# Introduction

The "classic" way of doing astrophotography is to use a telescope with a camera and lots of accessories such as guiding scope or OAG / Filter wheel / Dew Heaters / guide Camera / etc in combination with a PC / Laptop. This setup requires to extend long cables for data and power distribution that goes out of the mount and to your laptop which is a couple of meters / feet away from your EQ mount/setup.

For better cable management and mobility, we recommend the use of the Ultimate Powerbox in combination with a "PC Stick" or a mini PC (e.g Intel NUC). The small factor PC can be placed as "piggyback" on the Ultimate Powerbox (or under the Ultimate Powerbox ).



Our main concept is to operate your mini PC, remotely, using your tablet / laptop's Wifi.
This adds great mobility in the field and it is a perfect solution for a "grab and go" setup.

Most people are going to say that the power of the mini PC is not enough for astrophotography sessions.

Trust us, it is more than enough!! Nowadays these boxes have an i5 and i7 intel CPU inside with plenty of RAM.

Ideal Setup
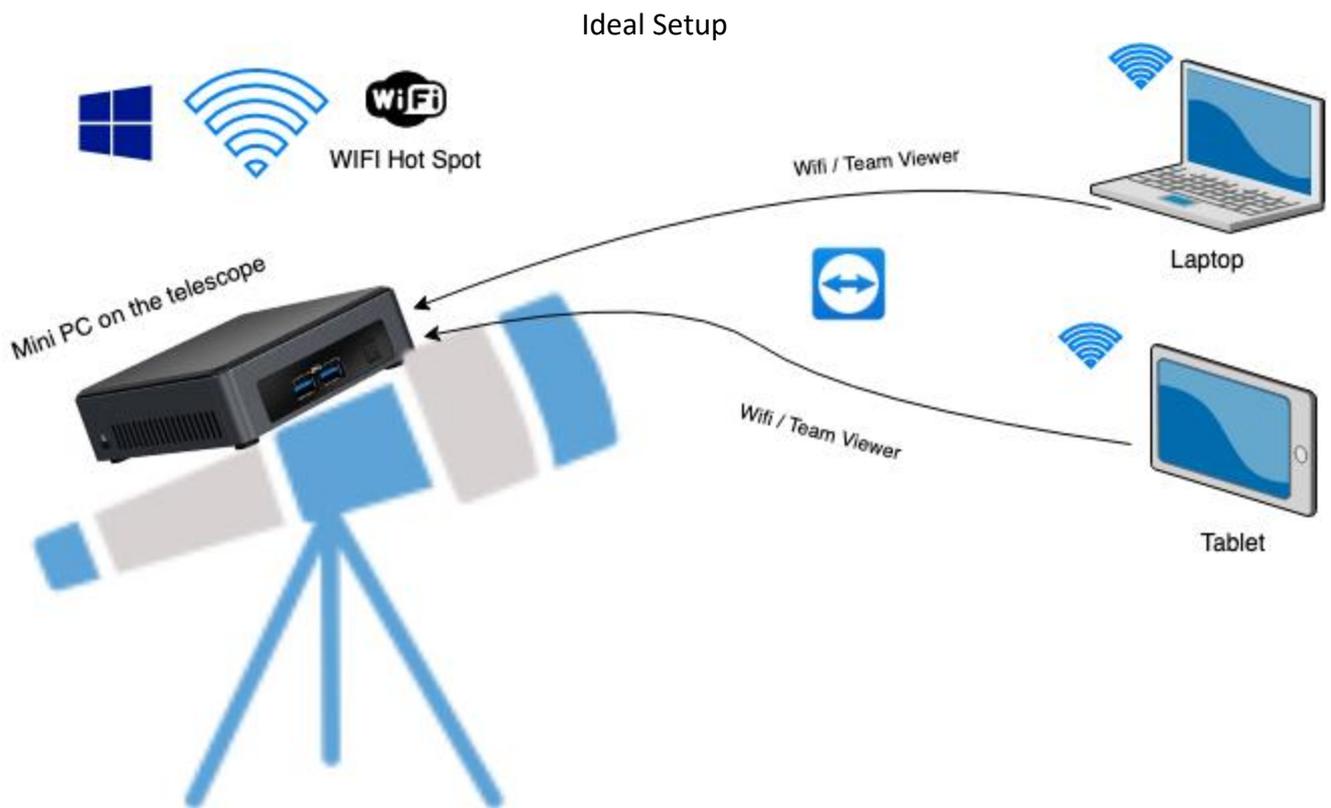
Mini PC is configured as a WiFi Hotspot. Using a tablet / laptop or even your smart phone you can connect to this WiFi SSID and by Remote Desktop (RDP) or TeamViewer you can connect to the Mini PC and control your equipment.

