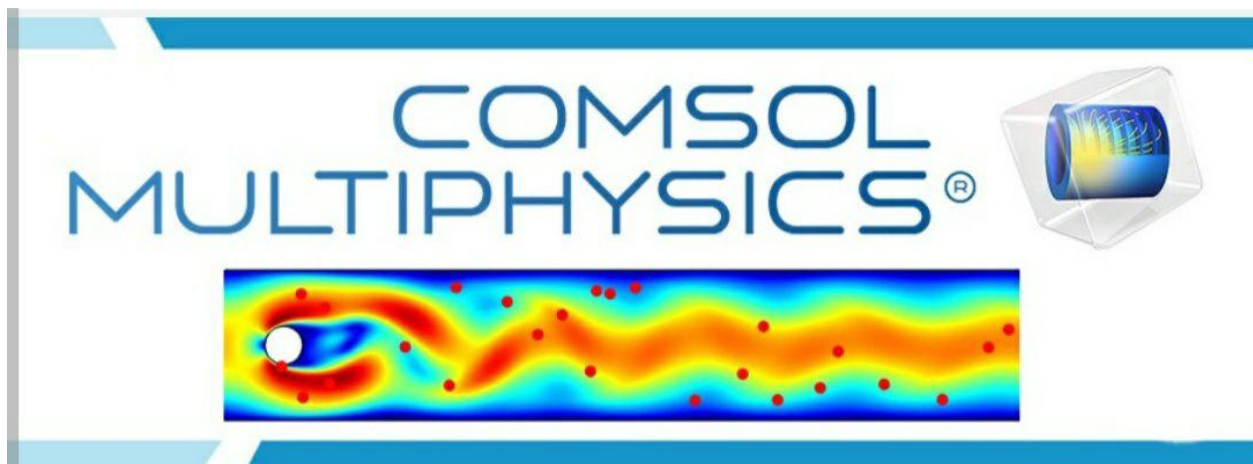المادة: تطبيقات الحاسوب3

التدريسي: م.م. ابرار عبد الكريم سعيد

المرحلة: الثالثة
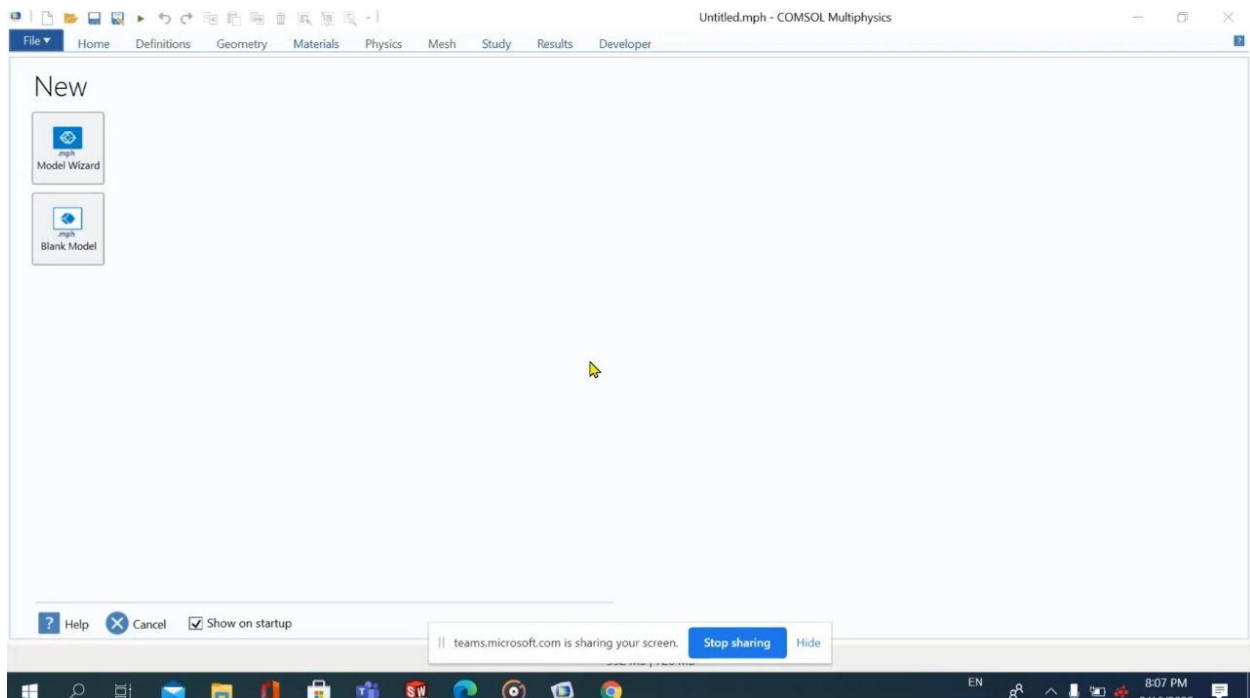
عنوان المحاضرة: المحاضرة الاولى

