

## Software

### Commercial

#### Microscopy

##### [SymPhoTime64](#)

A complete software suite for acquisition and analysis of time resolved fluorescence data. SymPhoTime features a powerful scripting language that allows customisation of existing analysis and even implementation of novel analysis techniques.

[Phasor Analysis](#) Phasor Analysis is currently not included in [SymPhoTime64](#). However, you can use [Globals](#) developed by the [Laboratory for Fluorescence Dynamics](#) to analyse FLIM data via the Phasor approach.

#### Spectroscopy

##### [EasyTau](#)

EasyTau is the systems software of PicoQuants time resolved spectrometer [FluoTime 300](#). EasyTau features a scripting language to automate more complex experiments. Examples of EasyTau scripts can be found on github: <https://github.com/PicoQuant/EasyTau-Scripts>

##### [FluoFit](#)

Decay curve analysis software

## Open Source

Please note that these are external projects for which PicoQuant takes no responsibility and provides no support. In case of problems please contact the respective authors. Also note that such projects may not be maintained continuously. In particular, please check if they use current versions of file formats and/or programming libraries before you invest in larger development work based on such projects.

If you develop improved or new code, please consider contributing your code back to the community.

The compilation below is probably not complete. If you are the maintainer of a software that deals with TCSPC data please edit this page and add your software listing. Alternatively you can also use <https://support.picoquant.com> to contact PicoQuant support to submit your software project.

## Data Analysis

### Complete packages

- **PAM** is a software package for quantitative analysis of fluorescence microscopy and spectroscopy data, with a focus on experiments using pulsed interleaved excitation. <http://pam.readthedocs.io>

- [Software Package for Multiparameter Fluorescence Spectroscopy and Imaging](#) by research group Seidel, HHU: A collection of independent software packages which enable the user to perform the analysis workflow put forward by the group. Please note that a trial version is available.
- **Open Tools for Solution-Based Single-Molecule Fluorescence Spectroscopy**
  - **FRETbursts**: software for burst analysis of freely-diffusing single-molecule FRET (smFRET) measurements including  $\mu$ s-ALEX. [FRETbursts Homepage](#) and [paper](#).
  - **PyBroMo** simulator for single molecule FRET experiments of freely diffusing particles.
  - [Researchgate group Open Computational Tools for Single-Molecule Spectroscopy](#)
- **PyCorrFit** is a general-purpose FCS evaluation software that, amongst other formats, supports the established Zeiss ConfoCor3  $\sim$ .fcs file format. PyCorrFit comes with several built-in model functions, covering a wide range of applications in standard confocal FCS. In addition, it contains equations dealing with different excitation geometries like total internal reflection (TIR).
- **FLIM-FRET analyzer**: open source software for automation of lifetime-based FRET analysis. This is a Microsoft Windows application originally developed in C#. The main goal of this application is to provide the FLIM community a user-friendly application.
- **Fluortools**. Fluorescence Decay and Anisotropy Analysis.
- **PyCorrelate**: Pycorrelate computes fast and accurate cross-correlation over arbitrary time lags. Cross-correlations can be calculated on “uniformly-sampled” signals or on “point-processes”, such as photon timestamps. Pycorrelate allows computing cross-correlation at log-spaced lags covering several orders of magnitude. This type of cross-correlation is commonly used in physics or biophysics for techniques such as fluorescence correlation spectroscopy (FCS) or dynamic light scattering (DLS).
- **QuickFit 3.0**: QuickFit 3 is our open-source data evaluation software for FCS and imagingFCS (imFCS) measurement. Actually QuickFit 3 itself is a project manager and all functionality is added as plugins. A set of tested plugins is supplied together with the software.
- **FCS Point Correlator** FCS Bulk Correlation Software accepting pt3 and ptu files.
- **FLIMfit**. FLIMfit is an open source package for rapid analysis of large FLIM datasets.
- <https://github.com/zhengkaiyu/FIMAS> Fluorescent Imaging Analysis Software
- **Extensible Time-tag Analyzer**. ETA, the extensible time tag analyzer, is an event driven programming language with graphical user interface for analyzing, plotting, and fitting of time tagged data. [More info](#).
- **Pals3D** is a graphical application to support the use of a Time-Correlated Single Photon Counting system for application to Positron Annihilation Lifetime Spectroscopy. <https://github.com/avancra/Pals3D>

