

# OpenPOWER Workshop at CINECA

## Silicon to Solutions using OpenPOWER Stack

On June 30<sup>th</sup> 2021 , spend 5 hours learning about Open POWER ISA, POWER innovations, Processor development, Processor Accelerator Interface, HPC Solution, Artificial Intelligence's latest solutions and gather the latest cutting-edge insights from the pioneers in multiple industries

Discover advances in deep learning tools and techniques from the world's leading innovators across industry, research and Public Sectors

We're excited to announce the prominent speakers will be joining us at the OpenPOWER Workshop

**CINECA**



## Agenda

2.00 pm CEST to 2.15 pm CEST

**Dr Massimiliano Guerrasi and Ganesan Narayanasamy**  
**Introduction about the workshop**

2.15 pm CEST to 2.30 pm CEST

**James Kulina , Executive Director , OpenPOWER Foundation**  
**Title : OpenPOWER Project Initiatives -**

2.30 pm CEST to 3.15 pm CEST

**Dr Jose Moreira, IBM Research**  
**Title : Power Innovations**

3.15 pm CEST to 4.00 pm CEST

**Luke Kenneth Casson Leighton, Libre-soc, Hardware Architect**  
**Title : Libre-SOC & Cray-style Vectors OpenPOWER**

4.00 pm CEST to 4.45 pm CEST

**Dr Leonarski Filip, PSI Switzerland Scientist**  
**Title : OpenCAPI solutions**

4.45 pm CEST to 5.30 pm CEST

**Dr Chekuri Choudari , Lab Architect**  
**Title : BOA and use cases**

5.30 pm CEST to 6.15 pm CEST

**Ander Ochoa , Cognitive Lead at IBM**  
**Title : Deep learning using Cloud Pak for Data**

6.15 pm CEST to 7.00 pm CEST

**Conclusion talk by Dr Massimiliano Guerrasi , CINECA**  
**8.45 pm CET to 9.00 pm CET**

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**OpenPOWER™**

# Organizers

- Dr Massimiliano Guarrasi  
*HPC Specialist and Technical Advisor for PRACE projects*  
**CINECA Interuniversity Consortium - HPC Department**
- **Ganesan Narayanasamy**  
OpenPOWER leader in Education and Research  
IBM Systems

Zoom Link for registration :

[https://zoom.us/webinar/register/WN\\_cULDSkFaR6y7uGkbAyaGdA](https://zoom.us/webinar/register/WN_cULDSkFaR6y7uGkbAyaGdA)

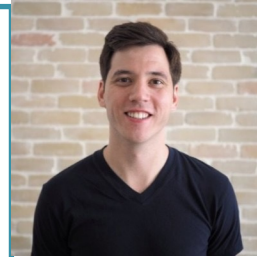
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**Speaker : James Kulina**

**Title: OpenPOWER Latest Projects**



James is Executive Director of the OpenPower Foundation, with over 10 years of open source experience across hardware, software, and network engineering disciplines. James brings a passion for open source and is committed to growing OpenPower Foundation's membership, community, and ecosystem.

He is a serial entrepreneur with a background in enterprise technology and has worked in roles spanning operations, business development, product management, and engineering.

Previously, James was co-founder and COO at Hyper.sh, an open source cloud-native virtualization startup acquired by Ant Financial. Prior to that, he led product management in Red Hat's OpenStack group, and was a product lead on AT&T's first OpenStack Cloud



**Speaker : Dr José E Moreira, IBM Research**

## **Title:** High-Performance Computing with the IBM POWER10 Processor

**Abstract :** The IBM POWER10 processor represents the 10<sup>th</sup> generation of the POWER family of enterprise computing engines. Its performance is a result of both powerful processing cores and high-bandwidth intra- and inter-chip interconnect. POWER10 systems can be configured with up to 16 processor chips and 1920 simultaneous threads of execution. Cross-system memory sharing, through the new Memory Inception technology, and 2 Petabytes of addressing space support an expansive memory system. The POWER10 processing core has been significantly enhanced over its POWER9 predecessor, including a doubling of vector units and the addition of an all-new matrix math engine. Throughput gains from POWER9 to POWER10 average 30% at the core level and three-fold at the socket level. Those gains can reach ten- or twenty-fold at the socket level for matrix-intensive computations.



JoséE. Moreira is a Distinguished Research Staff Member at the IBM Thomas J. Watson Research Center. He received a B.S. degree in physics and B.S. and M.S. degrees in electrical engineering from the University of Sao Paulo. He received a Ph.D. degree in electrical engineering from the University of Illinois at Urbana-Champaign. Dr. Moreira is a Fellow of the IEEE (Institute of Electrical and Electronics Engineers) and a Distinguished Scientist of the ACM (Association for Computing Machinery).