COMSOL Multiphysics : is a finite element analyzer, solver, and simulation software package for various physics and engineering applications, especially coupled phenomena and multiphysics. The software facilitates conventional physics-based user interfaces and coupled systems of partial differential equations (PDEs). COMSOL Multiphysics provides an unified workflow for electrical, mechanical, fluid, heat transfer, acoustics, and chemical applications.

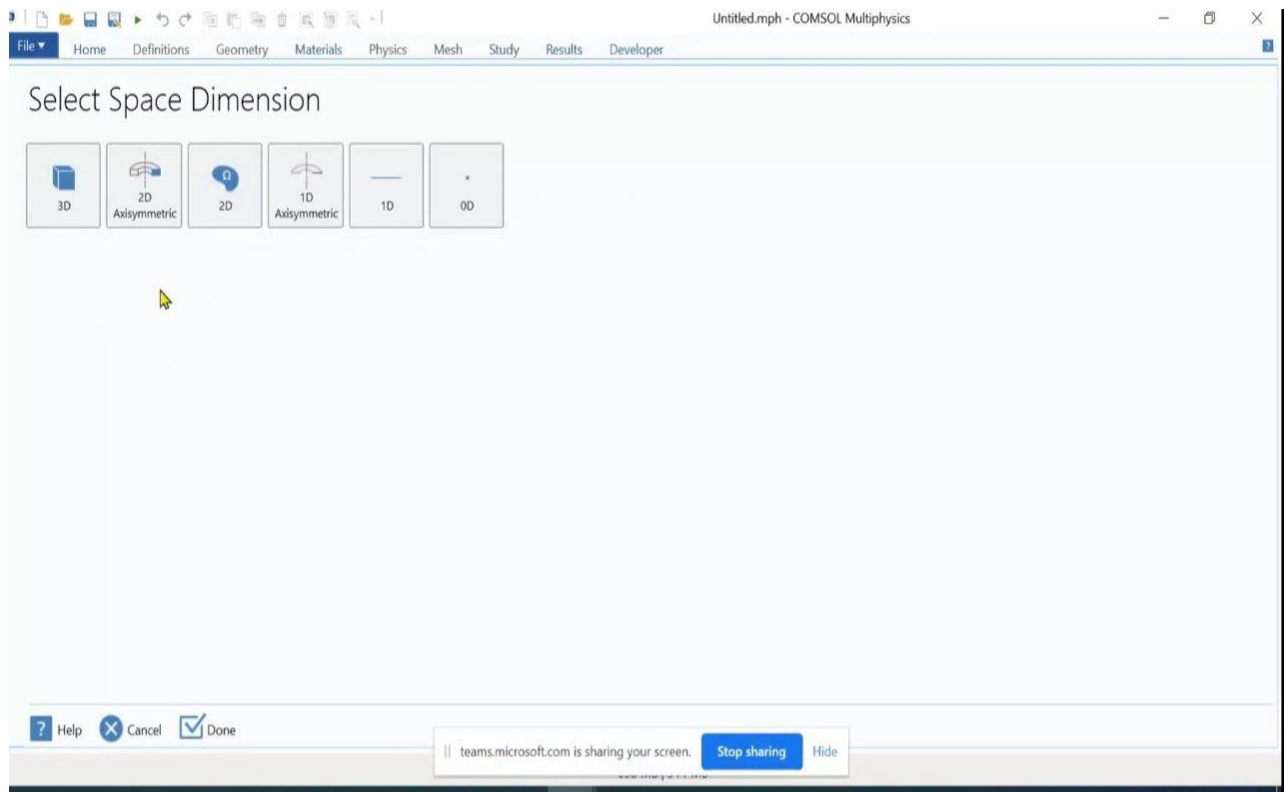E-mail: Abrar.Abdulkareem.Saeed@uomus.edu.iq

