

Atos HPC, AI & Quantum

Exascale and beyond

Agnès Boudot

October 2018

We are THE European IT Leader

and a top 5 Digital services player worldwide

€ 13bn
in 2017

73
countries

100,000
*Business
technologists*



Atos

Worldline
atos e-payment services

Bull
atos technologies

UNIFY
atos collaboration solutions

Big Data & Security

1 Mission, 4 Go-to-Markets, 4 Business Lines

HPC, AI & Quantum

*High-performance solutions,
data management & quantum
computing innovation*

Big Data

*High-end platforms and
appliances & IT
modernisation*

Cyber Security Cyber Services

*Intelligent platforms
for digital security,
trust & compliance*

Mission Critical Systems

*Intelligent systems
for Defence, Homeland Security,
Aerospace & Transport*



Intelligence in a data driven world

A data-driven economy is now on its way



1 ZETTABYTE = 10^{21} bytes = 1,000,000,000,000,000,000 bytes

HPC & Quantum Global Business Line

Key figures

300

M€ Revenue in 2017

> 20% growth vs 2016

500++ HPC experts worldwide



HPC Players
19,2% 2017/2016 growth



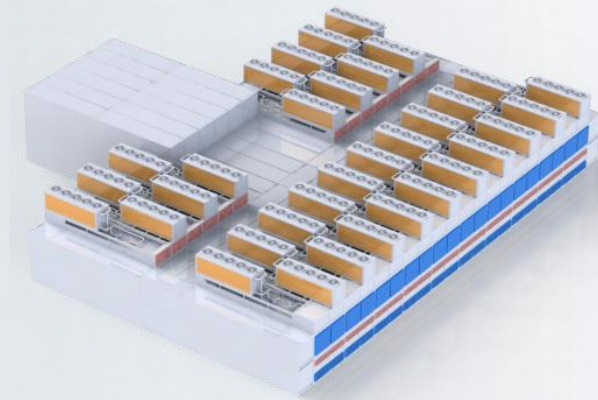
Expanding HPC limits



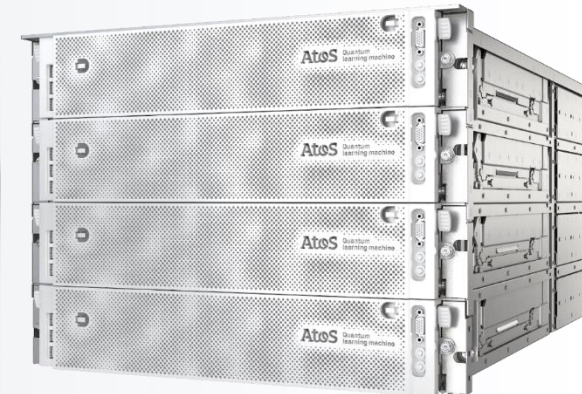
**HPC & AI systems
Data Management
SW environment**



HPCaaS



**Modular Data
Centres**



**Quantum
Computing**

HPC & Quantum Business Line

Solutions High Performance Computing, Quantum et IA



BullSequanaX delivered in main centers in France & Germany



ALSO



50++
PFlops
sustained

20 Calculateurs Pétaflopiques



12 PFlops / Rank #1



6 PFlops / Rank #1



Key numbers/ References

Atos has a unique value proposition



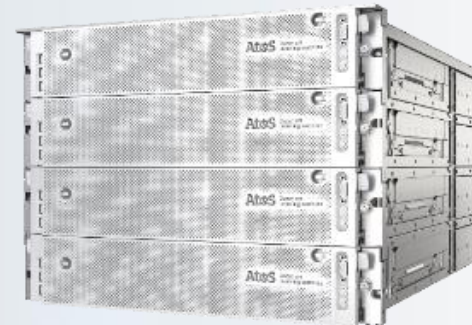
HPC & Quantum

High Performance High-performance technologies for insight platforms & data management

As a pioneer (#1 in Europe , #5 worldwide) in High-Performance Computing, we provide uniquely powerful HW/SW solutions and services to compute massive data flows and turn them into business outcomes.



