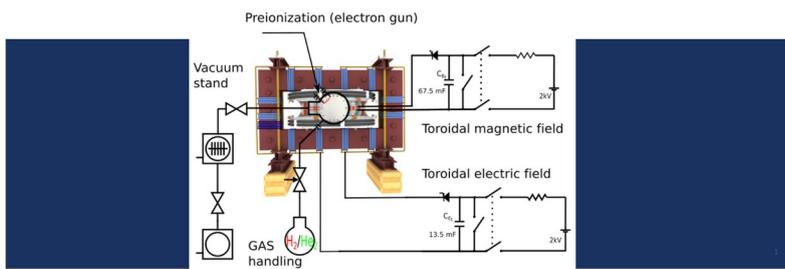
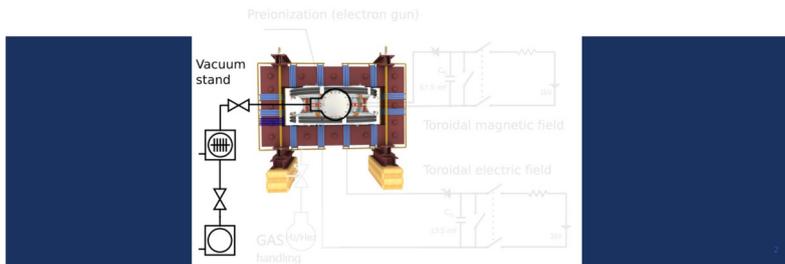


**Next to GOLEM:** Hello, welcome, my name is Martina and I will be your guide in this video series about the systems and diagnostics of tokamak GOLEM.

## SYSTEMS AND DIAGNOSTIC OF TOKAMAK GOLEM



## VACUUM SYSTEM OF TOKAMAK GOLEM



In this presentation, we will look more closely at the vacuum system of tokamak GOLEM

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Those are the topics we will be **covering cover?**

Firstly, we will take a look at what exactly vacuum is and where we can find it.

Then, we will talk about the basics of vacuum systems, the components and how do they work.

After that, we will move to tokamaks **generally** and finally, to the specifics of tokamak GOLEM.

## VACUUM - INTRODUCTION



### Common definition:

The state of gas in a vessel at which the pressure of the gas is lower than the ambient surrounding atmosphere or lower than 300 mbar (which is the lowest pressure on the Earth's surface)



Sources of pictures as of the last page list:  
111, 121, 141, 151, 1121 and 1141

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There are several definitions of vacuum. Most commonly, vacuum is referred to as a state of gas at which the pressure of the gas is lower than the ambient surrounding atmosphere i.e. 100 kPa or lower than 300 mbar 30 kPa. This level, 300 mbar kPa, is the pressure at the top of Mount Everest, making it the lowest pressure on the surface of the Earth.

And where can we encounter vacuum? **Animation** Free space is a prime example, one which would come to a mind of many of you at the first place. Also, vacuum is used for a protection layer. In a light bulb **Animation** there is a metal wire heated by the passing current. The vacuum inside the bulb protects it from an oxidation and a disintegration.

And of course, a vacuum can be used for a suction. Probably most of you have a machine using this principle at home, **Animation** a vacuum cleaner. Another example of using the system of creating vacuum is a straw you put into your drink to be able to get the fluid or some types of wells work by decreasing pressure to pump the liquid.

Since this is a presentation about tokamaks, it is no surprise that tokamaks also use vacuum **Animation**, let me tell you more about that later. But also other scientific machines rely on vacuum (free space), such as particle accelerators. You can encounter evacuated tubes even in a school laboratory, for example, tubes used to show cathode rays.

Another example from everyday life **Animation** is a thermos flask or, more generally, insulation.

And finally, **Animation** vacuum is widely used in the food industry for dry-freezing or persevering the

