



# Workshop Welcome

*CERN openlab technical workshop*

Maria Girone, CERN openlab CTO

23/01/2019

# 2018 – The start of phase VI

Following the White Paper and many brainstorming, CERN openlab phase VI has started in January 2018. Since last Technical Workshop in 2018 we have new members and projects

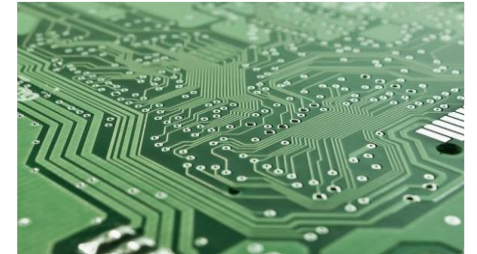
- New industry members
  - Micron is a new **partner**, project kicked-off
    - Specialist in FPGA and ML
  - E4 is a new **contributor**, project kicked-off
    - A project on applications of GPU technology (many and diverse use cases)
  - Ongoing discussions with Google for project definition
- More than 20 ongoing projects, whose status and plans will be presented today

# Three Main Areas of R&D

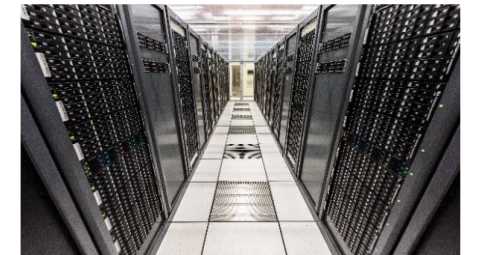


COMPUTING  
CHALLENGES

Increase **data centre performance** with hardware accelerators (FPGAs, GPUs, ..) optimized software



