







Hard drive Teardown

flying heads, voice coil
motors, amazingly smooth
surfaces & signal processing

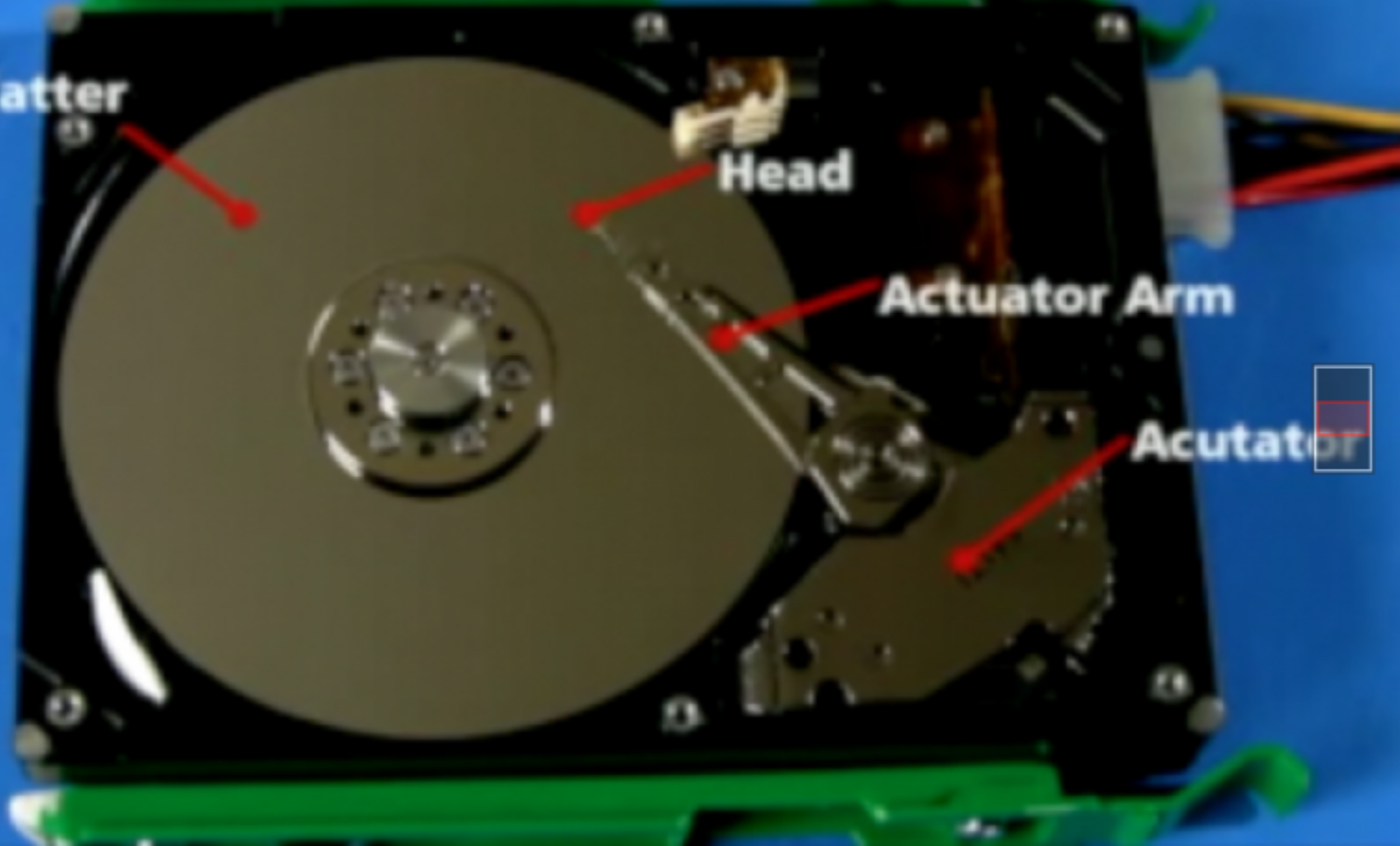
series 3 | [engineerguy videos](#)

