

Collaborating at a Distance: the *How Can NIST Help* effort

Meeting the Challenge



Credit: NIST

Today I'm calling on all of you to help do something that NIST does better than anyone in the world and help America to address that uncertainty through our collective scientific and technical talent. NIST has risen to many challenges throughout the years, from the world wars, to 9-11, to addressing the Deepwater Horizon oil spill.

NIST is an amazing concentration of a broad array of scientific and technical expertise. It is time for us to aim that tremendous potential at the enormous COVID-19 crisis that is now consuming the entire world. How can we apply our talents in measurements, standards, AI, simulation, engineering, logistics, automation, mechanical systems, chemistry, communications, and many other areas to address the challenges brought about by this pandemic?

I am asking each of you to consider what NIST might do to help the world fight the corona virus.

Collaboration Team



Heather Evans (PCO)



Nick Barbosa (MML)



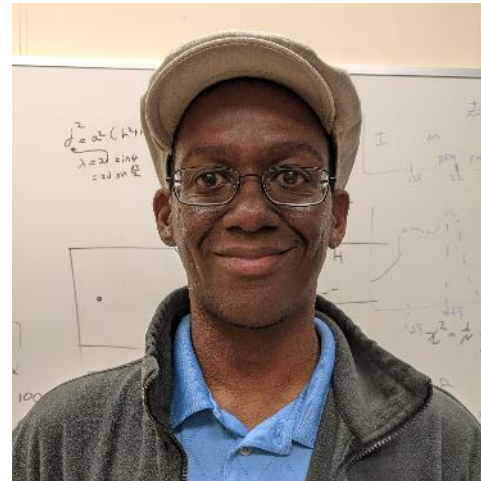
Sarah Hughes (CTL)



Michelle Stephens (PML)



Carmen Martinez (EL)



William Ratcliff (NCNR)



Elham Tabassi (ITL)

How Can NIST Help?



1. Idea Generation

2. Information Sharing

3. Collaboration

4. Action



How Can NIST Help Fight the Coronavirus?

NIST is an amazing concentration of a broad array of scientific and technical expertise. This form is your way to submit an idea in response to ADLP Olthoff's call to action for ways NIST can apply its scientific and technical knowhow to work fighting the pandemic. Help us put the great resources of NIST to work on this perilous problem!

NOTICE: Do not put any PII, business confidential or otherwise sensitive information in this form. By submitting your idea, you agree to allow NIST staff to review your submission, including laboratory directors and their delegates. Your idea may be posted to the INET site for NIST staff to follow and provide comments.

* Required

THIS FORM WILL CLOSE ON FRIDAY, APRIL 24. CONTACT ANY MEMBERS OF THE COLLABORATION TEAM IF YOU HAVE QUESTIONS, AND THANK YOU FOR YOUR INTEREST!