**Scale out capacity** with public clouds, HPC, new architectures

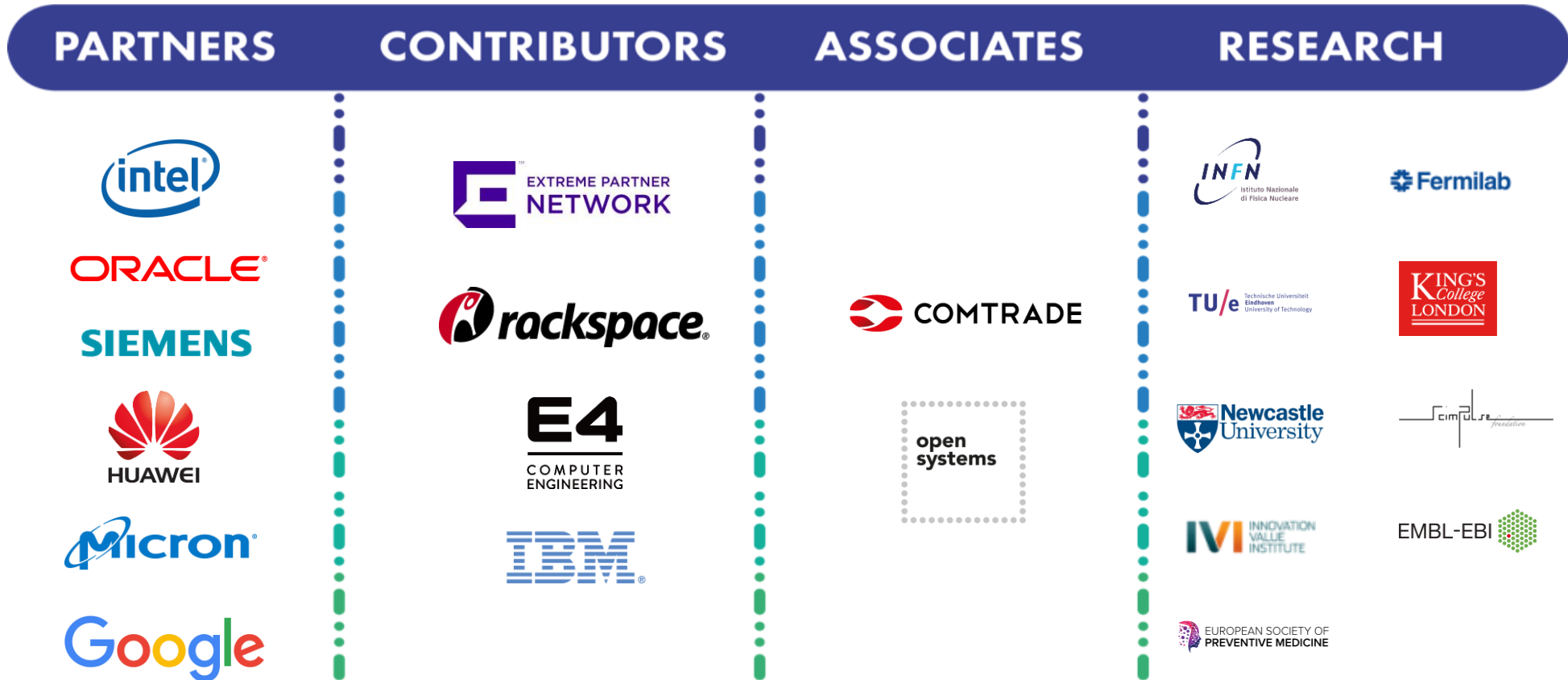


**Change the computing paradigms** with new technologies like Machine Learning, Deep Learning, Advanced Data Analytics, Quantum Computing



# COLLABORATION MEMBERS

*A public-private partnership between the research community and industry*



# Workshop overview – Day 1

Computing architectures for machine learning, data acquisition and processing

<b>Intel big data analytics</b>	<i>Vaggelis Motesnitsalis</i>
<i>503-1-001 - Council Chamber, CERN</i>	09:45 - 10:05
<b>Oracle Data Analytics and Autonomous Data Warehouse service on the Cloud</b>	<i>Manuel Martin Marquez</i>
<i>503-1-001 - Council Chamber, CERN</i>	10:05 - 10:25
<b>Siemens Data Analytics and SCADA evolution status report</b>	<i>Filippo Maria Tilaro</i>
<i>503-1-001 - Council Chamber, CERN</i>	10:25 - 10:45
<b>Partner talk Siemens: AI on the machine level in industrial automation</b>	<i>Ingo Thon et al.</i>
<i>503-1-001 - Council Chamber, CERN</i>	11:15 - 11:35
<b>Intel fast simulation</b>	<i>Federico Carminati</i>
<i>503-1-001 - Council Chamber, CERN</i>	11:35 - 11:55
<b>IBM Evaluation of power architectures for machine learning</b>	<i>Ahmad Siar Hesam et al.</i>
<i>503-1-001 - Council Chamber, CERN</i>	11:55 - 12:15
<b>Micron: Exploring Accelerated Machine Learning for Experiment Data Analytics</b>	
<i>503-1-001 - Council Chamber, CERN</i>	13:30 - 13:50
<b>Partner talk Micron: Advanced Computing Solutions</b>	<i>Jason Adlard</i>
<i>503-1-001 - Council Chamber, CERN</i>	13:50 - 14:10
<b>E4: A Testbed for GPU Accelerated Applications</b>	<i>Felice Pantaleo</i>
<i>503-1-001 - Council Chamber, CERN</i>	14:10 - 14:30
<b>Status of the DEEP-EST project and outlook</b>	<i>Viktor Khristenko</i>
<i>503-1-001 - Council Chamber, CERN</i>	14:30 - 14:50
<b>Intel: Fast deep neural network inference on FPGAs</b>	<i>Jennifer Ngadiuba</i>
<i>503-1-001 - Council Chamber, CERN</i>	14:50 - 15:10

