



# The CERN against Covid-19 task force

Beniamino Di Girolamo (ATS/DO)

CERN against COVID-19 Task Force Seminar - 20 May 2020

# Background

- Task force established by the DG on 26 March
- First meeting 27 March, twice weekly since then.
- **Mandate:**  
*“to collect and coordinate potential ideas and contributions from CERN’s scientific community of over 17 000 people worldwide to the societal fight against COVID-19. These initiatives will draw on technical and scientific expertise and facilities at CERN, in the Member State countries and beyond and will be carried out in collaboration with that community.”*
- **Main message:** CERN is present to help society and researchers in other fields at this difficult time



<https://againstcovid19.cern/>

# The Task Force



Beniamino Di Girolamo (CERN, ATS-DO, Chair), Bettina Hamoudi (CERN, IPT-KT, Secretary)  
Giovanni Anelli (CERN, IPT-KT), Gianluigi Arduini (CERN, BE-ABP), Kirsten Baxter (DG-LS),  
Ian Bird (CERN, IT-SC), Themis Bowcock (University of Liverpool, LHCb), David Chaloin (SMB-SC),  
Paolo Chiggiato (CERN, TE-VSC), Manuela Cirilli (IPT-KT), Alberto Di Meglio (CERN, IT-DI),  
Friedemann Eder (IR-REL), Cédric Garino (CERN, SMB-SC), James Gillies (CERN, IR-SPE),  
Massimo Giovannozzi (BE-ABP), Angela Goehring-Crinon (HSE-DI) Beate Heinemann (DESY, ATLAS), André  
Henriques (CERN, HSE-OHS), David Lange (Princeton University, CMS), Diego Perini (CERN, EN-MME), Lucie  
Pocha (DG-LS), Marco Van Leeuwen (NIKHEF, ALICE), Tim Smith (IT-CDA) and Maarten Wilbers (DG-LS).

# The Task Force

- **The multidisciplinary composition of the task force is a key element enabling it to be receptive to all possible ideas and contributions from researchers and the general public**
  - Several colleagues not officially in the task force are extremely active and complement the work
- **The work of the task force has allowed the acceleration of initiatives, finding short routes to results, and making known and available resources that are part of CERN's normal life and now deployed to provide help in this emergency**
- **In addition, some initiatives have been proposed and initiated in previously unexplored territories, such as ventilators**
- **Today, the aim is to describe most of the initiatives that it has been possible to take onboard, and to have a first look at the legacy of this work**

# Approach

- Collect ideas and initiatives. More than 300 mail exchanges, ~100 proposals (several duplications), over 150 people involved at various levels
- Organise ideas by theme and coordinate to avoid duplication.
- Implement and/or provide support to initiatives, leveraging the technologies and specific competences of the CERN community.
- Liaise with other bodies, such as the WHO and local hospitals for medical aspects, with the support of the Occupational Health, Safety & Environmental Protection and Knowledge Transfer Units, allowing the relevance of the proposed projects and actions to be assessed.
- Liaise with other national laboratories, research centres and universities.



# Categories of work

## Medical Applications

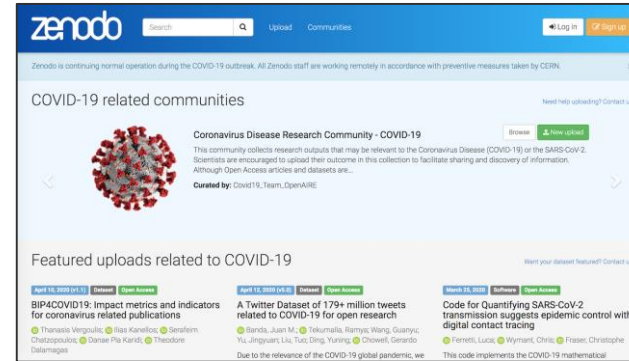
- Ventilators

## Computing and Data Analysis

- Zenodo
- folding@home

## Help to Society

- Shields
- Visors
- Masks
- Support to emergency services
- Sanitizing gel
- Logistical support
- UV boxes



Today all will be mentioned

# Beyond the emergency

- **The Task Force allows CERN to provide help in this emergency**
- **This model of working, and the tools developed, will remain part of CERN's culture: we can learn from what has happened and be prepared to respond in future to any similar situation**
- **The landscape is already changing: enormous worldwide response to the first outstanding healthcare and medical research challenges (ventilators, masks, sanitisers, computing/data storage).**

# Beyond the emergency

- **Some of these initiatives will come to an end soon as they were specifically targeted to the immediate response, but the Task Force will ensure that the ideas already implemented will have a bridge for continuation**
- **For ideas that it has not yet been possible to respond to, a deeper analysis will be done before the Task Force concludes its business**
- **The novel coronavirus will impact research and innovation for a long time, both directly (epidemiology, vaccines, drug development, medical imaging, medical procedures...) and indirectly (rethink work environment and public spaces, e.g. ventilation; impact on economy, industrial processes; recovery strategies with strong focus on climate and energy actions).**
  - Some examples in the next slides and more might arise



# Beyond the emergency

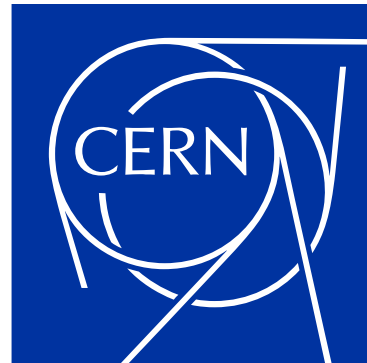
- **Bridges to ensure the continuation of some activities are already being prepared**
  - Several activities can certainly continue in our Knowledge Transfer Unit, others in the Information Technology Department
  - In general, CERN is welcome in multiple research groups outside High Energy Physics because it is seen as a model of organisation and neutrality
    - CERN skills in Big Data are highly respected in the scientific community
    - As is CERN's role in integrating technologies
  - It is very important for CERN to make what has been developed available to everybody whenever possible, of course with extreme prudence for medical applications: we will make sure proper continuation is ensured by the right partners

# Some examples of initiatives

- **These are initiatives not explicitly mentioned later and that will have a life beyond the Task Force, mostly in the Knowledge Transfer unit**
  - Use of Medipix/Timepix detectors from LAMBDA for COVID-19 studies at PETRA at DESY, investigation on enhanced colour CT for early pneumonia detection (MARS Bioimaging), Quality Assurance during sample irradiation.
  - Building/ICU room ventilation systems (in collaboration with civil aviation)
  - Sensors to detect the proximity of people
  - DAQ and slow controls for telemedicine
  - Science box – project with Artificial Intelligence in images for CT and X-rays, using the work done on MRI for head & neck cancer and exploring lungs damages typical of COVID-19
  - Exploring whether CERN data analytics can help modelling the economic and social impact of post-COVID-19 recession

# Conclusions

- **CERN responded to the emergency with this Task Force joining the worldwide effort of the scientific community**
- **We are sure that this experience will not be forgotten and reused if the need arises again**
- **Both the number and quality of ideas received is very high**
  - We implemented many, we will not forget the ones we didn't have possibility yet to explore
- **This emergency has increased the contacts of CERN with society and research in other fields than High Energy Physics**
- **My deep gratitude goes to the members of the task force, to the colleagues helping and to all people that contacted us proposing initiatives or asking help**
  - **We did our best and we will continue!**



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