Your Name (if a team, list the team champion) *

Your answer

Your OU *

Choose

Names of any other teammates

Your answer

Idea Submission Criteria

**Has the promise of a significant impact within weeks or a few months*

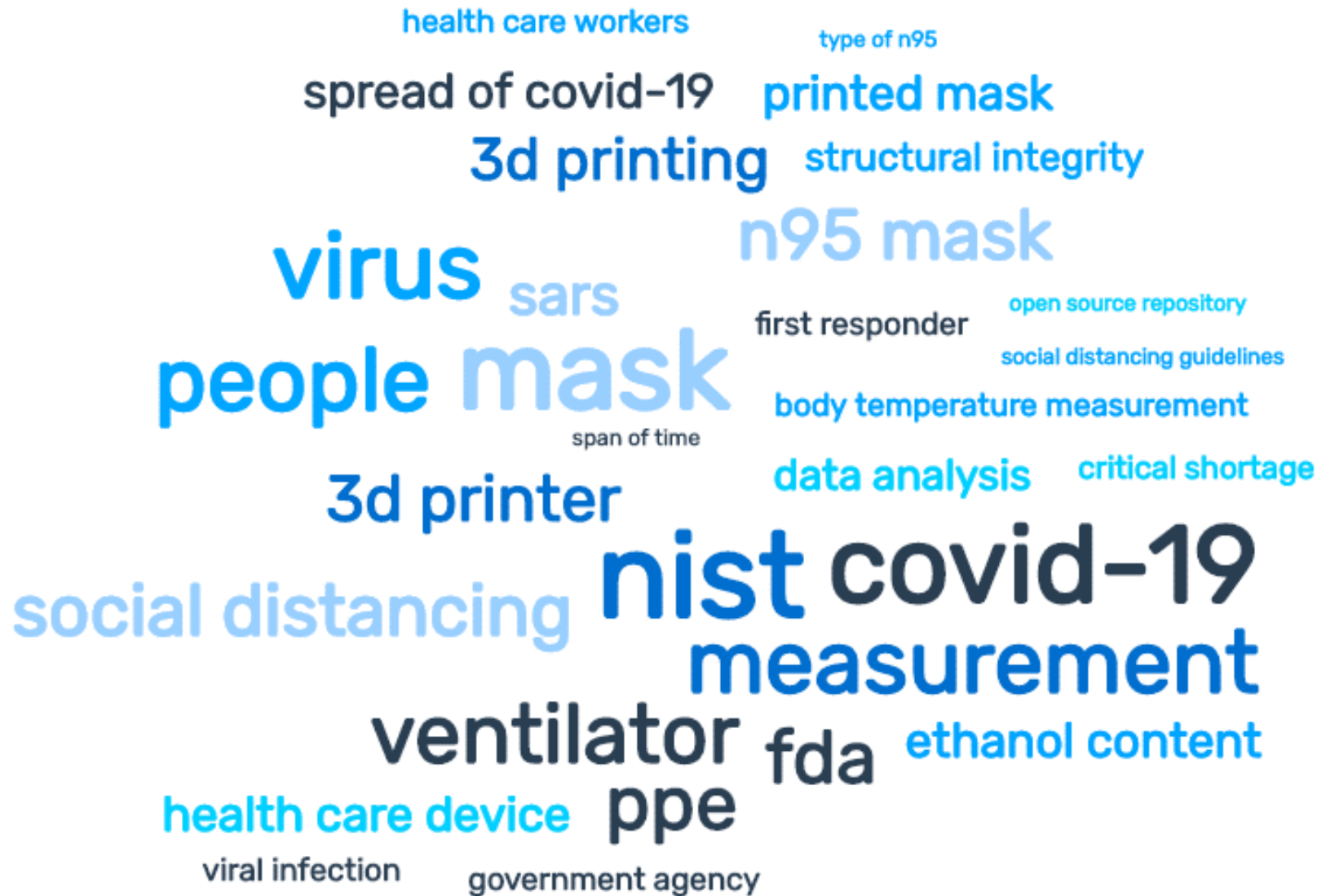
**Can be accomplished either by telework or with limited on-site presence*

**If on-site work is required, it must be possible safely and with limited environmental conditions*

Your submission should address:

1. What is the idea?
2. What outcomes and impacts are expected?
3. What personnel and resources are required?
4. What is the expected timeline?

