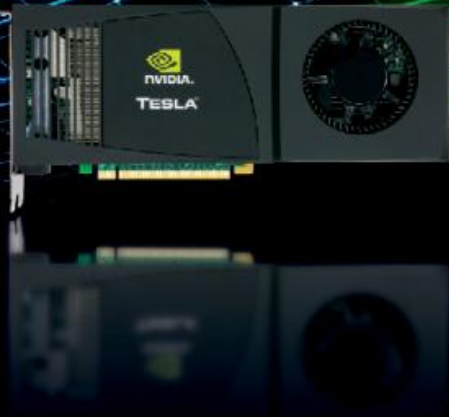


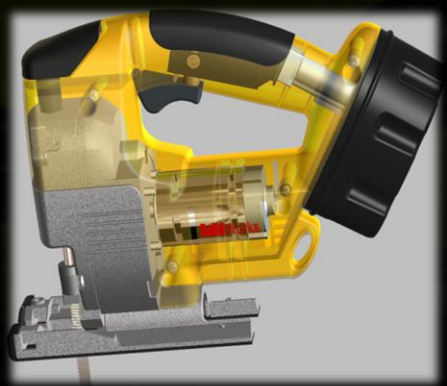
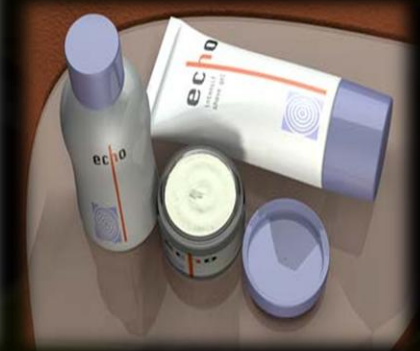


June 30th 2009



Tesla: Fastest Processor Adoption in HPC History

Jen-Hsun Huang
Co-founder, President and CEO of NVIDIA



1995

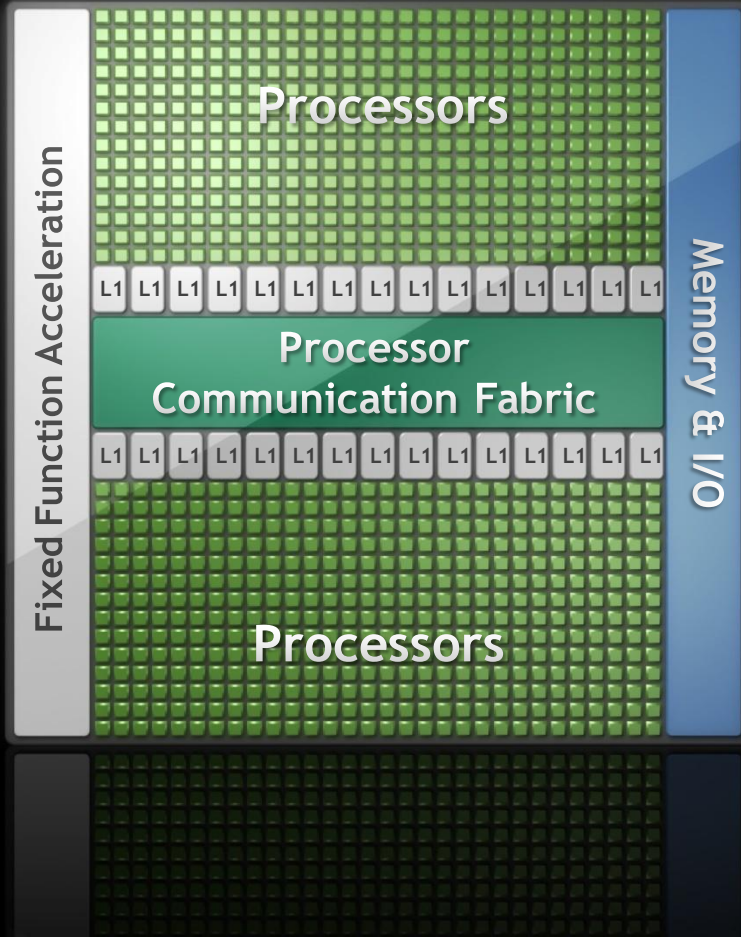
5,000 triangles/second
800,000 transistors GPU