The first step is to choose whether it's a blank model or model wizard as demonstrated below:

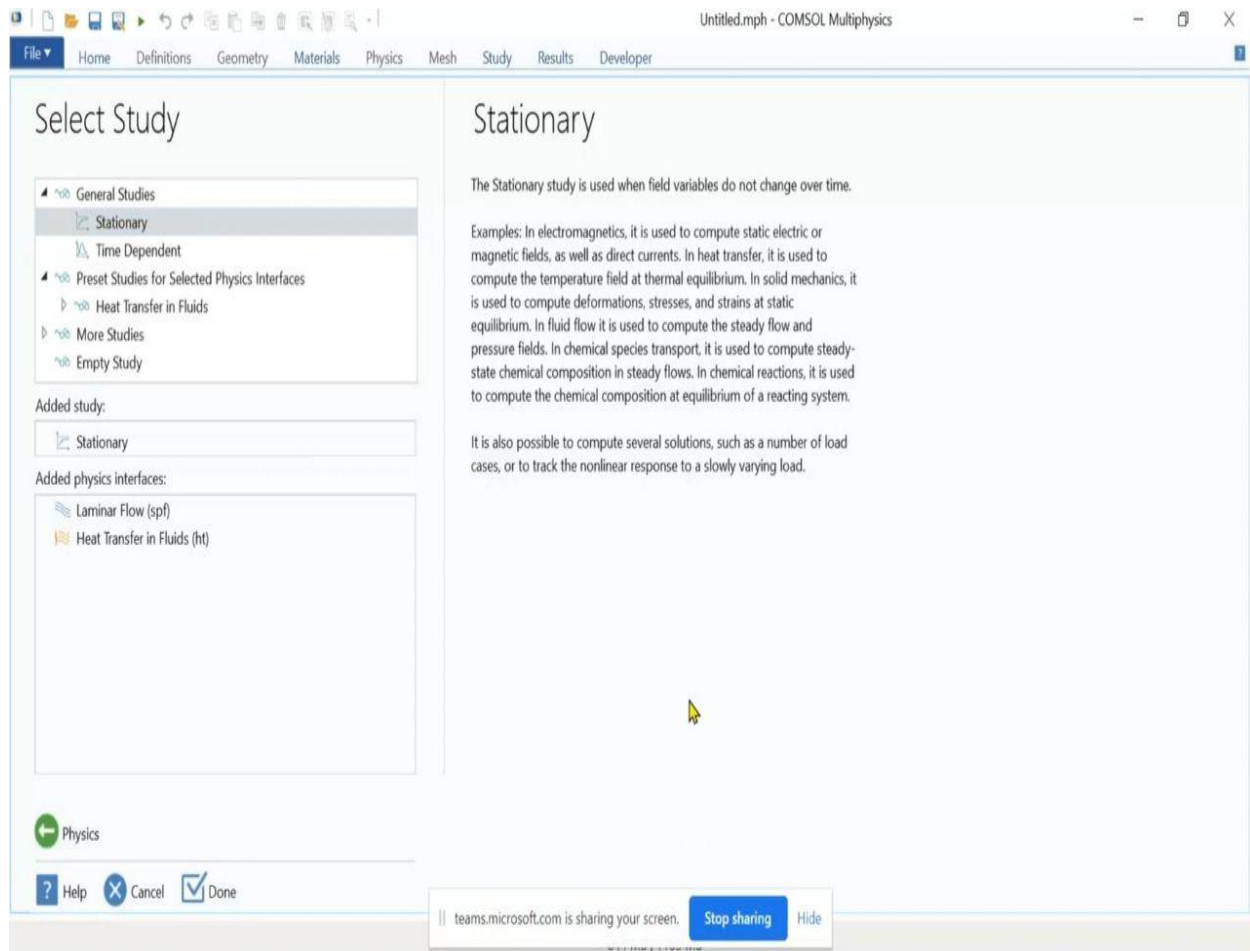Choosing a model wizard would be the perfect choice for beginners.

