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# Human Subjects Testing in the COVID Era

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**Director**  
**National Advanced Driving Simulator**

TRB mid-year ACH60 meeting  
September 2, 2020



# Unique Environments

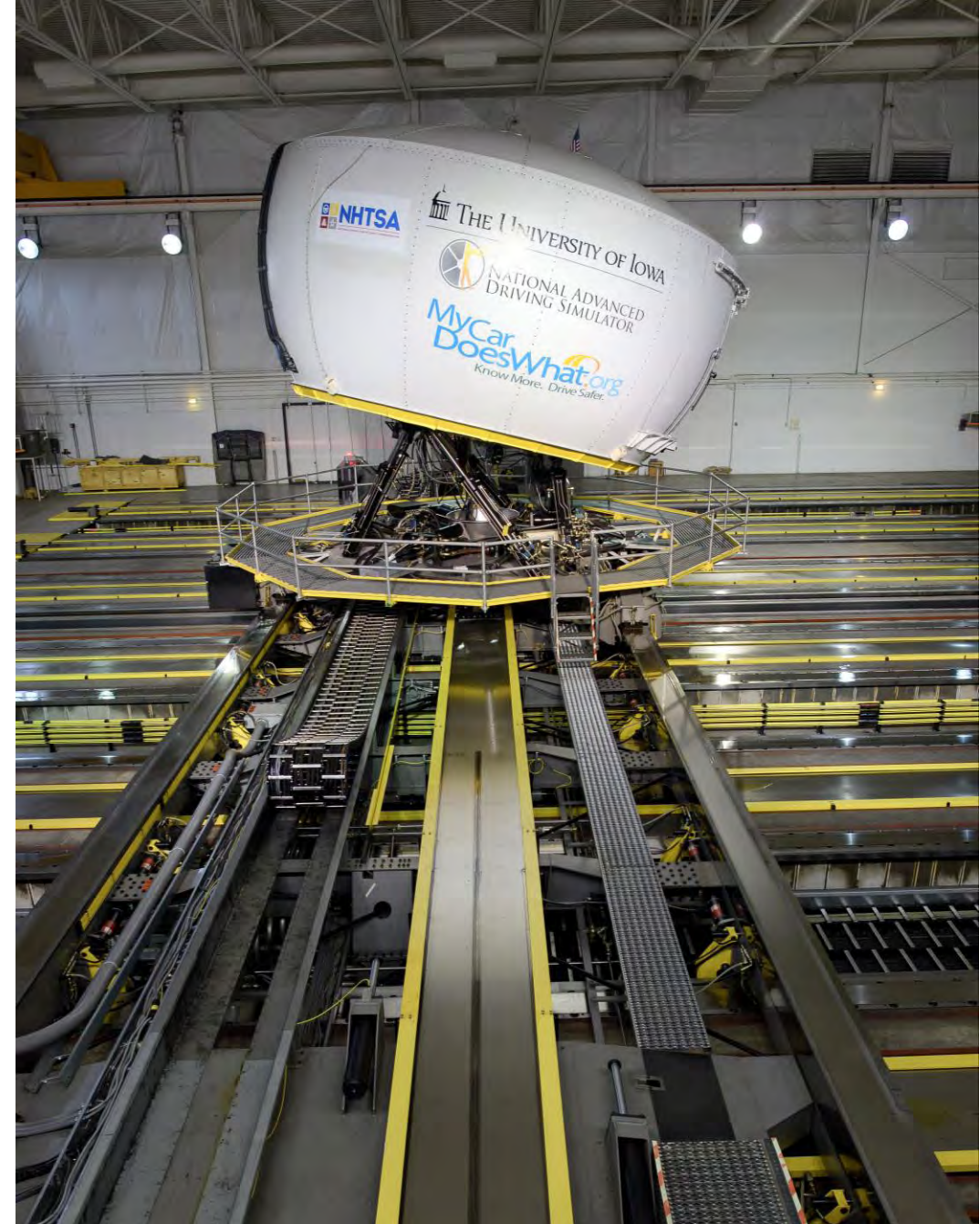


