

GPU Supercomputing Accelerates China's Solar Energy Research

Researchers at CAS-IPE Run Record-Breaking Scientific Simulation on World's Fastest Supercomputer

SANTA CLARA, CA -- Chinese researchers have run the world's highest performing molecular simulation to examine improved techniques for more efficient production and use of [crystalline silicon](#), a key material used in solar panels and the semiconductor industry. Researchers at the Chinese Academy of Sciences' Institute of Process Engineering (CAS-IPE) used Tianhe-1A, the world's fastest supercomputer, to perform a simulation on NVIDIA® Tesla™ GPUs that was five times the performance and more than twice the size of the previous highest-performing molecular simulation. The simulation modeled the behavior of 110 billion atoms at an unprecedented 1.87 petaflops of performance. The previous record for a simulation of this kind was 49 billion atoms at 369 teraflops of performance.

"Computer simulations are critical to the study of new materials and production methods as it can reveal far more details than experimental measurements, at much less cost," said Dr. Wenlai Huang, research associate at CAS-IPE. "The levels of performance we achieved by using all 7,168 NVIDIA GPUs in the Tianhe-1A supercomputer enabled us to run simulations that come closer than ever to reproducing the behavior of the material in different aspects and its true bulk properties under different conditions, which are more meaningful for engineering and industrial purposes."

Tianhe-1A, located at the National Supercomputing Center in Tianjin, China, was named the world's fastest supercomputer in November 2010 by the [Top 500](#) organization, the first time the title was given to a Chinese supercomputing center. In addition to the CAS-IPE led research, it is being used to explore the areas of oil exploration, drug discovery and weather modeling.

CAS-IPE research in this field is ongoing and new world records in the sustainable performance of molecular dynamics simulations are expected by the institute. Members of the CAS-IPE research team will present this research at the upcoming GPU Tech Conference (GTC) in San Jose, CA, May 14-17, 2012, and at GTC China taking place December 15-16, 2011 in Beijing.

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¹ Source: <http://onlinelibrary.wiley.com/doi/10.1002/cpe.1483/abstract>

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Media Contacts

Hector Martinez

+1 408 486 3443

hmartinez@nvidia.com

Andrew Humber

(408) 486-8138

ahumber@nvidia.com