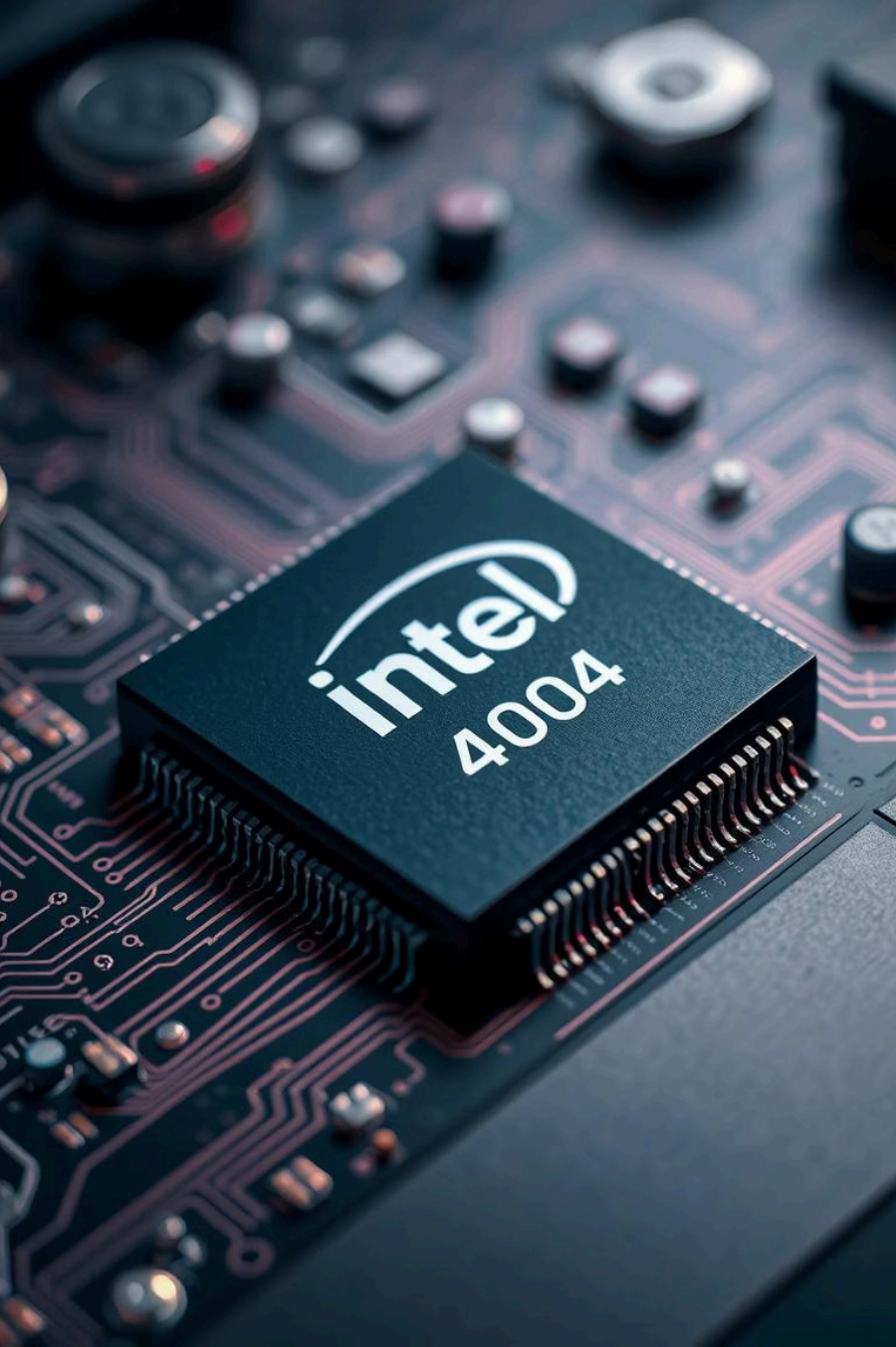
## Intel's Start

Intel released the first microprocessor, the 4004, in 1971.