# Unique Environments



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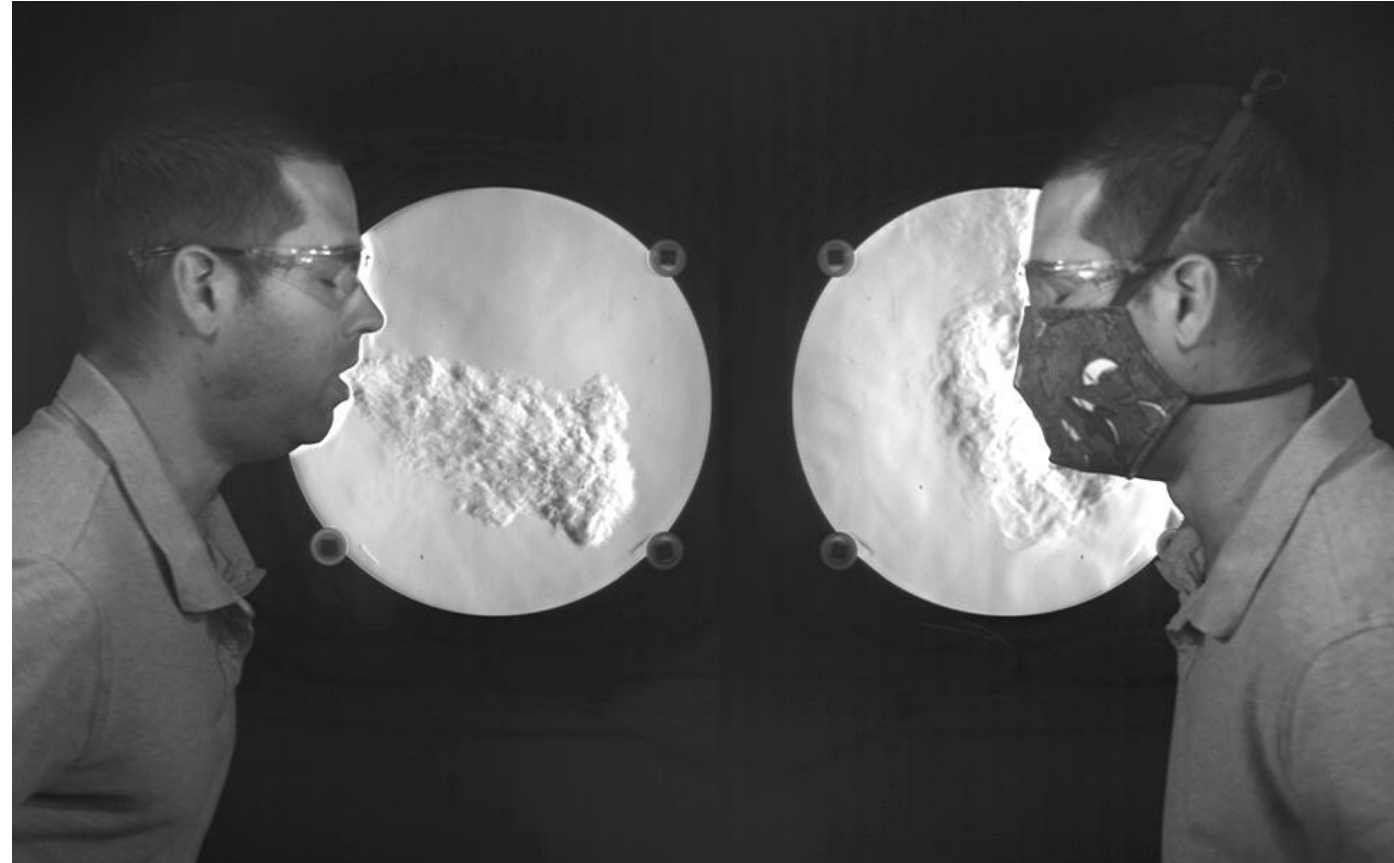
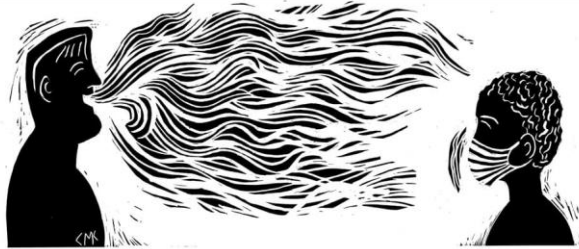
- Unable to social distance
- On-board experimenter(s)
- HVAC systems vary between sims and on-road vehicles



