EXOTIC Installation Instructions for Windows Users

There are two ways you can run EXOTIC, either with a Python Notebook in the Google Collab (or Jupyter) or on your own personal machine using the command line. Please review the details of the two processes below and select the best option for you.

Google Collab:

Running EXOTIC in the Google Collab is the recommended option for all users as it offers a more user-friendly and interactive experience. It is especially recommended for new users, those who are unfamiliar with using the command line, students, and those analyzing data via remote observatories. To run EXOTIC with the Python Notebook, please visit the instructions 'How-to-Run-EXOTIC-with-the-Python-Notebook' in the Documentation folder.
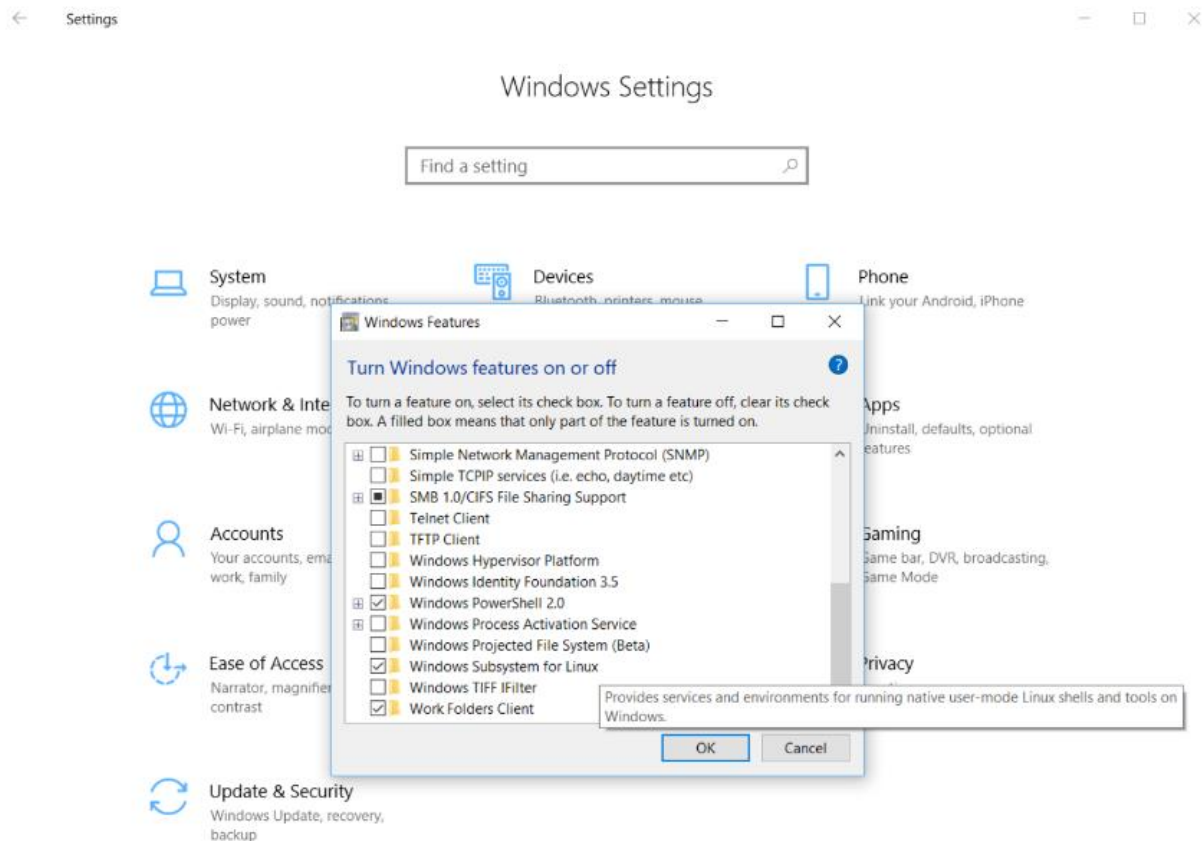
Command line:

If you feel comfortable using the command line, are reducing large data sets, or are looking to learn more about EXOTIC and how to run it on your own machine, follow the set of instructions on the following pages:

Please note: in order to be able to click on the links and select text in this document, you must **download it off GitHub**. The GitHub preview simply shows you an image of the document, which does not allow for those functions.

I. Install Ubuntu
- Open Windows Settings
- Search "Turn Windows features on or off"
- Check the box for "Windows Subsystem for Linux"
- Click OK.
- Click Restart now.

- Open Microsoft Store
- Search "Ubuntu"
- Install the application

Note: Ubuntu operates on what is known as a Linux operating system. The operating system is the software that manages your computer's processes and memory. Installing Ubuntu will simply allow you to make use of the Linux operating system when (and only when) you are using the app. It will in no way affect your current

Windows operating setup, but it will make running EXOTIC a lot easier and faster!

