

Kontext: Hur hanterar vi hot mot mänskligheten?

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Några inledande kommentarer om denna kopia

IBM Research har en policy runt IBM Quantum-presentationer: Inga generella åhörarkopior. Så denna är kraftigt beskuren.

Jag har bloggat om den inledande kontexten här:

<https://www.ibm.com/blogs/think/se-sv/2021/02/23/det-femte-paradigmet/>

Och mer om IBM research finns här: <https://research.ibm.com>

The urgency of science
has never been stronger
than it is now.

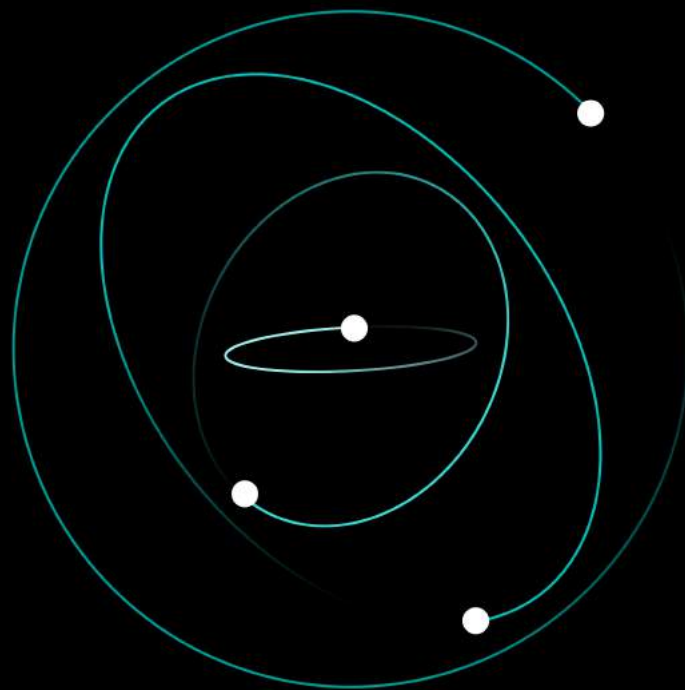


We must accelerate the process of discovery to address systemic challenges.



New discoveries nearly all rely on some version of the scientific method

- 1 Study
- 2 Hypothesize
- 3 Test
- 4 Iterate



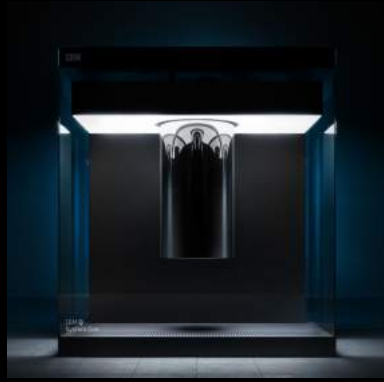
The accelerated discovery cycle

The use of AI will consolidate all of humanity's knowledge on a specific topic.

Traditional and quantum simulations will cover the knowledge gaps.

The corresponding data can be used to create inference models to generate hypotheses and automate their testing.

This composable infrastructure of emerging technologies will be enabled and managed by the hybrid cloud.

