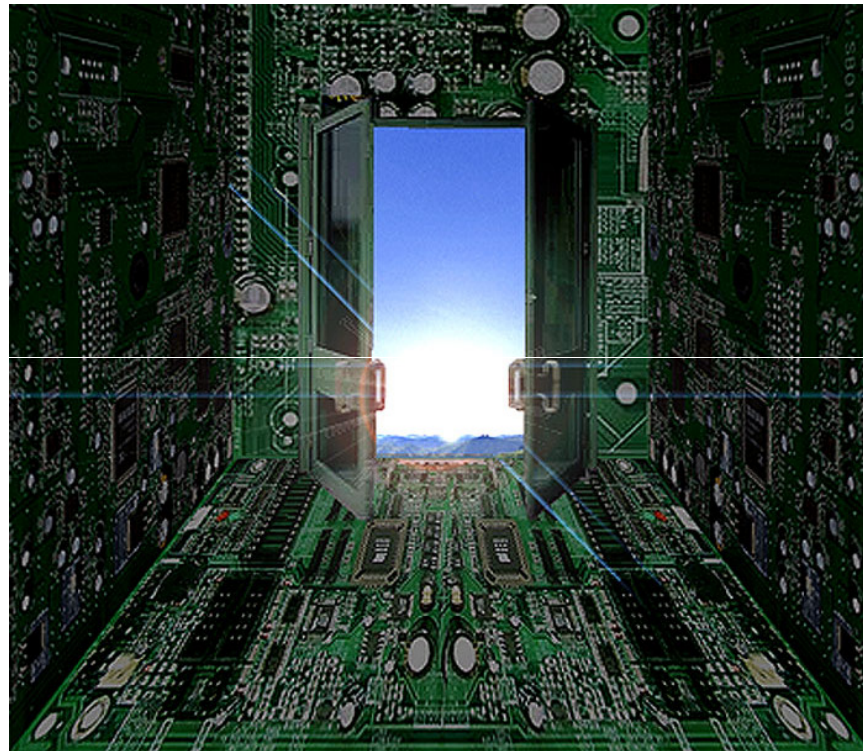# The Race to Petascale Competitiveness
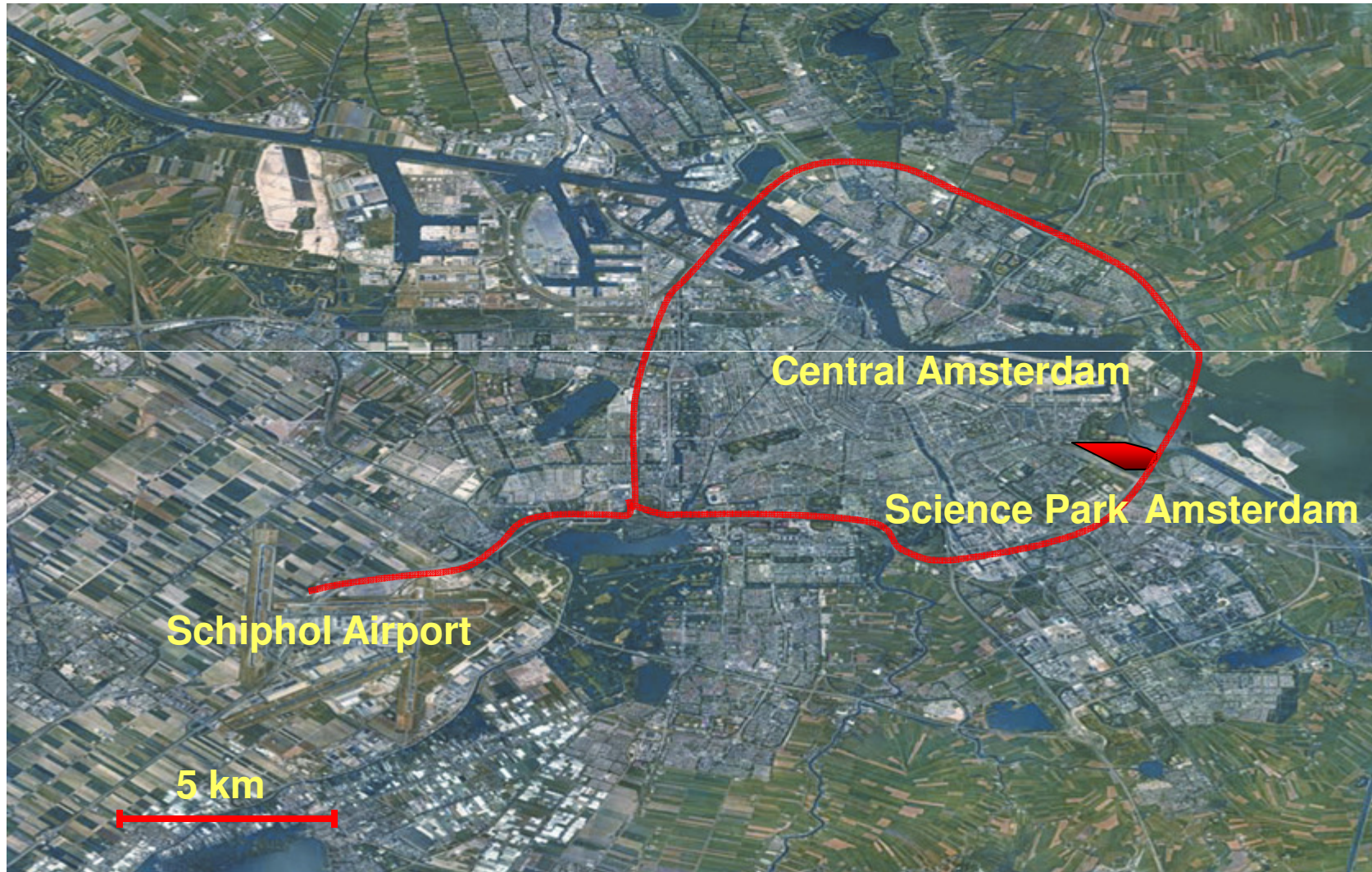
Anwar Osseyran
Managing Director SARA
11 October 2010

