* **Discuss new trends and research in BUS architecture.**

  “Laptops are dramatically getting closer to the performance of desktop computers, but still lag when it comes to graphics power, because they are limited by small size and low power consumption. OCuLink is a new solution that connects a laptop with an external graphics card with the same performance as those used in desktop computers.

The solution is very simple – instead of directly connecting to the motherboard, as is done by connecting GPU, PCI Express is connected via the new OCuLink cable which allows very high data transfer. The cable can be used to connect any external components, such as data storage devices and the like, but the most interesting is certainly the possibility to connect an external graphics card.

OCuLink cable still has limitations and currently supports only PCI Express four-lane transfer a maximum of 32 GBps, unlike solutions for placing directly on the plate graphic that have 8 or 16 lanes, with a maximum transfer of 64 GBps. However, support for more bands to come soon and enable connection even with the most powerful graphics market currencies, such as NVIDIA Titan X.

Besides the possibility of using the improved graphics performance in notebooks, OCuLink cable can be used in desktop computers, to replace the existing PCI-e slots, in order to smaller the whole body of the PC.

OCuLink will be available at the end of the year, but all its opportunities will be available next year, when it will be able to perform along with PCIe 4.0.” (OCuLink allows placing an external graphics card on the laptop, 2015).

* **Discuss new trends and research in parallel processing.**

“[Concurrency](https://en.wikipedia.org/wiki/Concurrency_(computer_science)) is a term used in the operating systems and databases communities which refers to the property of a system in which multiple tasks remain *logically* active and make progress at the same time by interleaving the execution order of the tasks and thereby creating an illusion of simultaneously executing instructions”.

It appears that the real push, in super computing, is the ability for computers to operate at high petaflop levels.

Petaflop – one quadrillion floating-point operations per second.

Currently, the fastest computer in the world is operating at a performance of over 33 petaflops.

Three common types of parallel computing architectures:

1. Multiprocessor computing
2. Shared Memory
3. Distributed memory computing
4. REFERENCES

Knapp, A. (2014, June 23). Retrieved September 19, 2015, from <http://www.forbes.com/sites/alexknapp/2014/06/23/chinas-tianhe-2-remains-the-> worlds-fastest-supercomputer/

OCuLink allows placing an external graphics card on the laptop. (2015, June 25). Retrieved September 19, 2015.