

# New Mac Hardware

June 2022, PMUG

# New Mac Hardware: Mac Studio

Table 1

Chip	Apple M1 Max chip	Apple M1 Ultra chip
<b>Starting Price</b>	<ul style="list-style-type: none"><li>• \$1999</li></ul>	<ul style="list-style-type: none"><li>• \$3999</li></ul>
<b>CPU</b>	<ul style="list-style-type: none"><li>• 10-core CPU with 8 performance cores and 2 efficiency cores</li></ul>	<ul style="list-style-type: none"><li>• 20-core CPU with 16 performance cores and 4 efficiency cores</li></ul>
<b>GPU</b>	<ul style="list-style-type: none"><li>• 24-core GPU</li></ul>	<ul style="list-style-type: none"><li>• 48-core GPU</li></ul>
<b>Neural Engine</b>	<ul style="list-style-type: none"><li>• 16-core Neural Engine</li></ul>	<ul style="list-style-type: none"><li>• 32-core Neural Engine</li></ul>
<b>Band width</b>	<ul style="list-style-type: none"><li>• 400GB/s memory bandwidth</li></ul>	<ul style="list-style-type: none"><li>• 800GB/s memory bandwidth</li></ul>

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Chip	Apple M1 Max chip	Apple M1 Ultra chip
<b>Media Engine</b>	<ul style="list-style-type: none"><li>• Hardware-accelerated H.264, HEVC, ProRes, and ProRes RAW</li></ul>	<ul style="list-style-type: none"><li>• Hardware-accelerated H.264, HEVC, ProRes, and ProRes RAW</li></ul>
<b>Media Engine</b>	<ul style="list-style-type: none"><li>• Video decode engine</li></ul>	<ul style="list-style-type: none"><li>• Two video decode engines</li></ul>
<b>Media Engine</b>	<ul style="list-style-type: none"><li>• Two video encode engines</li></ul>	<ul style="list-style-type: none"><li>• Four video encode engines</li></ul>
<b>Media Engine</b>	<ul style="list-style-type: none"><li>• Two ProRes encode and decode engines</li></ul>	<ul style="list-style-type: none"><li>• Four ProRes encode and decode engines</li></ul>

# New Mac Hardware: Mac Studio

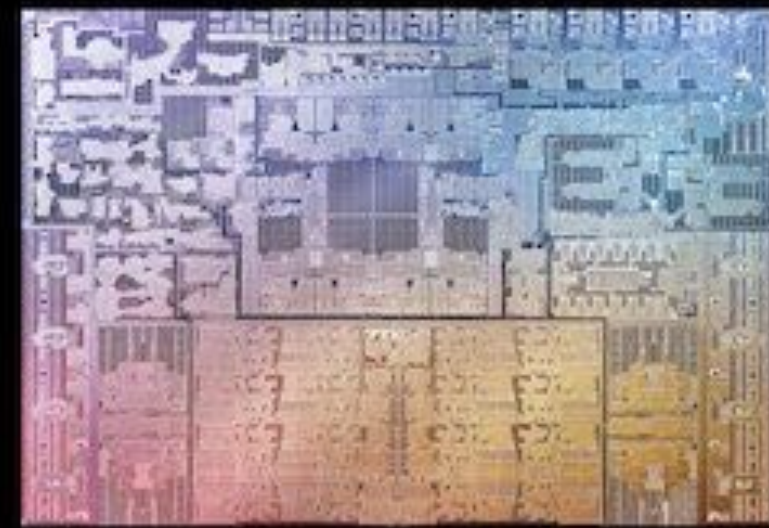
Table 1

Chip	Apple M1 Max chip	Apple M1 Ultra chip
<b>GPU</b>	Up to: 32-core GPU	Up to: 64-core GPU
<b>RAM</b>	32GB or 64GB	64GB or 128GB
<b>SSD</b>	512GB or 1TB or 2TB or 4TB or 8TB	2TB or 4TB or 8TB

