# QuTiP: Quantum Toolbox in Python

Version 0.1

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## 1 Getting Started

### 1.1 Introduction

QuTiP is designed to be an open-source software solution to solve for the dynamics of open quantum systems. QuTiP is written in the Python programming language, allowing for platform-independent operation without the need to compile any source code. The numerics underlying QuTiP are based on the standard high-performance numerical and graphical packages available for Python:

**NumPy:**http://numpy.scipy.org
**SciPy:**http://scipy.org
**matplotlib:**http://matplotlib.sourceforge.net

**PyGTK:**http://www.pygtk.org (Linux / Windows)
**CocoaDialog:**http://cocoadialog.sourceforge.net (Mac)

The creation of QuTiP was inspired by the highly successful qotoolbox http://www.qo.phy.auckland.ac.nz/qotoolbox.html, but goes beyond by providing for a more flexible work environment, capable of handling general time-dependent problems. In addition, QuTip enables support for parallel processing found in most modern computers.

## 1.2 Installation

QuTiP uses the standard Python distribution tool distutil for installation. Once the dependences have been satisfied, installing QutiP is as simple as downloading the installer and running from the command-line:

```
sudo python setup.py install
```

which will install QuTiP into the directory specified by your Python distribution. Directions for installing the dependences can be found via the links in Sec. 1.1. However, in the the sections that follow, we will briefly highlight the quickest installation method for the various platforms.

### 1.2.1 Linux

The quickest way to get started using Linux is to install the necessary packages via your distributions software management program. QuTiP requires the NumPy, SciPy, and matplotlib packages to run. In addition, PyGTK is an optional (but recommended) install for graphical output. Finally, it is useful to access QuTip via the command line, which is provided by the iPython http://ipython.scipy.org package.

### 1.2.2 Macintosh

On the Macintosh, it is recommended that you install the necessary programs using the SciPy SuperPack http://stronginference.com/scipy-superpack, or obtain the all-in-one numerical Python distribution provided by Enthought http://www.enthought.com, the developers behind the NumPy and SciPy packages. This software is freely available for academic institutions and users, but requires a license fee for commercial use. Using either of these two methods fulfills all the installation requirements for QuTiP.

### 1.2.3 Windows

Windows sucks

# 2 Your First Calculation

```
2 for i in range(intmax):
3   do nothing
4 print 'done'
```