



# STEMBoost Newsletter

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## The Third Annual STEMBoost Invitational

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From 1/22-1/30, the Third Annual STEMBoost Science Olympiad Invitational successfully took place in open format. With a total of 67 teams from 29 schools and 6 states participating in the 23 events within the virtual competition, the STEMBoost officer team as well as some Kennedy Middle School Gold Team members worked hard to prepare, review, and grade the written tests and device submissions. We would like to specifically thank Allen Li, Alyssa Yang, Amol Rama, Andrew Zhou, Angela Zhang, Anish Bayyapu, Ashish Kashyap, Dylan Yang, Edwin Xie, Eric Ju, Iona Xia, Irene Tian, Ishanvi Kommula, Joseph Lee, Leela Srinivas, Michael Smith, Ryan Li, Shree Patel (from Del Norte High School) & Rachel Yoon (from Whitney M. Young Magnet High School), Sunny Yao, and Varun Kumaravelu for serving as the event supervisors for this invitational.

In addition, the Tournament Directors (David Smith, Dylan Yang, and Ryan Li), Program Manager (Andrew Zhou), and the operations people (Andrew Zhou, Angela Zhang, Dylan Yang, Iona Xia, Joseph Lee, and Ryan Li) maintained transparency between the updates within the invitational and all of the teams participating. Also, all of these people played a crucial role in timely test delivery and grading. The recorded award ceremony for the STEMBoost Invitational will be uploaded onto the STEMBoost YouTube one week after the end of the tournament (on 2/6). Congratulations to all the teams that participated!



### Fun Fact

Where is the most isolated lake on Earth located? (See answer in the back)

## What is Long Covid?

Angela Zhang

As the Covid-19 spike from January begins to wane, we are also beginning to see the aftereffects of Covid-19 infections, most notably “long Covid”, in which anywhere from 10 to 50 percent of people that catch Covid-19 are estimated to suffer from. Symptoms vary widely, ranging from respiratory symptoms like difficulty breathing to even problems with other body systems like heart palpitations. Though it’s not fully known what causes this mysterious condition, there are two leading theories for the cause of long Covid: the remaining amounts of coronavirus in the body, or dysfunction of the immune system post-Covid.

The first theory suggests that the lingering coronavirus in the body after infection wreaks havoc on tissue and organ systems to cause the symptoms of long-Covid. Though it may not make sense that some virus levels are

still present in the body after recovery, research has suggested that coronavirus RNA can remain in the body for over 230 days post-infection, often in the tissues. The exact mechanism by which these reservoirs can generate long Covid symptoms are unknown, but hypotheses suggest that they may leak viral proteins into the blood, which would induce clotting that is resistant to digestion and ultimately reduce oxygen delivery to tissues.

The second theory, on the other hand, points the finger at an overactive immune system attacking body tissues, a phenomenon known as autoimmunity. In this theory, microclots-- small blood clots forming in the bloodstream in response to the presence of inflammatory molecules-- induce the formation of autoantibodies, antibodies that attack the individual's own cells rather than pathogens. This phenomenon has been noted in other conditions as well, with research linking previous infection with the Epstein-Barr virus (which causes infectious mononucleosis) to the onset of multiple sclerosis, an autoimmune condition where autoantibodies are formed and attack the body's neural insulation, known as myelin. As a result of myelin degradation, neurons translate impulses much more slowly, causing the signature symptoms of MS.

Regardless of the causes of long Covid, it is a health outcome associated only with individuals infected with Covid-19. Therefore, we encourage everyone to get all shots of the Covid-19 vaccine, including the booster when applicable, and to practice social distancing, masking, and good hygiene in order to reduce spread and the incidence of long Covid.

#### Works Cited

Tayag, Yasmin. "What Causes Long Covid? Scientists Are Zeroing in on the Answer." Vox, Vox, 31 Jan. 2022, <https://www.vox.com/22906853/omicron-long-covid-vaccinated-symptoms-cause>.

"Post-Covid Conditions." Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, 16 Sept. 2021, <https://www.cdc.gov/coronavirus/2019-ncov/long-term-effects/index.html>

Answer: The most isolated lake on Earth is located 4 kilometers under the Antarctic ice in Antarctica, untouched for at least 15 million years.