Welcome to the
Science Park Amsterdam

Central Amsterdam

Science Park Amsterdam

Schiphol Airport

5 km

Science Park Amsterdam
a world of science in a city of inspiration

- Faculty of Science of the "Universiteit van Amsterdam"
- National Institute for Particle and High Energy Physics (NIKHEF)
- Institute for Atomic and Molecular Physics (AMOLF)
- National Research Institute for Mathematics and Computer Science (CWI)
- SARA Computing and Networking Services
- AMSterdam Internet eXchange (AMS-IX)
- Matrix Innovation Center, with 80+ innovative companies in life sciences, ICT and other areas

SARA's Mission: Support Innovation

SARA Foundation is an independent (hybrid) organization with ~140 fte's in 2 locations (Amsterdam and Almere)

The mission of SARA is 2-fold:

1. Supporting research in the Netherlands by providing high-end Providing not-for-profit ICT services to geographically dispersed education and research communities [SARA for Science & Innovation]

2. Offering commercial high-end commodity ICT services based on the expertise built in the high-end activities [Vancis for adVANCed Ict Services]

Amsterdam

Almere

The Race to Petascale Computing

The Japanese Kei Starts to Ship

China's 'big hole' marks scale of supercomputing race

COMPUTERWORLD   🖶 Print Article   ☒ Close Window

China's 'big hole' marks scale of supercomputing race
1,000 U.S. scientists are involved in exascale development, but China and Europe have stepped up their investment, IBM warns

Patrick Thibodeau

September 24, 2010 (Computerworld)

WASHINGTON -- To make a point about China's interest in supercomputing, David Turek, IBM's vice president of deep computing, displayed a slide with a picture depicting a large construction site for a building that will house a massive computer.