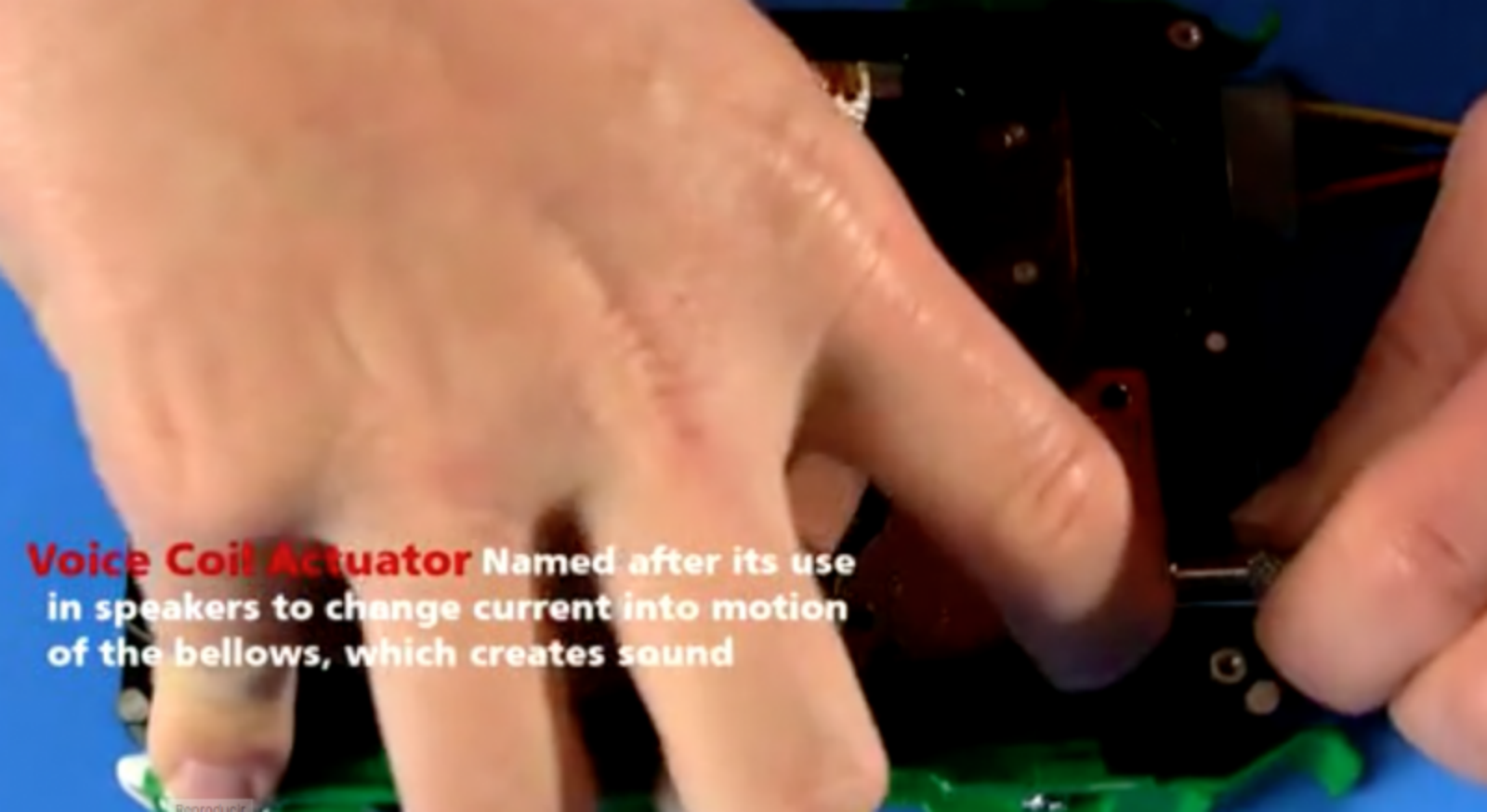
Platter

Head

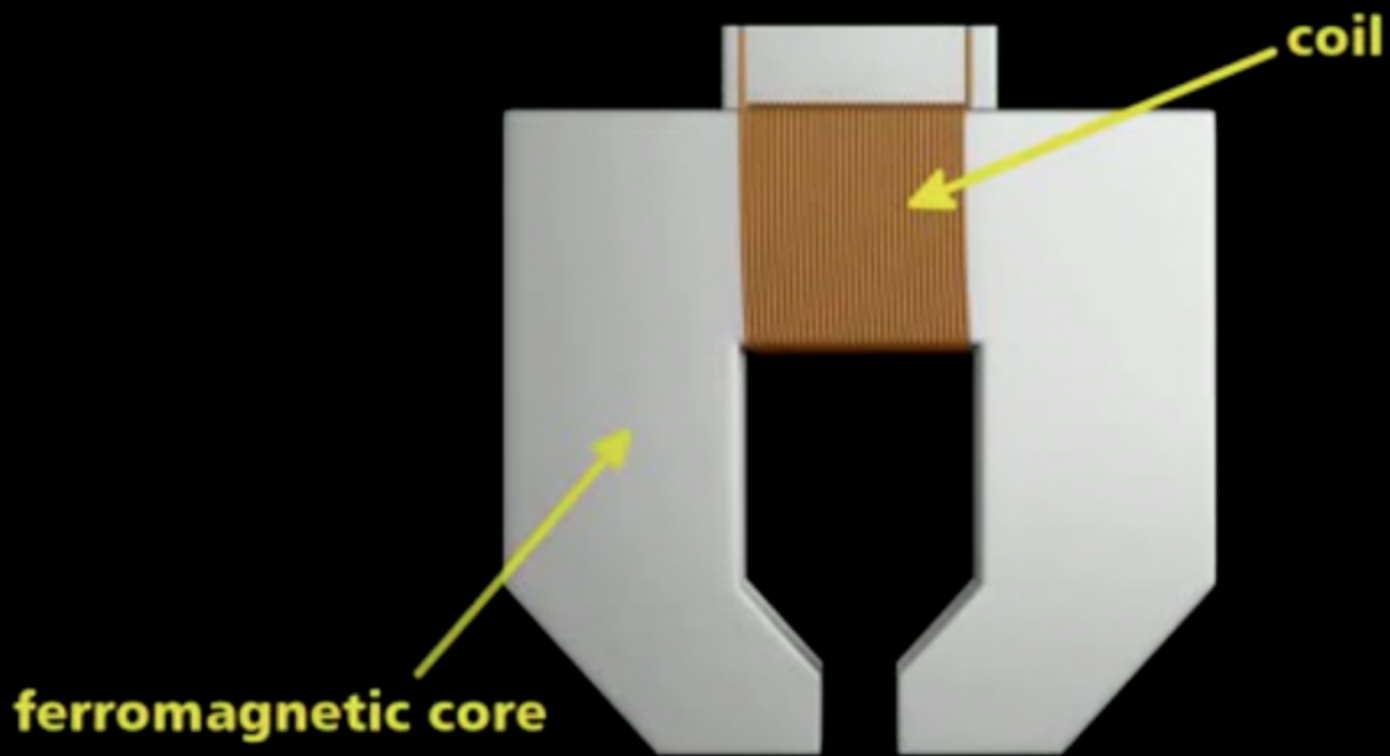
Actuator Arm

Actuator



A close-up photograph of a person's hand holding a small, dark-colored mechanical component. The component has a cylindrical shape with a central shaft and some internal wiring or structure visible. The background is a solid blue color. The text is overlaid on the lower-left portion of the image.