Ideas Summary

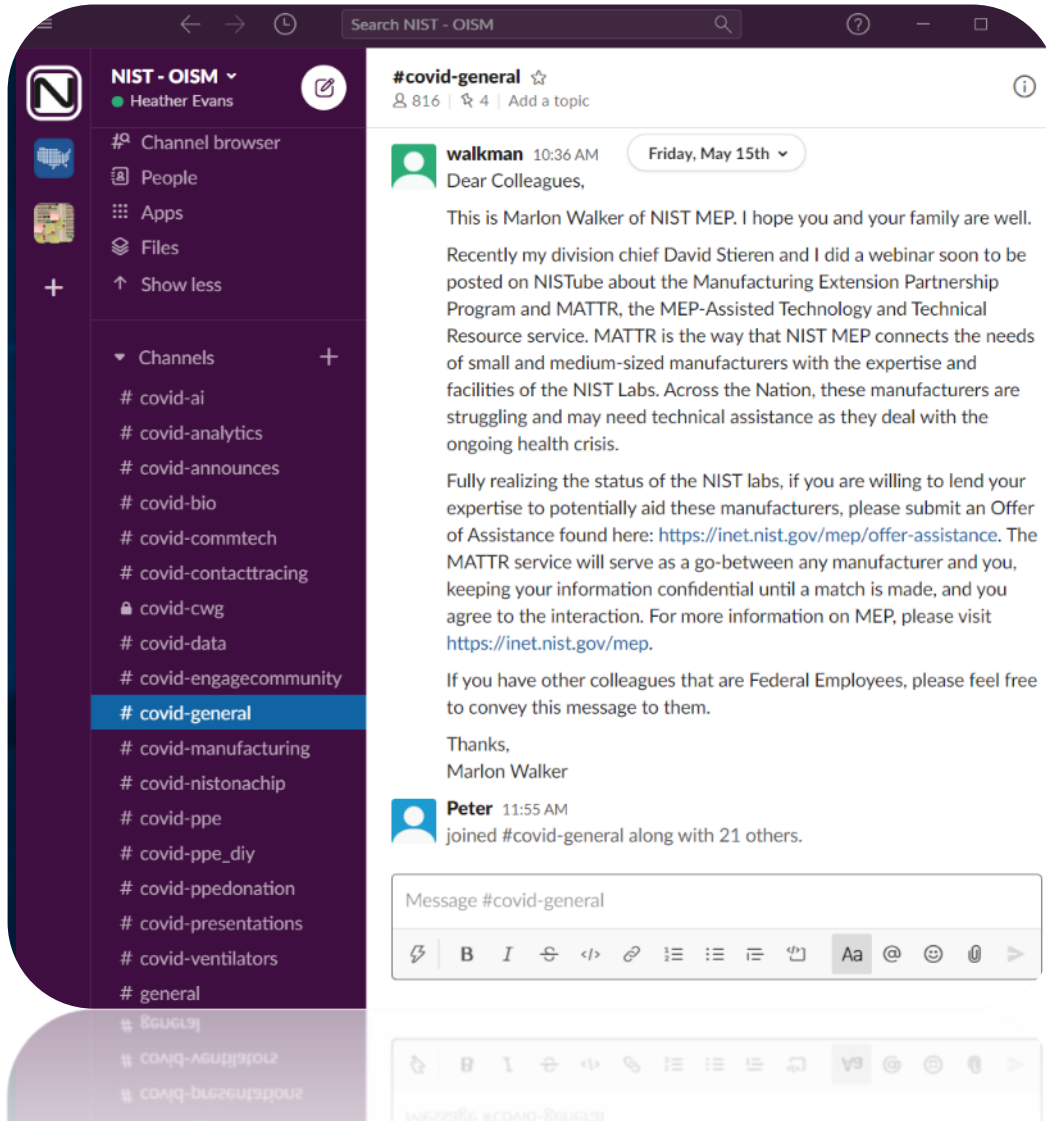


Idea Submission
Form open for 4
weeks

75 submissions

Responses from
across all 6
laboratories

Collaboration and Information Sharing



Seminars

- The COVID Impact on Community Colleges
- National Science Foundation Response to COVID-19
- The MEP Response & Opportunities for Engagement
- Underpinning COVID-19 Detection Measurements
- Electronic Contact Tracing Efforts



How Can NIST Help: The Manufacturing Extension Partnership Successes and Opportunities

The Manufacturing Extension Partnership (MEP) Response to the COVID Crisis: Successes and Opportunities for Engagement

David Stieren - Chief, Extension Services Division
Marlon L. Walker - Technical Manager, MATTR Service, Extension Services Division

The NIST MEP National Network has been working directly with small and medium-sized manufacturers to support the national COVID-19 response. MEP has leveraged their deep experience working side-by-side with manufacturers to reduce costs, improve efficiencies, develop the next generation workforce, create new products, find new markets to coordinate and accelerate the national response. We will provide an overview of MEP and highlight MEP COVID-19 response efforts. We will also describe the MEP-Assisted Technology and Technical Resource (MATTR), as a way to connect YOU the NIST technical experts to questions from small and medium-sized manufacturers working to respond to the COVID-19 crisis.