The second step is to choose the dimensions of the constructed geometry. Many options are available such as 1-D, 2-D and 3-D.

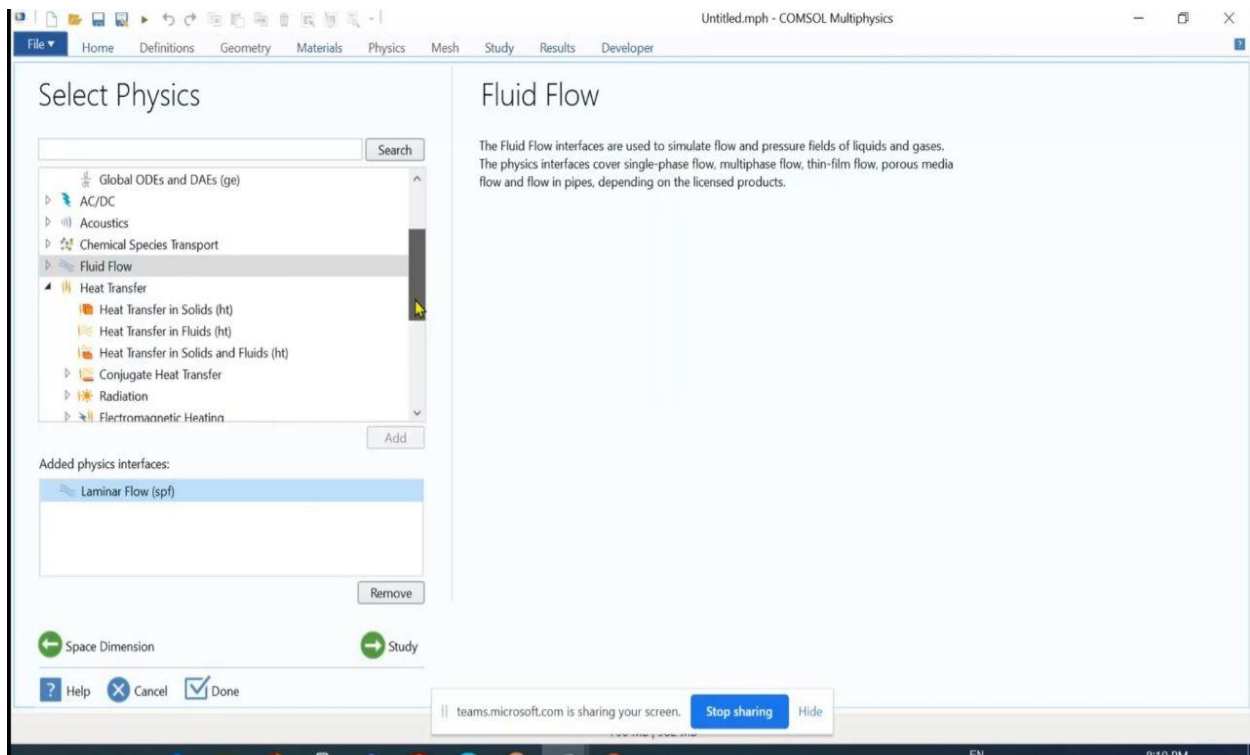Choosing the dimensions depends on the case that needs to be studied.