Speaking at an IEEE-USA forum here on Thursday, Turek pointed to a photo (below) of a supercomputing center being built in Shenzhen, China, and said, "That's a truck -- that's a big truck, that's a big hole, and that's going to be a big building. And that's only the first building they are going to build there."

Under construction: China's massive new supercomputing center site in Shenzhen.

Why the race to Petascale Computing?

- *"HPC has become a competitive weapon – global competitiveness is driving R&D.*

- *Governments view HPC leadership as critical – national pride and economic prosperity.*

- *There are critical issues that need HPC to be solved – global warming, alternative energy, national security, etc.*

- *"Live" science and "live" engineering – time to solution is months faster with simulations"*

"HPCWire, June 2010"

Council on Competitiveness
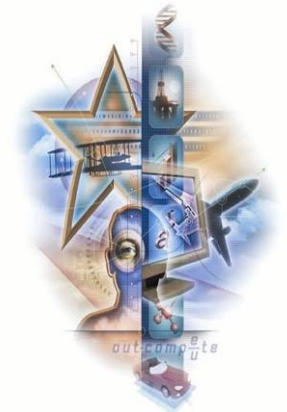
"Out-compute to Out-compete"
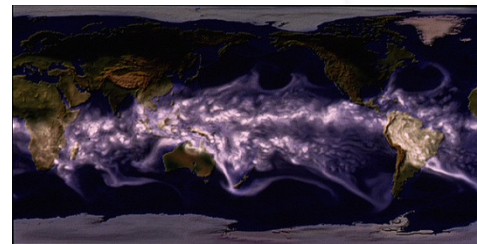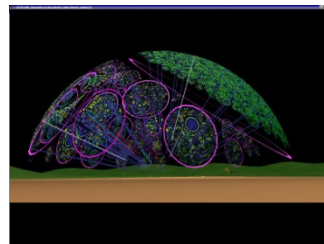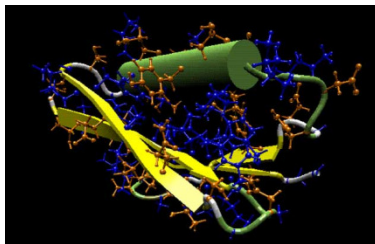
Competitive Advantage
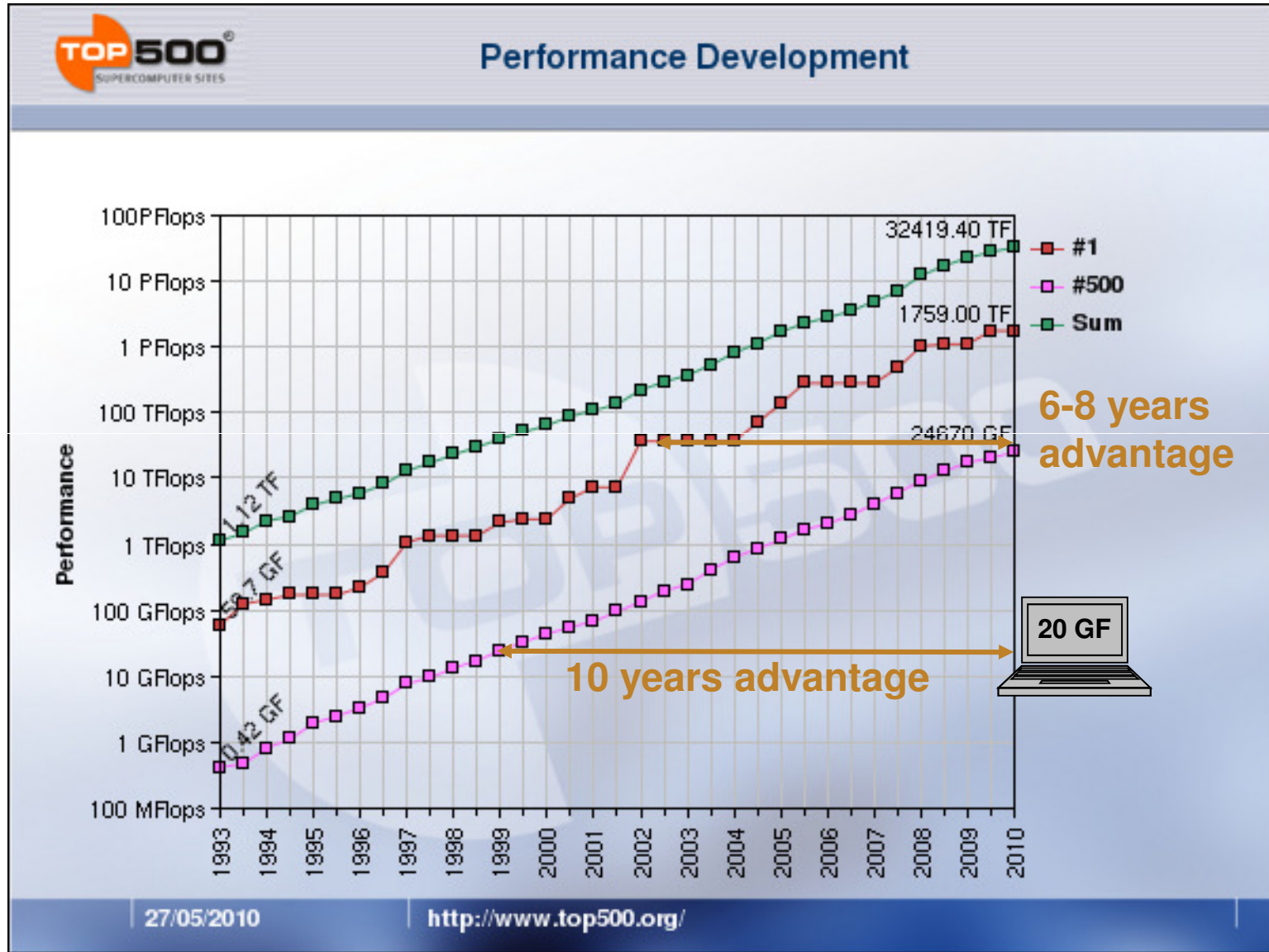
HPC for creating jobs and revitalizing U.S. manufacturing