0:00 / 1:02:55

CC Flag Settings NIST i

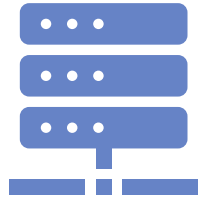
Mission and Purpose



Actions

www.nist.gov/coronavirus

Main Themes

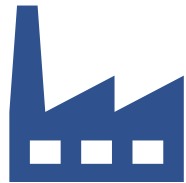


**ML/AI, Data
and Analytics**

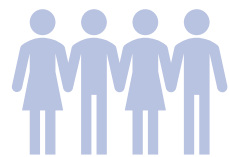


**Personal
Protective
Equipment**

**Manufacturing
& Industry**



**Biological
Measurements**



**Volunteering &
Engagement**

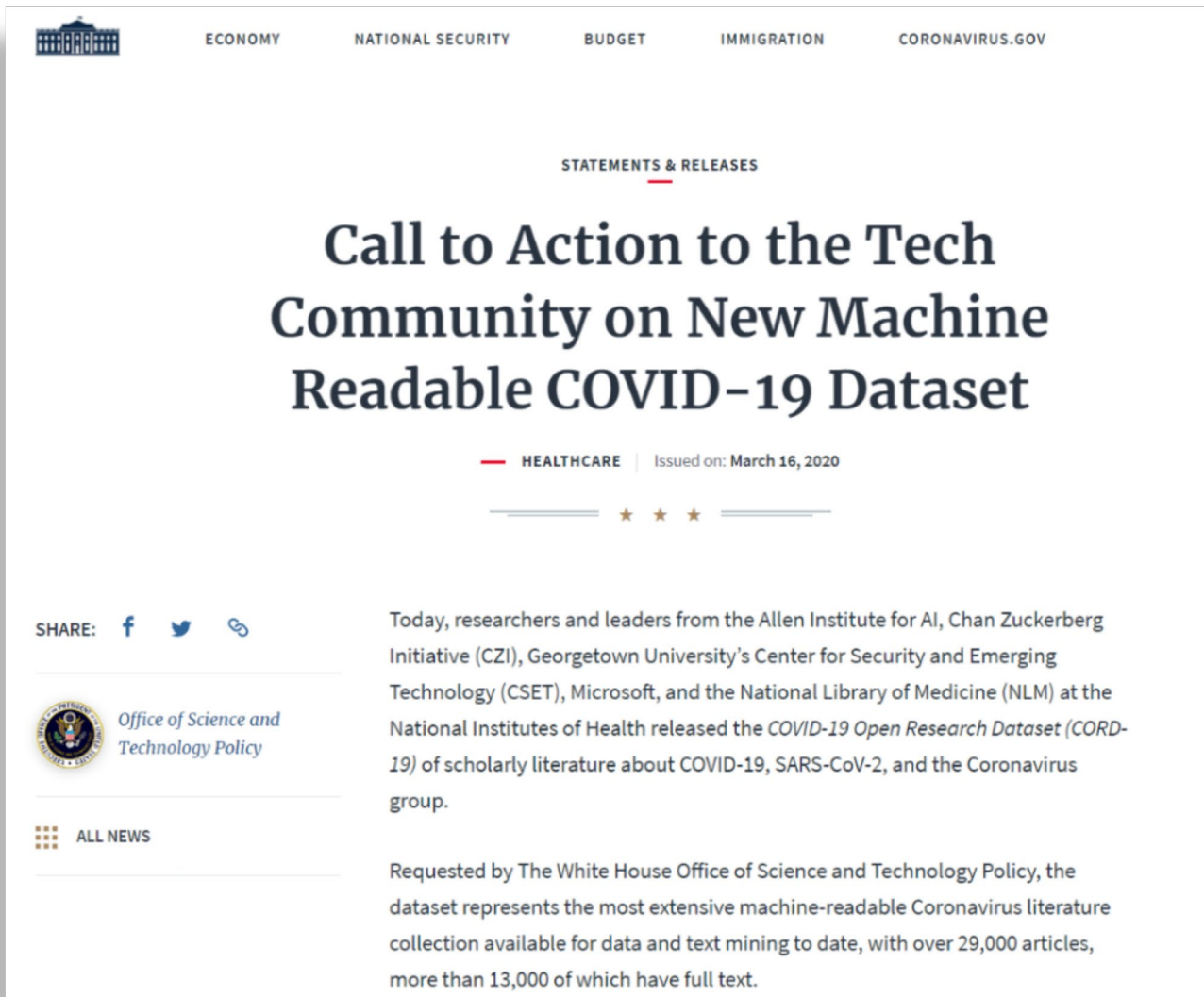


**Energy &
Environment**

**Wireless
Innovations**



ML/AI, Data and Analytics



The screenshot shows a press release from the White House Office of Science and Technology Policy. The page has a dark blue header with navigation links: ECONOMY, NATIONAL SECURITY, BUDGET, IMMIGRATION, and CORONAVIRUS.GOV. The main heading is 'Call to Action to the Tech Community on New Machine Readable COVID-19 Dataset', dated March 16, 2020. The text describes a dataset of COVID-19 literature released by a group of researchers and institutions. It mentions that the dataset is the most extensive machine-readable collection available, with over 29,000 articles, 13,000 of which have full text.

Call to Action to the Tech Community on New Machine Readable COVID-19 Dataset

HEALTHCARE | Issued on: March 16, 2020

Today, researchers and leaders from the Allen Institute for AI, Chan Zuckerberg Initiative (CZI), Georgetown University's Center for Security and Emerging Technology (CSET), Microsoft, and the National Library of Medicine (NLM) at the National Institutes of Health released the *COVID-19 Open Research Dataset (CORD-19)* of scholarly literature about COVID-19, SARS-CoV-2, and the Coronavirus group.