There is also a special option here, 2-D axisymmetric which splits the geometry into two identical halves and shows the results around the central axis.

The third step is to choose whether the study is stationary(time independent)

Or Transient(time dependent).

After choosing the time parameter we can select the types of physics that needs to be studied.

Choosing the physics is very important because it specifies the type of results that are going to be attained.
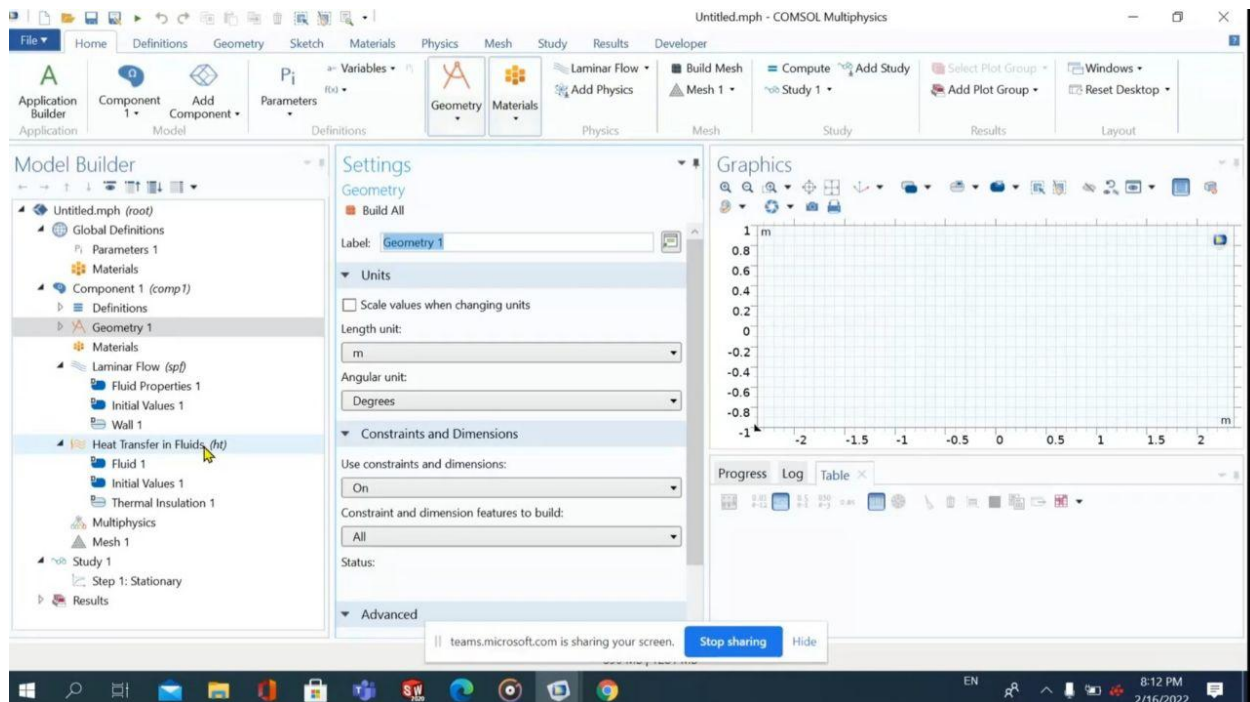

Here we are choosing two physics, fluid flow and heat transfer. Each physics has a specific options. For example: fluid flow contains two options to choose whether the flow is laminar or turbulent.

