

# Message to COHERENT from ORNL

Marcel Demarteau  
Division Director  
Physics Division

*COHERENT Workshop*  
June 8 – 10, 2020

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U.S. DEPARTMENT OF  
**ENERGY**



The unanimous Declaration of the thirteen united States of America.

When in the Course of human Events, it becomes necessary for one People to dissolve the political Bands which have connected them with another, and to assume among the Powers of the earth, the separate and equal Station to which the Laws of Nature and of Nature's God entitle them, a decent Respect to the Opinions of Mankind requires that they should declare the Causes which impel them to the Separation. We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. That to secure these rights, Governments are instituted among Men, deriving their just Powers from the Consent of the governed. That whenever any Form of Government becomes destructive of these ends, it is the Right of the People to alter or to abolish it, and to institute new Government, laying its foundation on such Principles and organizing its Powers in such Form, as to them shall seem most likely to effect their Safety and Happiness. Prudence, indeed, will dictate that Governments long established should not be changed for light and transient Causes; and accordingly all experienced Men will admit, that no Merit is more deserving to suffer, than to be subjected to a frequent Change in the Forms of Government, to which they are accustomed. But when a long Train of abuses and Usurpations, pursuing invariably the same Object evinces a design to reduce them under absolute Despotism, it is their Right, it is their Duty, to throw off such Government, and to provide new Guards for their future Security. Such has been the Patient Sufferance of these Colonies; and such is now the Necessity which constrains them to alter their former System of Government. The History of the present King of Great Britain is a History of repeated Injuries and Usurpations, all having in direct or indirect Object the Establishment of an absolute Tyranny over these States. To prove this, let Facts be submitted to a candid World. He has refused his Assent to Laws, the most wholesome and necessary for the public Good. He has forbidden his Governors to pass Laws of immediate and pressing Importance, unless suspended in their Operation, till his Assent should be obtained; and when so suspended, he has utterly neglected to attend to them. He has refused to pass other Laws for the Accommodation of large Districts of People, unless those People would relinquish the Right of Representation in the Legislature, a right inestimable to them and pernicious to tyrants only. He has called together legislative Bodies at Places unusual, uncomfortable, and distant from the Depository of their Public Records, for the sole Purpose of embarrassing them with his Measures. He has dissolved Representative Houses repeatedly, for opposing with manly Firmness his Invasions on the Rights of the People. He has refused for a long Time, after such Dissolutions, to cause others to be elected; whereby the Legislative Powers, requisite to the Safety of the Colonies, have remained in the mean Time exposed to all the Dangers of Invasion from without, and convulsions within. He has endeavored to prevent the Population of these States; for that purpose obstructing the Laws for Naturalization of Strangers; refusing to grant Letters of Naturalization to others; encouraging their migrations hither, and raising the Conditions of new Appropriations of Lands. He has obstructed the Administration of Justice, by refusing his Assent to Laws for establishing Judiciary Powers. He has made Judges dependent on his Will alone for the Tenure of their Offices, and the Amount and Payment of their Salaries. He has erected a multitude of New Offices, and sent hither Swarms of Officers to harass our People, and eat out their Substance. He has kept among us, in Times of Peace, standing Armies without the Consent of our Legislature. He has endeavored to bring large Bodies of armed Troops among us: For protecting them, by a mock Trial, from Punishment for any Murders which they should commit on the Inhabitants of these States: For cutting off our Trade with all Parts of the World: For imposing Taxes on us without our Consent: For depriving us in many Cases of the Benefits of Trial by Jury: For transporting us in distant Parts of the World for pretended Offences: For abolishing the free System of English Laws in a neighboring Province, establishing therein an Arbitrary Government, and enlarging its Boundaries so as to render it at once an example and fit Instrument for introducing the same absolute Tyranny into these Colonies: For taking away our Charters, abolishing our most valuable Laws, and altering fundamentally the Forms of our Governments: For suspending our own Legislatures, and declaring themselves invested with Powers to legislate for us in all Cases whatsoever. He has abdicated Government here, by declaring us out of his Protection and waging War against us. He has plundered our Coasts, burnt our Towns, and destroyed the Lives of our People: He is at this time transporting large Armies of foreign Mercenaries to complete the Works of Death, Desolation and Tyranny, already begun with circumstances of Cruelty & Rapidity, scarcely paralleled in the most barbarous Ages, and lately unworthy the Head of a civilized Nation. He has constrained our fellow Citizens taken Captive on the high Seas to bear Arms against their Country, to become the Executioners of their Friends and Brethren, or to fall themselves by their Swords. He has excited domestic Contentions amongst us, and has endeavored to bring on the Inhabitants of our frontiers, the merciless Indian Savages, whose known Rule of Warfare, is an undistinguished Destruction, of all Ages, Sexes and Conditions. In every Stage of these Oppressions We have Petitioned for Redress in the most humble Terms: Our repeated Petitions have been answered by repeated Injury. A Prince, whose Character is thus marked by every Act which may define a Tyrant, is unfit to be the ruler of a free People. Nor have We been wanting in Attention to our British Brethren. We have warned them from Time to Time of Attempts by their Legislatures to extend an unbecomingly Jurisdiction over us. We have reminded them of the Circumstances of our emigration and Settlement here. We have appealed to their native Justice and Magnanimity, and we have conjured them by the Ties of our common Kindred to disavow these Usurpations, which would inevitably interrupt our Connections and Correspondence. They too have been deaf to the Voice of Justice and of Consanguinity. We must, therefore, retrace to the Necessity, which denounces our Separation, and hold them as we hold the rest of Mankind, Enemies in War, in Peace Friends. We therefore, the Representatives of the united States of America, in General Congress, Assembled, appealing to the Supreme Judge of the world for the Rectitude of our Intentions, do, in the Name, and by Authority of the good People of these Colonies, solemnly publish and declare, That these United Colonies are, and of Right ought to be, Free and Independent States; that they are Absolved from all Allegiance to the British Crown, and that all political Connection between them and the State of Great Britain, is and ought to be totally dissolved; and that as Free and Independent States, they have full Power to levy War, conclude Peace, contract Alliances, establish Commerce, and to do all other Acts and Things which Independent States may of Right do. And for the support of this Declaration, with a firm Reliance on the Protection of Divine Providence, we mutually pledge to each other our Lives, our Fortunes and our sacred Honor.