Note: EXOTIC can be run on your Widows computer without installing Ubuntu. However, we do not recommend this as the installation process is much more difficult and EXOTIC runs much slower on Windows. However, if you would prefer running EXOTIC natively on Windows (instead of in Ubuntu), follow this guide instead: https://github.com/rzellem/EXOTIC/blob/master/Documentation/EXOTIC-Instructions.pdf

II. Download DS9 (Astronomical Image Viewing Software)
- Follow the link: https://sites.google.com/cfa.harvard.edu/saoimageds9?pli=1&authuser=1
- Download the version corresponding to your Windows operating system.
- Run the installer once downloaded.
- Follow the instructions in the installer to complete the installation.

Note: This software will be used to view the ".FITS" images you obtain during observations. For more information on DS9, check out the User Guide: http://ds9.si.edu/doc/user/index.html

III. Open Ubuntu
- Click the start button in the lower left-hand corner.
- Type "Ubuntu" or scroll down to "U" in the list of applications
- Click on Ubuntu.
- When opening Ubuntu for the first time, you might be prompted to enter a password. Enter your new password and take note of it. You will be prompted again later to enter it.

<u>Note</u>: Ubuntu allows you to perform actions on your computer (run python programs, install applications, edit files, etc.) by typing in commands. If you are interested in learning more about Ubuntu and the different commands you can use, follow this link: https://ubuntu.com/tutorials/command-line-for-beginners#1-overview

IV. Installing EXOTIC – Execute the following commands in Ubuntu.

- Type "sudo apt update" – do not include the quotes.
- Hit Enter.
- You may be asked to enter the password you just created (or already had if you did not need to install Ubuntu). Enter your password.
- Hit Enter.

- Type "cd /mnt/c/Users/your_username/"– do not include the quotes and replace "your_username" with the username for the account you are signed into on Windows. Hit Enter.

- Type "cd /PATH/" – replacing PATH with the directory you want the EXOTIC folder to be downloaded in. For example, typing "cd Documents" will mean that the EXOTIC files will be stored in /mnt/c/Users/your_username/Documents/EXOTIC/.
- This will also be the location in which you run the program.

  - <u>Note:</u> cd stands for "Change Directory". In executing this command, you are navigating to your Downloads folder, just as you would by double-clicking on Downloads in File Explorer.

```
mjs2369@DESKTOP-R2PG3MN:~$ cd /mnt/c/Users/Marlena\ Smith/Documents/
mjs2369@DESKTOP-R2PG3MN:/mnt/c/Users/Marlena Smith/Documents$
```

- Install Python (or update Python to the latest version) on Ubuntu by using the command 'sudo apt-get install python3'. Here you will be prompted for the password you created in the beginning (or already had if you've used Ubuntu before).

Running these next few commands will take some time (probably a few minutes). Wait for them to complete.

- Type 'curl https://bootstrap.pypa.io/get-pip.py -o get-pip.py' and hit enter.
- Type 'python3 get-pip.py' and hit enter. If this command fails, try replacing 'python3' with 'python'.

⭐ • Run the command **'pip3 install exotic || pip install exotic'**. This command will install EXOTIC and all necessary Python packages used to run EXOTIC.
  - **Please Note: If this command fails, you can manually download EXOTIC off GitHub. To do this, follow the**

- Wait a while. This process may take several minutes.
- Type 'exotic' and hit enter. You should see the introductory header to EXOTIC as pictured at the bottom of this document, which tells you that it is all up and running!

I you experienced issues with the starred command above, please follow these next steps:

- Type "chmod 755 exotic_installation_linux.sh" – do not include the quotes.
- Hit Enter.
- Note: this command alters the file you downloaded "exotic_installation_linux.sh" to be executable (i.e. you can now run it in your terminal).

- Type "./exotic_installation_linux.sh" – do not include the quotes.
- Hit Enter.
- Enter the password you created earlier (or already had) when prompted.
  - Note: this command runs the file you downloaded, which is called a script. A script is simply a list of commands to be executed in the Ubuntu. This script will download Python (unless you already have it) and install all the

necessary packages to run EXOTIC. Finally, the script will run EXOTIC to test that it is functional.

- Wait a while. This process may take several minutes.
- Once the process has completed, you should see the introductory header to EXOTIC as pictured at the bottom of this document, which tells you that it is all up and running!

If you are seeing this header in your Ubuntu terminal, EXOTIC is successfully installed, and you are ready to begin analyzing exoplanet data!

```
Thinking |
*****************************************************************
Welcome to the EXOplanet Transit Interpretation Code (EXOTIC)
Version  0.7.5
*****************************************************************

Enter "1" for Real Time Reduction or "2" for for Complete Reduction:
```

And that's it! You have successfully installed EXOTIC and can now use it at any time to reduce the data from your amazing transit observations!

To learn how to run the code and how EXOTIC works, check our other guides on GitHub!

→ **https://github.com/rzellem/EXOTIC/tree/main/Documentation**

If you have any questions or comments, please feel free to reach out to us on Slack or email at exoplanetwatch@jpl.nasa.gov