For heat transfer three options are available:

1. Heat transfer in solids
2. Heat transfer in solids and fluids
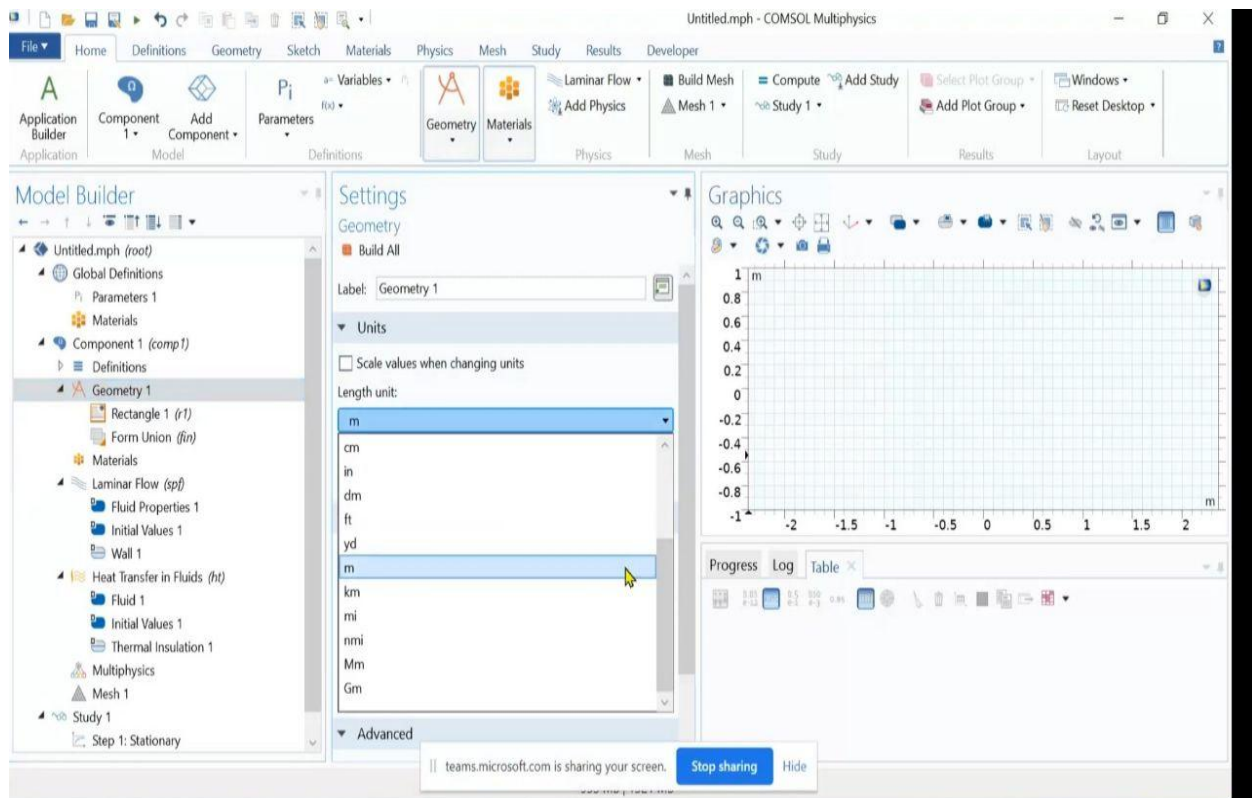3. Heat transfer in fluids

The front screen demonstrates all the available options and menus in the model builder:

There exists the model builder which contains options such as:

1. Parameters
2. Materials
3. Geometry
4. The chosen physics such as (heat transfer in fluids, fluid flow)
5. The initial values
6. Mesh
7. The study command
8. The results of the study

Choosing the units of the dimensions of the geometry that is going to be designed and studied is very an important parameter because it can affect the attained results.

Here it shows the available units such as centimeter , millimeter, meter and etc..