

3D Printers

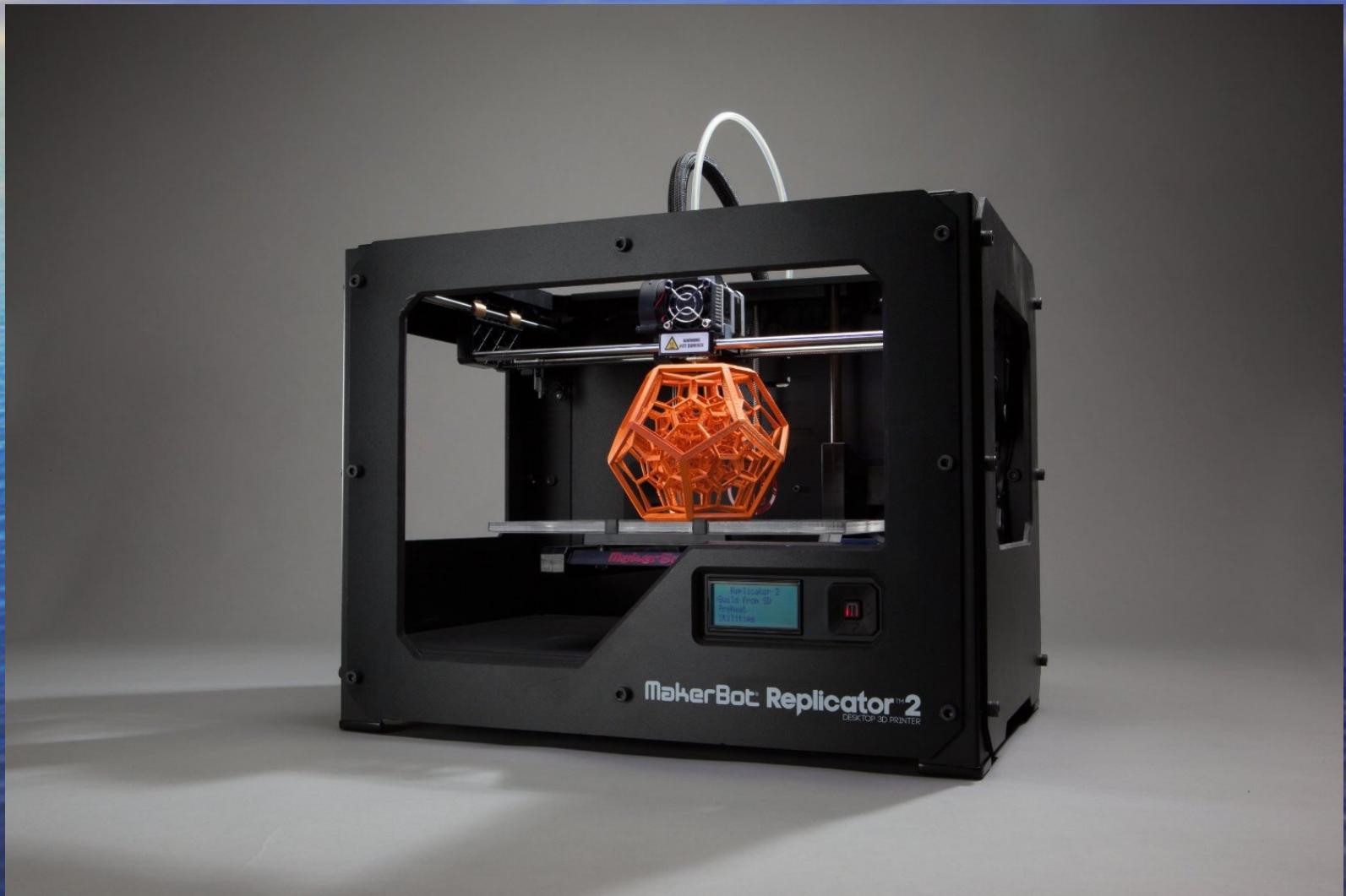
What are they and what are they good for?

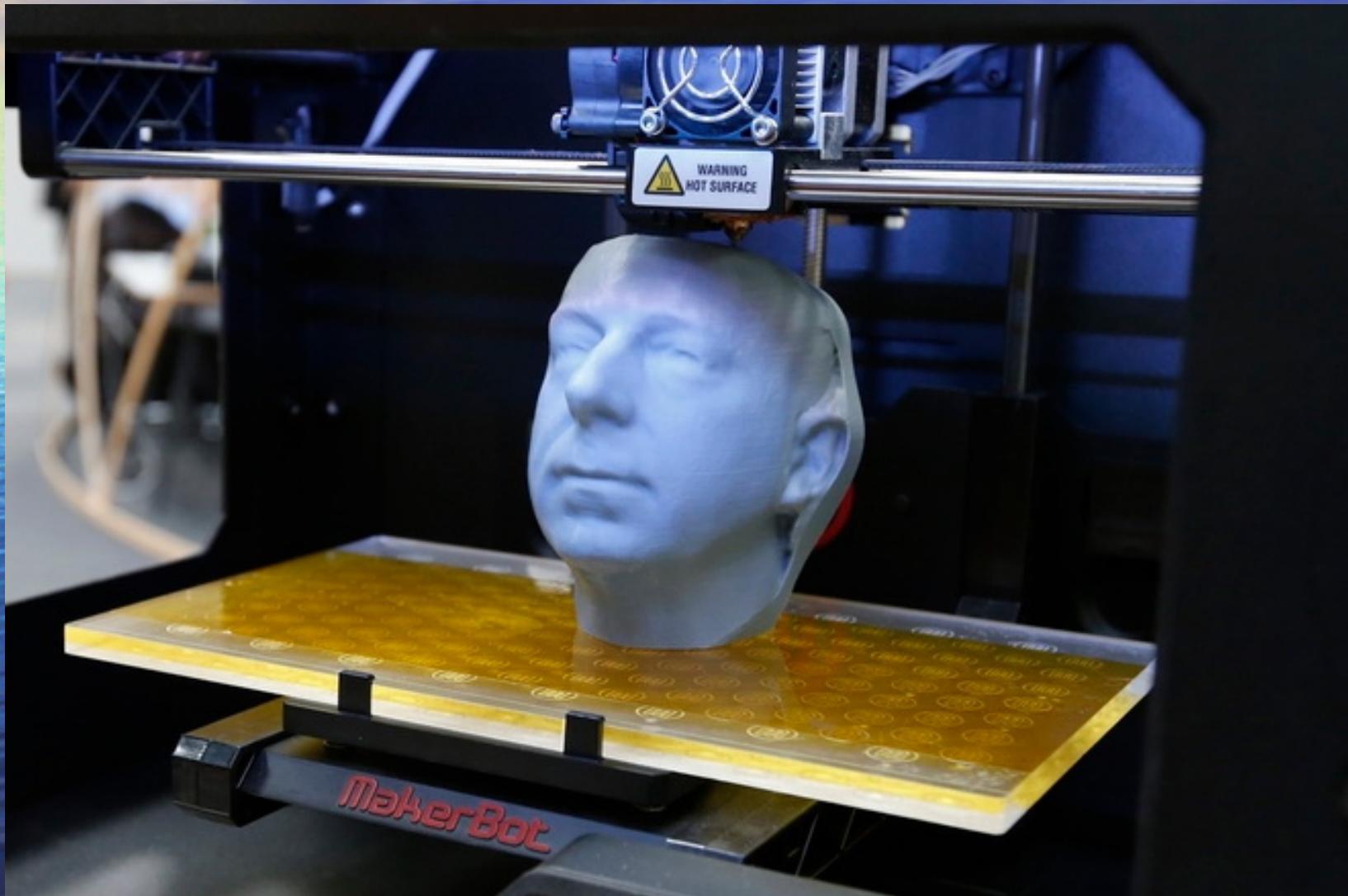
Presented to Enlighten – Kitsap Community Forum
By Stan Stumbo
May 12, 2017