2008

350 Million triangles/second
1.4 Billion transistors GPU



GPU for Computing

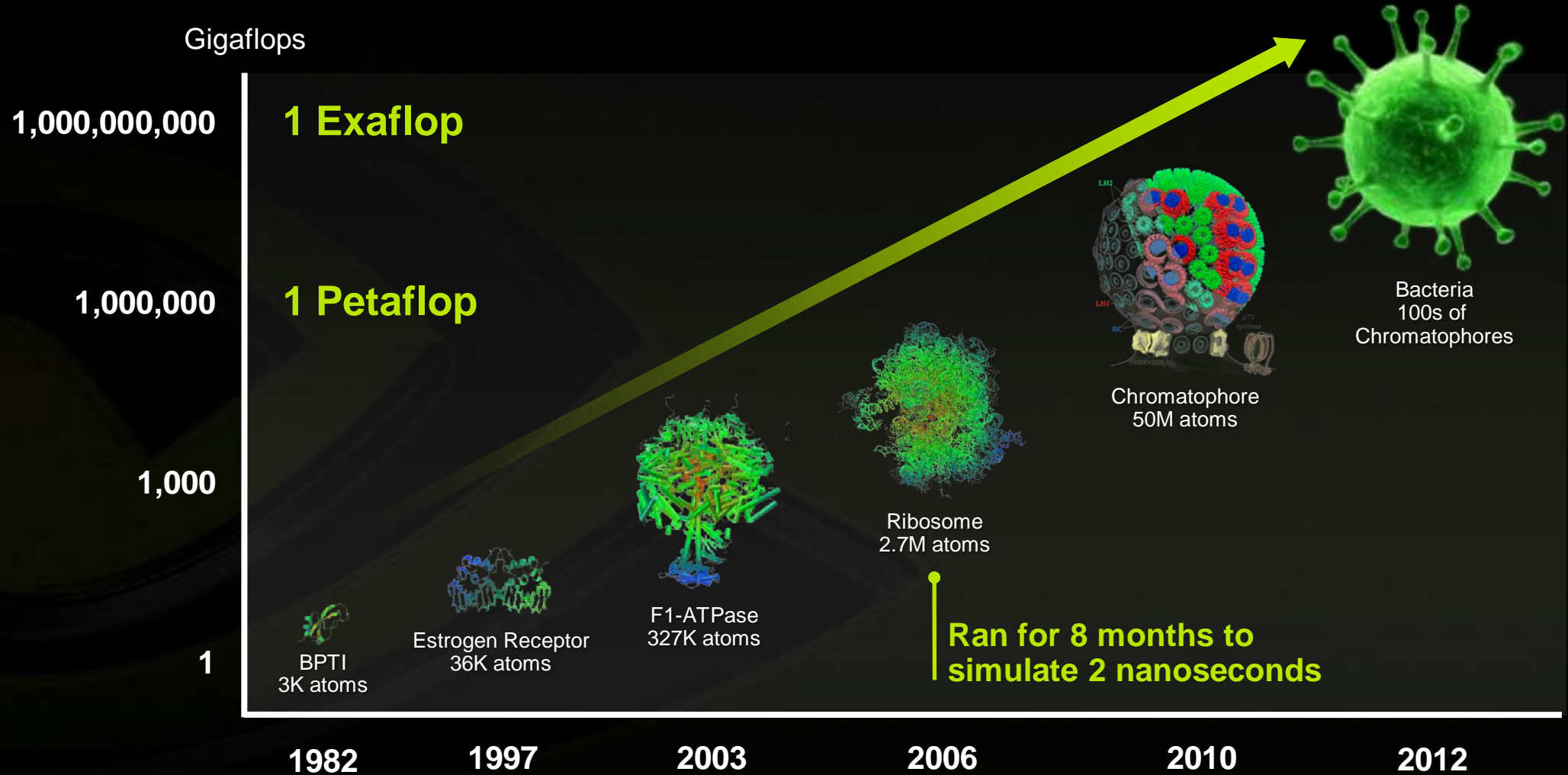
Massively parallel, throughput architecture

