Pasqal Defining the quantum reality

From neutral atom arrays to real world applications

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Pasqal

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Introduction to Pasqal

Quantum Computing with Neutral Atoms

Introduction to Pasqal

Pasqal

Founded 5 years ago, backed by Nobel prize-winning technology

15+ patents and applications
800+ publications
250+ employees

We build neutral atom-based Quantum Processing Units

350+ qubits
Analog and Digital-Analog mode

Application-driven research and full-stack approach

Public Roadmap

Pasqal

		2022 - 2023	2024 - 2025	2026 - 2027	2028+
Technology PASQAL & affiliated ecosystem	**HARDWARE PLATFORM**				
	Max qubits	200	1,000	10,000	
	Addressability	Z add	Z+X add; Addressable 1Q and 2Q gates	Addressable 1Q and 2Q gates (cont.)	
	Base repetition rate	1 Hz	3 Hz	10 Hz	100 Hz
	FTQC Program		Atom shuttling; Ultra High-Fidelity Gates	Scalable logical qubits architecture	
	HARDWARE ACCELERATED LIBRARIES				
	Quantum Matter & Quantum AI	Algorithm Blueprint	Algorithm Development	Production	Production (cont.)
Products	**QUANTUM PROCESSORS**				
	Generation	**Orion Alpha** ~3M gates	**Orion Beta** ~5M gates On premise delivery; **Orion Gamma** ~10M gates On premise delivery	**Vela** ~40M gates; **Pegasus** ~200M gates	**Centaurus FTQC QPU** 128+ Logical qubits 200M+ gates
	Total hours of QPU for users	500	5-10,000; 20-30,000	60-70,000; 200-250,000	500-550,000
	Factories	France	Canada; Factory 3		
	COMMUNITY				
	Platform		Learn; Interact	Collaborate	
	Open-source Software Stack	Pulser	Qadence; Solvers & Emulators	Solvers & Emulators (cont.)	

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Software Stack: Low-Level

Pulser & Pulser Studio

Pulser

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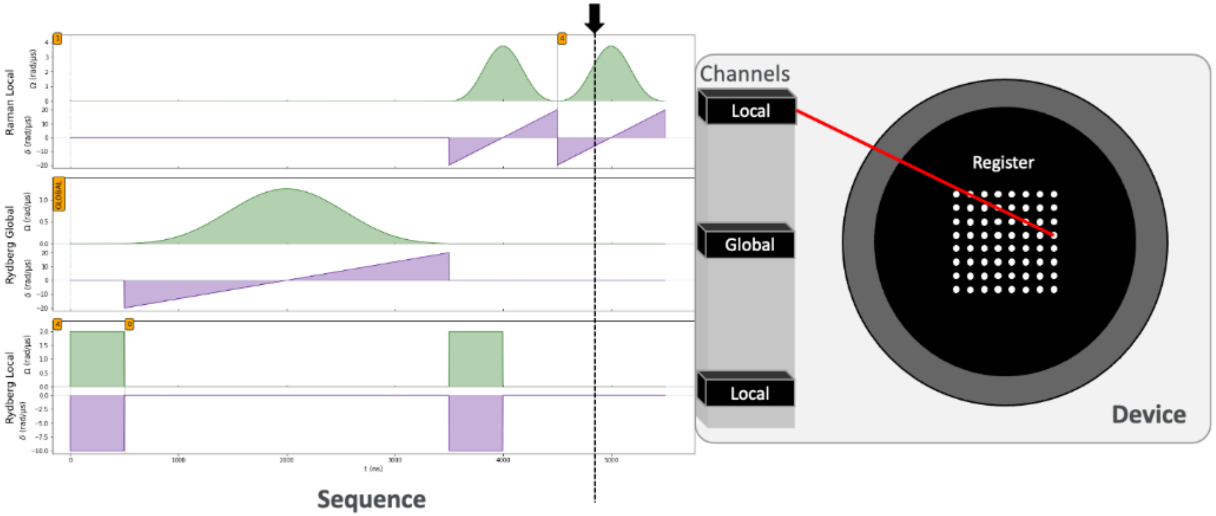
- Open-source Python package for programming neutral atom arrays.
- Allows for both **digital** and **analog** quantum simulations.
- Whatever can be done in the device, it can be done with Pulser.