Requested by The White House Office of Science and Technology Policy, the dataset represents the most extensive machine-readable Coronavirus literature collection available for data and text mining to date, with over 29,000 articles, more than 13,000 of which have full text.

COVID-19 Data Repository

<https://covid19-data.nist.gov/>

NIST Scientific Indexing Resource

<https://randr19.nist.gov/>

NIST COVID-19 Resource Registry

<https://covid19-registry.nist.gov/>

Curated Archive cord19-cdcs-nist

<https://github.com/usnistgov/cord19-cdcs-nist>

Research Project to Apply ML (*in progress*)

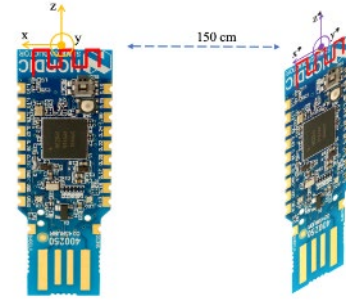
TREC-COVID (*presentation to follow*)

Exposure Notification

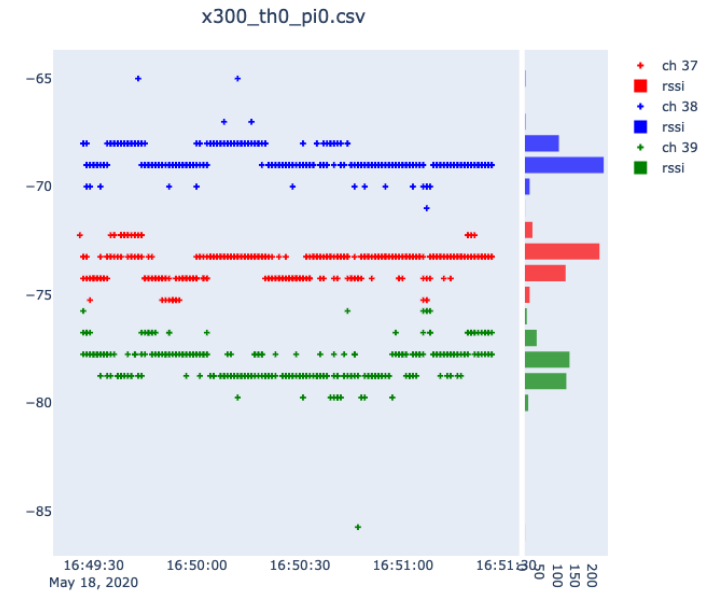


Image credit: Christine Daniloff, MIT

- Privacy & cybersecurity
- Performance & accuracy using Bluetooth®
- Other modes of accessibility, e.g. populations without smart phones



Credit: S. Nam, N. Moayeri, M. Keller (NIST)



<https://www.nist.gov/itl/iad/mig/nist-tc4tl-challenge>

Engagement with many groups:



Manufacturing & Industry

Tampa Bay Times CORONAVIRUS NEWS SPORTS OPINION ARTS & ENTERTAINMENT FOOD LONG READS

Hurricane 2020: Seven things to know about a hurricane season like no other


What if a hurricane makes landfall during the COVID-19 pandemic? Here's what you need to know about the double-disaster scenario facing Florida.