240 Processor Cores

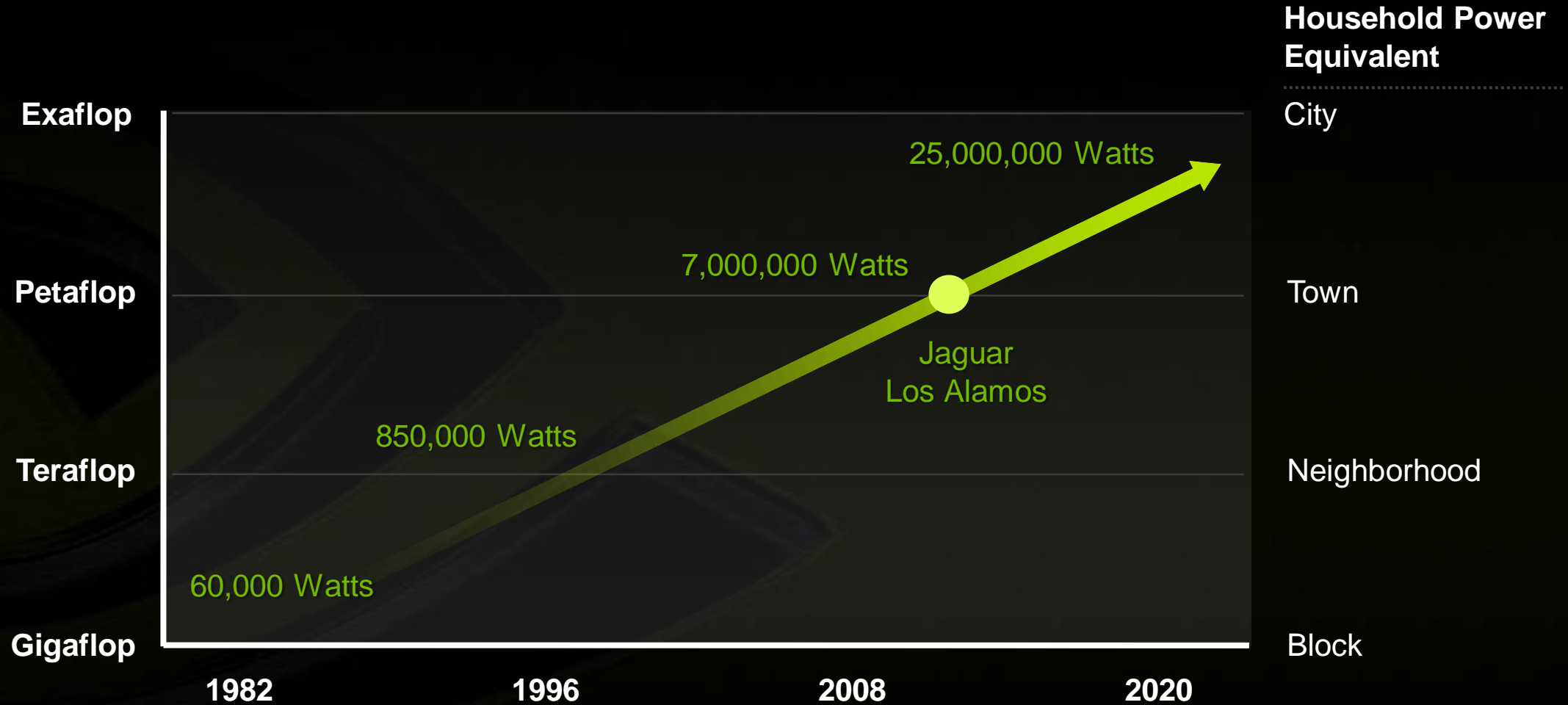
1 Teraflops - 1,000 times Cray X-MP

IEEE Compliant Double