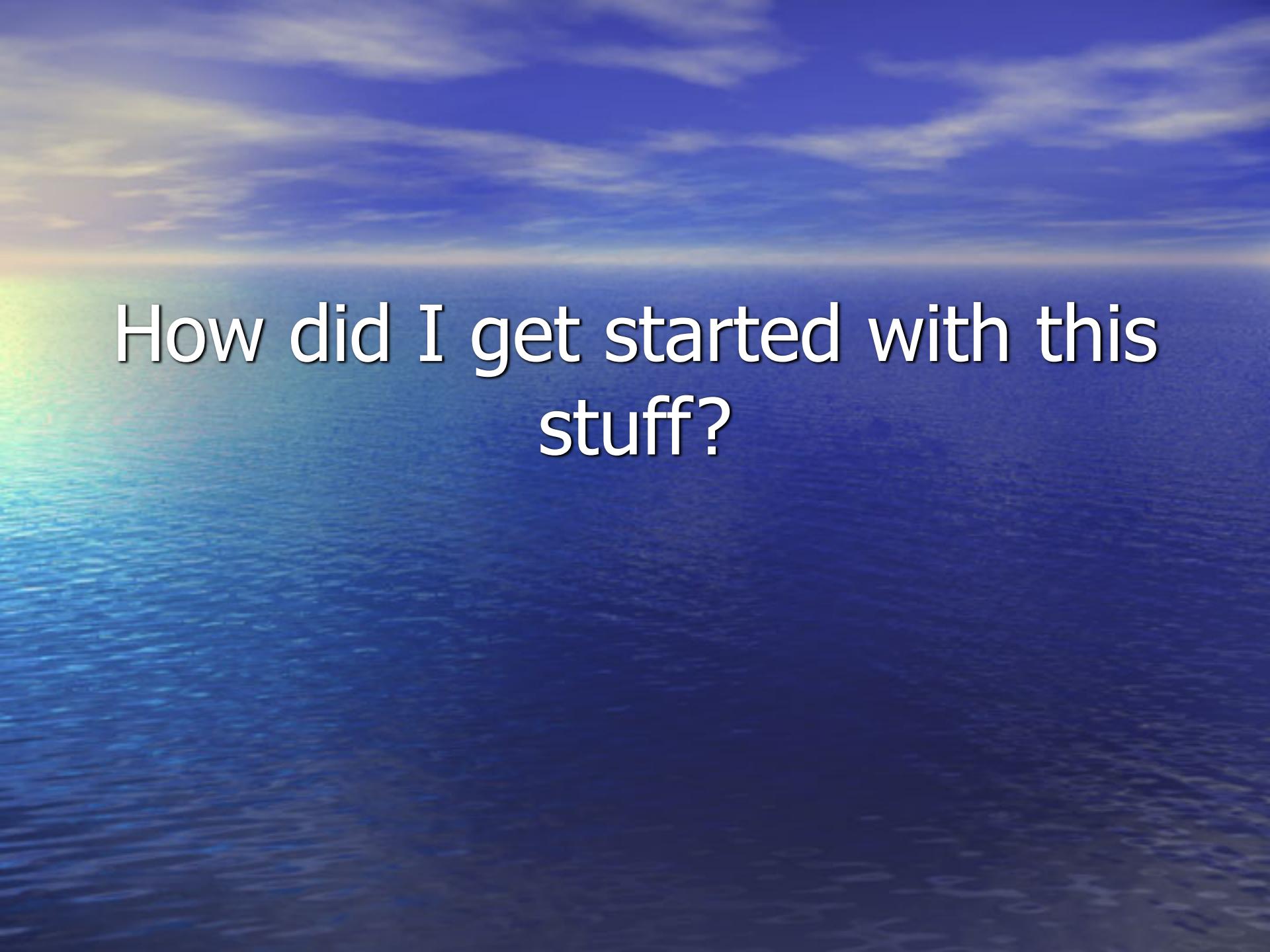
3D Printers are part of Additive Manufacturing

- Conventional manufacturing takes a piece of material and carves away stock to fashion the part desired.
- Additive Manufacturing is any of various processes for making a three-dimensional object of almost any shape from a 3D model or other electronic data source primarily through additive processes in which successive layers of material are laid down under computer control.

