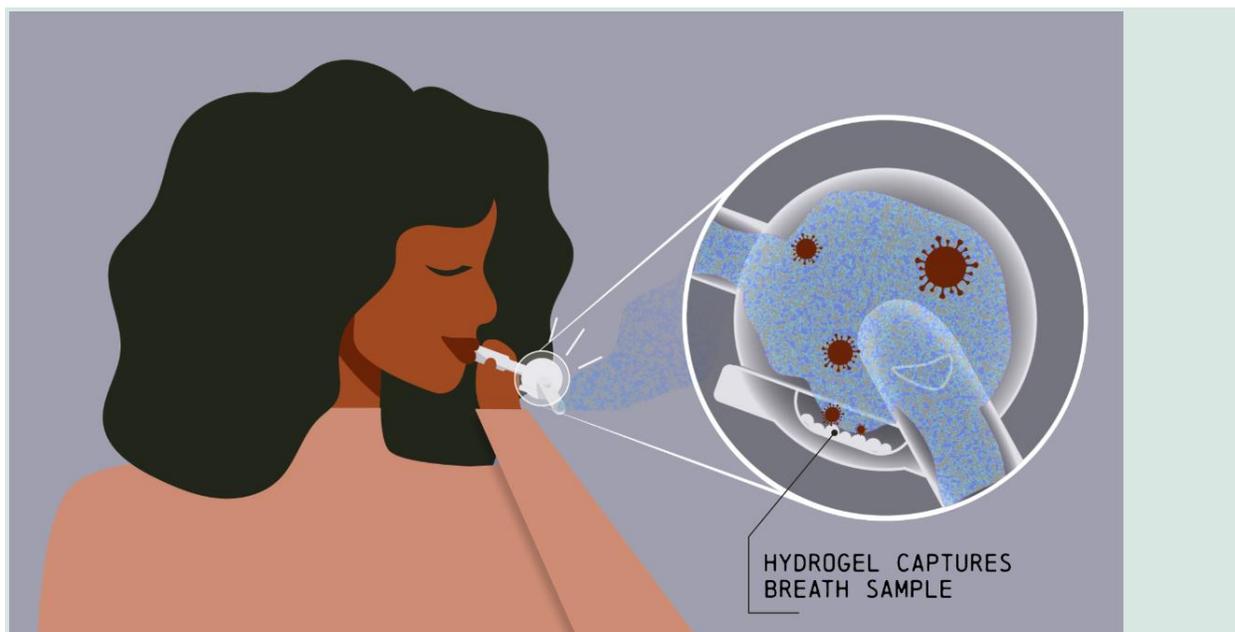


Nanoscience – Blowing the whistle on COVID-19



Researchers at ORNL's Center for Nanophase Materials Sciences and the University of Tennessee Health Science Center partnered to design a COVID-19 screening whistle for convenient home testing. Credit: Michelle Lehman/ORNL, U.S. Dept. of Energy

Collaborators at Oak Ridge National Laboratory and the University of Tennessee Health Science Center are developing a breath-sampling whistle that could make COVID-19 screening easy to do at home.

