

## About Orange Quantum Systems

Orange Quantum Systems is a spin-off of QuTech that accelerates the research on quantum physics and the development of quantum technology for quantum computing. We support R&D labs with custom characterization and calibration software and develop customized full-stack setups for R&D into quantum computing. Orange Quantum Systems is part of Quantum Delft's world-leading ecosystem for innovation in quantum technologies.

## The project

Many applications in quantum computing such as variational quantum algorithms (VQA) and calibration experiments require an accurate reconstruction of a quantum state. The standard technique that is used to reconstruct quantum states is quantum-state tomography. Although the basic principles of quantum-state tomography are straightforward, making a tomographic reconstruction that correctly takes into account the statistics of the measurement and the biases introduced by control and measurement errors can be challenging. In this project you will be implementing both linear-inversion based quantum-state tomography as well as more advanced variants for use in experiment. If time allows, the developed protocols will be tested on real quantum hardware developed by Orange Quantum Systems and our partners.

## Required skills and expertise

We are looking for a motivated MSc. student with an interest in (experimental) quantum physics and programming. For this internship we require that you:

- Have completed some courses in quantum information processing and are familiar with the basics of quantum-state and quantum-process tomography.
- Are familiar with common scientific Python libraries and data visualization (e.g., scipy, numpy, matplotlib, jupyter, etc.).
- Are interested in further developing your software engineering skills (version control, test-driven development, documentation).

## What we offer

We offer a paid internship in an inspiring environment with a dedicated team of scientists, engineers at the forefront of quantum technology.

## Interested?

If you have any questions on the project, please do not hesitate to contact us.

If you are interested in applying for the project, please send a motivation letter and resume to Adriaan Rol ([adriaan@orangeqs.com](mailto:adriaan@orangeqs.com)).