

# How to connect and work remotely

Whether you use Windows, MAC OS X or Linux platform, you can setup a remote connection to our Physics and Astronomy computing system and access your lab work.

You want to be able to connect remotely, transfer files both ways, open graphic windows and multiple sessions if necessary. For the expert, the connection is using the X window system, version 11 (this is why it is called X11).

## A- If your are using Windows

1- Download Cygwin from <https://www.cygwin.com/>, run `setup-x86.exe` and follow these installation steps:

- i- choose "install from internet"
- ii- click "Next" several times until you are asked to choose a download site
- iii- pick one up, if it is too slow, try another one
- iv- you are presented with a list of packages to install. You have to install the **ssh**, **xinit**, **nano**, **xterm** and **emacs** packages. To do this, type **ssh** in the search box and check all ssh related things for install (it should switch from skip to some cryptic number/name). Do the same for **xinit**, **emacs**, **emacs-X11**, **nano**, **xterm**. Then click next until the install starts. It will take a while!

2- Start Cygwin

3- Add the following two lines to the `.bashrc` file (use the nano editor, note that the filename starts with a dot "."):

```
export DISPLAY=:0.0
startxwin >& /dev/null &
```

4- Close the cygwin window by typing **exit**.

5- start cygwin again and run the connection test below in D-

Note that you can always rerun `setup-x86.exe` anytime later in order to update an existing cygwin installation, it will not erase the packages already installed (unless you switch them back to "skip" in the packages window).

If you have any trouble with the above instructions, you should have a look at the Cygwin/X installation instructions there <http://xfree86.cygwin.com/docs/ug/>

## B- If you are using MAC OS X

1- Install XQuartz from <https://www.xquartz.org/>

2- Install iTerm2 from <https://www.iterm2.com/>

3- Start iTerm2 open an `xterm` window and run the connection test below in D-

### C- If you are using Linux

1- you have nothing to do, just open an `xterm` terminal (console) window and run the connection test below in D-

### D- How to test your connection setup

From your `xterm` window, establish an **ssh** connection between your home computer (or laptop) and the PHAS server (**ssh.phas.ubc.ca**):

```
ssh -XY yourusername@ssh.phas.ubc.ca
```

where **yourusername** is your login username for PHYS210. You will be prompted for your password. **ssh** is a secure connection protocol that is universally used for remote connections ([https://en.wikipedia.org/wiki/Secure\\_Shell](https://en.wikipedia.org/wiki/Secure_Shell)). If you type **man ssh**, you will see the list of options it comes with, but you only need to use **-XY** in order to enable **x11** forwarding so you can open graphic windows, from the remote server, which will pop up on your computer.

To make sure **x11** is enabled, type **xterm** once you are connected, a new `xterm` window should appear on your screen. You can close an `xterm` window by typing **exit** in it.

From the connection you have just established, you should test the few UNIX command lines we have discussed in class and lab 1 (**pwd**, **ls**, ...). You will see that the files and environment is the same as the one you worked on in class. You are physically logged on the PHAS network. You can work from home, edit with **nano**, start python, etc... and next time you connect from the computer lab, your work will be in the same state you have left it last (whether it was from home or from the lab room).

Let us know if you experience any problem ([phys210instructors@phas.ubc.ca](mailto:phys210instructors@phas.ubc.ca))