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(I) The MVM Ventilator: Particle physicists, National Labs and Industry

Wednesday 9 June 2021 15:50 (10 minutes)

In response to the needs for ventilators for critically ill Covid-19 patients a collaboration of international particle physicists, engineers, software specialists, industry and medical specialists came together to create rapidly a simple, low-cost, open-source ventilator tailored specifically for such patients. The project was initiated by Professor Cristian Galbiati, spokesperson of the DarkSide-20k experiment designed to use about 55 tons of low-radioactivity liquid Argon to search for high-mass WIMPS as Dark Matter candidate particles at the Gran Sasso underground laboratory. This experiment is a successor to the DEAP experiment and precursor to the proposed ARGO experiment at SNOLAB. It was realized that the expertise in gas handling and computer control that has been developed for these experiments could be used to develop the Mechanical Ventilator Milano (MVM). The Italian group was immediately joined by Canadian scientists and engineers from TRIUMF laboratory, CNL Chalk River, SNOLAB and the McDonald Institute and other international collaborators. A prototype was working in the lab within 10 days, papers were published openly for the design, industrialized versions were developed and the collaboration won a Canadian government contract that has now resulted in the delivery of over 6000 ventilators to the Canadian stockpile following Health Canada Interim Authorization. Donation to other countries in need is another possibility under discussion. A description will be provided of how this highly motivated team pivoted their work to make a contribution to the COVID-19 pandemic.

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