# First, the principles...it's mostly about breathing bad air

→ Masks contain YOUR Droplets—aerosolization

**MASK UP!**  
SAVE YOUR BREATH & SAVE MINE TOO!



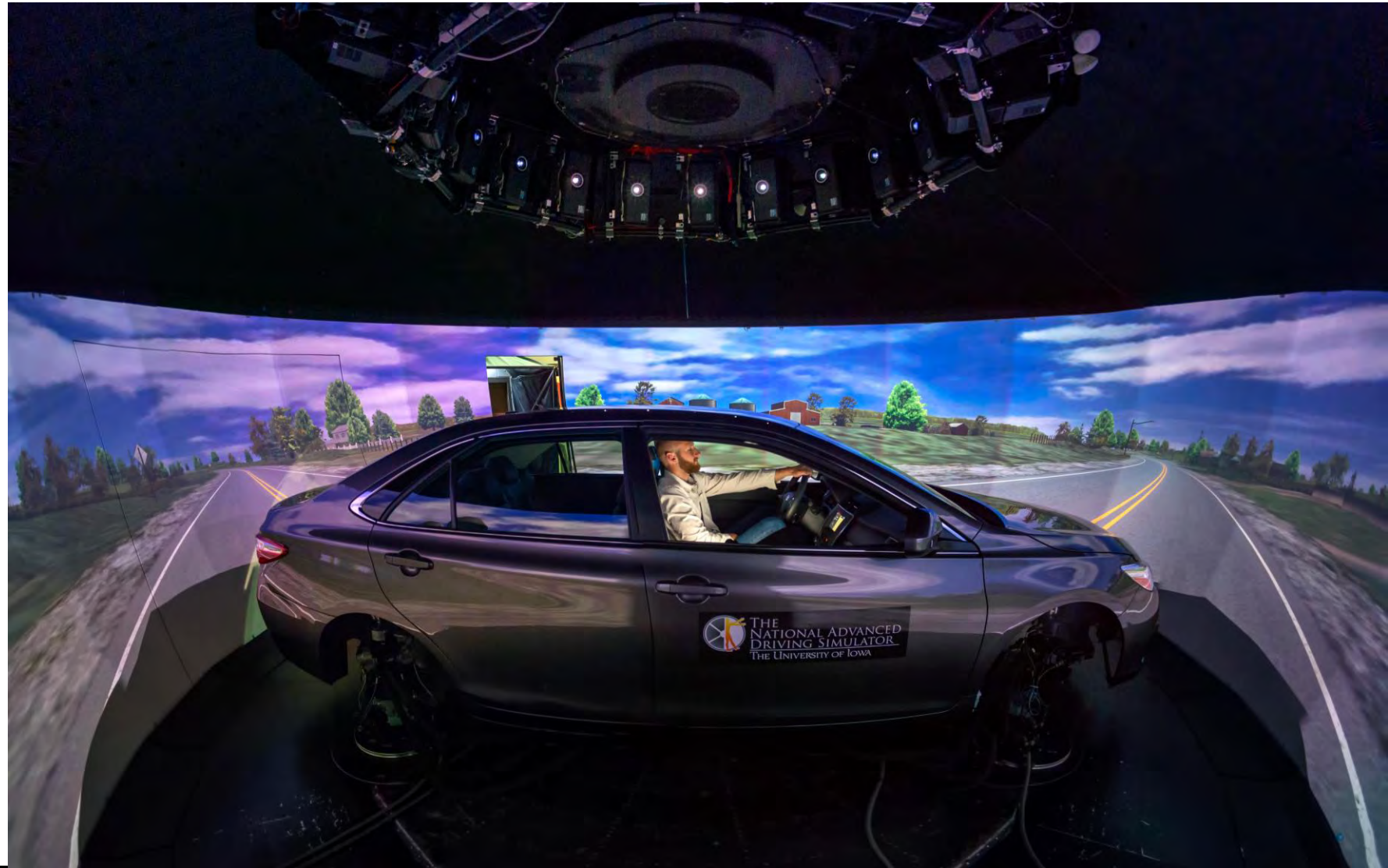
# Face shields reduce your risk

- Protect your eyes, nose and mouth
- Also reduces surface contamination
- Best protection to **wear both mask and shield**