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DISTILLED SPIRITS COUNCIL OF THE UNITED STATES Policy & Advocacy Data & Economic Impact Latest News & Insights Membership & Benefits Responsibility & Who We Are Follow Us Spirits United

Distilleries Making Hand Sanitizer to Fight COVID-19



Credit: Aaron Urbas



Wireless Innovations

Spectrum Load:

- collecting data on spectrum occupancy, traffic load, and the number of devices/networks operating
- develop scenarios for future testing
- support more resilient communication networking

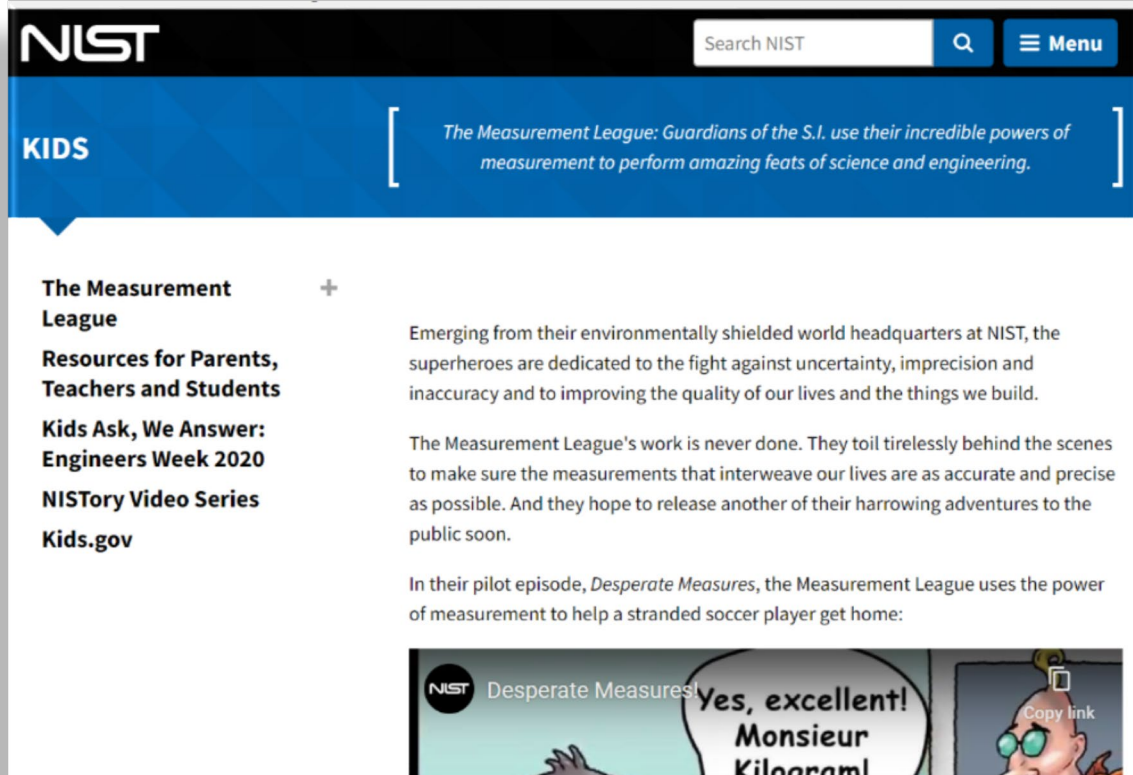
Wifi to Monitor Respiratory Function:

- exploring the feasibility of implementing a software update to wireless routers or base stations
- non-contact respiratory monitors in home and medical environments



Credit: NIST CTL

Volunteering & Engagement



NIST Search NIST Menu

KIDS


The Measurement League: Guardians of the S.I. use their incredible powers of measurement to perform amazing feats of science and engineering.

The Measurement League +
Resources for Parents, Teachers and Students
Kids Ask, We Answer: Engineers Week 2020
NISTory Video Series
Kids.gov

Emerging from their environmentally shielded world headquarters at NIST, the superheroes are dedicated to the fight against uncertainty, imprecision and inaccuracy and to improving the quality of our lives and the things we build.