**Advantages:**

- **Cable Management** (every cable is tightly placed close to the telescope axis).
- **Grab and Go**: You can have everything prepared on the telescope. Fix each cable and device near the telescope (CCD, Filter Wheel, OAG, Guide Camera). Put the optical tube inside a carry bag and when you are ready just place the telescope on top of your Equatorial mount.
- **Single 12V power supply**: You don't need to carry inverters to provide a constant 220 / 110V AC power supply to your laptop during the night. Most mini PC require DC 5-12V.
- **Battery consumption**: Imagine that without a laptop inverter working all night long, you need a smaller battery as your power consumption is lower.
- **Mobility**: Your whole setup is light weighted. Battery is smaller, think also that you don't need to carry a chair and a table to place your laptop close to your setup.
- **Operation range up to 100m**. You can remotely connect to your equipment. You don't have to be close to your gear.  Control your setup from inside a tent or from your warm fireplace / house. Mini PC work independently and you can only connect, frequently, via Teamviewer or RDP to monitor your session.
- **Reduce Light Pollution** in surrounding area: Your laptop's monitor is big and bright. If you don't use a laptop close to your equipment you eliminate the emitted light towards your equipment. Visual observers who are close to you will respect that. ☺

## Step 1: Setup a Mobile Hot Spot

Most Mini PC have pre-installed "Windows 10 Home Edition". There are some limitations (remote desktop/ WiFi hot spot) in the functionalities of Windows 10 Home but we'll bypass them by using 3rd party software.

We strongly suggest to download and install "**Connectify**" which turns your PC into a WIFI hotspot.

You can find it here: https://www.connectify.me/

Please notice: The free version is OK for what we want to use it for.
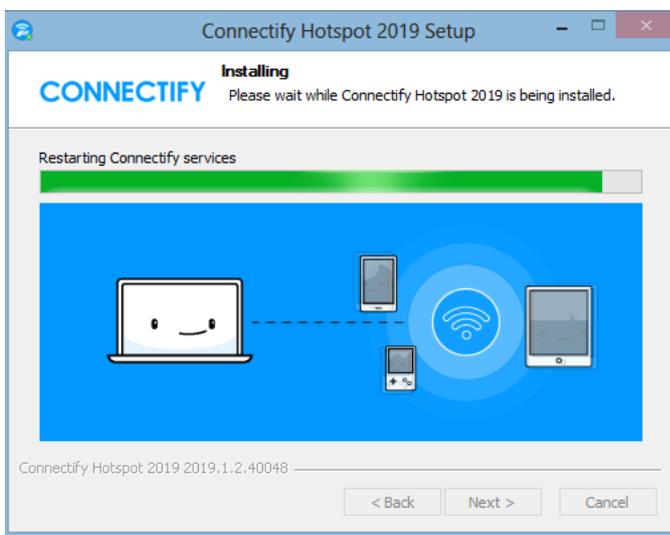


It takes a couple of minutes to install the software and it required a reboot to enable the WiFi hotspot functionality.

After reboot open "Connectify" and click **Settings -> Startup Options**.
Select "**Always**" when it asks you to resume-hotspot on boot-up. **This is very important**! You always need the WiFi hotspot ON.
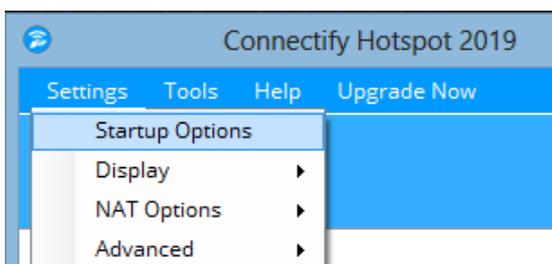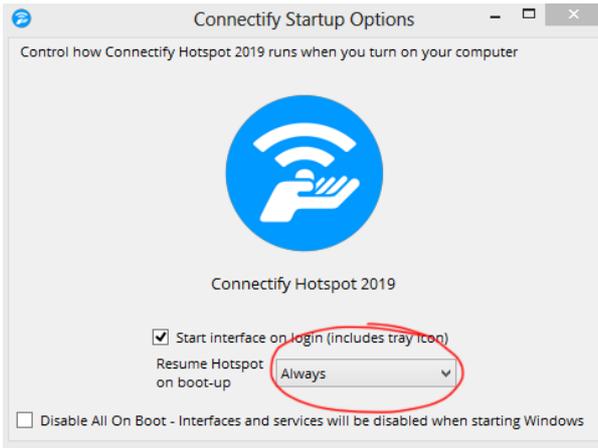
Select -> Create a... **WI-FI HotSpot**
Internet to Share: You can also select None
Network Access: Routed
Hotspot Name: Connectify-**Your-Name**
Password: Set a password for your Hotspot