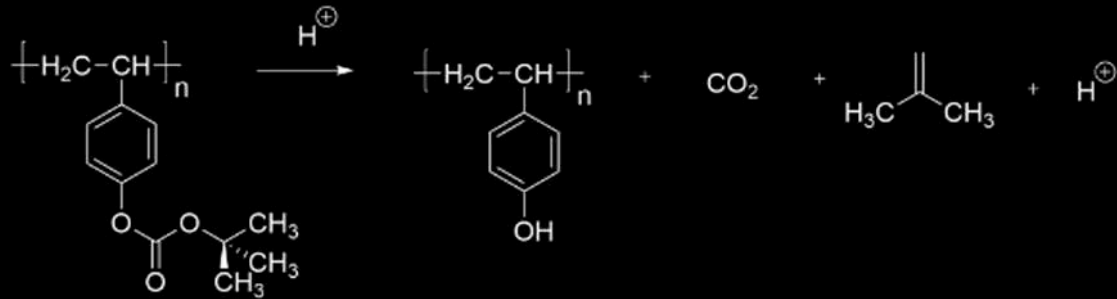
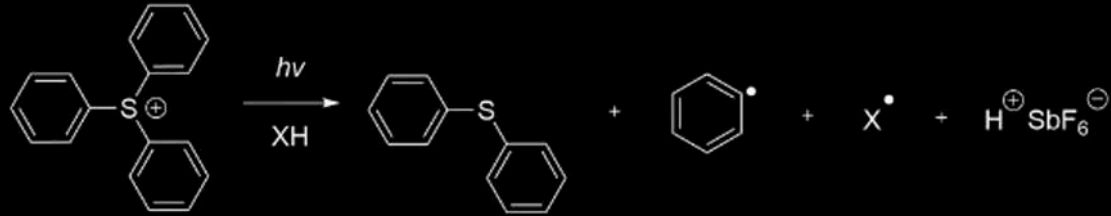


The process of material design and discovery

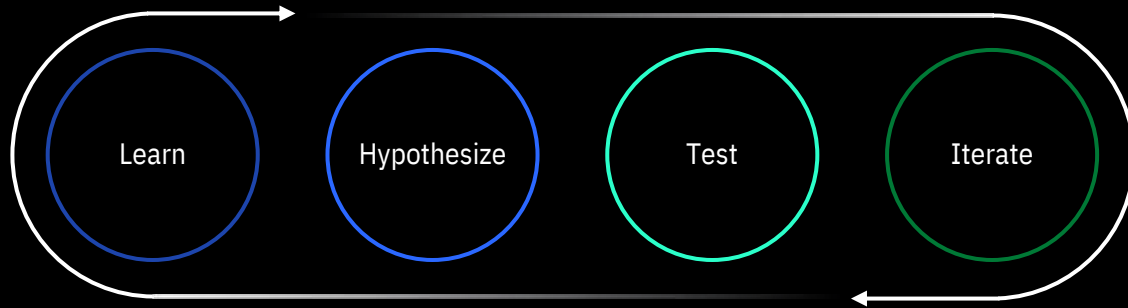
It typically takes roughly 10 years and upwards of \$10 - \$100 million to discover one new material.

We aim to cut down both years and cost by 90%

A chemically amplified photoresist example, developed at IBM in 1983

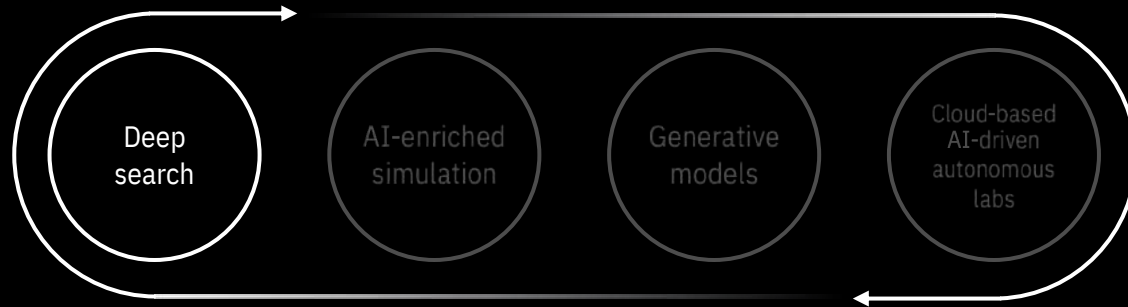


We apply the supercharged scientific method



Deep search

- **1000x** faster ingestion
- Ingest and structure technical literature at scale