## Libraries/scripts/readers

- [Demo Code for reading PicoQuants PTU File format](#)
- [Reading PicoQuants PTU File formats to MatLab - 100x faster than the Demo Code](#)
- **libpicoquant**: Tools for reading PicoQuant file formats: <https://github.com/tsbischof/libpicoquant>
- **Open Microscopy's BioFormat** supports PicoQuant bin files ([pre-histogrammed Image Data File](#)) <https://www.openmicroscopy.org/site/support/bio-formats5/formats/picoquant-bin.html>
- **ImageJ data readers-**
  - Import Filter for pt3 files: [http://imagejdocu.tudor.lu/doku.php?id=plugin:inputoutput:picoquant\\_.pt3\\_image\\_reader:start](http://imagejdocu.tudor.lu/doku.php?id=plugin:inputoutput:picoquant_.pt3_image_reader:start)
  - Import of ptu/pt3 image files (+intensity/average lifetime stacks): [https://github.com/ekatruxha/PTU\\_Reader](https://github.com/ekatruxha/PTU_Reader)
- <https://github.com/QuantumPhotonicsLab/readPTU> readPTU: a Python Library to Analyse Time Tagged Time Resolved Data

“readPTU is a python package designed to analyze time-correlated single-photon counting data. The use of the library promotes the storage of the complete time arrival information of the photons and full flexibility in post-processing data for analysis. The library supports the computation of time resolved signal with external triggers and second order autocorrelation function analysis can be performed using multiple algorithms that provide the user with different trade-offs with regards to speed and accuracy. Additionally, a thresholding algorithm to perform time post-selection is also available. The library has been designed with performance and extensibility in mind to allow future users to implement support for additional file extensions and algorithms without having to deal with low level details. We demonstrate the performance of readPTU by analyzing the second-order autocorrelation function of the resonance fluorescence from a single quantum dot in a two-dimensional semiconductor.”

<http://qpl.eps.hw.ac.uk/>

- [ptuT3toT2](#) - a program that converts ptu files from picoquant from T3 mode to T2 mode
- **Photon-Tools** Python utilities for working with photon timestamp data from fluorescence spectroscopy experiments <https://github.com/bgamari/photon-tools>
- **Photon Correlation** A suite of command-line tools for performing calculations on photon arrival data, as produced by hardware such as the PicoQuant PicoHarp and HydraHarp: [https://github.com/tsbischof/photon\\_correlation](https://github.com/tsbischof/photon_correlation)
- **dspFRET**: Matlab code for analyzing TTTR data from PicoQuant. Typical application is analysis of single pair FRET measurements with pulsed interleaved excitation (PIE-FRET). <https://github.com/RobinsonLab/dspFRET>
- [exciton diffusion \(Matlab\)](#)
- **FoCuS-point**: FoCuS-point utilises advanced time-correlated single-photon counting (TCSPC) correlation algorithms along with time-gated filtering and innovative data visualisation. [FoCuS Homepage](#) and [paper](#)
- [TCSPC curve fitting for phd files \(Python\)](#)

## Data Acquisition

- **qudi**: A modular laboratory experiment management suite which supports PicoHarp300. <https://github.com/Ulm-IQO/qudi>
- **pyPL**: wxpython integration of software and hardware for micro-photoluminescence measurements: WinSpec, PicoHarp, and Thorlabs/APT piezos and stepper motors. <https://github.com/kaseyrussell/pyPL>
- PicoHarp Multiscan with Prior Stage: [https://bitbucket.org/ywsong2/uky\\_ptu\\_convert](https://bitbucket.org/ywsong2/uky_ptu_convert)

## Demos about Controlling PicoQuant Devices

### Sepia II and Solea

- <https://github.com/PicoQuant/PQLaserDrv>

### TimeHarp 260

- <https://github.com/PicoQuant/TH260-Demos>

### PicoHarp 300

- PicoHarp 300 TCSPC system hardware plug-in for ScopeFoundry (Python)
- Python binding, Tango device server and Taurus gui to access the PicoHarp300 photon counter
- <https://github.com/PicoQuant/PH300-v2.x-Demos>
- <https://github.com/PicoQuant/PH300-v3.x-Demos>

## HydraHarp 400

- Control HydraHarp400 (python)
- <https://github.com/PicoQuant/HH400-v1.x-Demos>
- <https://github.com/PicoQuant/HH400-v3.x-Demos>

## MultiHarp 150

- <https://github.com/PicoQuant/MH150-Demos>

## Other

- PicoHarp Library in Python  
<https://github.com/srgblnch/PicoHarp300>

GitHub repositories mentioning PicoQuant and supporting the PicoQuant t3r data file format:

<https://github.com/search?&q=picoquant+OR+picoharp+OR+hydrharp+OR+TimeHarp>

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