



GPU COMPUTING OVERVIEW

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CALL OF DUTY®
MODERN
WARFARE®

OCTOBER 25

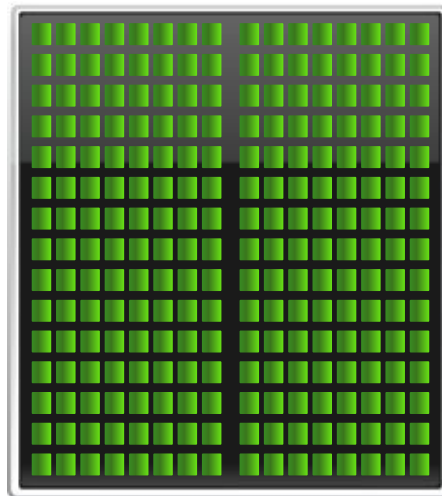


Add GPUs: Accelerate Science Applications

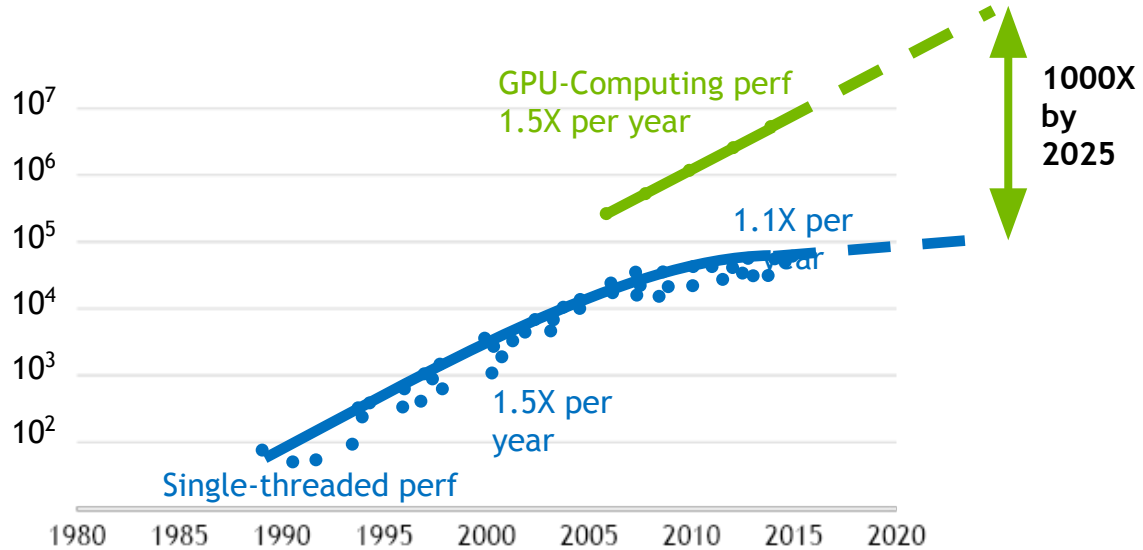
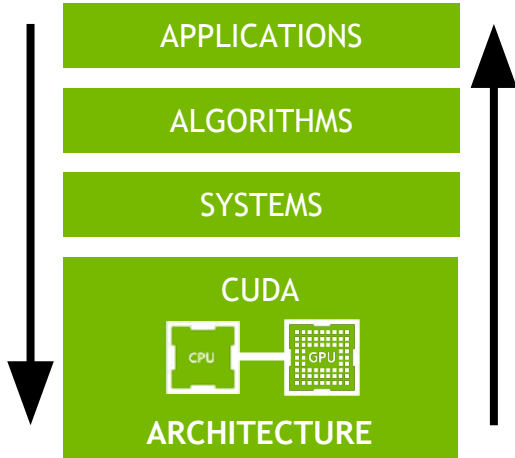
CPU