The Measurement League's work is never done. They toil tirelessly behind the scenes to make sure the measurements that interweave our lives are as accurate and precise as possible. And they hope to release another of their harrowing adventures to the public soon.

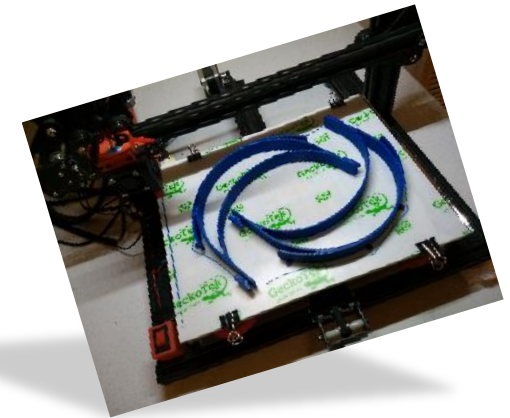
In their pilot episode, *Desperate Measures*, the Measurement League uses the power of measurement to help a stranded soccer player get home:



NIST Desperate Measures Yes, excellent! Monsieur Kilogram! Copy link



Public Interest
Internship
Experience



& More...

FaTIMA - Fate and Transport of Indoor Microbiological Aerosols (FaTIMA)

pages.nist.gov/CONTAM-apps/webapps/FaTIMA/index.html

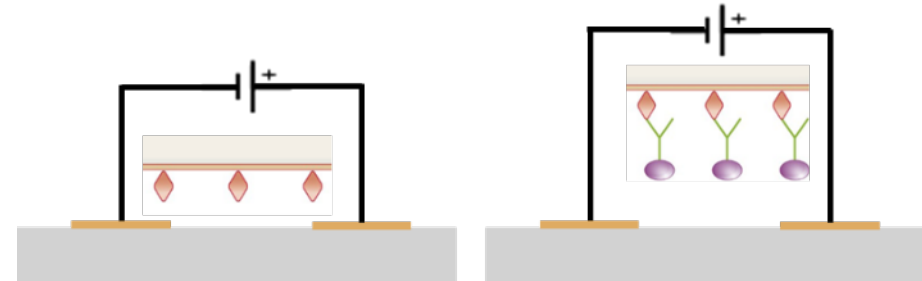
NIST MULTIZONE MODELING

Fate and Transport of Indoor Microbiological Aerosols (FaTIMA)

Instructions: Set Inputs then click the RUN SIMULATION button.

Inputs

Zone Geometry	Volume: 100 m ³	Floor Area: 40 m ²	Wall Area: 63.25 m ²	Ceiling Area: 40 m ²
	Other Surface Area: 4 m ²	Surface to Volume Ratio: 1.5		
Infiltration	Infiltration: 0.5 1/h	Particle Penetration Coefficient: 1		
Ventilation System	Supply Airflow Rate: 400 sm ³ /h	Outdoor Air Intake Fraction: 0	Return Airflow Rate: 400 sm ³ /h	Local Exhaust Airflow Rate: 0 sm ³ /h
System Filters	Outdoor Air Filter: None	Recirculation Air Filter: None		
Calculated Airflows	Total Outdoor Air Change Rate: 0.5 1/h	Outdoor Air Intake Rate: 0 sm ³ /h	Recirculation Airflow Rate: 400 sm ³ /h	
Room Air Cleaner	Maximum Airflow Rate: 200 scfm	Fan Flow Fraction: 0	Filter Efficiency: 0.8	CADR: 0 scfm
Particle Properties	Name: IV1	Diameter: 1 μm	Density: 1 g/cm ³	Particle Deactivation: Off
	Half-life: 1.1 h	Decay Rate: 0.63014 1/h		
Continuous Source	Source: On	Generation Rate: 3.2 #/min	Generation Time Period: Start 00:00 / End 24:00	
Burst Source	Source	Burst Type	Amount per Burst	Generation Time Period



Credit: A. Stelson



Image credit: FDA

Select Snapshots of Activities



Dr. Peter Vallone
COVID-19 Detection



Dr. David LaVan
Personal Protective Equipment



Dr. Ellen Voorhees
TREC-COVID