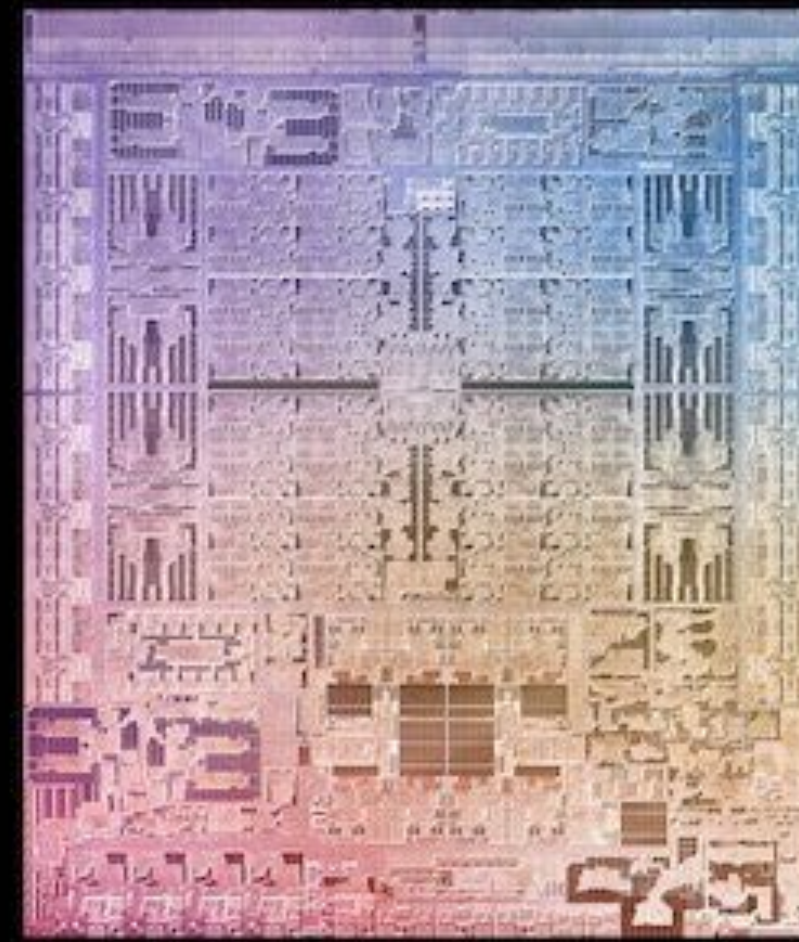
# M1 Family Chip Comparison



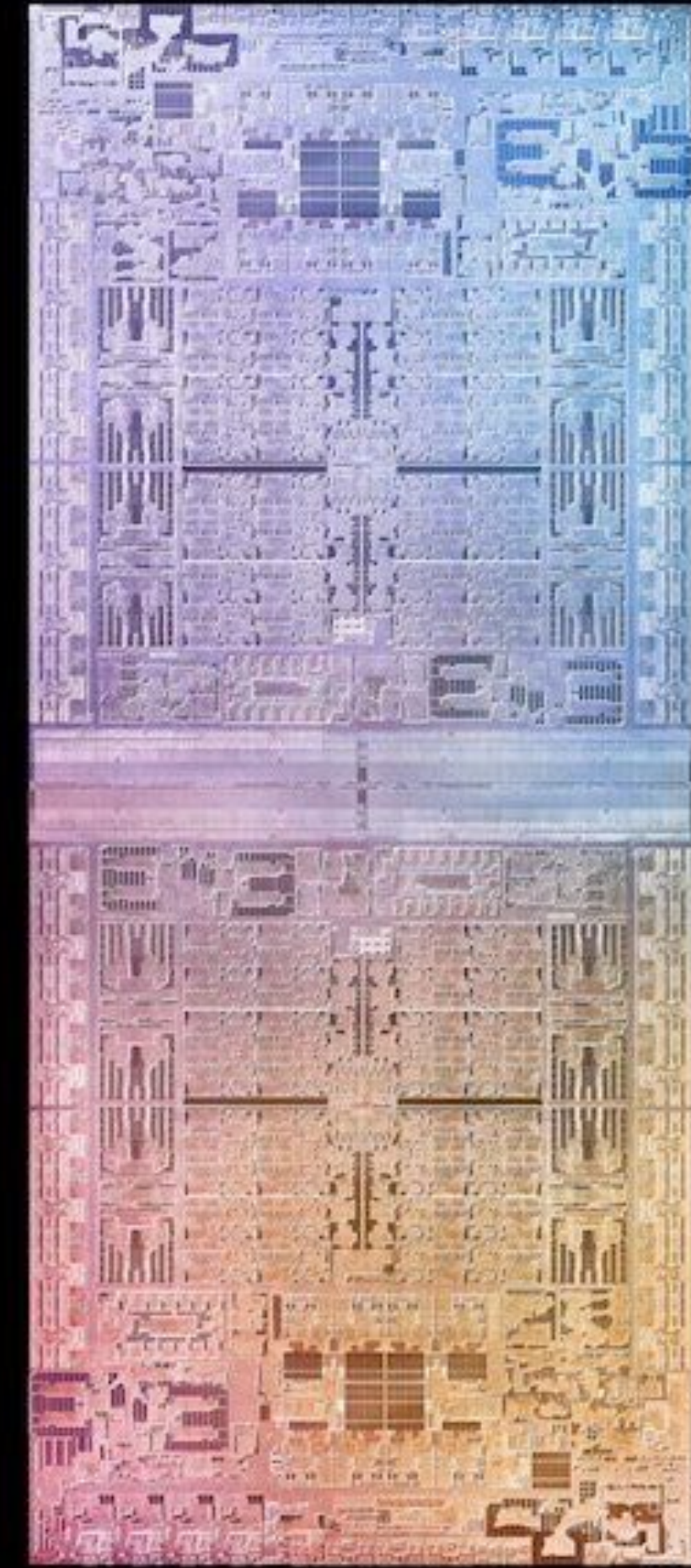
Apple M1



Apple M1 Pro



Apple M1 Max