BullSequana X

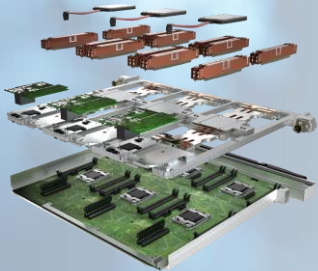


Atos Quantum Learning Machine

High Performance Computing

Delivering efficient HPC Solutions

Be Efficient



Pick the
Best of Breed
Technologies



Design the
right
solutions

**center for
excellence in parallel
programming**

Speed-up
productions,
Give value to
simulations



Consider
Hybridation
through HPC
cloudification



Deliver
Operational
Excellence



**ARTIFICIAL
INTELLIGENCE**

Bring Innovation
into
your solutions

Artificial Intelligence apps gain momentum



Cognitive

50%

of all consumers
will interact with services
based on cognitive
computing on a regular
basis by 2018*



Analytics

50%

of all business analytics
software will include
prescriptive analytics built on
cognitive computing
functionality by 2020*



Smart machines

40%

of new enterprise
applications will include
smart machine
technologies**

* IDC

** GARTNER

Atos technologies strategy on AI

2017

2018

2019

2020



High Performance Computing

BullSequana X
(GPU blades)

READY

New components targeting Exascale

EPI

(European Processor Initiative with Vector acceleration)

Google Alliance

(ML Engine & APIs in the Cloud)

READY

BullSequana S
(2 to 32 CPU + 2 to 32 GPU)

READY

Next gen memory & node controller



Enterprise Computing

Data Lake Appliance
(also used in Prescriptive SOC)

READY

 **Codex AI Suite**

3Y roadmap with a meeting point on Quantum roadmap

Machine Intelligence
(with Siemens)

READY

New use cases



Edge Computing

Edge Computer Prototype
(embedded computing)

EPI

(European Processor Initiative with Deep Learning acceleration)