Precision Floating Point

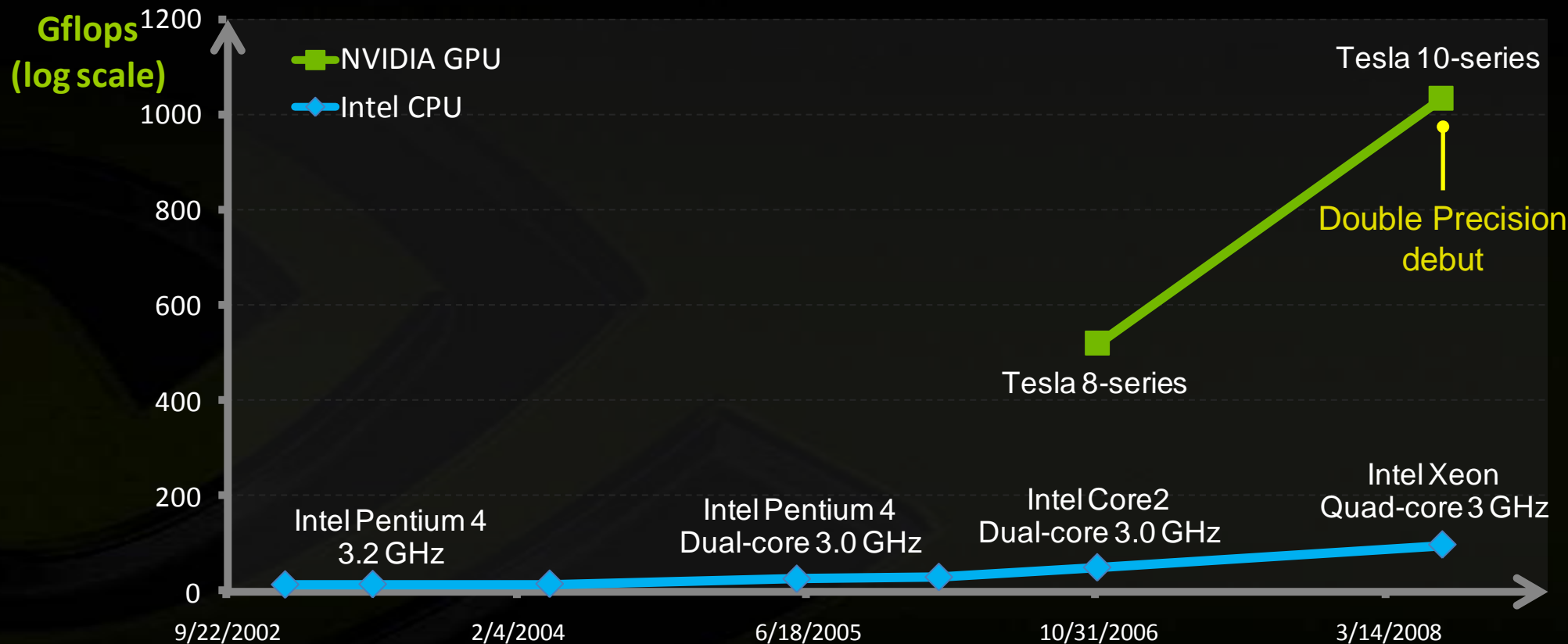
Science in Desperate for Computing Throughput