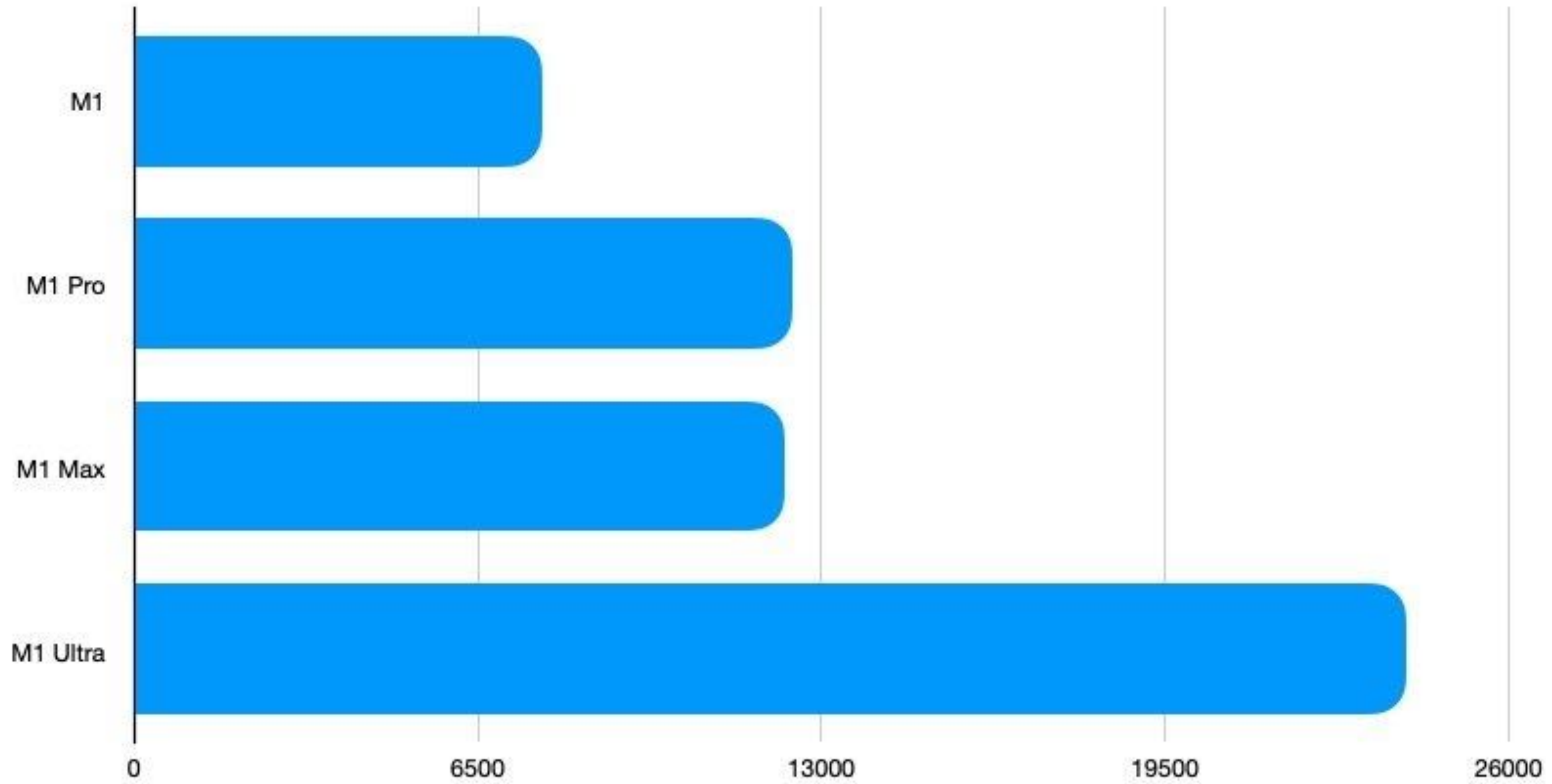
Apple M1 Ultra

# M1 Family Chip Comparison

	M1 (2020)	M1 Pro (2021)	M1 Max (2021)	M1 Ultra (2022)
CPU Cores (Total)	8	8 or 10	10	20
CPU Performance Cores	4	6 or 8	8	16
CPU Efficiency Cores	4	2	2	4
GPU Cores	7 or 8	14 or 16	24 or 32	48 or 64
Neural Engine Cores	16	16	16	32
Memory Bandwidth	68.25GB/s	200GB/s	400GB/s	800GB/s