Click "**Start Hotspot**"

**Hooray! Your Mini PC is now a WIFI HotSpot.**

# Step 2: Configure TeamViewer in your Mini PC

Download and install the latest Teamviewer: https://www.teamviewer.com

Click **Extra** -> **Options**

Tick the "**Start TeamViewer with Windows**" and setup a password.
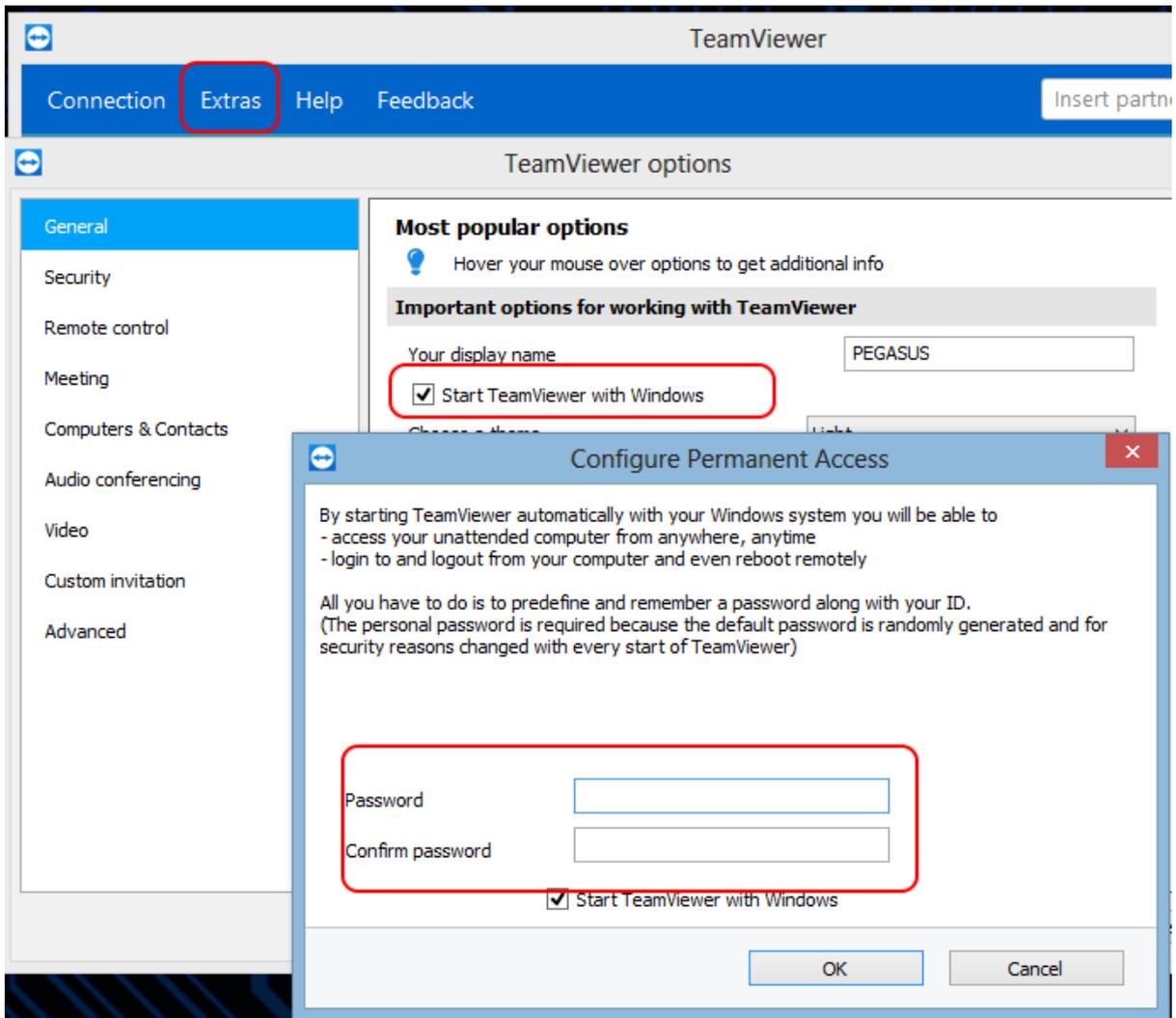
Moreover, select to "**Accept**" Incoming LAN connections
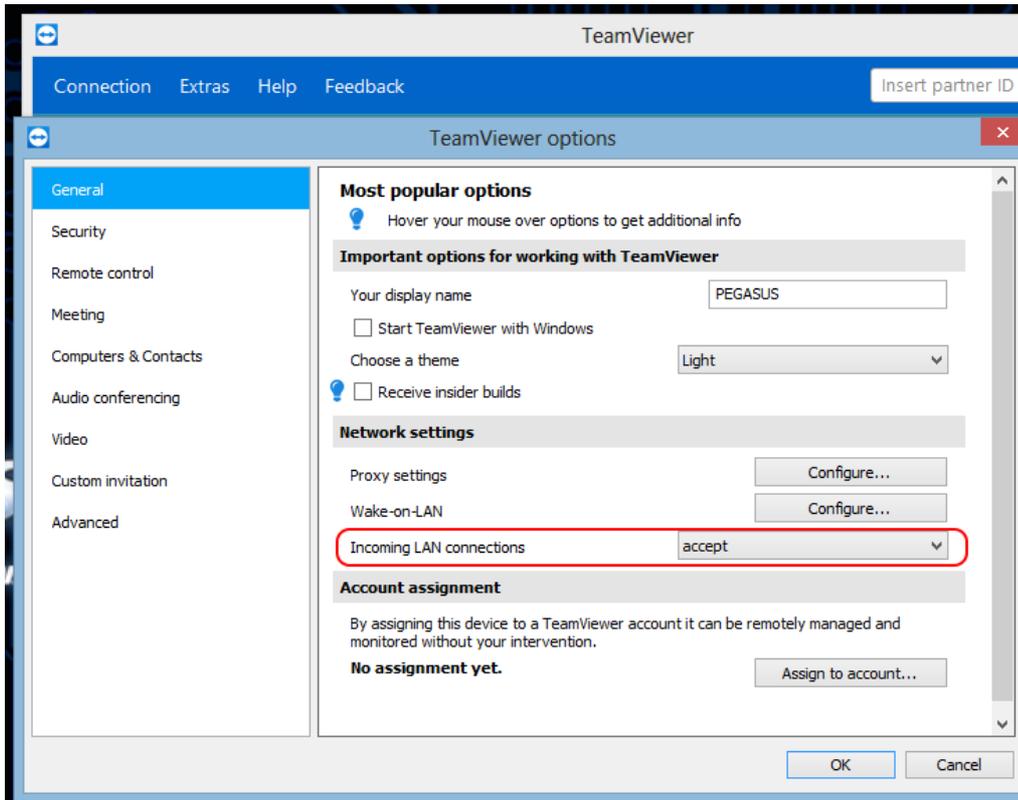