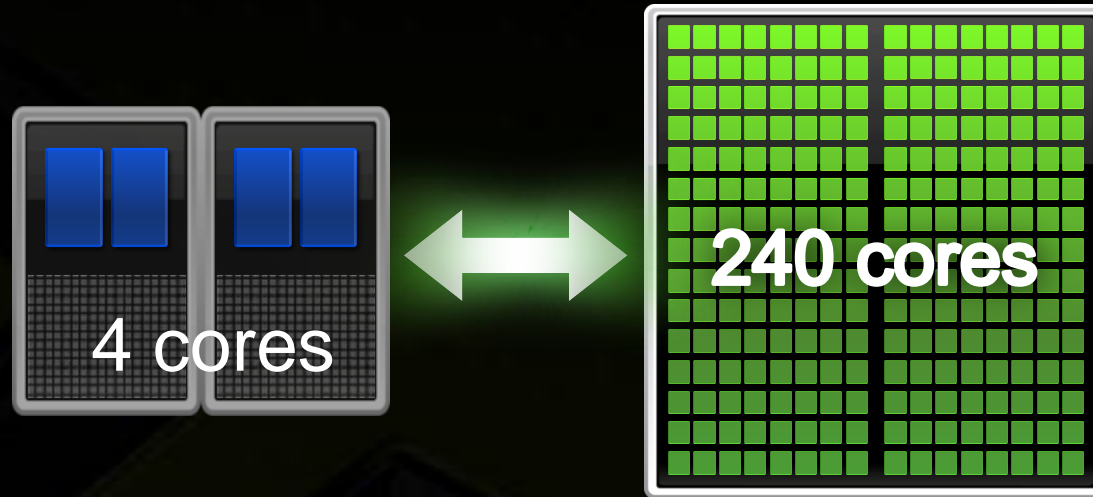
Power Crisis in Supercomputing



The GPU Computing Discontinuity

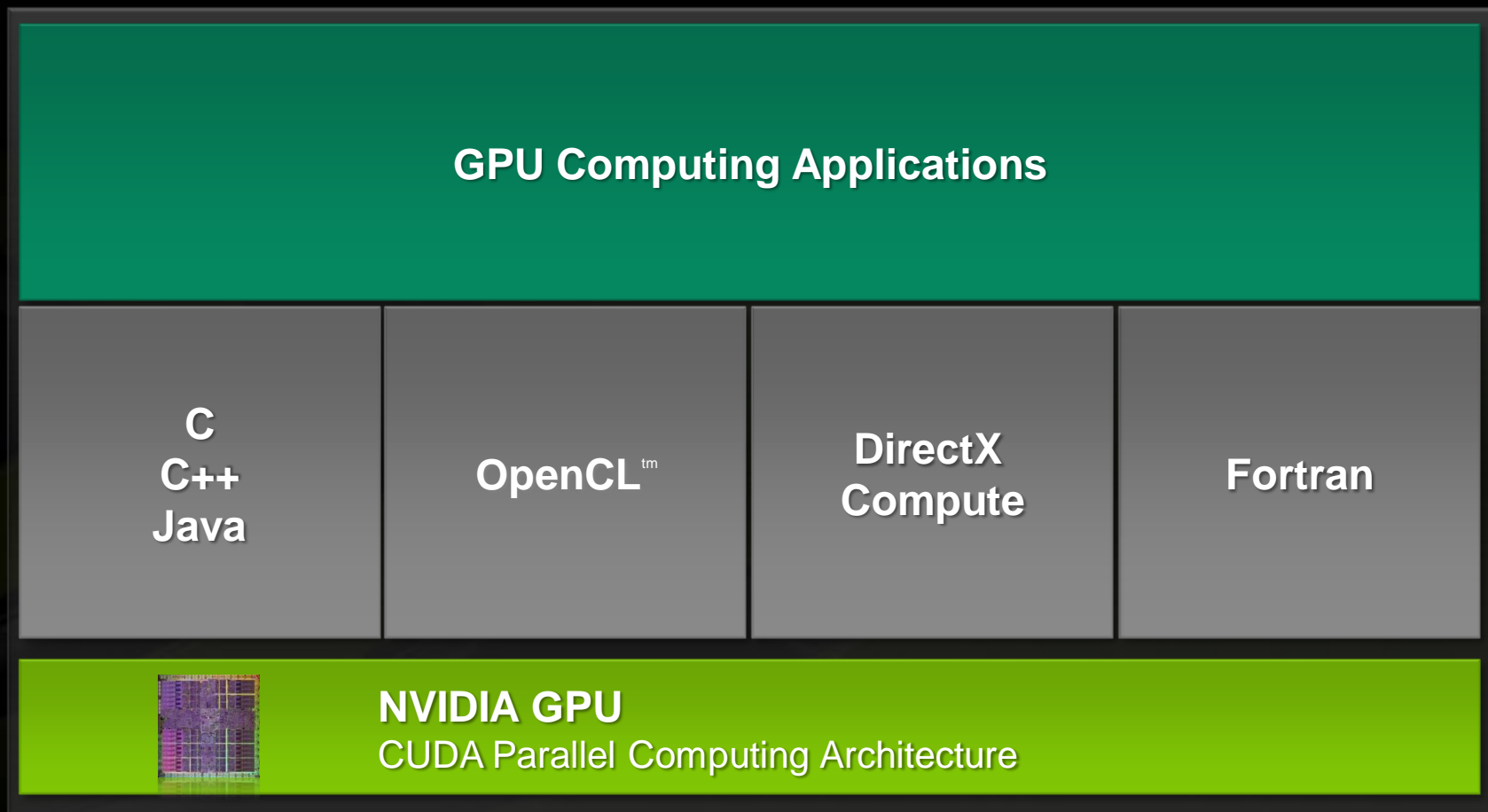


Advent of GPU Computing



CPU + GPU Co-Processing

CUDA GPU Computing Architecture



CUDA Ecosystem



Over 200 Universities Teaching CUDA

UIUC
MIT
Harvard
Berkeley
Cambridge
Oxford
...

IIT Delhi
Dortmundt
ETH Zurich
Uni. Perpignan
Ecole Centrale
Paris 6 Jussieu
...