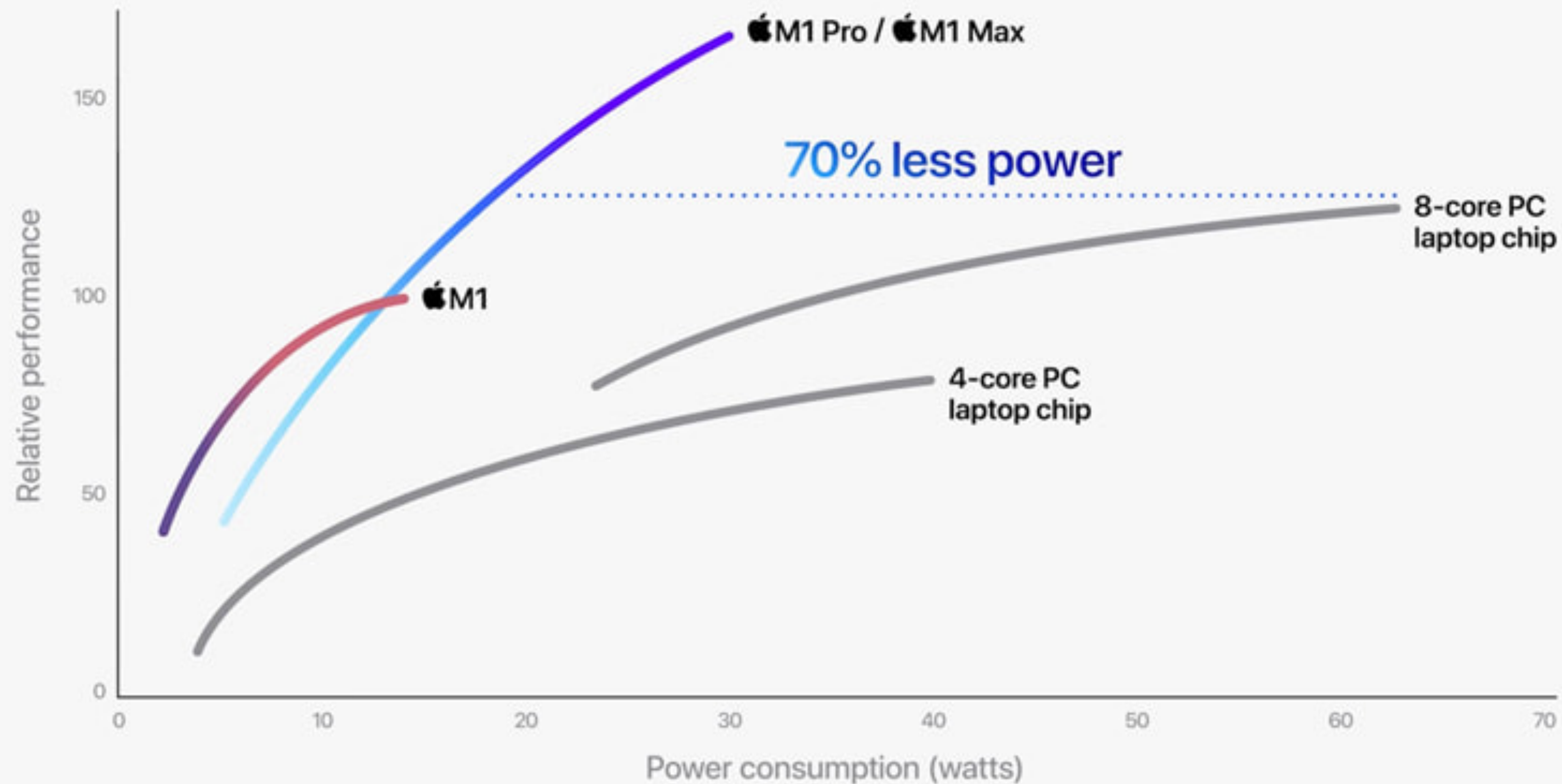
# M1 Family Chip Comparison

## Geekbench 5 Multi-Core Benchmark



# M1 Family Chip Comparison

## CPU performance vs. power



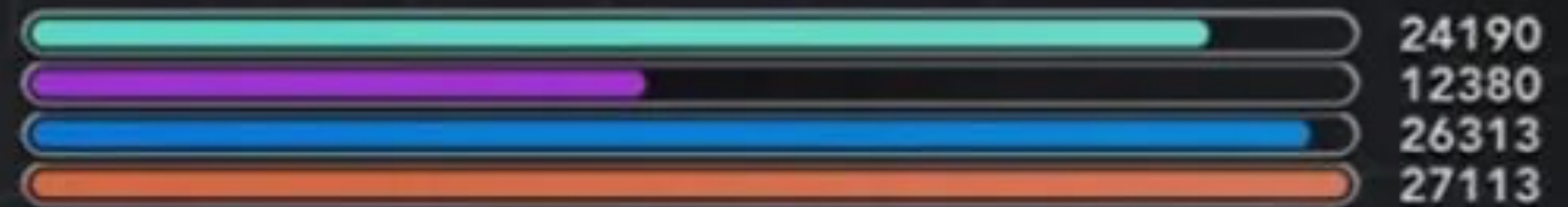


# M1 Ultra vs Intel & AMD Chip Comparison

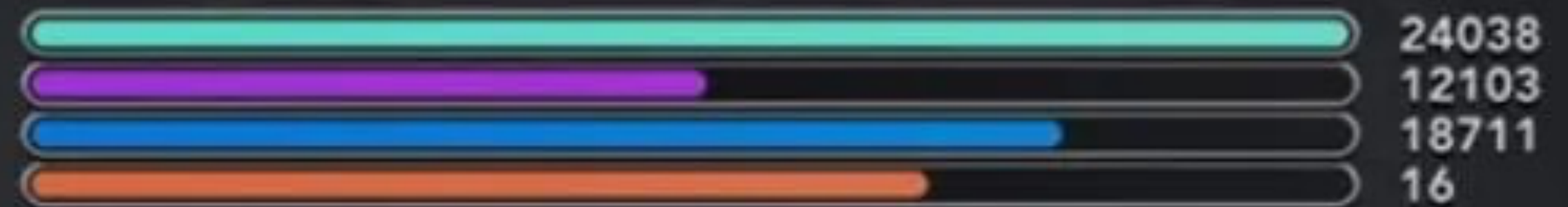
## CPU PERFORMANCE



CINEBENCH R23  
MULTICORE

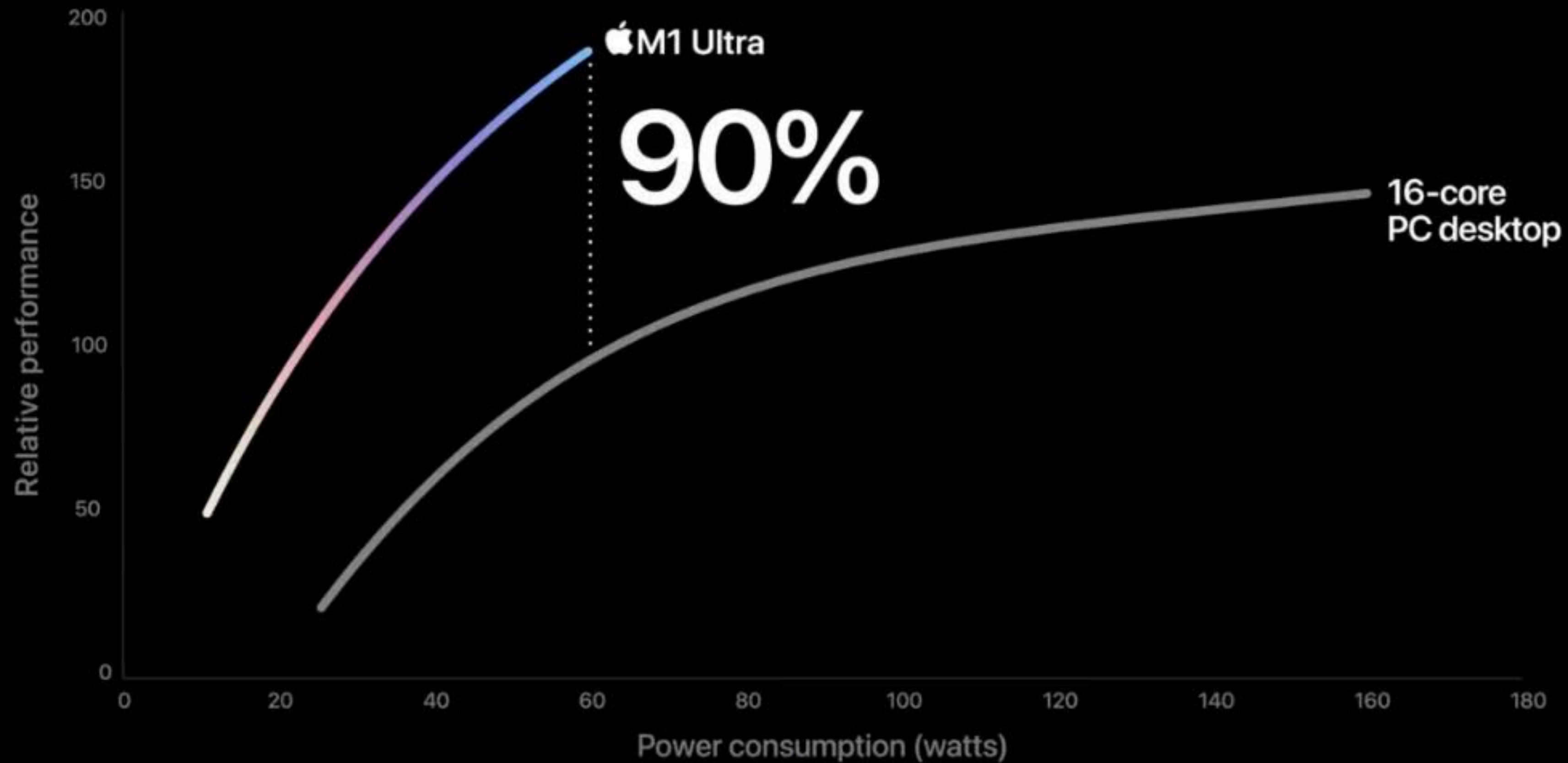


GEEKBENCH 5



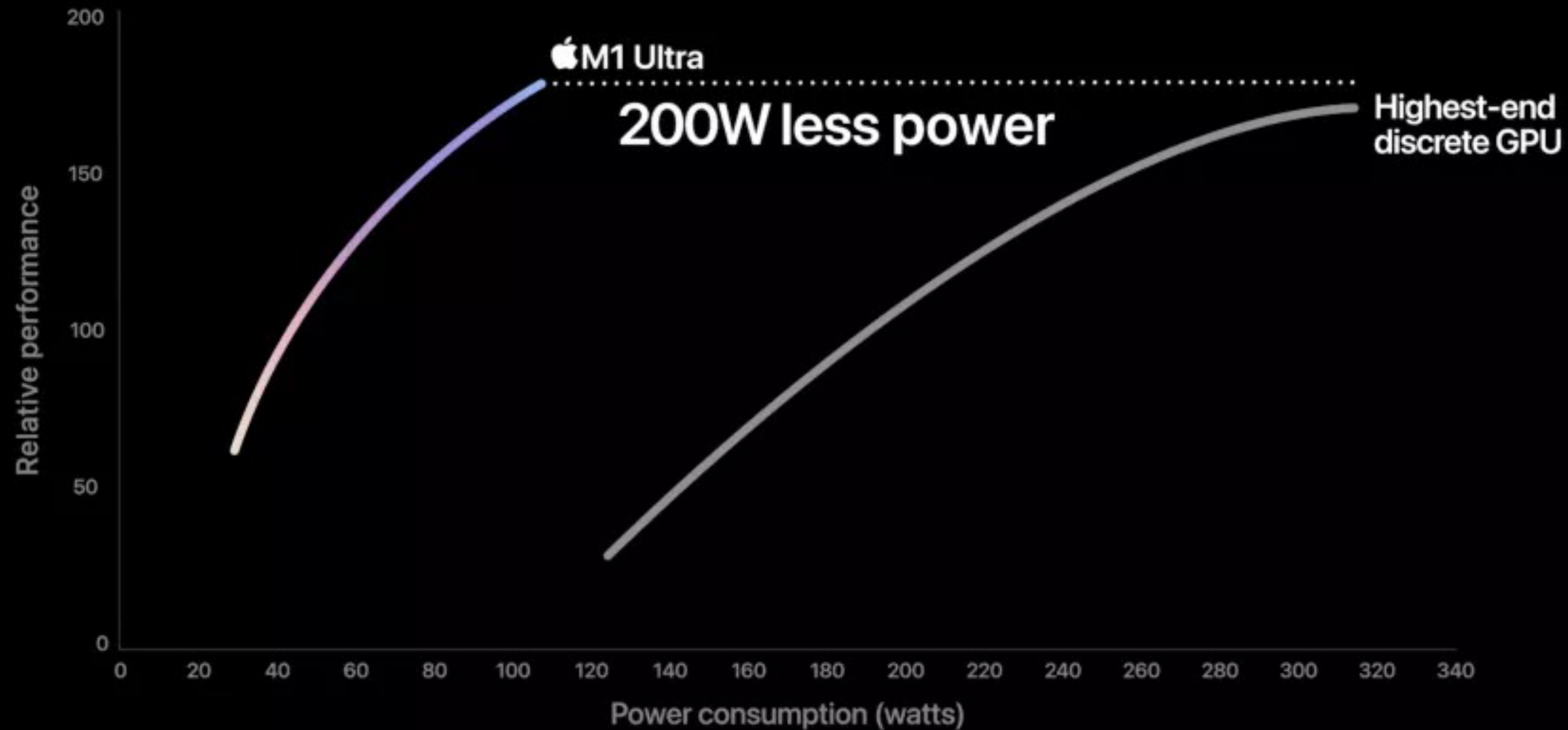
# M1 Ultra vs Intel CPU Comparison

## CPU performance vs. power



# M1 Ultra vs GPU Comparison

## GPU performance vs. power



# Mac Studio

- <https://www.apple.com/mac-studio/specs/>



