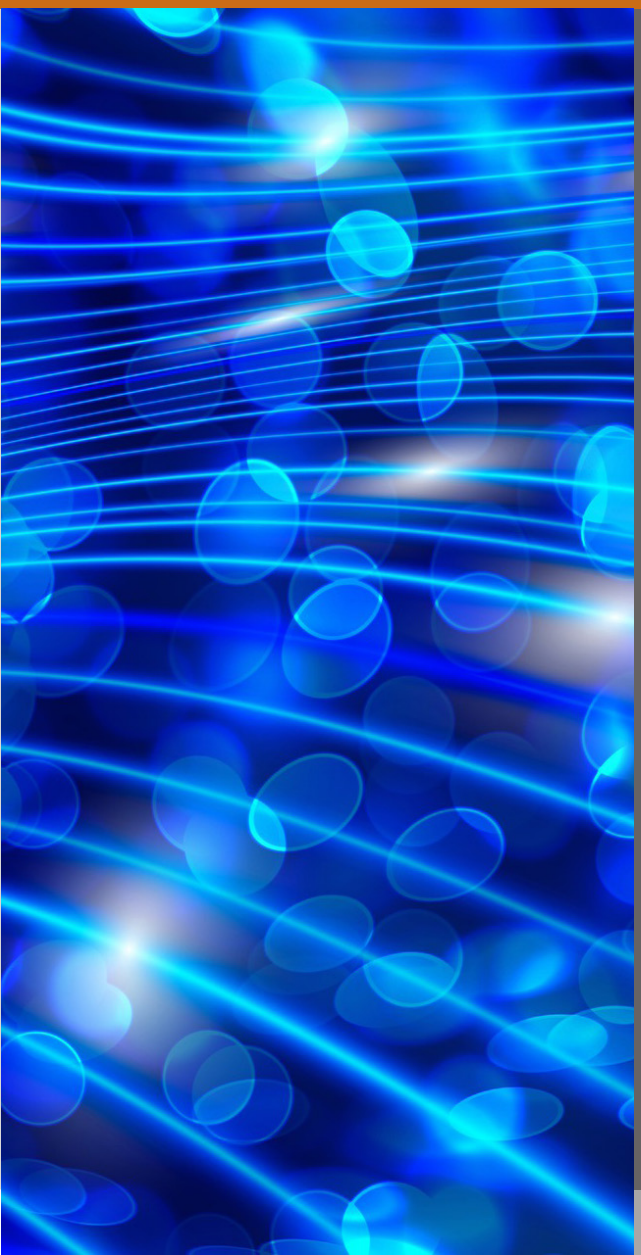
MIT CSAIL

# QUANTUM INFORMATION SCIENCE GROUP

The MIT Quantum Information Science Group explores the capabilities and limits of quantum computers, and computational complexity theory more generally.




**Professor of Applied Mathematics**

**Prof. Peter Shor**
Telephone: 253-1827
Email: shor@csail.mit.edu

**Assistant Professor in Electrical Computing and Engineering**

**Prof. Anand Natarajan**
Email: anandn@mit.edu

**CSAIL / MIT**


**Website:**
qis.mit.edu

**Location:**
The MIT CSAIL Quantum Information Science Group is located in the Ray and Maria Stata Center, Room 32-G574 at MIT.


**Research Group Address:**
Quantum Information Science Group
MIT CSAIL
77 Massachusetts Avenue
Cambridge, MA 02139

## Research Vision

We seek to expand quantum computing and information as a field of study, focusing on a variety of topics in quantum theory and quantum algorithms.

## Areas of Research

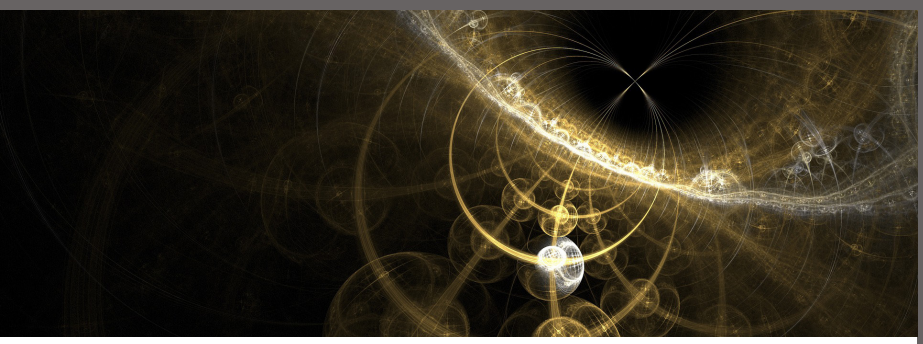
- Quantum computing
- Algorithms and theory

## Research Activities

- Investigating the efficiency of quantum computers
- Applying quantum information to the study of black holes
- Finding quantum algorithms that improve on classical ones, such as Shor's algorithm, which enables quantum computers to break the RSA (Rivest-Shamir Adelman) encryption algorithm
- Quantum complexity theory
- Quantum soundness of the classical low individual degree test
- Quantum interactive proof systems

## Industry Applications

- Cryptography
- Computing and health
- Cybersecurity
- Big data
- Energy



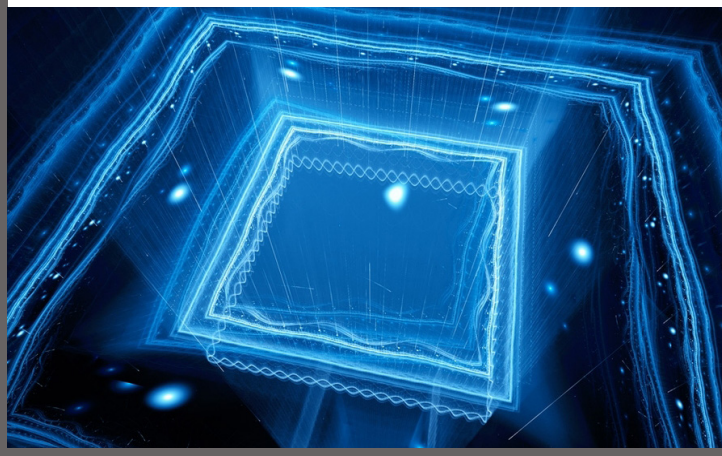
## In the News

- In 2020, Prof. Peter Shor received the BBVA Foundation Frontiers of Knowledge Award in the Basic Sciences category for his contributions in quantum computation.

- Seemingly simple quantum computers show more entanglement than researchers previously believed. This means that quantum computers powerful enough to be of practical use could be closer than we thought.

"Everyone thought that you couldn't correct errors on quantum computers, because as soon as you try to measure a quantum system you disturb it. In other words, if you try to measure the error so as to correct it, you disturb it and computation is interrupted. My algorithm showed that you can isolate and fix the error and still preserve the computation."

*– Prof. Peter Shor*



## Current Principal Investigators, Researchers, Postdocs, and Graduate Students in the Group

Peter Shor
Anand Natarajan
Aram Harrow
Honghao Fu
Andrey Khesin
Sujit Rao

MIT CSAIL