*SUPER*computers: past, present & future

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In the **'70's**, NASA's top Supercomputer achieved 0.2 Million FLoating Point Operations/Sec (MFLOPS) to solve science problems. Since then:

1989: Olaf's NASA team exceeded 10^3 MFLOPS, receiving Cray's 1st GigaFLOP Performance Award for their Space Shuttle structural analysis.

1998: ORNL team exceeded 10^6 MFLOPS (TFLOPS) on NASA's CrayT3E.

2008: ORNL's Jaguar Cray supercomputer reached 10^9 MFLOPS (PFLOPS).
2015: ORNL's Titan Cray is the fastest US Supercomputer @ 26 PFLOPS.
2017: ORNL's Summit IBM may reach 200+ PFLOPS, 1 trillion times the speed of NASA's '70's Supercomputer.

With theory and experiment, Supercomputers are DOE's 3rd leg for scientific discovery. Experiments are costly and slow, so significant discoveries now rely on supercomputers, with GPU or FPGA accelerators performing ~90% of computations and traditional CPUs "directing traffic" to distribute computations.

Dr Storaasli will describe past, present and future Supercomputers and applications they solve. Based on his NASA and ORNL research, he'll project the future (ExaFLOP): architecture, software and performance enabling breakthrough scientific discoveries and "trickle down" spinoff to servers, PCs & laptops.

About Olaf Storaasli

Olaf, NASA's Finite-Element Machine developer, Supercomputer Pioneer and author of novel computation algorithms (i.e. GPS*) for current & future HPC systems harnessing accelerators (FPGAs & GPUs) to enable science discovery (i.e. rapid solution of large matrix systems). Olaf earned his Engineering Ph.D. from NCSU and held postdoc Fellowships at NTNU & Edinburgh University.

* NASA Software of the year Award