[SQUEAKING, RUSTLING]

[CLICKING]

AKSHAY SINGH: In this video, we will look at different compositions of gallium and indium and at what temperature they will melt. First, we start with solid indium. We put a small piece of solid gallium. And we just shake it for some time, maybe around one or two minutes.

And then it is a liquid alloy. Why does this happen? So this is the phase diagram of gallium-indium system. As you can see, gallium melts around 30 degrees Celsius, which is close to room temperature, as indium melts around 157 degrees Celsius.

We have prepared four different compositions. A is pure gallium. And it all melts at room temperature but not quite. Mixture B, which is a composition that's close to the eutectic composition. It's a liquid-like material.

But you can see, when we shake it, when we shake the cuvette, you can see the movement. And C, similarly, close to the eutectic but at a higher temperature. So it moves less, whereas D is, as we saw before, solid indium, which melts at 150 degrees Celsius. So it's solid at around 30 [AUDIO OUT].

Take another look at composition B, which clearly is a liquid. Now, let's dynamically create a eutectic alloy. So what we'll do is-- so for this, we start with almost room-temperature gallium, slightly higher, around 30 degrees Celsius. And we put a piece of indium in there. And we will see how they mix.

So we put this piece of indium. And we will gently mix it in the next minute or so. So as you mix it, this is a piece of indium that actually melts at a much higher temperature. It melts because we are going down the composition slope into close to the eutectic, which melts at room temperature.

This is a very cool way to create a eutectic alloy at temperature and also trying to understand the phase diagram of this system.