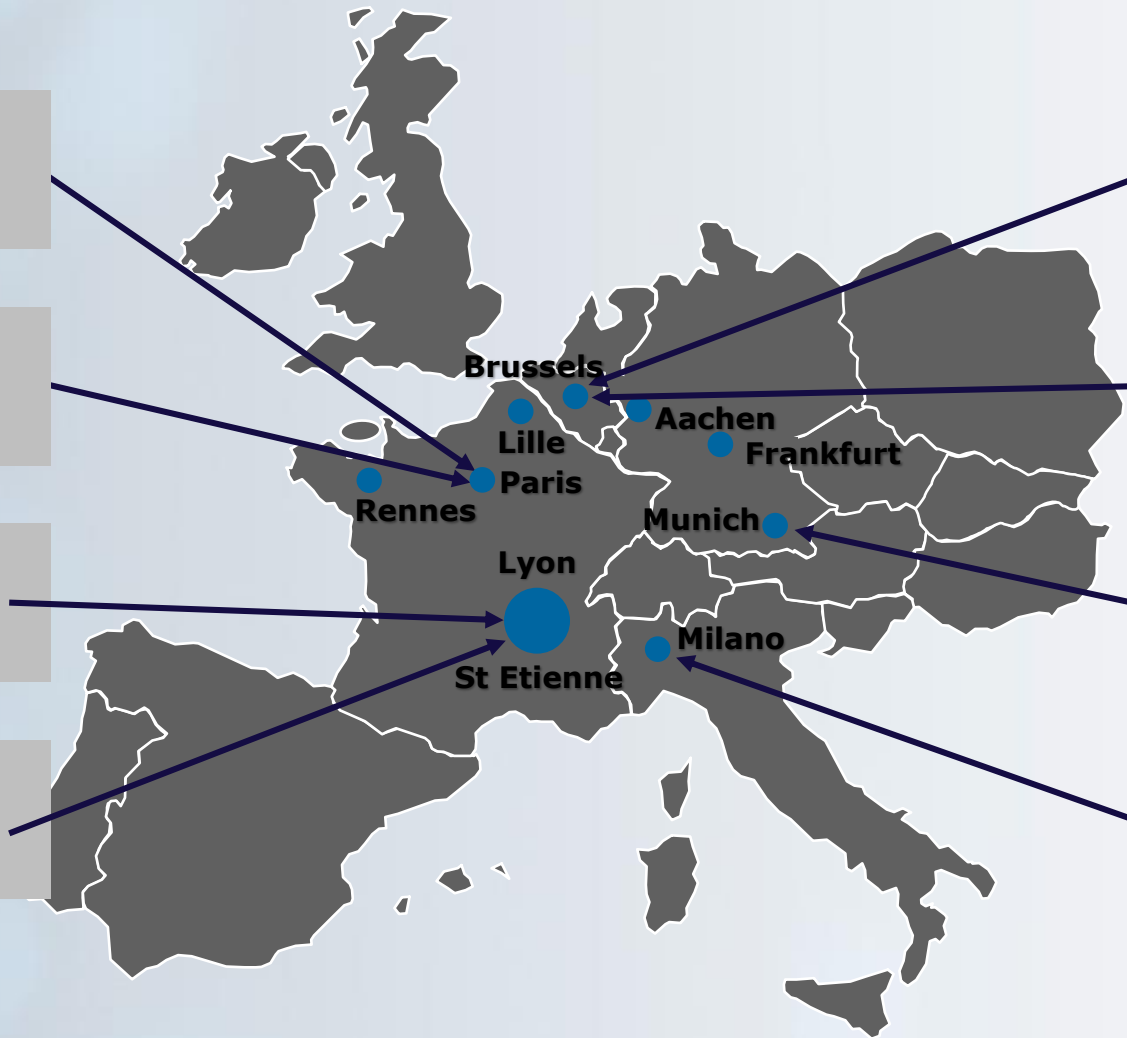
ATOS Research program on AI

ENS – Saclay
- Advanced Machine Learning
- Algorithm development
- IPOL

CEA List – Saclay
- Advanced Machine Learning FMK
- Machine Learning expertise
- High performance hardware

Jean Monnet University /
Hubert Curien - St Etienne
- Online learning and boosting methods
- Massive Deep Learning topology

INSA of Lyon
- Linked Data for Prescriptive Analytics
- Feature Selection
- Data Value assessment



Free University of Brussels
- Scalable fraud detection techniques in big data context
- Time Series

Catholic University of Louvain
- Graph mining for fraud detection

University of Passau
- Data Value Assessment
- Certificate Program
- Deep Learning on Data Streams

University of Milano
- Expert rules ranking methods

Atos & Worldline Research programs



Why Codex AI Suite?



Fast track to Artificial Intelligence

An AI software suite, leveraging machine learning and deep learning capabilities to easily build and deploy artificial intelligence applications across any infrastructure



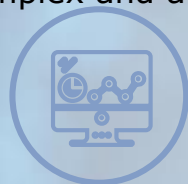
école
normale
supérieure
paris-saclay

Codex AI suite differentiators



End-to-end, fast development of complex enterprise use cases

Enable to easily combine ML, DL, analytics and data management to deliver complex and accurate use cases



Studio



Forge



Applications are infrastructure-agnostic

Enable applications to run on HPC, enterprise and Edge servers, on clouds and on-premises



Orchestrator



HPC business can deliver NG applications

From precision medicine, to imaging diagnosis, driver assist, autonomous maintenance, ...

