Windows Subsystem Linux installation of the DISCUS/DIFFEV/KUPLOT/REFINE software
Version 6.12.00 and later

0.   Preparation:

As the DISCUS_SUITE Version 6 is based on the Windows Subsystem for Linux (WSL) the
complete installation must be run from within the user account that you will use to run DISCUS. Do
not install a WSL distribution from a separate admin account. WSL is always unique to the
individual user account!
 The installation will eventually create an icon on your desktop that can be used to start the
DISCUS_SUITE. You will actually have an additional App "Ubuntu" installed that offers the full
options of a Linux system.
During the installation, please ensure that you have internet access. Check you firewall settings. The
settings need to be such that the firewall asks you for access rights for new software. If access rights
are denied automatically, the installation script will fail and this error is not straightforward to
detect. Check the settings of any Anti-Virus and malware checker. Sometimes these block Windows
Subsystem for Linux!

First, please check if WSL is installed and if a distribution is available. Open a powershell window,
administrator rights are not required at this step. Please type
>   **wsl -l -v**
If no Linux distribution is installed yet you should get a lengthy help message.
If wsl is enabled you will get a message similar to :

	Name	State	Version
*	Ubuntu	Running	2

or

	Name	State	Version
*	Ubuntu	Stopped	2

Either is fine, and you can proceed with the DISCUS installation.

If wsl is not enabled you need to get this started. As usual life is easiest if your user account does
have administrator rights.
With administrator rights
>   In this case open a powershell with administrator rights and type
>   **wsl --install --distribution Ubuntu**
>   Note that there are two minus signs in front of "install" and "distribution".
>   Alternatively you can download and install "Ubuntu" from the Microsoft store.
Without administrator rights
>   Change to a user with administrator rights and enable WSL without installing a distribution:
>   In this case open a powershell with administrator rights and type
>   **wsl --install --no-distribution**
>   Note that there are two minus signs in front of "install" and "no-distribution". Return to
>   your user account. Please visit the Windows Store, download and install "Ubuntu", or open a
>   powershell and type
>   **wsl --install --distribution Ubuntu**
>   The Microsoft store seems to work more reliable.
For the rest of the installation administrator rights are no longer needed.
Check the hints on the installation of Ubuntu and in particular the hints on the user name and
password in section **2 Ubuntu Preparation:**

1. DISCUS installation

Please download **BOTH** of the latest installation scripts:

bbb_install_suite_Windows_WSL.ps1 and
bbb_install_suite_Windows_WSL.bat

from the DiffuseCode download site at:

https://github.com/tproffen/DiffuseCode/releases/

and save these into your **Downloads** folder on the **C** drive. See the hints on Admin rights and the execution policy for these scripts in section **3 Troubleshooting**.

Start the "Windows Terminal" or a powershell window as standard user.
To do so type **terminal** in the search window, click on the app icon and choose to run. Make sure the terminal runs the powershell, you should see "PowerShell" as name on the tab. Within the terminal window run the **BAT** script. Type the following and follow further instructions:

```
cd $HOME\Downloads
.\bbb_install_suite_Windows_WSL.bat
```

At the end of a successful installation the program will install a Desktop icon called **DiscusSuite_WSL.** Double click this to start the discus_suite.

As an option you can place a further Desktop icon that will start a WSL Ubuntu terminal. The installation will ask if you would like to place this as well. If you are not familiar with Linux, feel free to decline.

The very first time Discus is started after a reboot, it may take quite some time. If you use DISCUS a lot consider to answer the second option with yes. This will place an initialization script into your "autostart.bat", which will initialize DISCUS every time you boot your computer.

For all future updates you can simply type "**update**" within the discus_suite program or equivalently run the installation bat shell again.

Enjoy!

2   Ubuntu Preparation:

While the initial Ubuntu Setup is running or after a restart of your computer, the Ubuntu window will be present and ask you:

> Please create a default UNIX user account. The username does not need to match your Windows account.
> For more information visit: https://aka.ms/wslusers
> Enter new Unix username:

Choose any suitable name, which need not coincide with your Windows user name. Please make sure that the user name consists of letters, numbers and may be the underscore. Avoid any special characters, language specific characters and especially, by all means do NOT include a blank in the user name. I strongly recommend to use "**discus**" as user name, as the installation has been tested extensively using this name. Also, **please do provide a user name, as an empty return/enter will make "root" as the sole and default user.** A root user has many special administrator rights within Ubuntu and the Ubuntu system might accidentally be corrupted by typing a wrong command.

> Enter new UNIX password:
> Retype new UNIX password:

The password need not and probably should not coincide with your Windows password. I recommend a strong and save password, as Ubuntu lets you run all sorts of scripts. **As gentle reminder, please be aware that the password you type is not prompted at the screen.**

To close the Ubuntu window, please type

```
exit
```

within the activated window.