The Opportunity

- *"Nearly 300,000 small and medium sized manufacturers exist in the U.S.*

- *HPC modeling and simulation capabilities are a key American asset.*

- *Advanced computational methods provide a competitive advantage for SMMs."*

NCMS September 2010
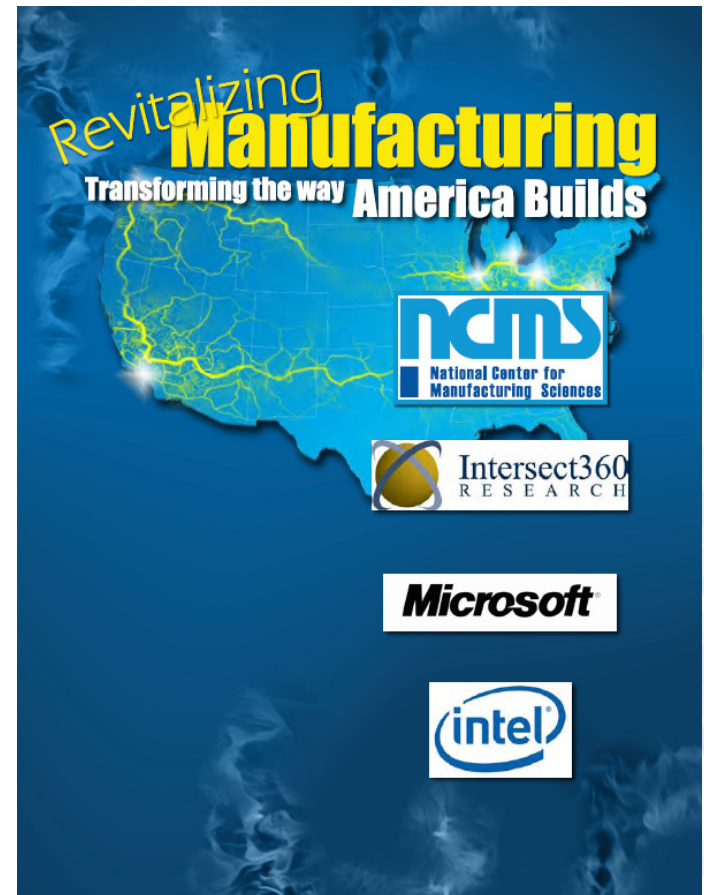
10 Everyday Products Designed by Supercomputers