## Continuous Innovation

Introduced architectures that shaped modern computing.



A close-up photograph of an Intel 4004 microprocessor mounted on a dark green printed circuit board (PCB). The chip is a small, square, black integrated circuit with the 'intel 4004' logo printed in white on its top surface. The PCB is populated with various other electronic components, including resistors, capacitors, and other integrated circuits, all interconnected by a network of fine, copper-colored traces. The lighting is focused on the microprocessor, creating a slight shadow and highlighting its edges and the texture of the PCB.

# Intel 4004 (1971): The World's First Microprocessor

## 4-bit Processor

Consisted of 2,300 transistors.

## Low Speed

Operated at 740 kHz clock rate.

## Early Applications

Used mainly in calculators and simple electronics.

# Intel 8086 & 8088: A Leap to 16-bit Architecture

## Intel 8086

The first 16-bit Intel processor introduced in 1978.

## Intel 8088

8-bit external bus version used in the first IBM PC.



# Intel 386 (1985): Power of 32-bit and Multitasking

## 32-bit Processing

First Intel chip to support 32-bit computing.

## Transistor Count

Contained 275,000 transistors for enhanced power.

## Multitasking

Enabled multitasking for advanced operating systems.



# Intel Pentium Series: Superscalar to Higher Speeds

## Pentium (1993)

Superscalar architecture, up to 60 MHz.

1

2

## Pentium II (1997)

Faster speeds up to 450 MHz for desktops.



# Intel Core Series: Multi-Core and Smart Technologies

## Core Duo (2006)

Intel's first dual-core processor.

## Core i3/i5/i7 (2008)

Introduced Hyper-Threading and Turbo Boost tech.

## Core i9 (2017)

High-end chip for demanding computing tasks.

# Modern Architectures: Efficiency and Performance

1

## Nehalem (2008)

Integrated memory controller inside the CPU.

2

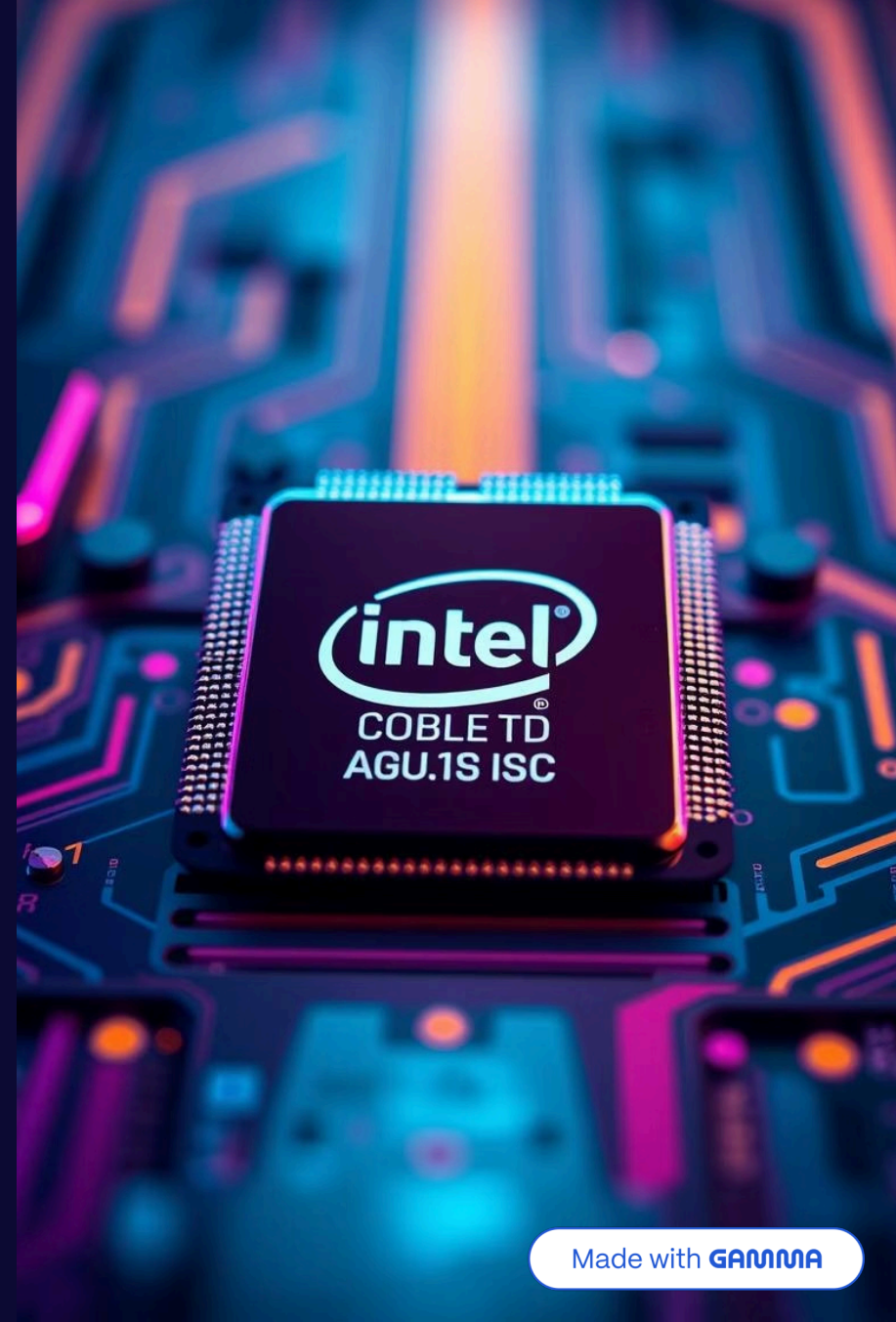
## Sandy Bridge (2011)

