

Detailed 3-D model of SARS-COV-2 revealed

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Credit: University of Glasgow

As the world races to understand more about SARS-CoV-2, the virus responsible for the COVID-19 pandemic, scientists are gaining increasing amounts of information about the viral components that make up the infectious particles.

While each new discovery on the virus provides scientists and governments with vital new information on SARS-CoV-2, none of them



are able to give a clear overall image of the virus particles that can infect us.

Now, a collaboration between experts has created one of the most detailed 3-D models of both the interior and the exterior of the SARS-CoV-2 virus particle.

The collaboration includes Annabel Slater, a freelance scientific Illustrator and graduate of The Glasgow School of Art—University of Glasgow Masters in Medical Simulation and Human Anatomy; scientists at MRC-University of Glasgow Centre for Virus Research; and experts from the School of Simulation and Visualisation at the GSA (SimVis).

The striking new images and videos are available to see on the UK Research and Innovation (UKRI) COVID-19 website, <u>Coronavirus</u> Explained.

Piecing together the complex scientific jigsaw of all the known details about this new coronavirus so far, the cross-disciplinary team have created a series of striking images and videos. While the illustrations do not reveal any new information about SARS-CoV-2, they are one of the first and most detailed 3-D representations of the virus particles.





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It was possible to create the detailed illustrations so quickly, thanks to a long-standing collaboration between the University of Glasgow and The Glasgow School of Art (the GSA).

The illustrations and 3-D models have been made freely available to view online and to download for use by anyone who wishes to visualise SARS-CoV-2. A set of science communication resources incorporating then, including colouring sheets and an <u>augmented reality</u> educational app, are already in development at the CVR and will be released in the near future.

By visualising existing data about the particles that transmit COVID-19, it's hoped that this model will provide a valuable resource for anyone who wants to have a mental image of the invisible agent behind the



current pandemic.

Annabel Slater said: "I think making scientific images into something 3-D, opens up a whole new world of interaction, exploration and understanding. The science of a virus can be better understood by making the virus particle into something tangible and interactable. I hope these models of the SARS-CoV-2 virus particle will help people by making the invisible visible."



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Dr. Ed Hutchinson, research fellow at the CVR who led the virology work in this project, said: "No single experiment can directly produce a detailed image of a SARS-CoV-2 virus particle. Not only are they incredibly small, like all viruses, but they are also irregular—every virus



particle is slightly different from the next—and getting detailed information requires each component of the virus to be studied in isolation.

"Fortunately, for several years we've worked with students doing projects for the MSc in Medical Visualisation and Human Anatomy, including Naina Nair who developed one of the most detailed models of the influenza virus particles—which are also very irregular, and then found ways to use those models for science communication.

"When the current pandemic began, Annabel got in touch and asked if we could collaborate on a model of the SARS-CoV-2 virus particle. As a graduate of the MSc programme herself, she was able to quickly pick up the methods needed to build a <u>model</u> of the <u>virus</u>, working with us to interpret a set of data that combined the most up-to-date studies of SARS-CoV-2 with 'missing information' from studies of related viruses."

Provided by University of Glasgow

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