# NADS Dome a Unique Challenge

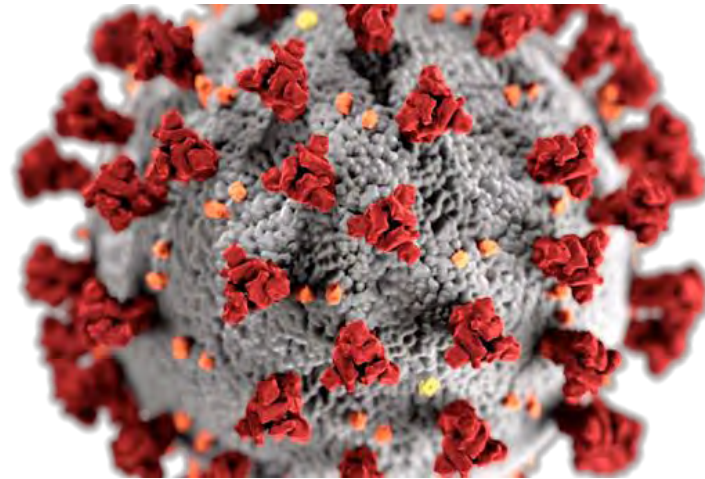
- HVAC
- Environment
- Acoustics
- Experimenter



# Consulting Infectious Disease Experts

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- Prof. Loreen Herwaldt, MD—University of Iowa
  - Professor of Infectious Diseases, COVID-19/SARS-Co-V2 expert
- Prof. John Conly, MD —University of Calgary
  - Past president of Canadian Infectious Disease Society
- Members of WHO Panels on Infectious Diseases





# Letter with Nine Recommendations



**Loreen A. Herwaldt, M.D.**  
*Department of Internal Medicine  
University of Iowa Carver College of Medicine  
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Email [loreen-herwaldt@uiowa.edu](mailto:loreen-herwaldt@uiowa.edu)*

August 10, 2020

Daniel McGehee, PhD  
Director  
National Advanced Driving Simulator  
College of Engineering  
University of Iowa

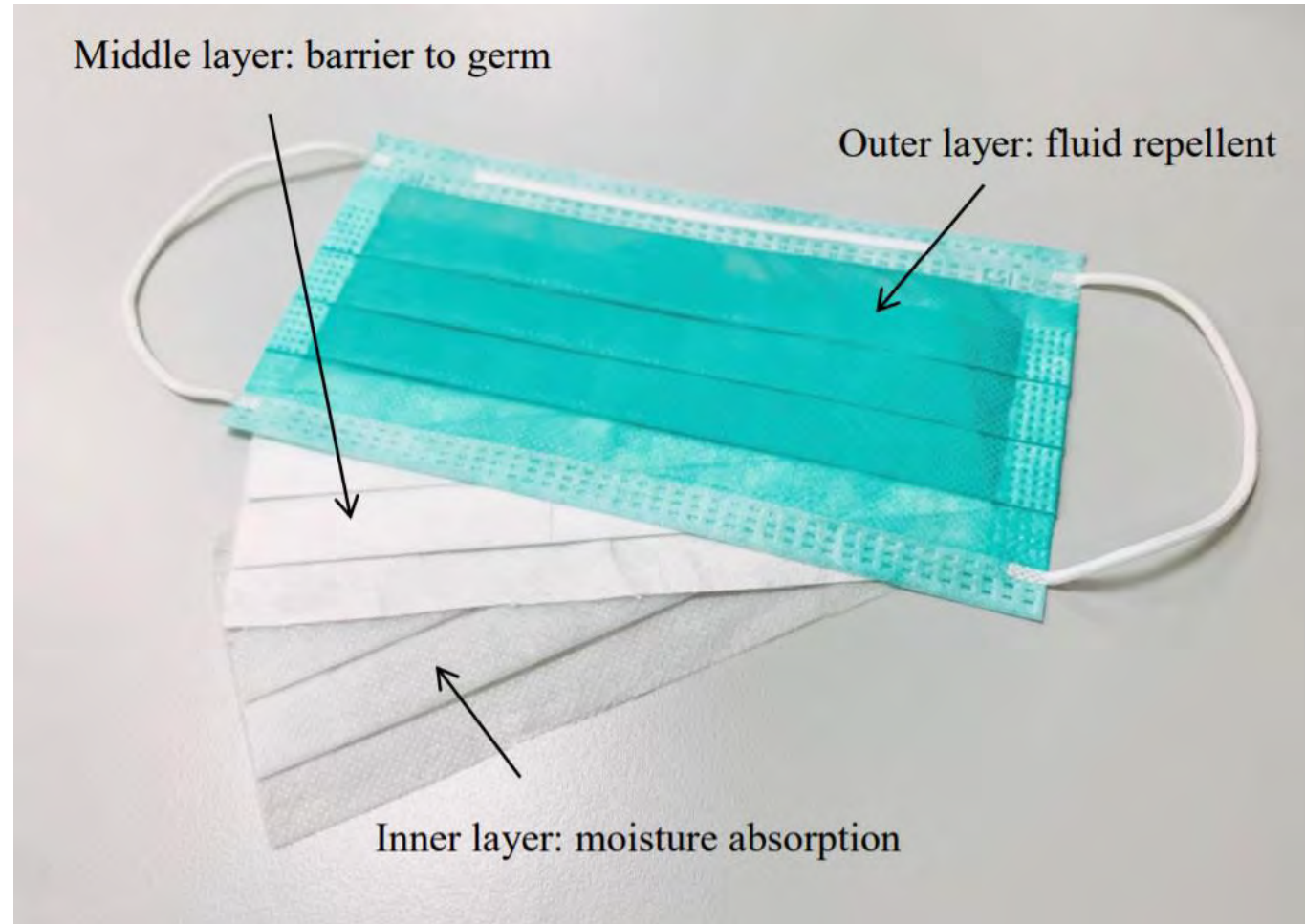
Dear Dr. McGehee:

With regard to our conversations and consultations with infectious disease experts on the transmission of the novel coronavirus in the in-vehicle context, there are a number of measures that can be taken to reduce the transmission of the virus. Before I begin, please keep in mind that we are learning new information almost daily, so we will keep in contact as conditions change. What we know and expect today may be different tomorrow. I appreciate that you have a highly trained and professional staff that makes executing and sustaining these measures possible.

Several infection prevention principles apply to the simulator and on-road vehicle cabs:

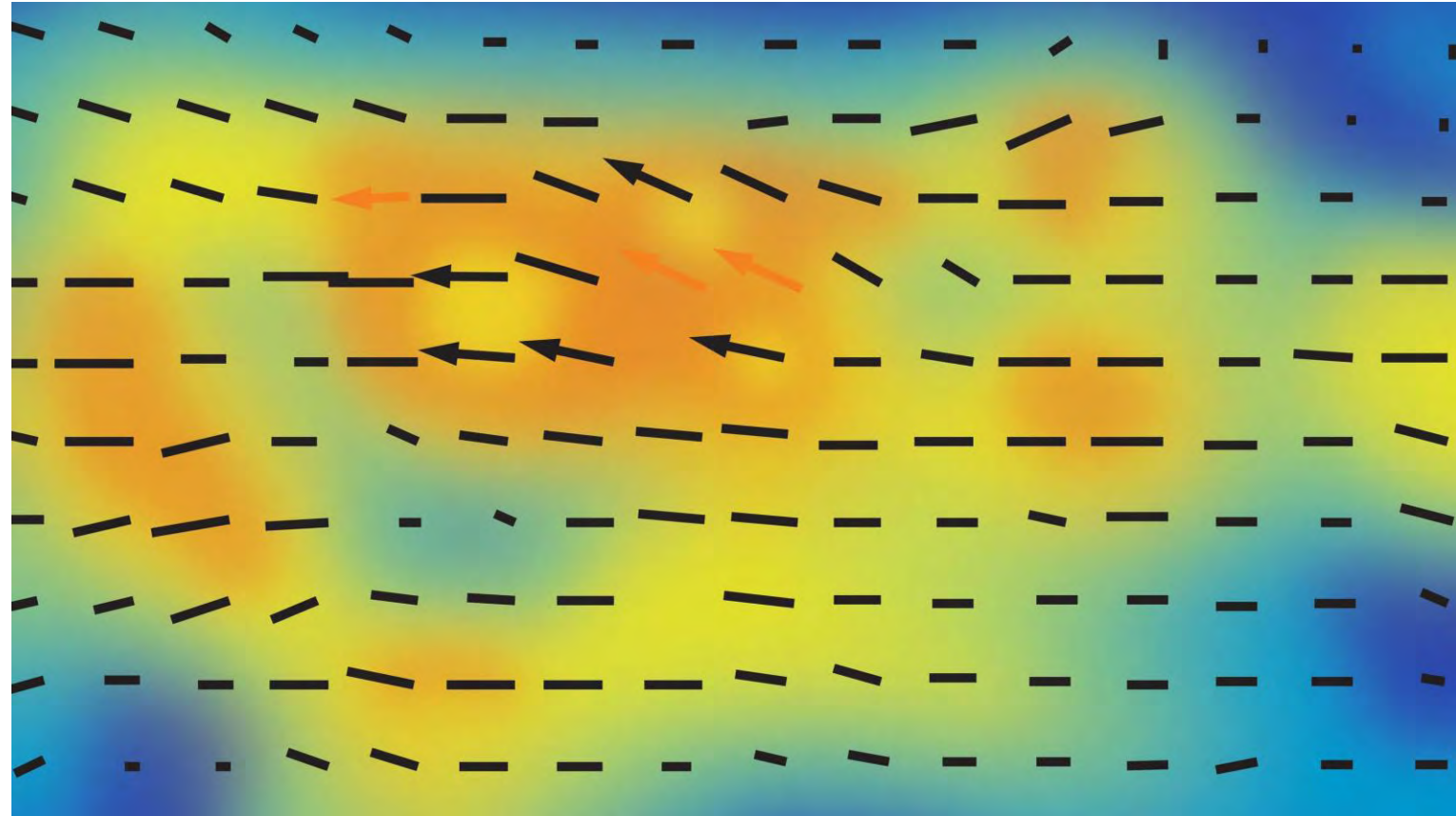
# Recommendation 1 and 2 /9

- Participants shall wear three-layer surgical masks
- Experimenters shall wear three-layer surgical masks
- If experiments require an unmask face, exclude on-board personnel if possible



# Recommendation 3/9

→ Keep utterances to a minimum between experimenter and participant



# Recommendation 4/9

→ Keep fans on low speed



# Recommendation 5/9

→ Open windows/sunroof for fresh air



# Recommendation 6/9

- Install High Efficiency particulate arrestance (HEPA) filters in HVAC systems



# Recommendation 7/9

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- Use CDC appropriate cleaning protocols on all surfaces including windows in the vehicle or simulator cab before/after each participant
- <https://www.cdc.gov/coronaviruses/2019-ncov/community/clean-disinfect/index.html>