GPU

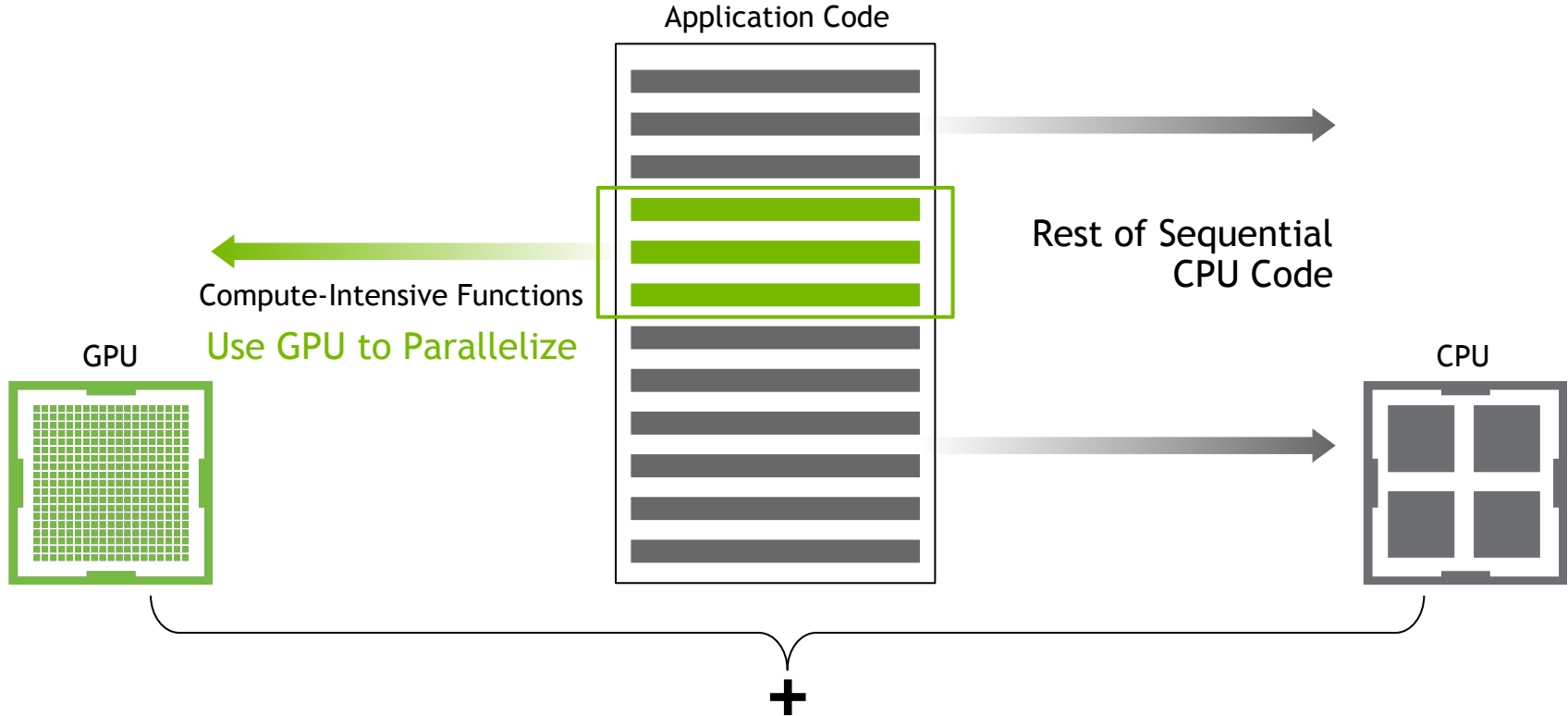


RISE OF GPU COMPUTING



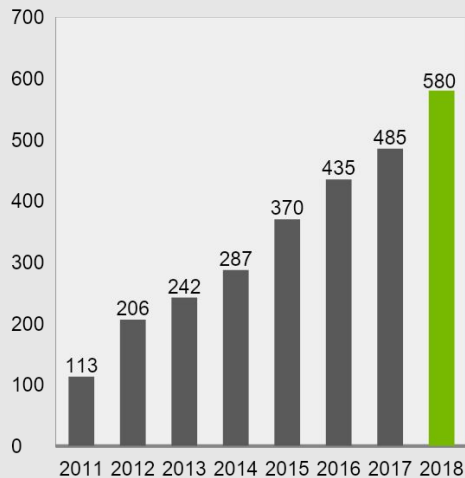
Original data up to the year 2010 collected and plotted by M. Horowitz, F. Labonte, O. Shacham, K. Olukotun, L. Hammond, and C. Batten New plot and data collected for 2010-2015 by K. Rupp