Makerbot 2 3D Printer





The background of the slide features a wide-angle photograph of a vast ocean. The water is a deep, vibrant blue, with small, gentle ripples across its surface. Above the horizon, the sky is a lighter shade of blue, dotted with wispy, white clouds. The overall atmosphere is serene and expansive.

How did I get started with this
stuff?



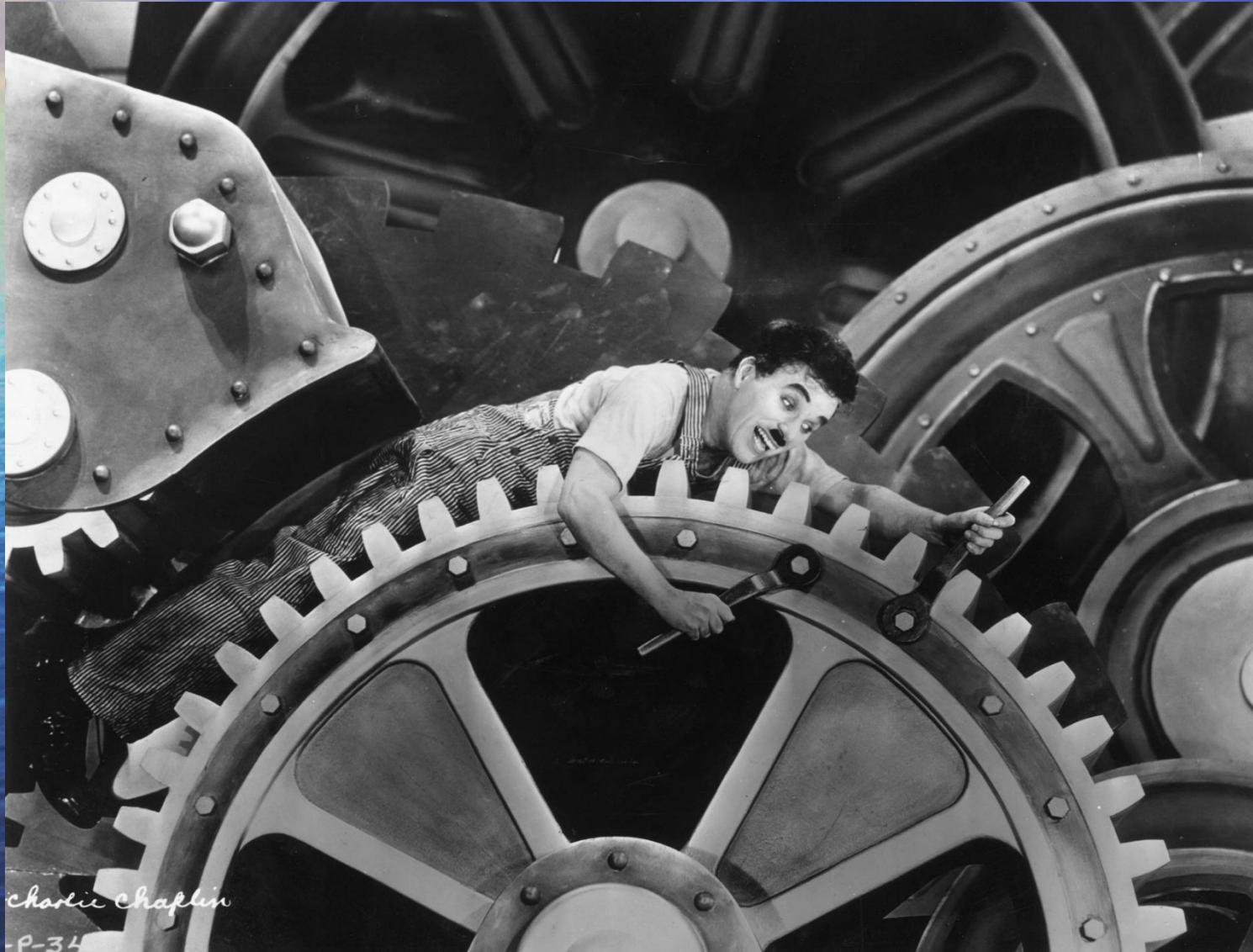




Extruder Assembly



Charlie Chaplin in the Factory



OK, what can you do with a 3D Printer?