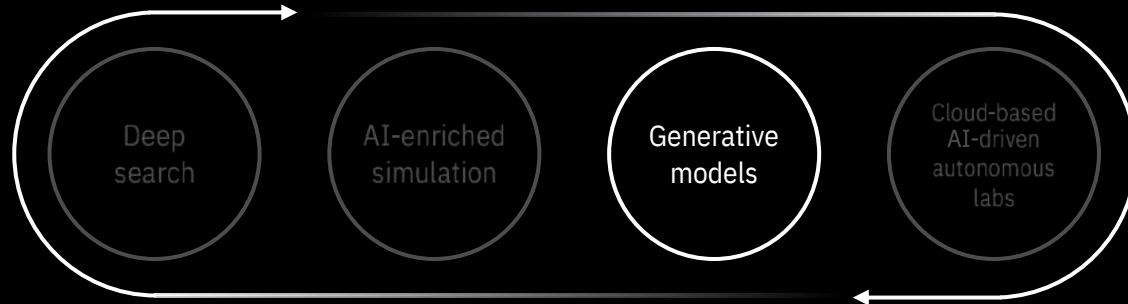
AI-enriched simulation

- **2-40x** faster screening.
- Automatically determines the right multi-physics simulation workflow.



Generative models

- **10x** faster designs.
- Automatically determines the right multi-physics simulation workflow.



Cloud-based AI-driven autonomous labs

- **100x** faster synthesis.
- Synthesize and validate most suitable candidates.



IBM Quantum: An Introduction

Mikael Haglund
IBM Quantum Technical Ambassador

Länkar till det som jag talade om

IBM Quantum generellt: <https://www.ibm.com/quantum-computing/>

IBM Quantum Hardware roadmap: <https://www.ibm.com/blogs/research/2020/09/ibm-quantum-roadmap/>

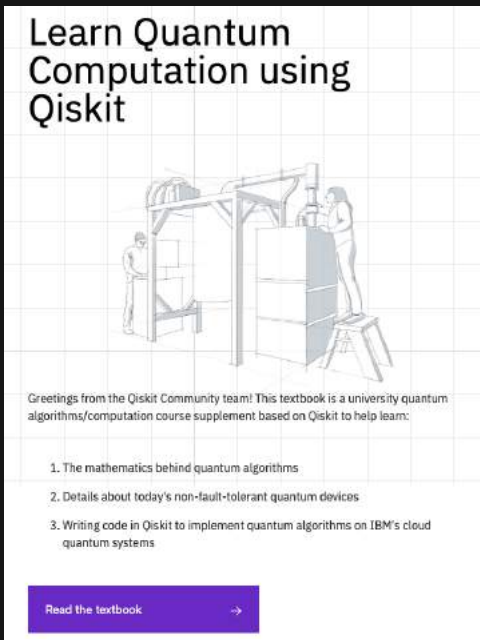
IBM Quantum Software roadmap: <https://www.ibm.com/blogs/research/2021/02/quantum-development-roadmap/>

Programmeringsmiljön där du kan testa själv: <https://quantum-computing.ibm.com/>

Open Source Textbook

IBM Quantum

<https://qiskit.org/textbook/>



Learn Quantum Computation using Qiskit

Greetings from the Qiskit Community team! This textbook is a university quantum algorithms/computation course supplement based on Qiskit to help learn:

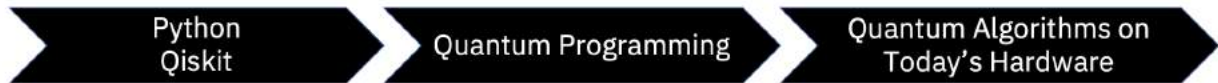
1. The mathematics behind quantum algorithms
2. Details about today's non-fault-tolerant quantum devices
3. Writing code in Qiskit to implement quantum algorithms on IBM's cloud quantum systems

[Read the textbook](#) →

Traditional Quantum Computation Course



Learn Quantum Computation using Qiskit Textbook



Chapters:

0. Prerequisites
1. Quantum States and Qubits
2. Single Qubits and Multi-Qubit Gates
3. Quantum Algorithms
4. Quantum Algorithms for Applications
5. Investigating Quantum Hardware Using Qiskit
6. Implementations of Recent Quantum Algorithms