Bloomberg Businessweek

SPECIAL REPORT   October 5, 2010, 12:19AM EST   text size: T | T

insideHPC > HPC > 10 Everyday Products Designed by Supercomputers

10 Everyday Products Designed by Supercomputers

10.8.2010

Like 5   In many ways, what was once considered HPC is now being used to design and optimize everyday products. Bloomberg Businessweek ran an interesting slide show this week showcasing 10 products designed by Supercomputers. They require you to click through each item to get the details, so we've compiled the list of stories for our readers.

- Whirlpool Appliances. Whirlpool uses thermal simulations to make its appliances more energy-efficient.
- Speedo Olympic Swimsuits. Designed with the supercomputings running Ansys software, the Speedo swimsuit worn by Michael Phelps helped Phelps shave precious time off his laps, says Tom Waller, head of Speedo's research and development facility, Aqualab. Phelps went on to win eight gold medals in the 2008 Olympics.
- Renault Formula One Car. Using CFD simulation-testing on an HP cluster to measure aerodynamics, the ING Renault F1 Team improved car performance with faster lap times.

GENCI, INRIA and OSEO Join Forces to Support SMEs in first-time Access to HPC

L E P r o G r E S T E C H N i Q U E

Inside Excellence *

INFORMATION INTERNATIONALE POUR LE PILOTAGE DE L'ENTREPRISE INDUSTRIELLE

L'essentiel de l'actualité industrielle du moment

GENCI, l'INRIA et OSEO s'associent pour accompagner les PME dans leur premier accès au calcul haute performance
▸ Innovation Lundi 6 Septembre 2010

Initiative HPC-PME, c'est le nom du programme que lancent conjointement GENCI, l'INRIA et OSEO, en partenariat avec quatre pôles mondiaux de compétitivité, pour faciliter et encourager l'accès des PME au calcul haute performance (HPC). Bâti en cohérence avec les recommandations du plan France Numérique 2012, ce programme vise à soutenir et accroître la compétitivité des PME dont les projets d'innovation industrielle peuvent tirer parti de l'utilisation du calcul haute performance. Au cœur du dispositif : un accompagnement dans la durée pour garantir une intégration efficace des capacités de développement offertes par le HPC.

Ouvrir le calcul haute performance aux PME pour soutenir et accroître leur compétitivité

En les accompagnant tout au long de leur première approche du calcul haute performance, le programme aidera les PME, aussi bien du point de vue technique, commercial que financier, à construire un projet d'innovation industrielle. Qu'il s'agisse d'optimiser les performances de leurs technologies ou de préparer les innovations de demain, l'objectif est d'aider les PME à prendre la mesure de l'intérêt économique du HPC au regard de leur modèle de croissance.

Le programme « Initiative HPC-PME » s'appuie sur la complémentarité des compétences de chaque partenaire : GENCI pour un accès accompagné aux ressources de calcul haute performance, l'INRIA pour son expertise scientifique et technologique, OSEO pour sa maîtrise des outils de soutien et de financement de l'innovation.