Languages

C, C++
DirectX
Fortran
Java
OpenCL
Python

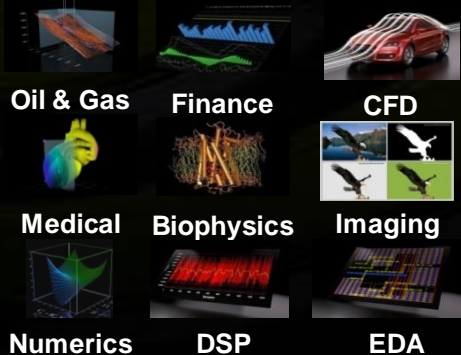
Compilers

PGI Fortran
CAPS HMPP
MCUDA
MPI
NOAA Fortran2C
OpenMP

Debuggers

Alinea
TotalView

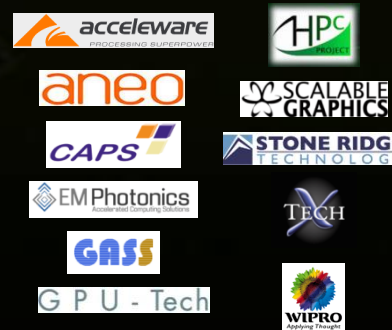
Applications



Libraries

FFT
BLAS
LAPACK
Image processing
Video processing
Signal processing
Vision

Consultants



OEMs



Tesla GPU Computing Products



Tesla S1070
1U System



Tesla C1060
Computing Board



GPUs

4 Tesla GPUs

1 Tesla GPU

Single Precision
Performance