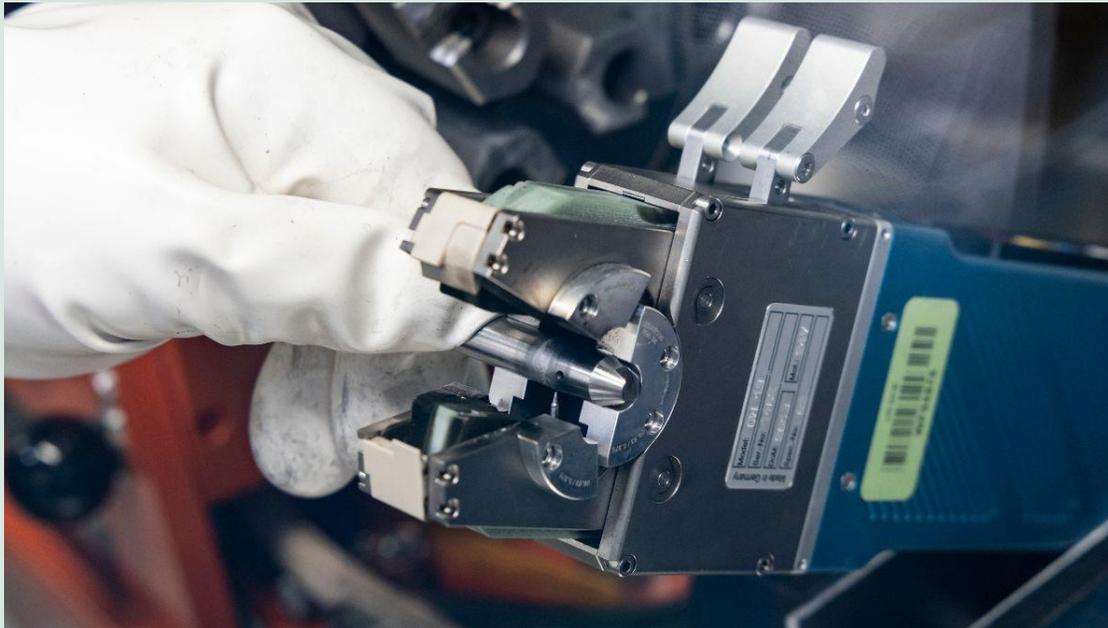
The technology incorporates a unique hydrogel material to capture aerosols from exhaled breath and preserve the samples, which could either be sent to a lab for analysis or, for a fully at-home approach, transferred to an accompanying test kit that could detect the SARS-CoV-2 virus that causes COVID-19.

"Our motivation is to put actionable information in the hands of users to help them make timely decisions, such as whether to go to work or school, quarantine, or seek medical care," said UTHSC's Dr. Scott Strome.

The user-friendly testing format is suitable for a broad range of users, including children and the elderly. The prototype was 3D printed at ORNL's Center for Nanophase Materials Sciences and designed for low-cost mass production.

Media contact: Ashley Huff, 865.241.6451, huffac@ornl.gov

Isotopes – Welding advances



The orbital welder makes a clean seam on hollow targets, eliminating the need for hand-finishing and reducing the amount of time staff spend in the glovebox. Credit: Carlos Jones/ORNL, U.S. Dept. of Energy

A better way of welding targets for Oak Ridge National Laboratory's plutonium-238 production has sped up the process and improved consistency and efficiency. This advancement will ultimately benefit the lab's goal to make enough Pu-238 – the isotope that powers NASA's deep space missions – to yield 1.5 kilograms of plutonium oxide annually by 2026.

ORNL began using an orbital welder inside a protective glovebox for the weld that closes the hollow tube containing neptunium feedstock – the last step before these targets are irradiated in ORNL's High Flux Isotope Reactor to produce Pu-238. ([Watch video](#))

The new computer-controlled orbital welder produces welds that do not require hand finishing, thereby shortening the time to complete welding jobs from a week to about a day.

"The time saved really adds up as we work toward our production goals," said ORNL's Robert Wham. Plutonium oxide is the power source for Perseverance, NASA's Mars rover.

Media contact: Kristi Nelson Bumpus, 865.253.1381, bumpuskl@ornl.gov

Hydropower – More than megawatts



The latest data show hydropower represents 6.6% of all electricity generated and 38% of electricity from renewables produced in the United States. Pictured is the Red Rock Hydroelectric Project in Marion County, Iowa. Credit: Missouri River Energy Services

A new Department of Energy [report](#) produced by Oak Ridge National Laboratory details national and international trends in hydropower, including the role waterpower plays in enhancing the flexibility and resilience of the power grid.

Much of this flexibility stems from pumped storage hydropower, or PSH, where reservoirs store water at higher elevations for on-demand electricity generation. PSH contributes 93% of grid-scale energy storage – more than batteries and all other technologies combined.

Interest has grown in PSH as a least-cost option for energy storage applications requiring long discharge cycles of four to 16 hours, with the project pipeline doubling over the last five years and new projects being explored in 21 states.

“Our analysis found that hydropower punches above its weight in terms of providing ancillary services like frequency regulation and reserves compared to its percentage of installed capacity,” said ORNL’s Rocio Uria-Martinez. “Hydropower’s dispatchable nature provides critical benefits in filling gaps in power supply and addressing peak demand.”

Media contact: Kim Askey, 865.576.2841, askeyka@ornl.gov