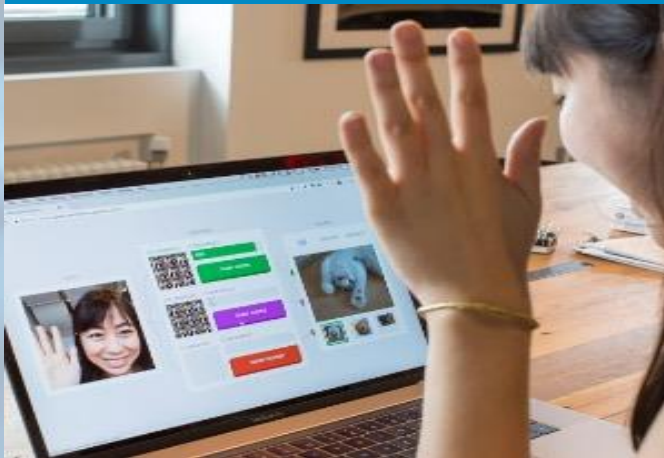


DL Engine

Atos AI Labs to find your AI business value

Discover

what AI can do for
you



AI learning

Design

the AI project to start
with



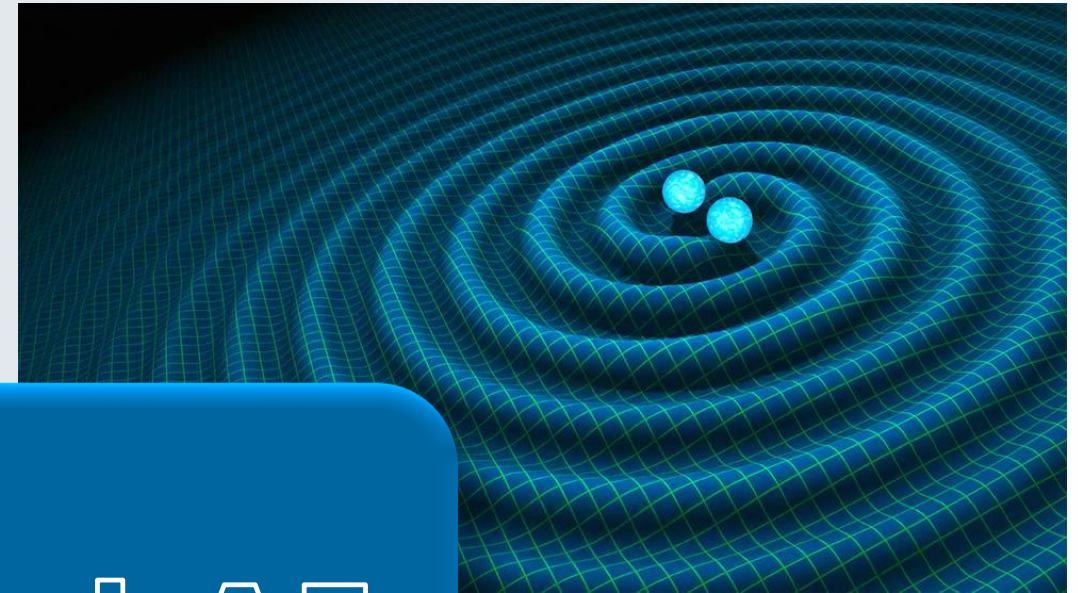
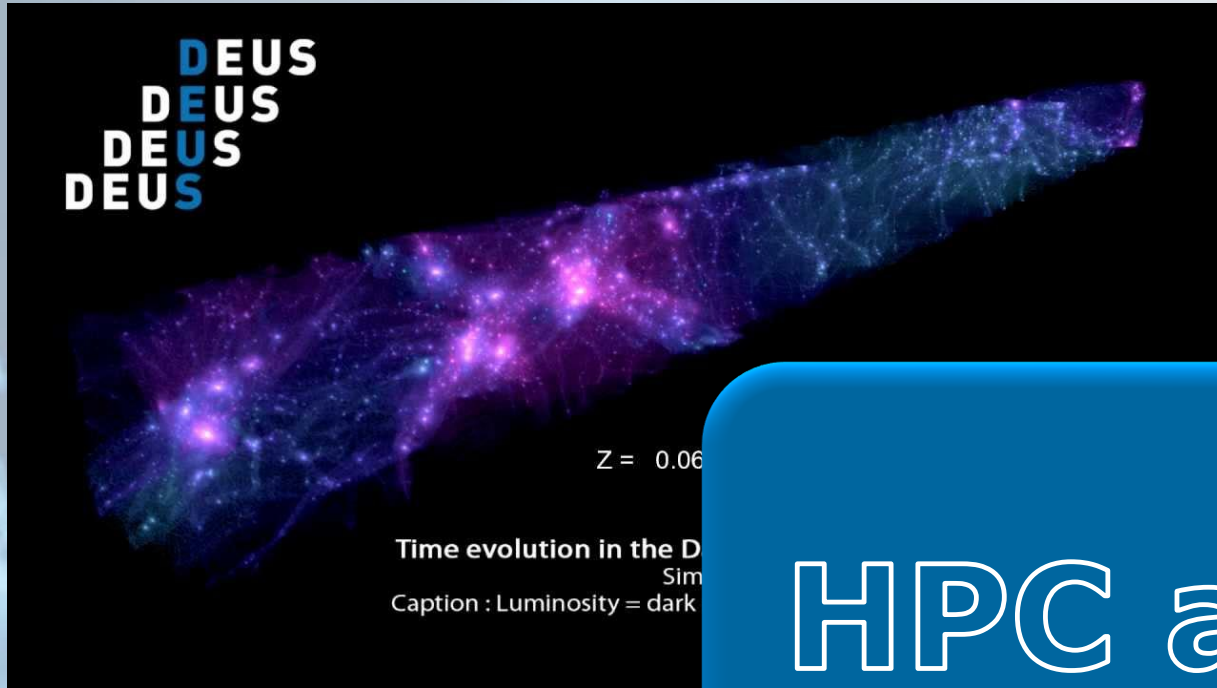
AI projects