Pulser Studio

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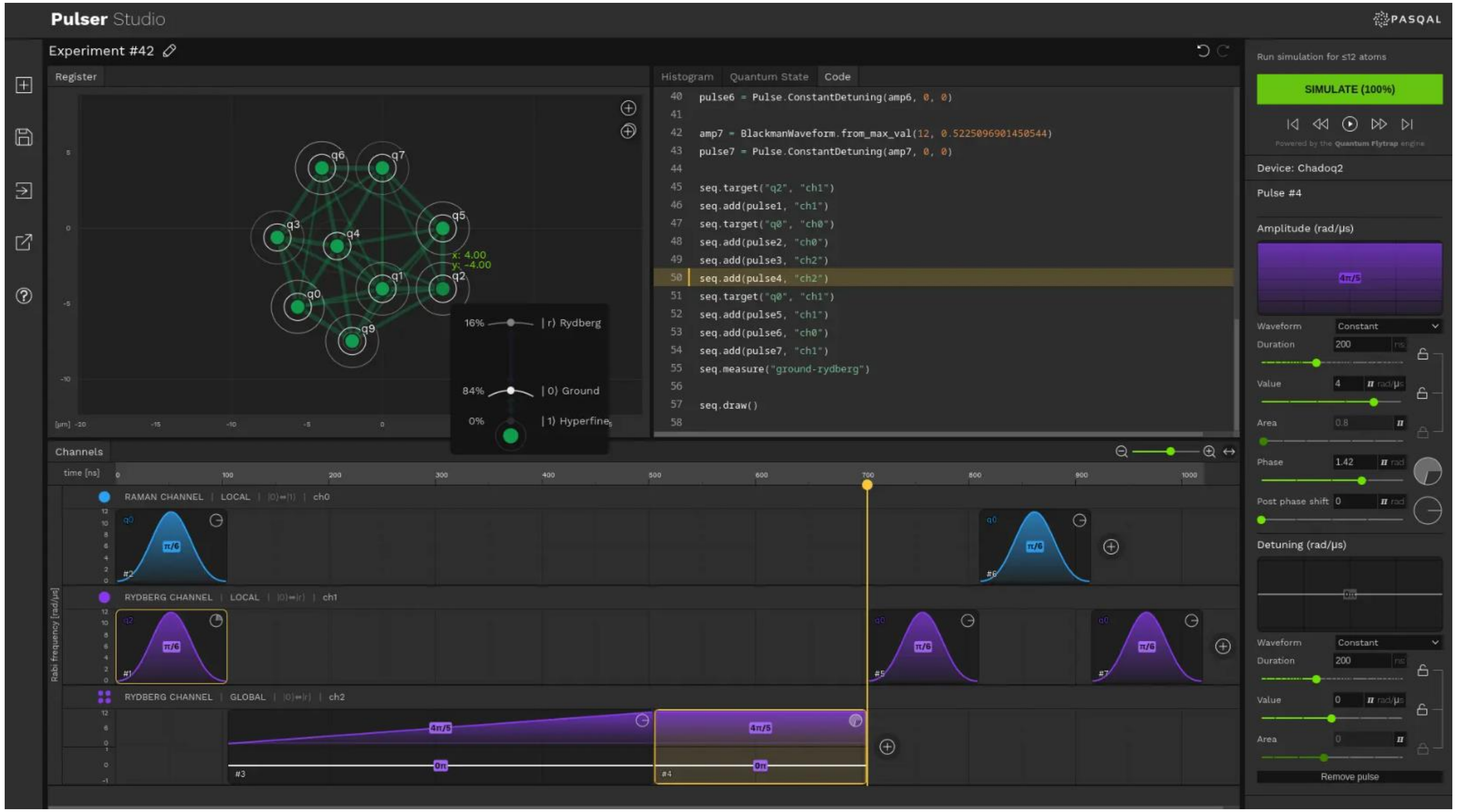
Zero-code neutral atom quantum computing platform



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Software Stack: High-Level

Qadence

Qadence

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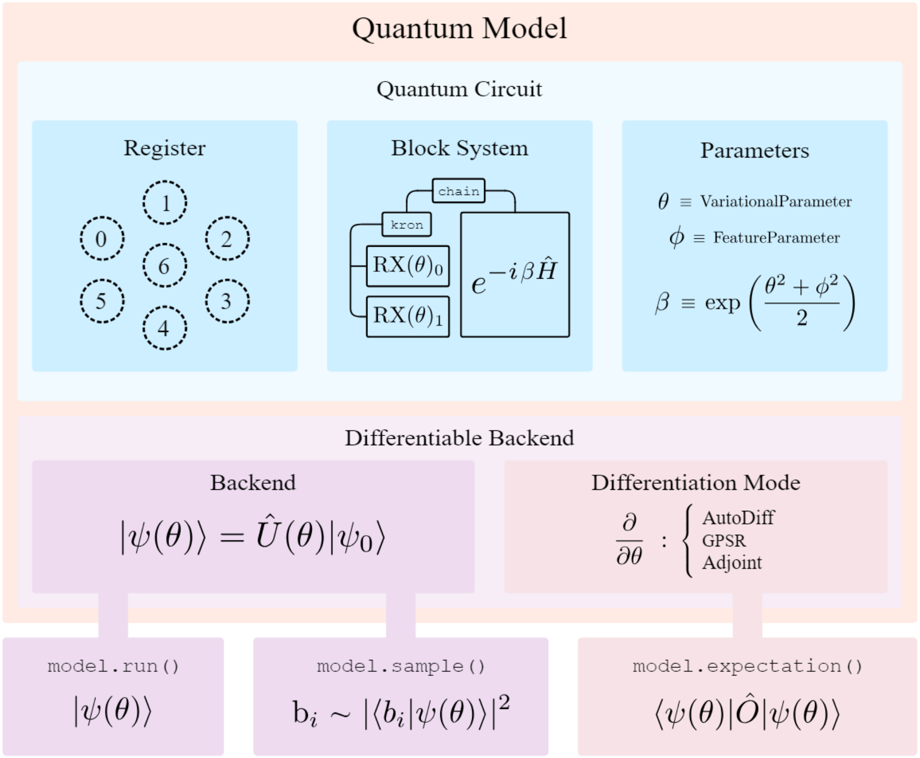
- First open-source software for digital-analog quantum computing.
- Flexible interface, native differentiability, and focus on real-device execution.
- Aimed at advancing research on variational algorithms built for native digital-analog platforms.



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Applications

Real world use cases

Applications

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- Develop domain-specific solvers for industrial applications.
- Minimize the need for quantum computing knowledge.
- Provide solvers and emulators to end-users.

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Any questions?

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Thanks for coming!