



DE LA RECHERCHE À L'INDUSTRIE

TQCI: the Teratec Quantum Computing Initiative

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Guillaume.Colin-de-Verdiere@cea.fr

Commissariat à l'énergie atomique et aux énergies alternatives - www.cea.fr

- Origin
- Partners
- Goals
- Some use cases
- The Atos QLM @ CCRT

- Merge of two parallel efforts

- **CCRT**
 - How to get our partners access to quantum technologies?
 - Install a QLM machine

- **Teratec**
 - How to develop a Quantum ecosystem around its members?
 - Leverage a fruitful mix of members
 - Big companies, research groups, SMEs, academics

CCRT partners

CEA

Safran

Cerfacs

Ariane Group

TechnicAtome

Ingeliance

Ineris

EDF

IRSN

Onera

IFP-EN

Soleil

Total

Thalès

L'Oréal

Valeo

- Techno provider
 - ATOS
- Large Companies
 - TOTAL, Dassault Aviation, EDF
- Research centers
 - CEA, IFPEN, CERFACS
- Academics
 - URCA

- Federate efforts around QC
- Improve quantum knowledge
 - On the technology
 - On how to program it (languages, libraries, algorithms)
- Is “use case” based
 - Important to be focused
- Means
 - QLM machine @ CCRT
 - Experts researchers (URCA) => training
 - Use cases provider (Total, EDF, ...)
 - A global coordination by Teratec
 - Seminars, training sessions

- Linear solvers
- Optimization
- Machine Learning
- Molecular chemistry and material science
- Programming models
 - Hybrid approach

- Installed @ CEA TGCC
- 30 qubit simulation capability
- QASM + python environment
- Able to simulate logical and physical qubits
- Total and URCA own also a QLM



- The myQLM program consists of:
- The **distribution of myQLM software to Atos QLM customers and end-users**. They will be able to program in AQASM (*Atos Quantum Assembly Language*) and pyAQSM languages and test their programs through digital simulation on their own computers.
- The possibility **to run programs developed with myQLM on a real Atos Quantum Learning Machine** appliance through a dedicated portal with access fees.
- A **myQLM user-led community** for sharing best practice, exchange of libraries and quantum application codes and collaborative support.
- **Interoperability with other quantum computing frameworks**. Atos ensures openness and interoperability by providing open source translators from myQLM to other main quantum programming environments
- Limited to QLM owners & ecosystem
 - To be extended soon

- Hervé Mouren
- Christian SAGUEZ

- myself guillaume.colin-de-verdiere@cea.fr



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Thanks.