Integrated GPU and better energy efficiency.

3

## Alder Lake (2021)

Hybrid architecture with performance and efficiency cores.







# Latest Innovations: GPU and Future Chips

## Intel Arc

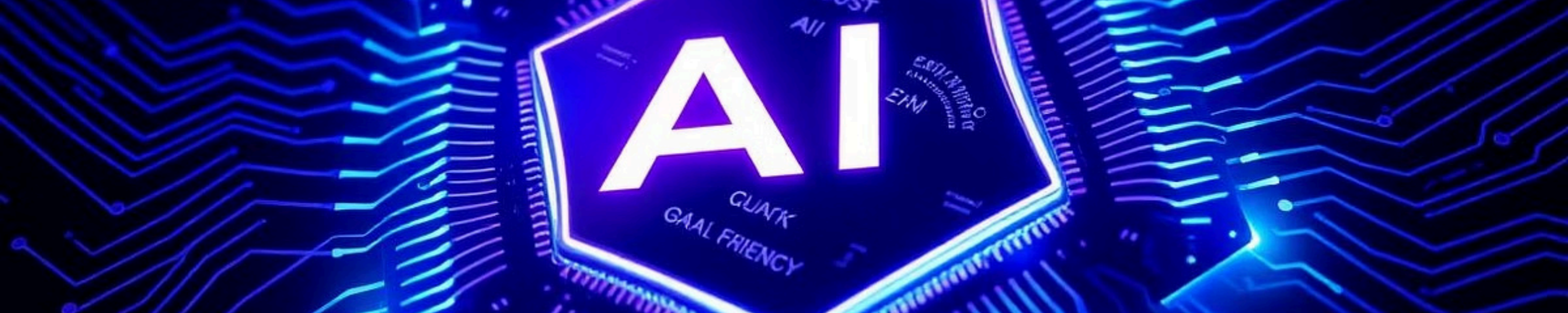
Intel's first discrete GPU for gamers and creators.

## Lunar Lake (2025)

Designed for ultra-efficient mobile devices.

## Panther Lake (2026)

Uses cutting-edge 18A manufacturing process.



# Conclusion: Intel's Journey and Future Outlook

## Key Role

Intel drives computer technology evolution.

## Legacy of Innovation

From 4004 to today, performance and efficiency.

## Future Focus

AI integration, energy savings, and deeper integration ahead.