# Recommendation 8/9

- Pre-screen participants before and at arrival for the standard COVID-19 symptoms
- <https://www.cdc.gov/screening/index.html>





# Recommendation 9/9

- At arrival conduct external temp checks and ensure that they are not above 100° F
- If they are above 100° F, send them home and advise to contact their healthcare providers if other symptoms



# A note about barriers

- Some concerns about crashworthiness issues that may outweigh COVID risk
- Glare
- These are all very small...





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# Summary

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- 1. Participants shall wear three-layer surgical masks. If experiments require an unmask face, exclude on-board personnel if possible
- 2. On-board experimenters should wear three-layer surgical masks and face shields
- 3. Keep utterances/talking to a minimum in the vehicle
- 4. Keep cooling fans on low speed
- 5. Open windows/sunroof for fresh air
- 6. Install Hepa filters in HVAC systems
- 7. Use CDC appropriate cleaning protocols on all surfaces including windows in the vehicle or simulator cab before/after each participant <https://www.cdc.gov/coronavirus/2019-ncov/community/clean-disinfect/index.html>
- 8. Pre-screen participants before and at arrival for the standard COVID-19 symptoms. <https://www.cdc.gov/screening/index.html>
- 9. At arrival conduct external temp checks and ensure that they are not above 100° F. If they are above 100° F, send them home and advise to contact their healthcare providers if other symptoms.

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