Click **OK** to save all of these settings.

Hint: You can also choose Remote Desktop. (RDP) as a way to remotely connect to your small factor PC. Windows **Professional** includes a Remote Desktop Server available. Unfortunately, Windows Home does not support that.

If you want to use a 3rd party RDP server and you know what you are doing you can download and install the latest version of RDP Wrapper library from: https://github.com/stascorp/rdpwrap/releases

# Step 3: Configure TeamViewer in your Remote Laptop / Tablet

- Use your laptop / tablet / smartphone to connect to the **WIFI Hotspot name** you previously configured: Connectify-**Your-Name**
- Download Teamviewer in your laptop / tablet / mobile phone and use the Connectify IP of your new WIFI Hot Spot. Usually Connectify uses the following static IP: "**192.168.137.1**"
- Place this IP in your Teamviewer client (in the partner ID box) and click **Connect.**
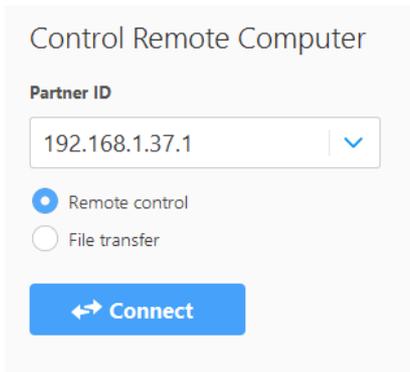


You are now connected to your small factor PC. Use all programs in the same way
Photo below is a real example of operating our setup through an Apple Pad and using SGPro. ☺



Enjoy and clear skies!