L'offre comporte quatre volets combinant l'ensemble de ces compétences : formation, expertise, accès aux équipements et intégration dans les dispositifs de financement de l'innovation.

HPC Supernodes: Innovation Hot Spots

- HPC Supernodes will be the centers of large scale research in Europe
- With large concentrations of scientific and industrial user communities
- And European Hard- and Software industries

BusinessWeek

keyword or company
Register | Sign In

HOME   INVESTING   COMPANIES   TECHNOLOGY   INNOVATION   MANAGE

Europe Home   Autos   Companies   Economy   Energy   Innovation   Investing

SPECIAL REPORT   April 28, 2008, 1:52AM EST

Europe's Innovation Hot Spots

Governments are making efforts to propel innovation on t competitive clusters centered around a specific sector

by Jennifer Fishbein

View Slide Show ▶

Europe may be known as the Old World, but these days it deserves credit for much that is new. As the continent continues to be transformed by the expansion of the European Union and rising competition from China and India, it is harnessing its longstanding tradition of creativity to sharpen its economic edge.

Why the need for
HPC Hot Spots in Europe?

- Petaflops machine acts as a Super-magnet for talent and businesses

- Direct interaction with hardware and firmware is necessary for innovation

- "Nothing tends so much to the advancement of knowledge as the application of a new instrument."

  Sir Humphrey Davy
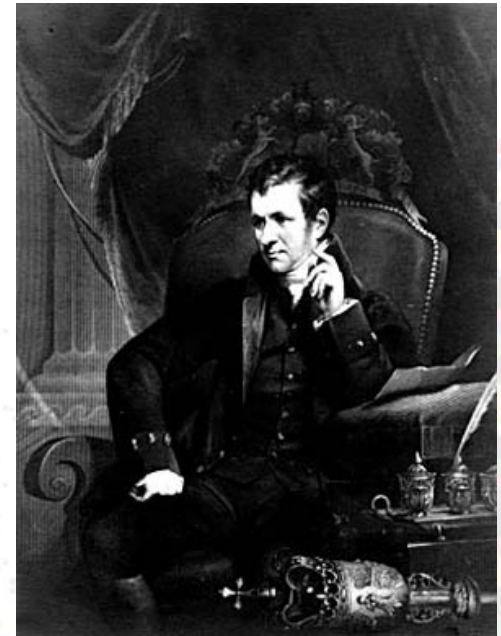
Supercomputers To Attract Researchers

MARINE TECHNOLOGY REPORTER

EMAIL THIS PAGE

KAUST: Supercomputers Attract Researchers

10/22/2008

A new science and technology university in Saudi Arabia will house one of the world's largest supercomputers and it is helping lure top researchers to the conservative desert state, according to a report on Reuters.

The King Abdullah University of Science and Technology (KAUST) is due to open in 2009 near Jeddah.

Inside the campus, male and female students will be able to mingle freely, contrary to strict gender segregation enforced in most of the country. The university is part of a series of reforms by King Abdullah aiming to open the country up.

The Supercomputer, dubbed Shaheen and named after the peregrine falcon, which reaches speeds of over 200 mph, Shaheen is expected to reach 222 teraflops, a measure equaling a trillion floating point operations per second, reportedly making it the sixth most powerful computer in the world.

Shaheen, according to the report, will be able to simulate the Red Sea environment and model oil fields in three dimensions.

(Source: Reuters)

Where to study?

Study in Germany — Gateway for Students and Scientists

rançais   Русский   中文   日本語   عربي   Gl

German supercomputers among ten fastest in the world (07/04/2009)

The two computers, which are both located at the Research Center Juelich, are the first models from Germany to simultaneously be in the top ten fastest supercomputers in the world. The first has been dubbed Europe's fastest computer. Its name is JUGENE and it was ranked third on the list of the Top 500 supercomputers, which was recently published at a supercomputer conference in Hamburg. The other computer from Juelich – JUROPA/HPC-FF – was tenth on the list. According to the Research Center Juelich, that's the first time in the history of the world rankings that two computers from a single European institute have been in the top ten at the same time. Both computers were developed by experts at the Juelich Supercomputing Center with support from partner firms. The computer JUGENE can complete more than one quadrillion computations per second, which is around 50,000 times faster than a modern PC.