- Doodads & Geegaws
- Useful stuff
- Online databases of design files

Orchid scanned by Smithsonian

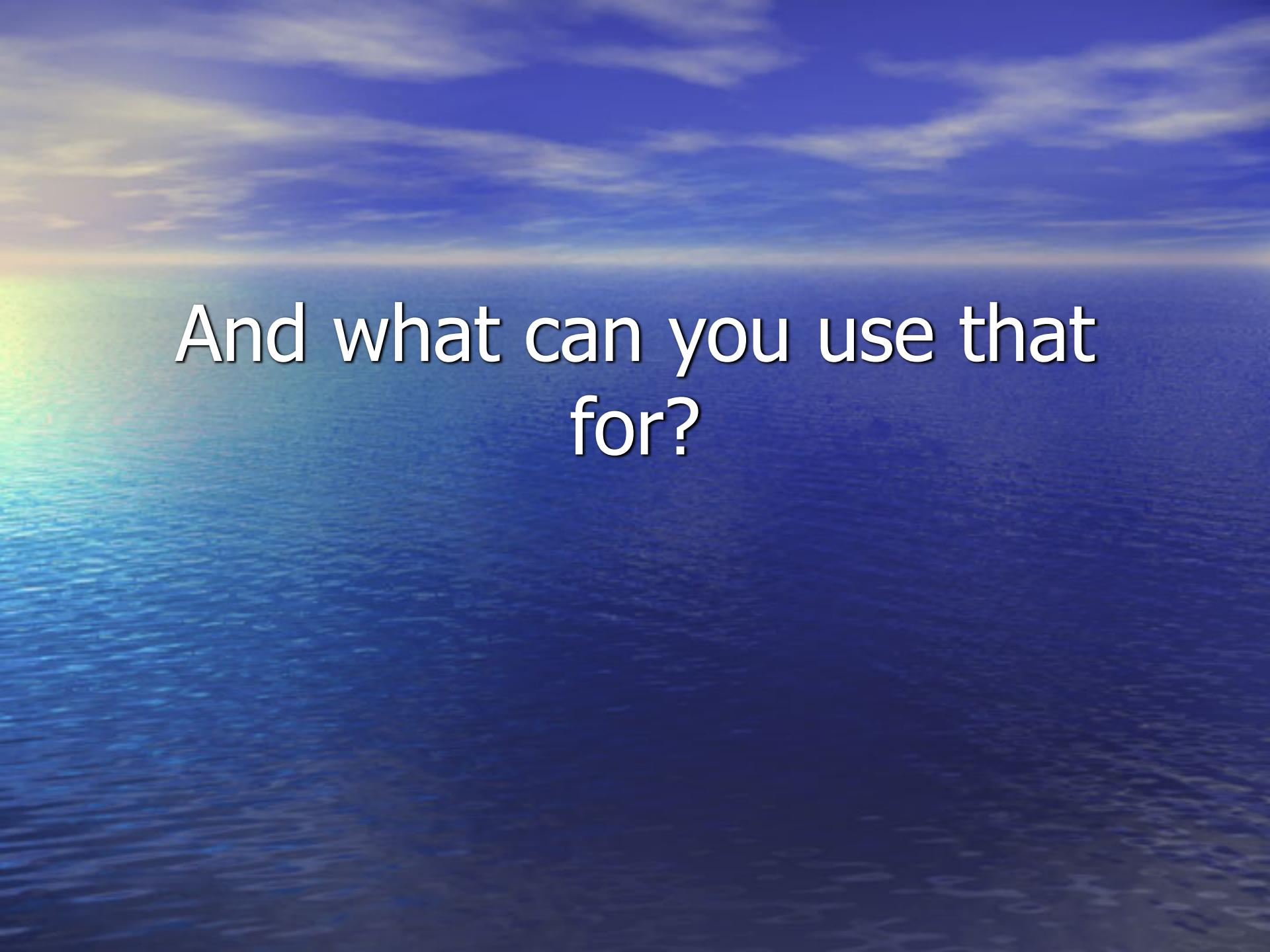


3D Laser Scanner

- Combined with a 3D Printer, creates a “3D Xerox Machine”

Makerbot Scanner



The background of the image is a wide-angle photograph of a calm ocean at sunset or sunrise. The sky is filled with soft, wispy clouds, transitioning from a warm orange and yellow near the horizon to a deep blue above. The ocean surface is a deep blue, with gentle ripples and reflections of the sky. The overall atmosphere is serene and expansive.

And what can you use that
for?

Fixing the picnic table



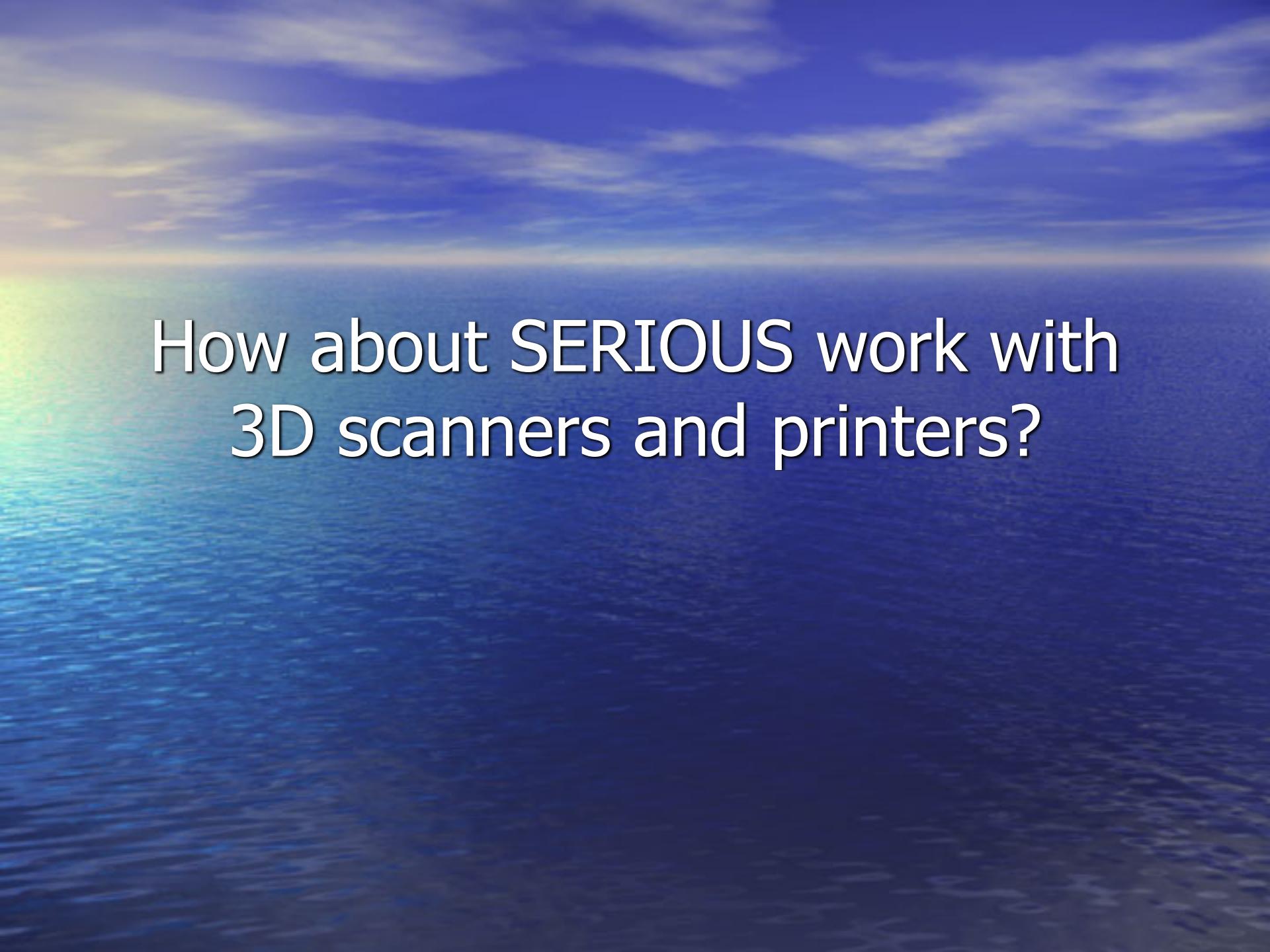
New Table Bracket!!