# Workshop overview – Day 1

## Data Center Technologies

<b>Storage Services evolution at CERN</b>	<i>Alberto Pace</i>
<i>503-1-001 - Council Chamber, CERN</i>	<i>15:50 - 16:10</i>
<b>Comtrade EOS productization</b>	<i>Luca Mascetti</i>
<i>503-1-001 - Council Chamber, CERN</i>	<i>16:10 - 16:30</i>
<b>Oracle Management Cloud: A unified monitoring platform</b>	<i>Aimilios Tsouvelekakis</i>
<i>503-1-001 - Council Chamber, CERN</i>	<i>16:30 - 16:50</i>
<b>Running JAVA application servers on Kubernetes</b>	<i>Antonio Nappi</i>
<i>503-1-001 - Council Chamber, CERN</i>	<i>16:50 - 17:10</i>
<b>Oracle partner talk: Making databases smarter and faster: innovations enabled by engineering software and hardware together</b>	<i>Cris Pedregal</i>

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# Workshop overview – Day 2

## Data Center Technologies

<b>Partner talk Intel: 2019 technology innovation</b>	<i>Andrea Luiselli et al.</i>
503-1-001 - Council Chamber, CERN	09:00 - 09:20
<b>Intel high performance cloud caching technologies</b>	<i>Danilo Cicalese</i>
503-1-001 - Council Chamber, CERN	09:20 - 09:40
<b>Extreme Networks Flow optimizer</b>	<i>Stefan Nicolae Stancu</i>
503-1-001 - Council Chamber, CERN	09:40 - 10:00
<b>Huawei OpenStack Cloud</b>	<i>Ms Surya Seetharaman</i>
503-1-001 - Council Chamber, CERN	10:00 - 10:20
<b>Rackspace: Cloud storage performance</b>	<i>Julien Collet</i>
503-1-001 - Council Chamber, CERN	10:20 - 10:40

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# Workshop overview – Day 2

## Multidisciplinary Knowledge Sharing Platforms

### Introduction to Data Analytics Platforms for Science

503-1-001 - Council Chamber, CERN

*Alberto Di Meglio*

11:10 - 11:25

### Biodynamo

503-1-001 - Council Chamber, CERN

*Lukas Breitwieser*

11:25 - 11:40

### Satellite Image Analysis for UNOSAT

503-1-001 - Council Chamber, CERN

*Taghi Aliyev*

11:40 - 11:55

### Medical Data Analysis

503-1-001 - Council Chamber, CERN

*Alberto Di Meglio*

11:55 - 12:10

### Smart platforms for science

503-1-001 - Council Chamber, CERN

*Taghi Aliyev*

12:10 - 12:25

### Mobility

503-1-001 - Council Chamber, CERN

*Fons Rademakers*

12:25 - 12:40

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# Workshop overview – Day 2

A new area of work, kicked-off in November 2018

## Quantum Computing

22 - Quantum computing and CERN openlab

Federico Carminati

23 - Machine Learning in quantum computing

Dr Sofia Vallecorsa

24 - Applying IBM quantum computing to LHC physics analysis Higgs coupling to two top quarks

Wen Guan



CERN openlab Quantum Computing for High Energy Physics workshop

5-6 November 2018  
CERN  
Europe/Zurich timezone

<https://indico.cern.ch/event/719844/>

# Posters

- Three poster sessions
  - Please vote for best posters
  - A ballot box will be available

## Lunch and poster session

503-1-001 - Council Chamber, CERN

12:40 - 14:00

## Cocktail and poster session

Pas Perdue , CERN

17:30 - 19:00

## Lunch and poster session

503-1-001 - Council Chamber, CERN

12:40 - 14:00

# CERN openlab in 2019

CERN openlab continues to innovate and engage with our collaborators

- Our focus for phase VI is advancing the computing systems in preparation for the LHC experiment upgrades and the HL-LHC
  - Transforming the techniques and technologies used in data processing and data analysis
  - Optimizing and enhancing the computing infrastructure
  - Finding common scientific computing solutions
  - Investigating disruptive technologies
  
- Exciting progress will be presented over the next two days



**Have a good workshop!**