**Speaker : Luke Kenneth Casson Leighton**

## **Title: Libre-SOC & Cray-style Vectors OpenPOWER**

**Abstract :** SVP64 is an initiative being developed by the Libre-SOC team and funded by NLnet, that brings Cray-style Variable-length Vectorisation to the OpenPOWER ISA in a seamless and non-disruptive fashion. The team is keeping the OpenPOWER Foundation appraised of progress, and plans to submit SVP64 as an RFC to the newly-formed OpenPOWER ISA Working Group.



Luke Kenneth Casson Leighton specialises in Libre Ethical Technology. He has been using, programming and reverse-engineering computing devices continuously for 44 years, has a BEng (Hons), ACGI, in Theory of Computing from Imperial College, and recently put that education to good use in the form of the Libre-SOC Project: an entirely Libre-Licensed 3D Hybrid CPU-VPU-GPU based on OpenPOWER. He writes poetry and has been developing a HEP Physics theory for the past 36 years in his spare time.

**Speaker : Dr Chekuri Choudary**

**Title: Bayesian Optimization for optimization of HPC workloads**

**Abstract** : IBM Bayesian Optimization Accelerator (BOA) is a do-it-yourself toolkit to apply state-of-the-art Bayesian inferencing techniques and obtain optimal solutions for complex, real-world design simulations without requiring deep machine learning skills. This talk will describe IBM BOA, its differentiation and ease of use, and how researchers can take advantage of it for optimizing any arbitrary HPC simulation.



Chekuri S. Choudary is a technical consultant with IBM. He has an application-oriented research background and experience in multiple areas of computing including multimedia processing and retrieval, high performance computing, hardware design and artificial intelligence. He acted as a Principal Investigator for multiple SBIR/STTR projects in collaboration with national labs and universities. His current efforts at IBM involve evangelizing AI adoption in enterprises and cross disciplinary academia, designing AI solutions, and developing new service offerings catering to the emerging technology landscape.

**Speaker : Dr Leonarski Filip , PSI**

**Title:** OpenCAPI-based Image Analysis Pipeline for 18 GB/s kilohertz-framerate X-ray Camera at the Swiss Light Source synchrotron

**Abstract :** Macromolecular crystallography is an experimental technique allowing to explore 3D atomic structure of proteins, used by academics for research in biology and by pharmaceutical companies in rational drug design. While up to now development of the technique was limited by scientific instruments performance, recently computing performance becomes a key limitation. In my presentation I will present a computing challenge to handle 18 GB/s data stream coming from the new X-ray detector. I will show PSI experiences in applying conventional hardware for the task and why this attempt failed. I will then present how IC 922 server with OpenCAPI enabled FPGA boards allowed to build a sustainable and scalable solution for high speed data acquisition. Finally, I will give a perspective, how the advancement in hardware development will enable better science by users of the Swiss Light Source.



Educated both in chemistry and computer science, Filip Leonarski is responsible for developing sustainable solutions to handle large volumes of data (multi-GB/s) from scientific instruments for protein crystallography at the Swiss Light Source synchrotron. He is currently working on projects involving accelerated computing (FPGA/GPU), edge computing and machine learning implementation. He has been selected as IBM Champion for year 2021.

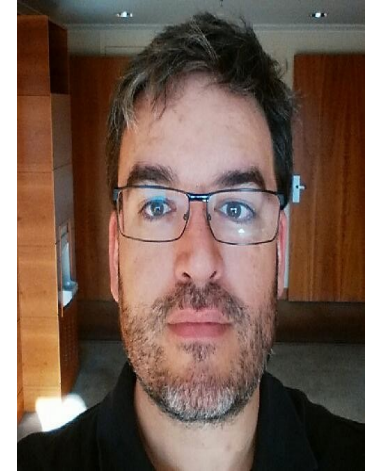


**Speaker :Ander Ochoa**

## **Title: Deep Learning for Cloud Pak for Data**

Everything is changing from Health Care to the Automotive markets without forgetting Financial markets or any type of engineering everything has stopped being created as an individual or best-case scenario a team effort to something that is being developed and perfected by using AI and hundreds of computers.

And even AI is something that we no longer can run in a single computer, no matter how powerful it is. What drives everything today is HPC or High-Performance Computing heavily linked to AI In this session we will discuss about AI, HPC computing, IBM Power architecture and how it can help develop better Healthcare, better Automobiles, better financials and better everything that we run on them



Ander Ochoa Gilo is Cognitive Computer Leader at IBM Europe and has been IBMer since 2000 , enjoyed most of IBM departments, worked as infrastructure consultant in GBS, Linux developer in SV, and Power Architecture pre-sales and then architect in IBM Systems. He has worked with Linux almost since its inception and I am a devoted Open-Source believer. In the last two years he has been bitten by the Artificial Intelligence fly and now almost fully focused on IBM PowerAI and all the AI ecosystem @IBM. Currently , he is leader of the Cognitive Systems group with a group of fantastic professionals.