Holster for the Hair Dryer



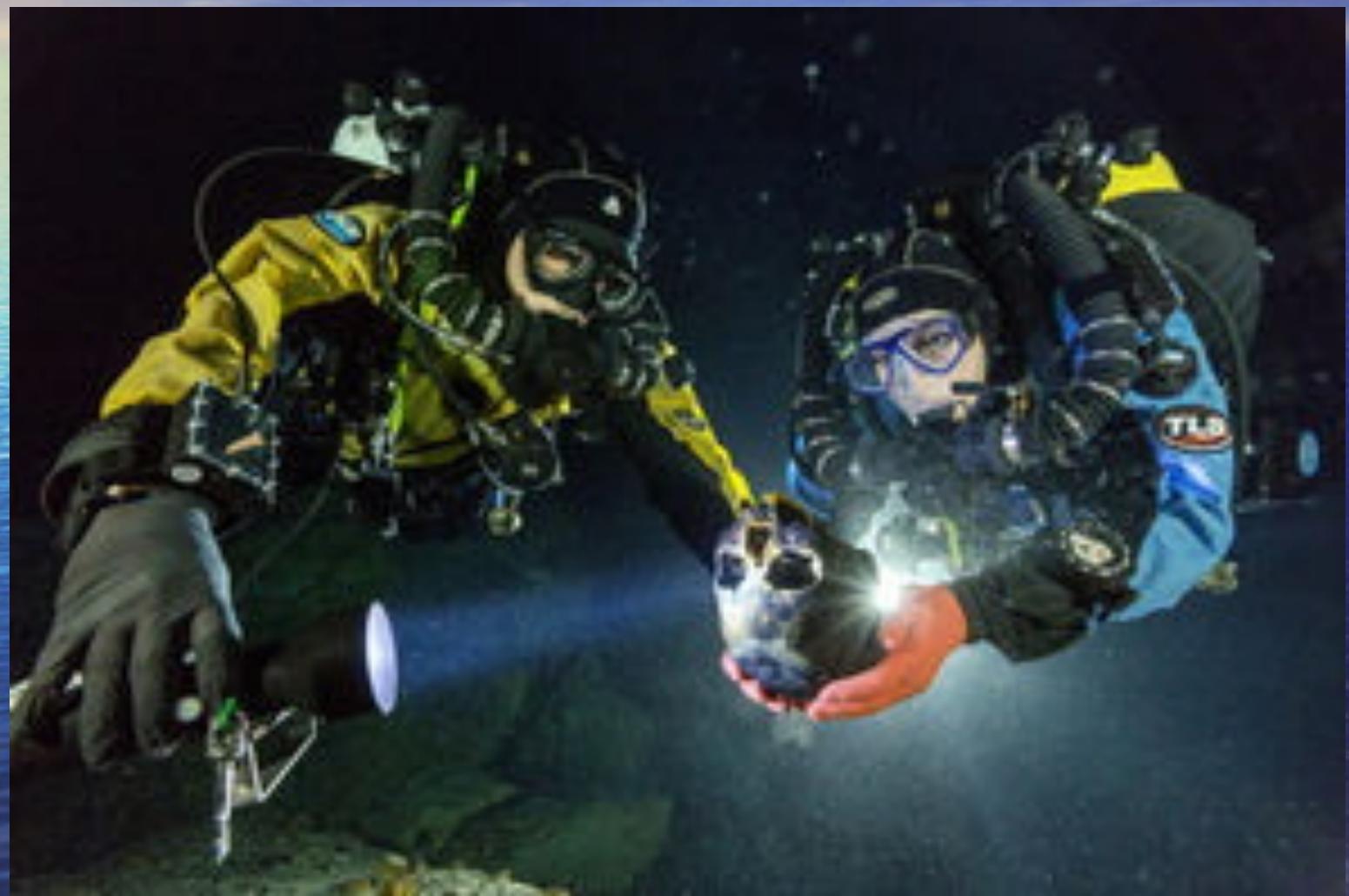


The background of the slide features a wide-angle photograph of a serene ocean. The water is a deep, vibrant blue, with small, gentle ripples across its surface. Above the horizon, the sky is a lighter shade of blue, dotted with wispy, white clouds. The overall atmosphere is peaceful and expansive.