To determine if you have WSL version 1 or 2 , please ensure that wsl is installed and then open a powershell or the Windows terminal with a powershell and type:

```
wsl -l -v
```

If you get something like:

> **NAME   STATE   VERSION**
> *** Ubuntu   Running   2**

Check if VERSION is 1 or 2. Unless you have other program installed that require/use wsl, I recommend to use wsl version 2. To switch to version 2 type within the powershell terminal:

```
wsl  --set-default-version 2
wsl  --set-version Ubuntu 2
```

Note that there are two minus-signs in form of "**set**".
At this point admin rights are no longer needed. Please reboot your computer.

3   Helpful tools

Since DISCUS uses a script oriented an editor program that can handle simle ASCII test files is super helpful.
Typ out for example notepad++

4   Trouble shooting

As all Windows are equal and some are more equal, you might encounter issues during the installation. Some common issues are:

A)   Issues running a powershell script

The security settings on your computer might not let you run a powershell script. Try:

Copy both installation scripts into a folder within Documents, say a folder
        Documents\DiscusInstallation
Open the powershell and type

```
cd $HOME
cd Documents\DiscusInstallation
bbb_install_discus_suite_Windows.bat
```

If this runs, fine! If not type in the powershell window:

```
Set-ExecutionPolicy -ExecutionPolicy unrestricted
```

Once the installation is finished, please make sure you restore the setting to the original restricted settings with

```
Set-ExecutionPolicy -ExecutionPolicy RemoteSigned
```

If this still does not work, talk to your administrators and ask them to lift (at least for the first installation) the security settings for powershells. After all, your computer is to do science, and should have more options than being just a type writer.

At some large research facilities security rules are super tight and they will not allow even a temporary lifting. In that case the DISCUS_SUITE will have to be installed from within the Ubuntu distribution.
Please download "bbb_install_script.sh" from

https://github.com/tproffen/DiffuseCode/releases/

and save the file into your **Downloads** folder on the **C** drive.

Start the Ubuntu distribution by typing Ubuntu into the Windows-11 search and run the Ubuntu App. You do not need administrator rights.
Within Ubuntu please type:
```
cp /mnt/c/Users/your_user_account/Downloads/bbb_install_script.sh .
```

Replace "your_user_account" with the actual name. If your Windows User account name contains blanks or special characters, place the string into double quotation marks:
```
cp "/mnt/c/Users/your_user_account/Downloads/bbb_install_script.sh" .
```
Notice the decimal point at the end of the line which is an integral part of the cp (=copy) command.

Next type:

```
chmod  u+x   bbb_install_script.sh
./bbb_install_script.sh
```

The installation should run smoothly at this point.
To exit the Ubuntu terminal type

```
exit
```

or close the window.

B)   Several or Wrong Linux distributions

DISCUS runs best within the Ubuntu distribution. You can actually install several Linux distributions. To check which distribution is installed, open a powershell and type

wsl -l -v

If no Linux distribution is installed yet you should get a lengthy help message.
If wsl is enabled you will get a message similar to :

Name	State	Version
* Ubuntu	Running	2

or

Name	State	Version
* Ubuntu	Stopped	2

The distribution marked '*' is the one currently active. To activate Ubuntu you can type

```
wsl --set-default-distribution Ubuntu
```

Notice the two minus signs in front of "set".

C)   WSL reset

Sometimes it seems that WSL can accidentally be set up in a different administrator account with a Linux distribution. I have encountered issued running/installing Discus for such a setting. As WSL is User specific you should be able (in a powershell)

```
wsl --unregister <DistributionName>
```

Afterward install Ubuntu either from the Microsoft Store or by

```
wsl --install --distribution Ubuntu
```

Be careful, once unregistered all data, programs etc from the original distribution are lost. Consult your administrator.

D)   Wrong WSL version

If the version at "**wsl -l -v**" is listed as "1" you should type

```
wsl –set-default-version 2
```

WSL version 1 and especially Windows 10 require much more detailed installation and are no longer supported.
Excellent help on all WSL commands is available on-line at:

https://learn.microsoft.com/en-us/windows/wsl/

5   Obsolete installations

On Windows 10 with WSL version 1 you need another software to run DISCUS:

      VcSsrv an X-Window server found at https://sourceforge.net/projects/vcxsrv/
           (Windows 10 and/or WSL Version 1 only)
The installation script bbb_install_suite_Windows_WSL.bat can install VcXsrv yet the many
different flavors of Windows seem to make this error prone, especially with Windows10.

The VcXsrv program is not needed if you have Windows 11 and wsl version 2:
      To determine if you have WSL version 1 or 2 , please ensure that wsl is installed and then
      open a powershell or the Windows terminal with a powershell and type:

      wsl -l -v

      If you get something like:
           NAME   STATE   VERSION
           * Ubuntu Running   2

      Check if VERSION is 1 or 2
      If you have Windows 10 and / or wsl version 1 , please go to the **VcXsrv** site at
      https://sourceforge.net/projects/vcxsrv/ , download the installer package and run this.
      Please accept all defaults and install.

Generally I recommend to run DISCUS with wsl version 2, see section
"**3 Trouble shooting**" how to change to wsl version 2.