Voice Coil Actuator Named after its use in speakers to change current into motion of the bellows, which creates sound





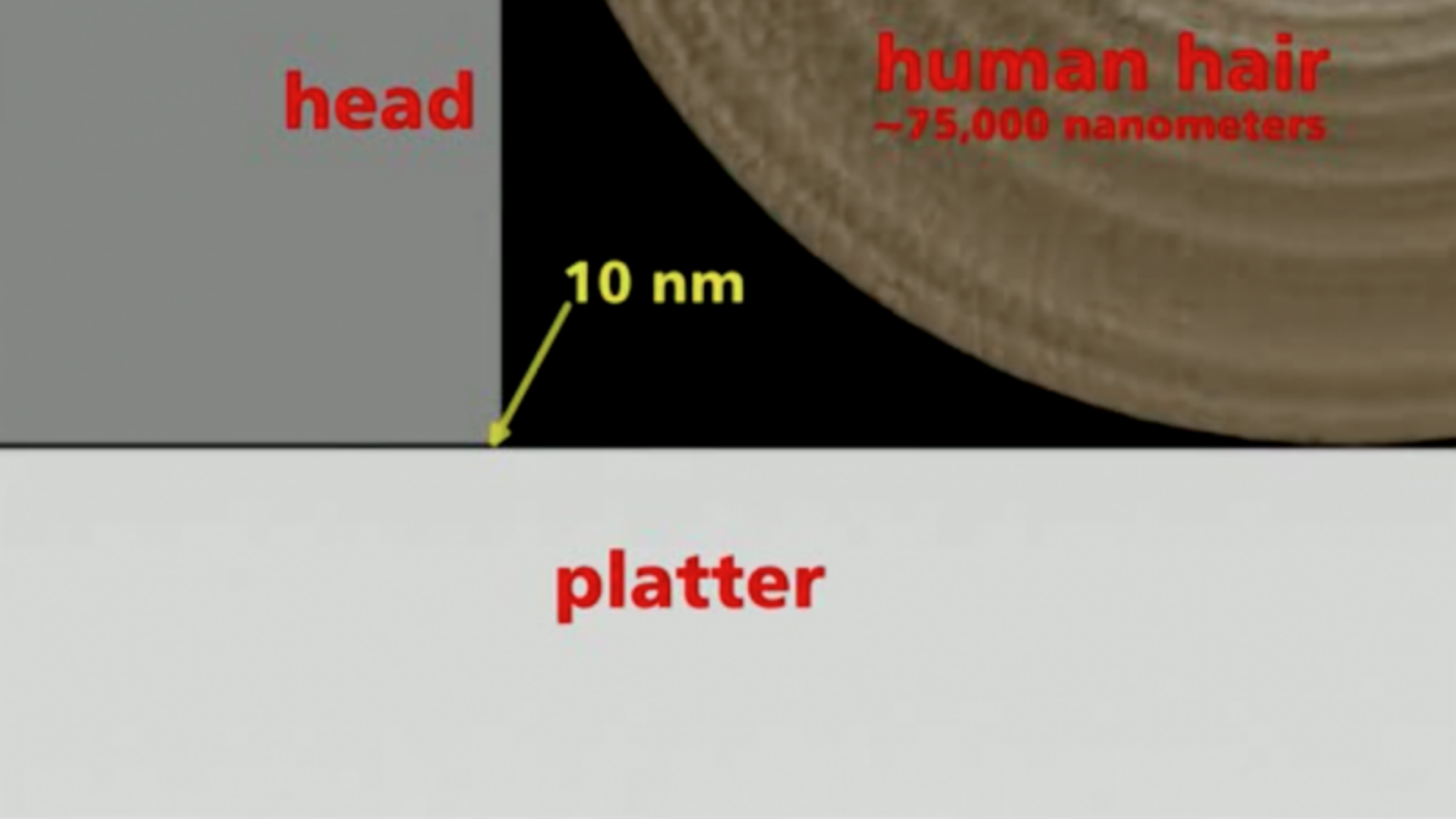
Faraday's Law The EMF (electromotive force) generated is proportional to the rate of change of the magnetic flux