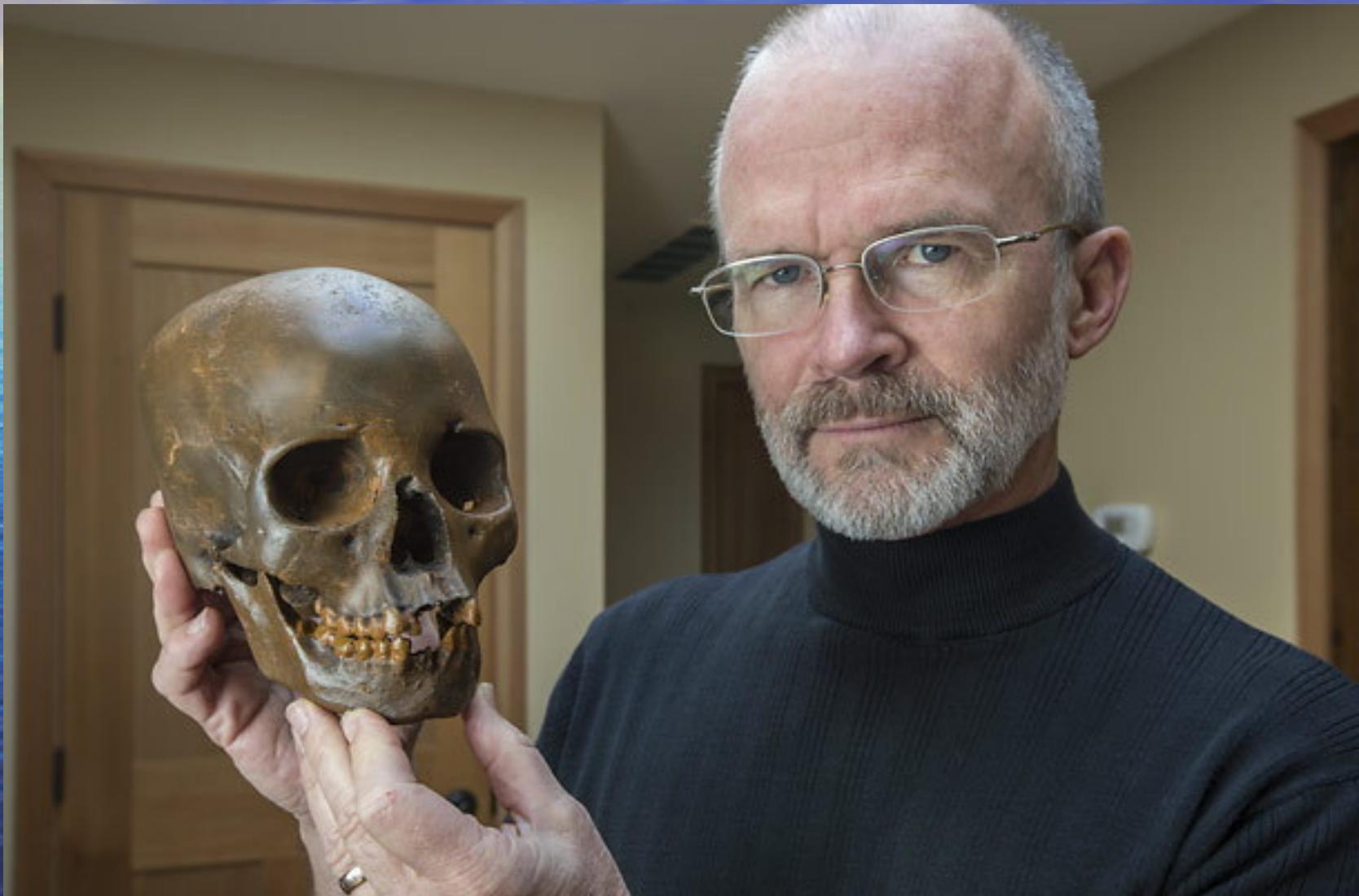
How about SERIOUS work with
3D scanners and printers?

Archeologists in underwater sinkhole cave, Guatemala











“Lucy” Discovered in 1974 in
Ethiopia



40 % of Lucy's Skeleton



Printed Turbine Blades

- Sonic speeds at blade tips
- 1400 deg. F



3D Printed House – 400 sq. ft.