SMALL CHANGES, BIG SPEED-UP

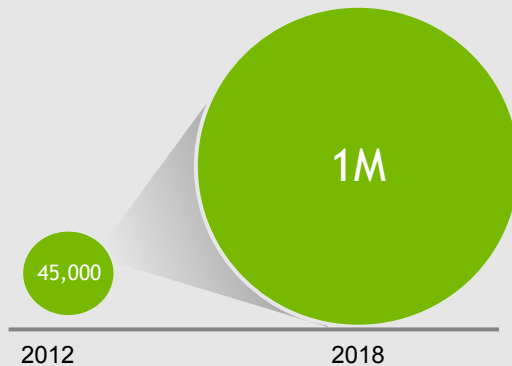


ACCELERATED COMPUTING IS GROWING RAPIDLY

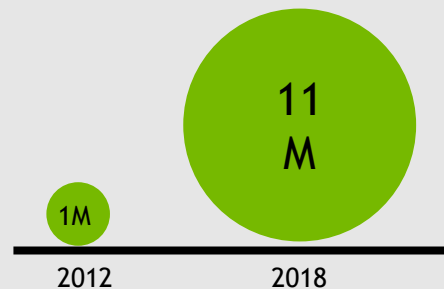
580 Applications Accelerated



22x GPU Developers



11x CUDA Downloads



CUDA POWERS ACCELERATED COMPUTING



**DL FRAMEWORKS AND HPC
APPLICATIONS ACCELERATED**

Googlenet Training Performance Vs K80



Over 80x in 3 Years

127 Systems on Top 500



World's **#1** Summit: 144 PF

World's **#2** Sierra: 95 PF

Europe's **#1** Piz Daint: 21 PF

Japan's **#1** ABCI: 20 PF

Industrial **#1** ENI: 12 PF

**DEFINING THE NEXT GIANT
WAVE IN HPC**

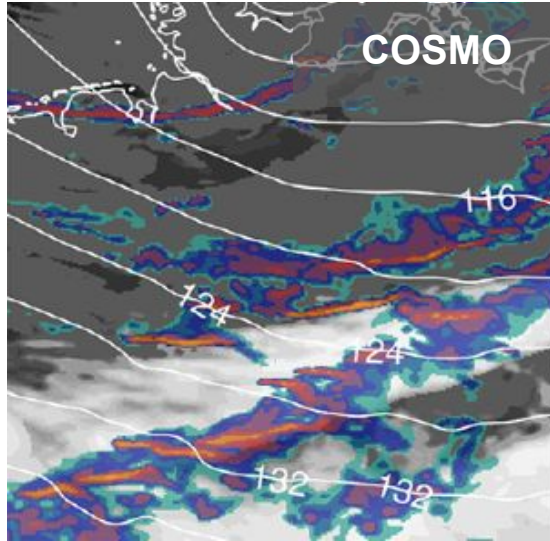
GRAND CHALLENGES REQUIRE MASSIVE COMPUTING



LAMMPS

**REINVENTING THE LI-ION
BATTERY**

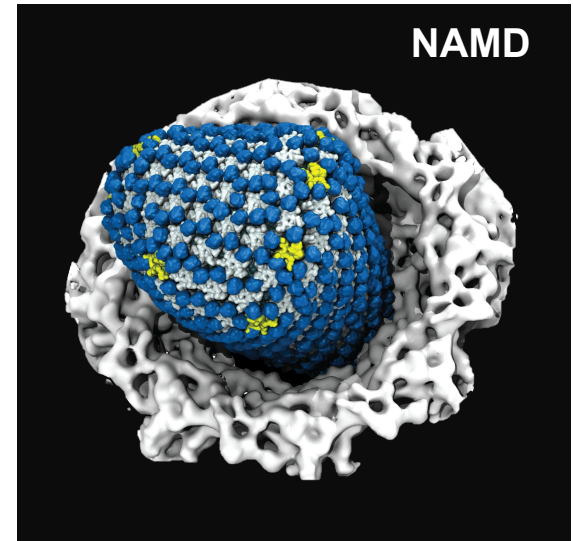
3M Node Hours | 7 Days on Titan



COSMO

**CLOUD RESOLVING CLIMATE
SIMULATIONS**

100M Node Hours | 840 Days on Piz
Daint



NAMD

**UNDERSTANDING HIV'S
STRUCTURE**

10M node Hours | 16 Days on BlueWaters

Parallel Processing Demo