4.14 Teraflops

933 Gigaflops

Double Precision
Performance

346 Gigaflops

78 Gigaflops

Memory

16 GB (4 GB / GPU)

4 GB

Performance

10,000x

**Tesla
Co-processing
Cluster**



**Tesla
Personal
Supercomputer**



100x

**Traditional
CPU Cluster**



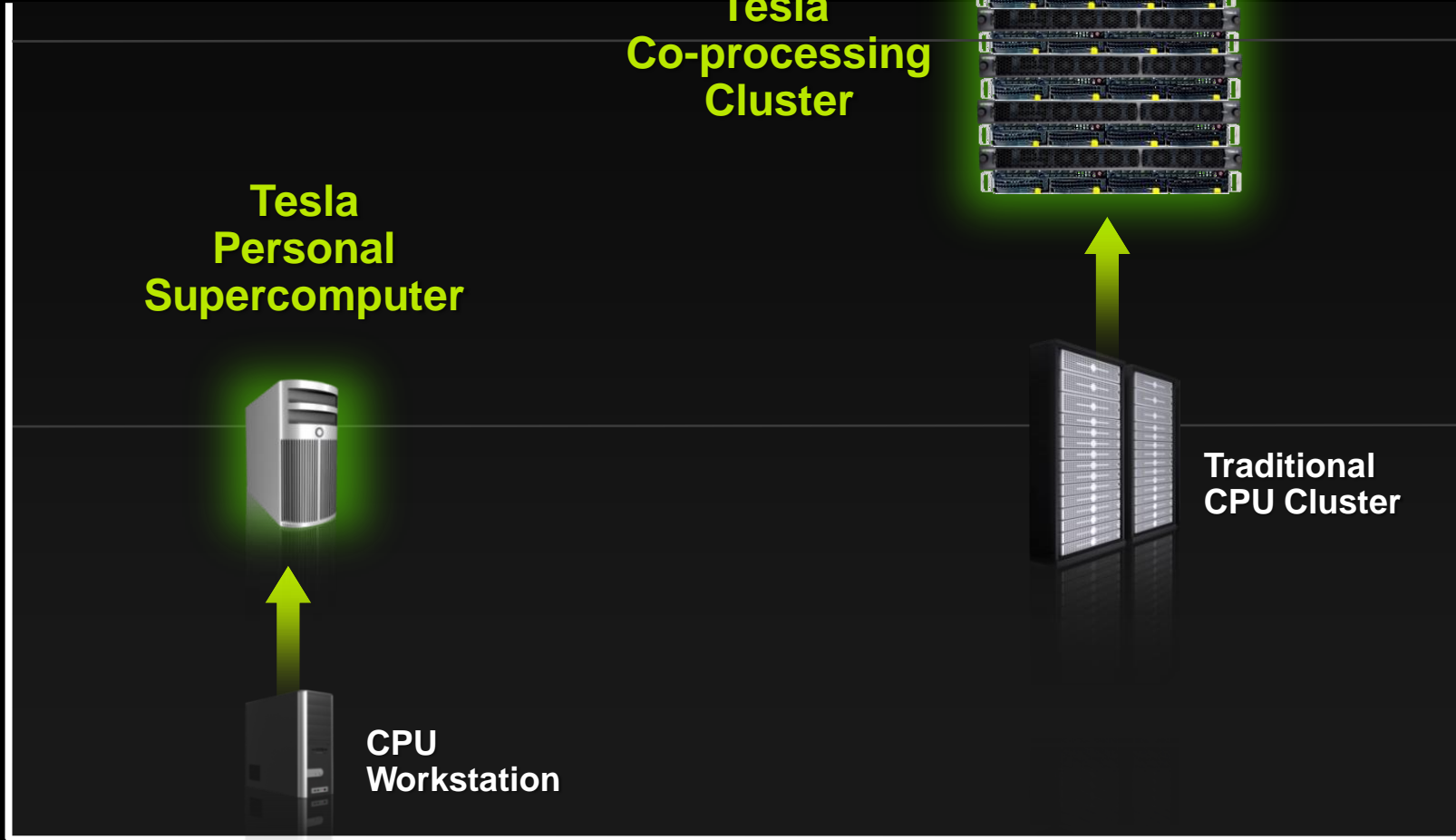
**CPU
Workstation**



1x

K\$

M\$



New Class of Co-Processing Supercomputers

2 Tesla
M1060 GPUs



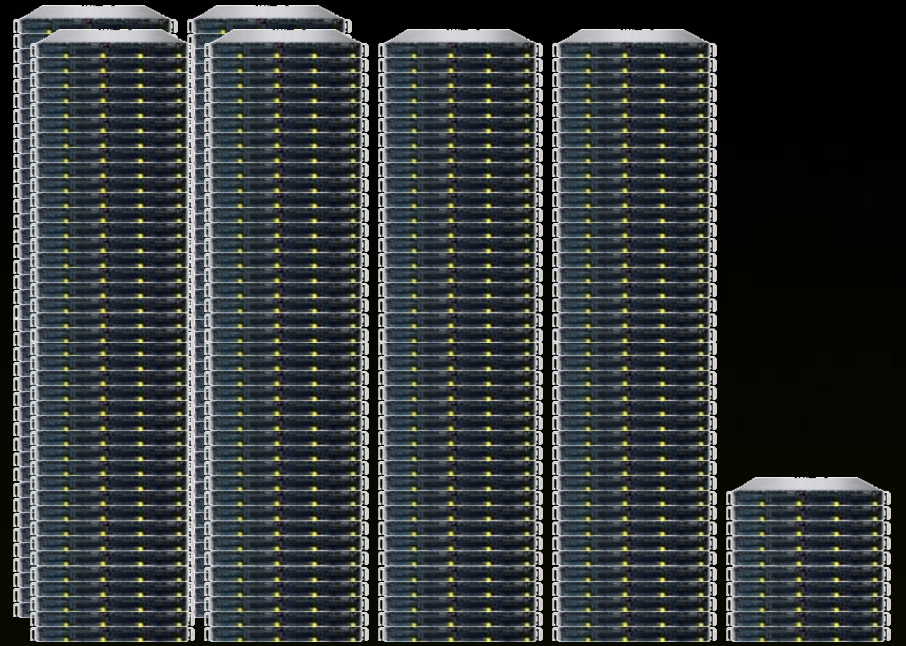
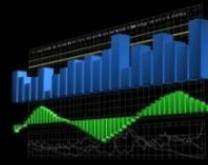
SuperMicro 1U
GPU Server