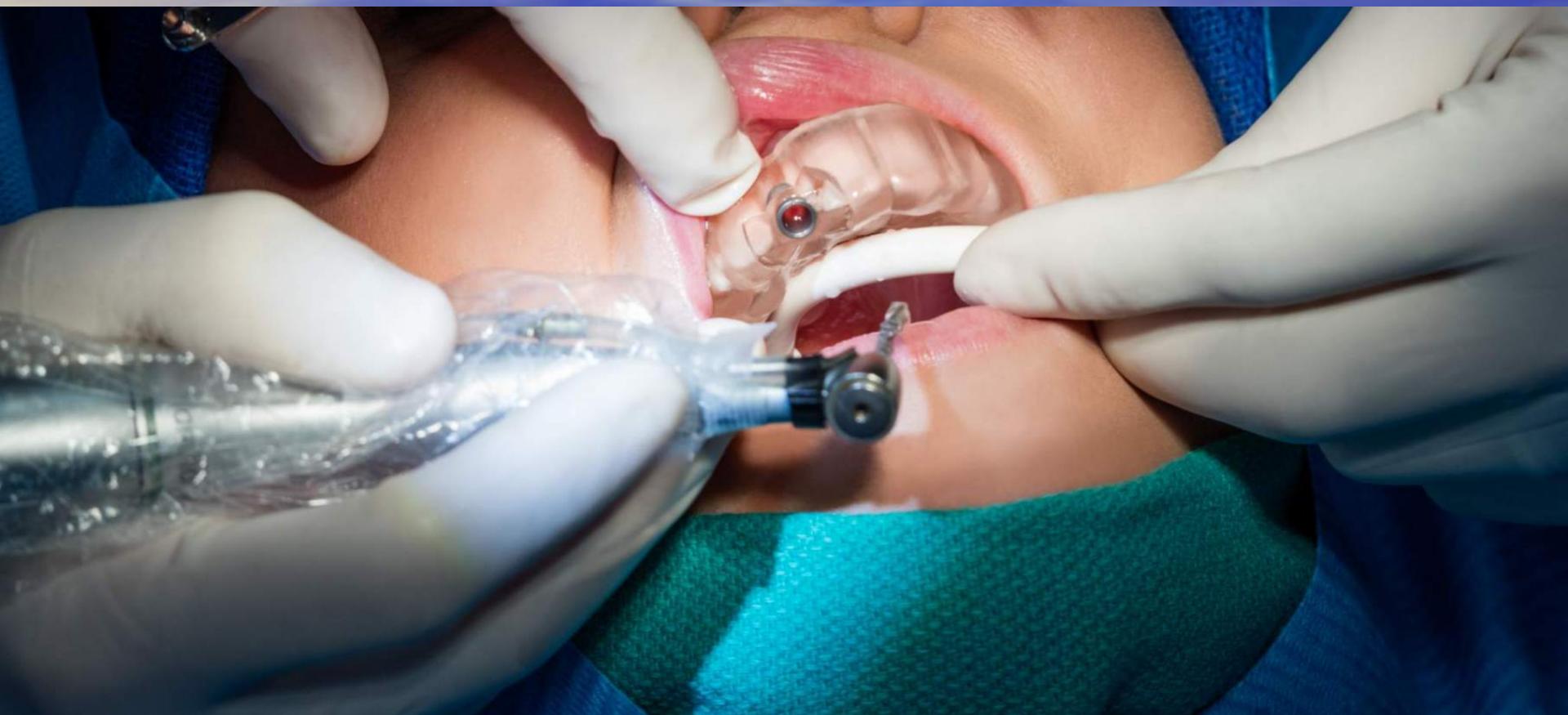


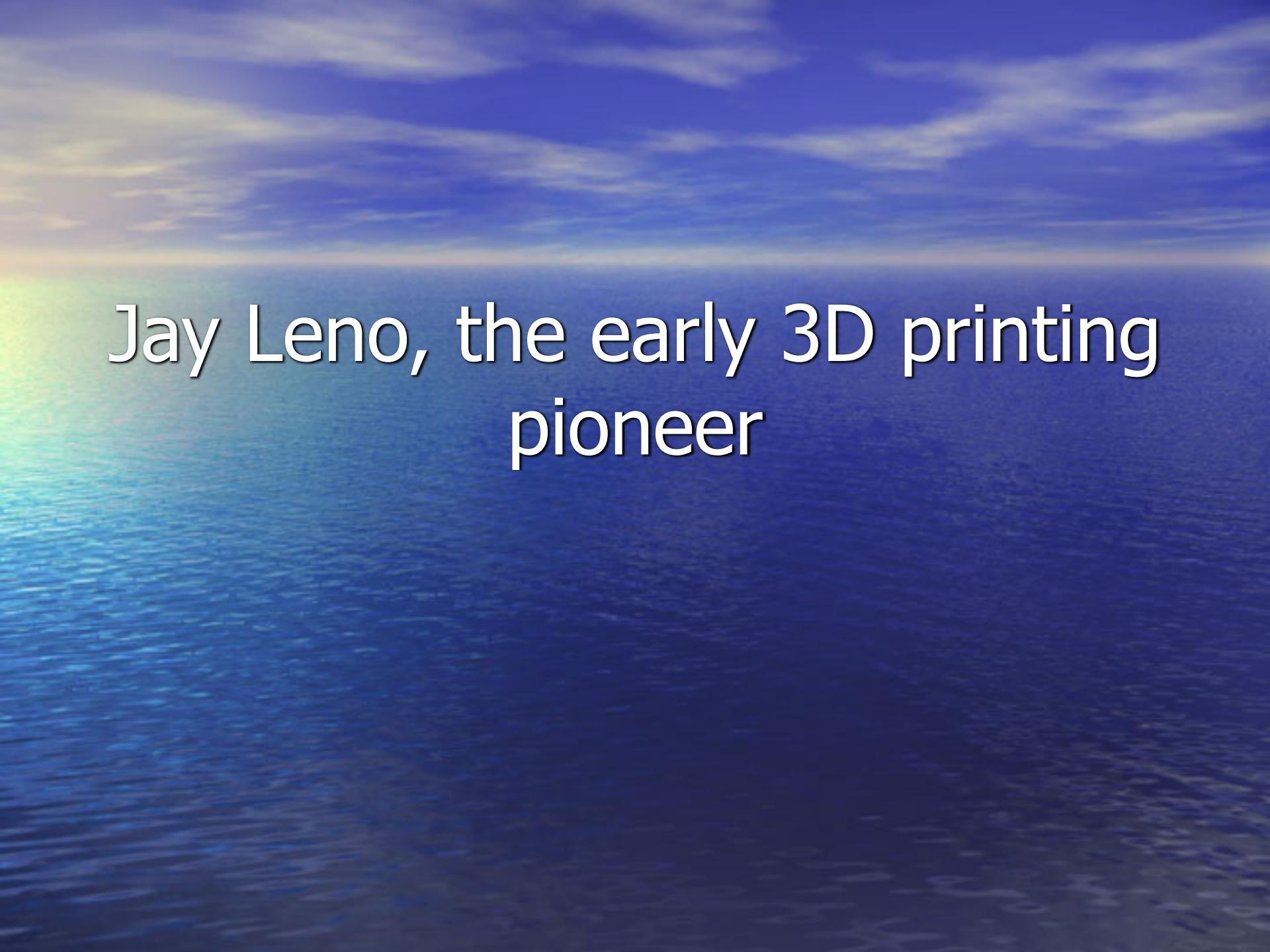


Better Visualization

Fossil Dolphin Skull, Panama





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Jay Leno, the early 3D printing
pioneer



Rolls Royce Hood Ornament



LIMONADE ROBERT

A black and white photograph capturing a dynamic moment during a vintage motor race. In the foreground, a classic open-top racing car, possibly a Mercedes-Benz or similar model, is shown from a three-quarter rear perspective. The car is leaning into a turn on a dirt track, kicking up a cloud of dust. Two drivers are visible; the one at the wheel wears a light-colored helmet and goggles. The background is filled with a large, dense crowd of spectators gathered behind a fence, watching from the top of a hill. A prominent sign reading "LIMONADE ROBERT" is mounted on a structure above the crowd. The sky is overcast, and the overall atmosphere is one of a lively historical racing event.







The background of the image is a wide-angle photograph of a vast ocean. The water is a deep, vibrant blue, with small, gentle ripples across its surface. Above the horizon, the sky is a lighter shade of blue, dotted with wispy, white clouds. In the upper left corner, there is a soft, glowing rainbow-like effect, possibly from a camera lens flare or a natural phenomenon.

Prosthetics

Printed Ear Matrix



Conventional Prosthetic Limbs

- Very expensive - \$30,000 and up
- Extensive fitting required
- New prosthetic required for growth or physical changes – another \$30K.