Further Information

Juelich Supercomputing Center
www.fz-juelich.de/...

DW Interview with Thomas Lippert, director of the Juelich Supercomputing Center
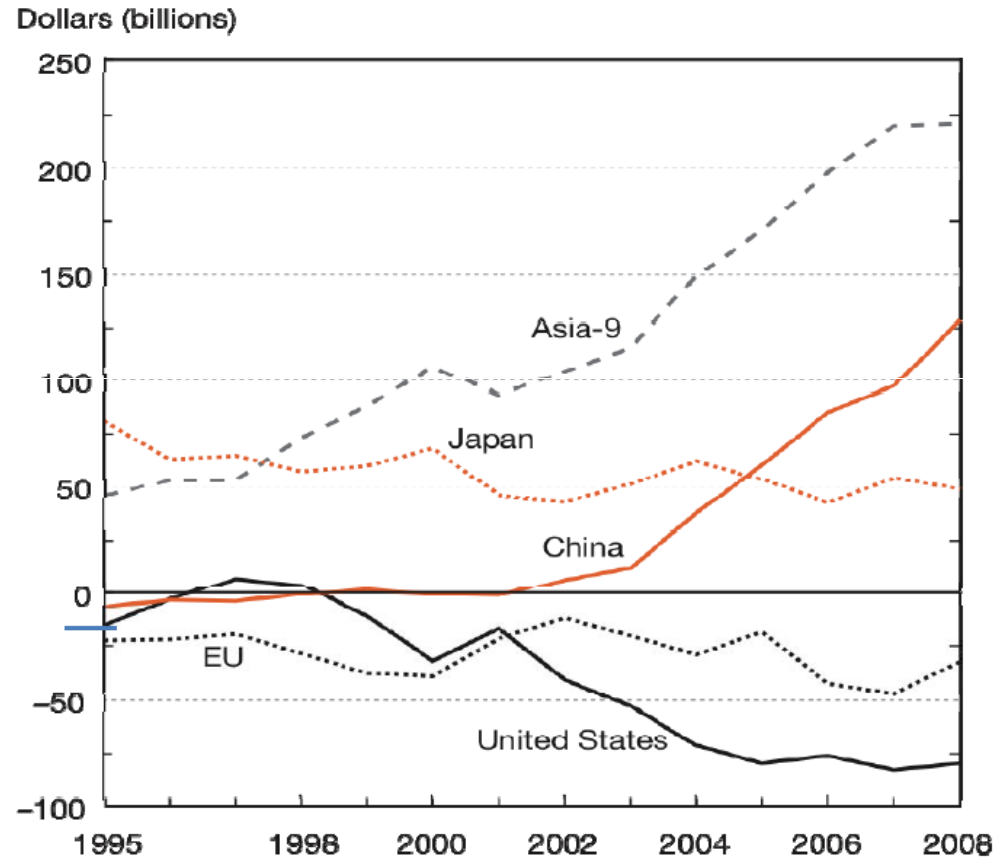www.dw-world.de/...

This page Print

So let us deploy HPC is to improve our High Tech Trade Balance

Trade balance in high-technology goods 1995–2008

NOTES: Asia-9 includes India, Indonesia, Malaysia, Philippines, South Korea, Singapore, Taiwan, Thailand, and Vietnam. China includes Hong Kong. EU excludes Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta, and Slovenia.

Source: NSF Science and Engineering Indicators 2010

IDC Workshop on the EU HPC Strategy 101011

Thank You

Out-Compute
to
Out-Compete™

Council on Competitiveness