Up to 18 Tesla
M1060 GPUs



Bull Bullx
Blade Enclosure

Finance: Equity Pricing



1

Equal Performance

1

2 Tesla S1070

16x Less Space

500 CPU Servers

\$24 K

10x Lower Cost

\$250 K

2.8 kWatts

13x Lower Power

37.5 kWatts

Oil & Gas: Seismic Processing



1

32 Tesla S1070

~\$400 K

45 kWatts

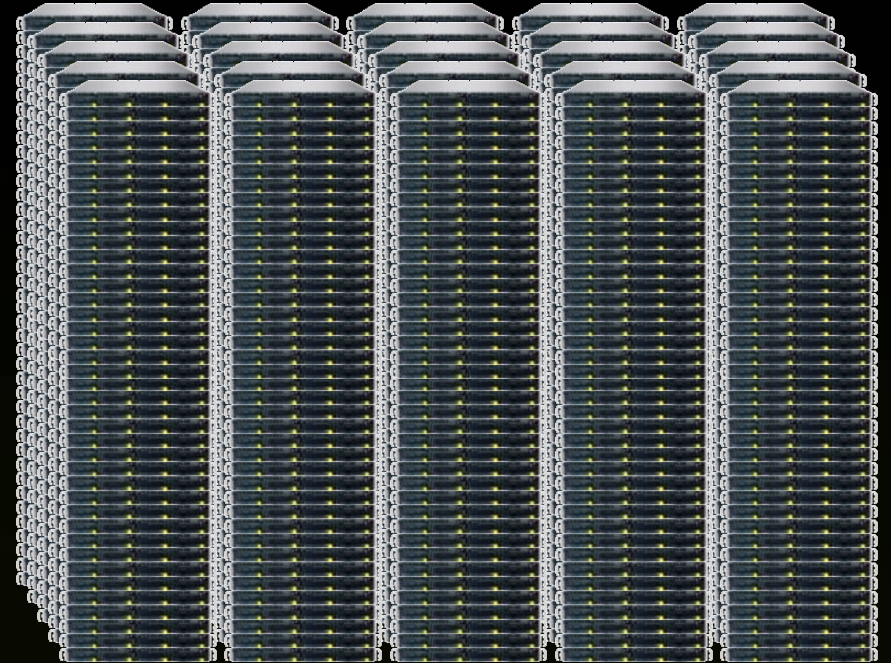


Equal Performance

31x Less Space

20x Lower Cost

27x Lower Power



1

2,000 CPU Servers

~\$8 M

1,200 kWatts



CEA-DAM CCRT

- 192 TFlops GPU



TOTAL Seismic Processing

- 256 TFlops GPU

Tesla: Helping solve the critical HPC challenges

GPU Revolutionizing Computing

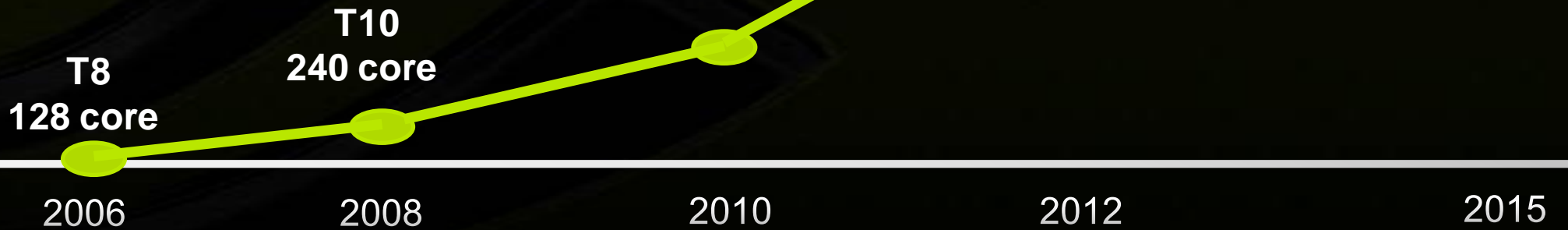


GFlops

A 2015 GPU *

- ~20x the performance of today's GPU
- ~5,000 cores at ~3GHz (50mW each)
- ~20 TFLOPS
- ~1.2TB/s of memory bandwidth

GPU



* This is a sketch of a what a GPU in 2015 might look like, it does not reflect any actual product plans

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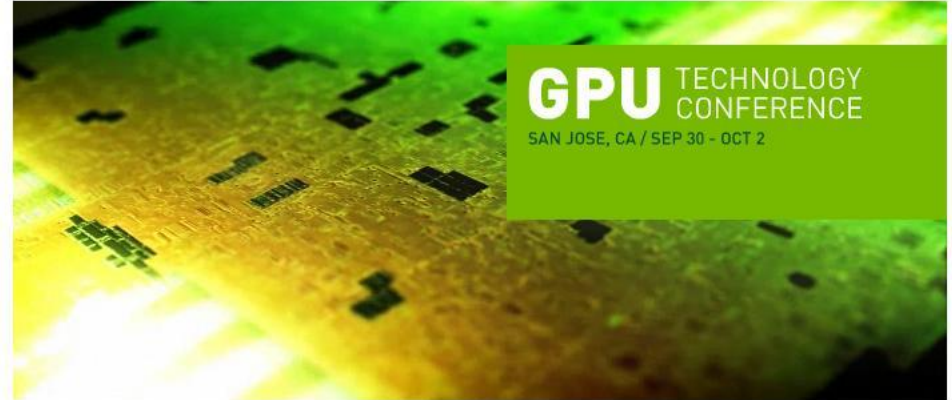
– 5/26/09

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– 5/12/09

[NVIDIA CUDA Toolkit 2.2 Released](#)

– 5/1/09



EMERGING COMPANIES SUMMIT



For Entrepreneurs and Venture Capitalists

GPU DEVELOPERS SUMMIT



For Developers and Programmers

NVIDIA RESEARCH SUMMIT



For Researchers and Academics

GPU Technology Conference

Sept 30 – Oct 2, 2009

San Jose, CA

www.nvidia.com/gtc

The GPU Technology Conference is the most significant event in 2009 dedicated to application development on the GPU. Encompassing three simultaneous summits, this event will focus on the latest breakthroughs developers, engineers, and researchers are achieving through the use of the graphics processing unit (GPU) to solve the world's most important computing challenges.

Thank You!





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[NVIDIA High Performance Computing Solutions](#)

[NVIDIA Tesla S1070 – Product Description](#)

[NVIDIA Tesla C1060 – Product Description](#)

[Tesla Personal Supercomputer](#)

[Tesla Personal Supercomputer – Where to Buy?](#)

[YouTube – Tesla videos](#)

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