\$50 Prosthetic Hand





Prothsetic Fingers



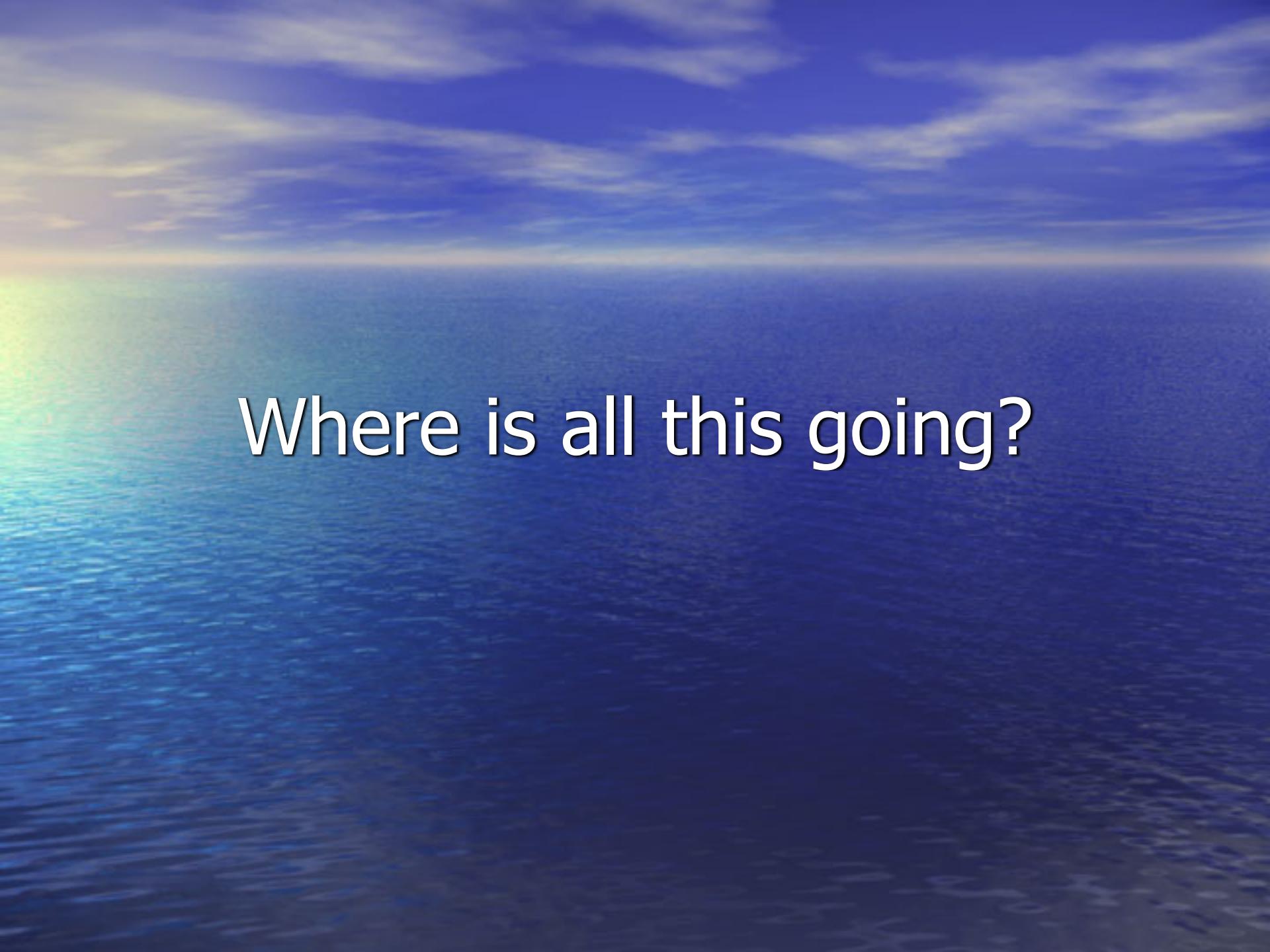
Guitar picks built into the fingers









The background of the image is a wide-angle photograph of a calm ocean. The water is a deep blue, with some light reflections and small ripples. Above the horizon, the sky is filled with wispy, white clouds against a bright blue expanse. In the far distance, a faint yellow glow suggests either the sun rising or setting.

Where is all this going?

SpaceX's 3D Printer for the International Space Station



Sending a 3D printer to the ISS



Don't carry spare parts, print them as needed:

- Hawthorne-based SpaceX carried the first 3-D printer into space, where NASA hopes astronauts will one day be able to print replacement parts on long-distance missions.
- “[W]e could go from having a part designed on the ground to printed in orbit within an hour to two from start to finish,” NASA’s 3-D printing project manager Niki Werkheiser said in a statement. “The on-demand capability can revolutionize the constrained supply chain model we are limited to today and will be critical for exploration missions.”

3D Printed Cast





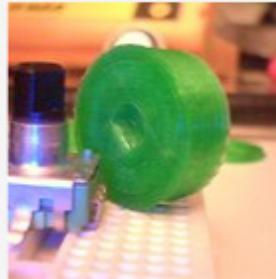
Online Designs to Download: Thingiverse

Who's Making What?



[Golf ball](#)

Made by [Tertzoid](#)
18 minutes ago



[knob for rotary
encoder](#)

Made by [meirm](#)
23 minutes ago



[RapMan 3.x Corner
Set](#)

Made by [Peerlinck](#)
1 hour ago



[Grubbed Z gear for
Rapman](#)

Made by [Peerlinck](#)
1 hour ago



[Ball of Stars - Math Art
by Dizingof](#)

Made by [Raygduncan](#)
3 hours ago

[View More Made Things](#)

Newest Derivatives



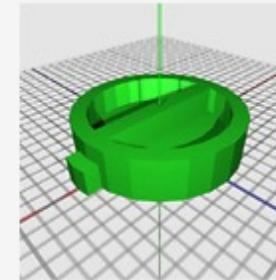
[MendelMax Power
Panel for a Smaller
Switch](#)
Created by [BenitoSanduchi](#)
1 hour ago



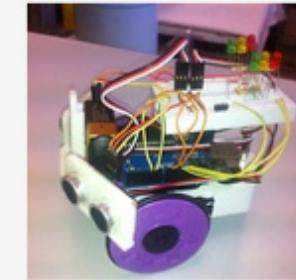
[Mendelmax Power and
USB Panel](#)
Created by [DarkStar2k](#)
3 hours ago



[Bottle Name Tag with
Logo](#)
Created by [daniel](#)
8 hours ago



[Pig for coins - Plug](#)
Created by [jspauld](#)
22 hours ago



[RPMBot](#)
Created by [ra_ules](#)
1 day ago

[View More Derivatives](#)

Early predictions are often very shortsighted --

"I think there is a world market for maybe five computers."

Thomas Watson, Chairman of IBM, 1943

Thank you.

- Questions?