head

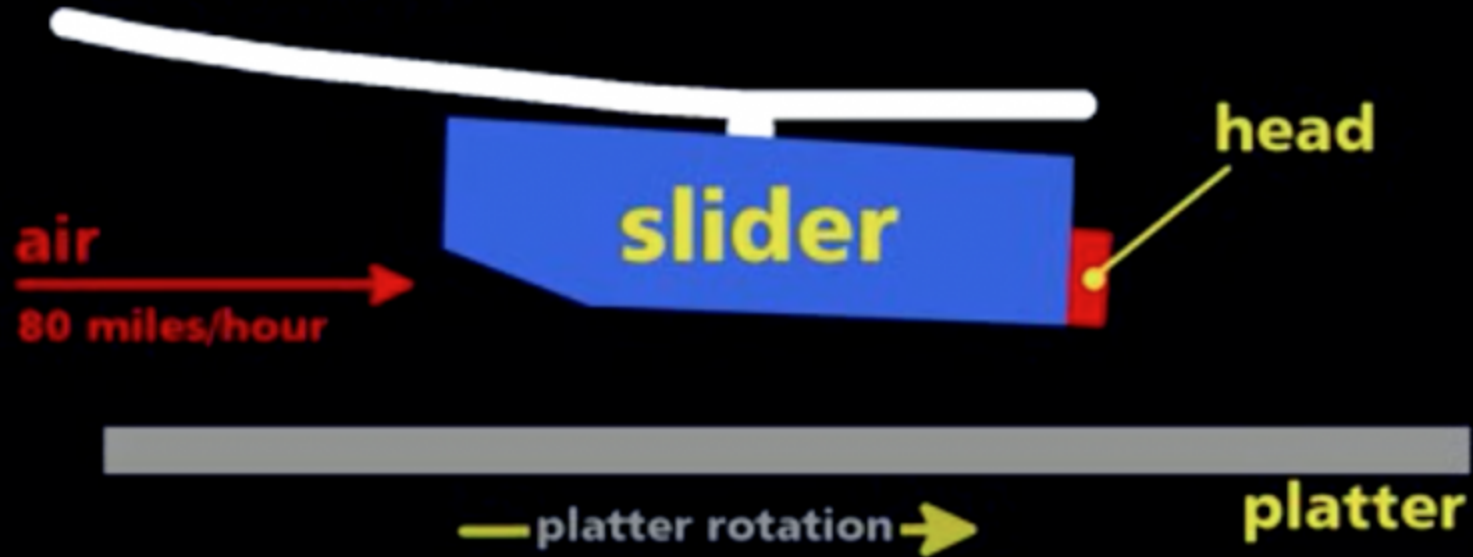
human hair
~75,000 nanometers

10 nm

platter



Suspension



head

slider

air
80 miles/hour

platter rotation

platter

Carbon Overcoat

tough layer with lubricant
to reduce wear

Magnetic Layer

Chromium

Aluminium

low density, rigid,
& low cost

Cobalt with platinum & nickel

Sputtered onto chromium, which provides
grained surface that is replicated in magnetic
layer, which helps reduce signal noise

Platter

The diagram illustrates the layered structure of a hard drive platter. It consists of four overlapping circular layers, each with a central hole. From left to right, the layers are: a brownish-yellow Carbon Overcoat, a teal Magnetic Layer, a purple Chromium layer, and a light blue Aluminium layer. The layers are shown in a perspective view, overlapping each other. A red arrow points from the text 'Cobalt with platinum & nickel' to the Magnetic Layer.

Partial Response Maximum Likelihood

010111

001111