# New Studio Display Monitor

- 27-inch (diagonal) 5K Retina display
- 5120-by-2880 resolution at 218 pixels per inch
- 600 nits brightness
- Support for 1 billion colors
- Wide color (P3)
- True Tone technology

# New Studio Display Monitor

- Camera: 12MP Ultra Wide with Center Stage
- One Thunderbolt 3 (USB-C compatible) port
- Three USB-C ports
- Six speaker system with force canceling woofers
- Wide Stereo sound with Spatial Audio support
- Studio quality three-microphone array
- Costs more than most 27" monitors, but has more that are not included on others.

# WWDC Announcement, June 2022

- Apple M2 chip
- New MacBook Air
- New MacBook Pro 13”
- MacOS Ventura
- iOS 16

# MacBook Air & MacBook Pro 13" M2

MacBook Air (M1, 2020) ▾

MacBook Air (M2, 2022) ▾

MacBook Pro 13-in. (M2, 2022) ▾

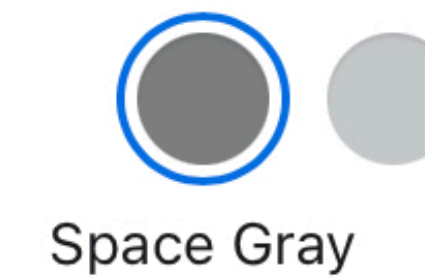
- <https://www.apple.com/mac/compare/>



From \$999



From \$1199



From \$1299



# MacOS Ventura

- 2017 iMac and later;
- 2017 iMac Pro and later;
- 2018 MacBook Air and later;
- 2017 MacBook Pro and later;
- 2019 Mac Pro and later;
- 2018 Mac mini and later;
- 2017 MacBook and later;
- 2022 Mac Studio

# iOS 16 iPhone & iPadOS 16 iPad support

- iPhone 8 and 8 Plus
- iPhone X
- iPhone XS and XS Max
- iPhone XR
- iPhone 11
- iPhone 11 Pro and Pro Max
- iPhone 12 and 12 mini
- iPhone 12 Pro and Pro Max
- iPhone 13 and 13 mini
- iPhone 13 Pro and Pro Max
- iPhone SE (2nd and 3rd gen)

# iPadOS 16 support tablets

- iPad (5th generation)
- iPad (6th generation)
- iPad (7th generation)
- iPad (8th generation)
- iPad (9th generation)
- iPad mini (5th generation)
- iPad mini (6th generation)
- iPad Air (3rd generation)
- iPad Air (4th generation)
- iPad Air (5th generation)
- iPad Pro 9.7-inch
- iPad Pro 10.5-inch
- iPad Pro 11-inch
- iPad Pro 11-inch (2nd generation)
- iPad Pro 11-inch (3rd generation)
- iPad Pro 12.9-inch
- iPad Pro 12.9-inch (2nd generation)
- iPad Pro 12.9-inch (3rd generation)
- iPad Pro 12.9-inch (4th generation)
- iPad Pro 12.9-inch (5th generation)