Define

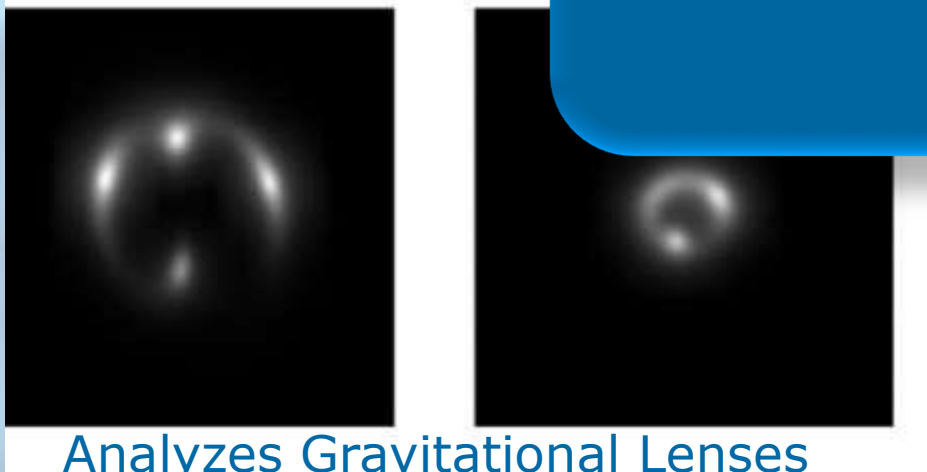
your AI journey in
just 2-days



**AI journey
& platforms**



HPC and AI

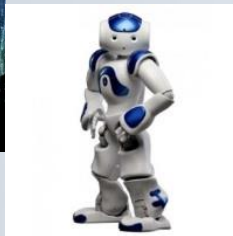


Analyzes Gravitational Lenses
10 Million Times Faster



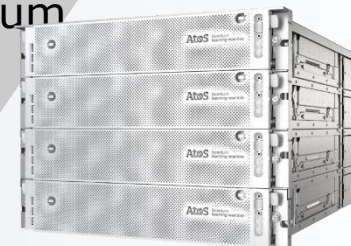
Square Kilometre Array

Exascale and beyond



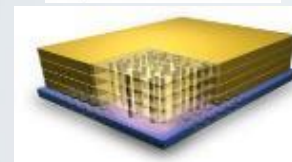
towards
eXascale

Quantum



European
Processor
Initiative

AI &
Machine
Learning



IOT



Big Data
Analytics



HPC 2018



Atos Quantum Learning Machine

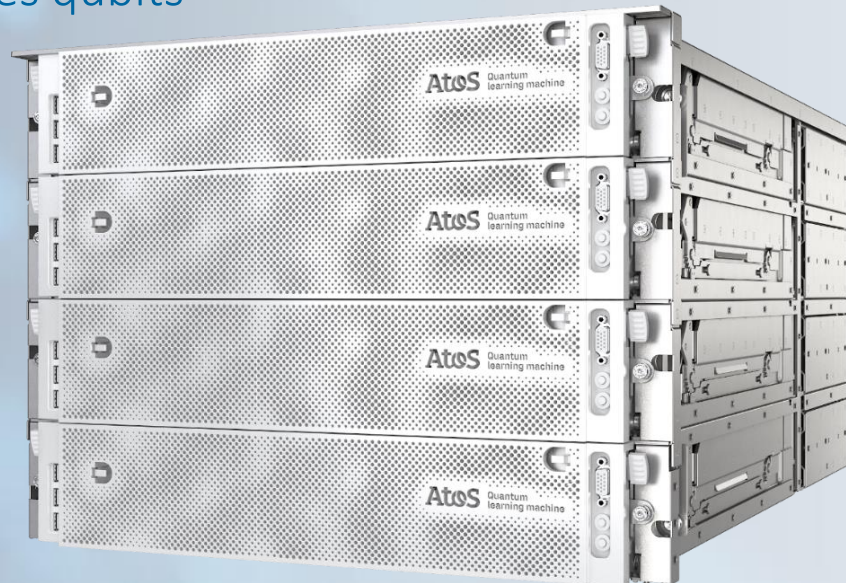
Quantum: a long term strategic R&D program

The Atos Quantum Learning Machine,
A Quantum simulator appliance

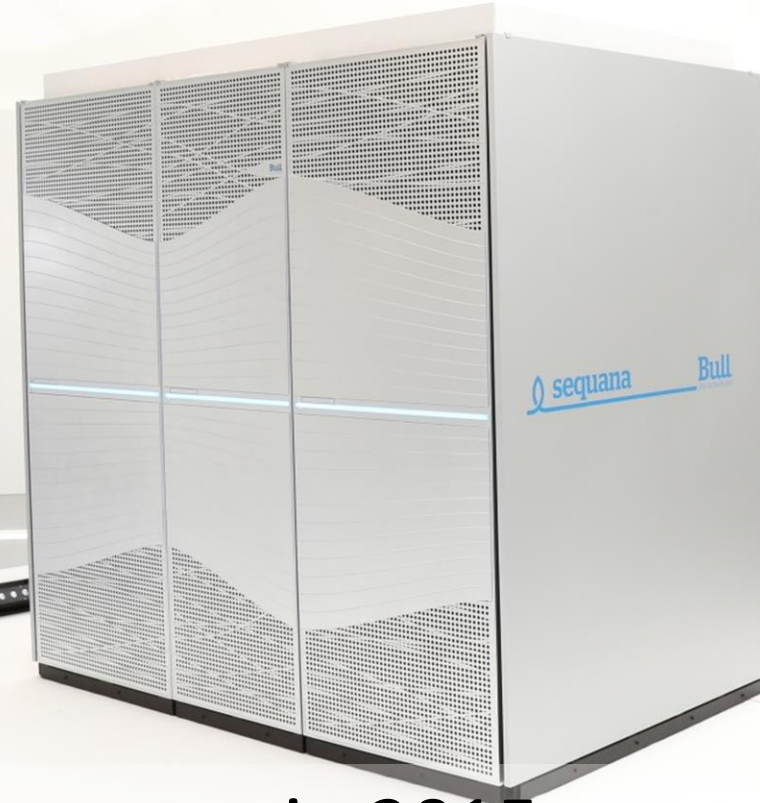
Generate Quantum algorithms without
quantum hardware constraints

Describe quantum circuits

Simulates qubits



From promises...



Bull Sequana announcement in 2015
“Live innovation to the fullest”

...to
reality !



Thank you

For more information please contact:
agnes.boudot@atos.net

Atos, the Atos logo, Atos Codex, Atos Consulting, Atos Worldgrid, Bull, Canopy, equensWorldline, Unify, Worldline and Zero Email are registered trademarks of the Atos group. September 2018. © 2018 Atos. Confidential information owned by Atos, to be used by the recipient only. This document, or any part of it, may not be reproduced, copied, circulated and/or distributed nor quoted without prior written approval from Atos.

The Atos logo is displayed in white, bold, sans-serif capital letters. The letter 'o' is stylized with a circular cutout in the center. The logo is positioned in the bottom right corner of the slide.