United States Declaration of Independence:

We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.

John Hancock, John Adams, Benjamin Franklin, Thomas Jefferson, George Washington, and other signatories of the Declaration of Independence.



- **Bill of Rights**

- Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the government for a redress of grievances.







## NPR: A Decade of Watching Black People Die

**ERIC GARNER - JOHN CRAWFORD III - MICHAEL BROWN - EZELL FORD DANTE PARKER - MICHELLE CUSSEAU - LAQUAN MCDONALD - GEORGE MANN TANISHA ANDERSON - AKAI GURLEY - TAMIR RICE - RUMAIN BRISBON - JERAME REID MATTHEW AJIBADE - FRANK SMART - NATASHA MCKENNA - TONY ROBINSON - ANTHONY HILL MYA HALL - PHILLIP WHITE - ERIC HARRIS - WALTER SCOTT - WILLIAM CHAPMAN II ALEXIA CHRISTIAN - BRENDON GLENN - VICTOR MANUEL LAROSA - JONATHAN SANDERS FREDDIE BLUE - JOSEPH MANN - SALVADO ELLSWOOD - SANDRA BLAND ALBERT JOSEPH DAVIS - DARRIUS STEWART - BILLY RAY DAVIS - SAMUEL DUBOSE MICHAEL SABBIE - BRIAN KEITH DAY - CHRISTIAN TAYLOR - TROY ROBINSON ASSHAMS PHAROAH MANLEY - FELIX KUMI - KEITH HARRISON MCLEOD - JUNIOR PROSPER LAMONTEZ JONES - PATERSON BROWN - DOMINIC HUTCHINSON - ANTHONY ASHFORD ALONZO SMITH - TYREE CRAWFORD - INDIA KAGER - LA'VANTE BIGGS MICHAEL LEE MARSHALL - JAMAR CLARK - RICHARD PERKINS - NATHANIEL HARRIS PICKETT BENNI LEE TIGNOR - MIGUEL ESPINAL - MICHAEL NOEL - KEVIN MATTHEWS - BETTIE JONES QUINTONIO LEGRIER - KEITH CHILDRESS JR. - JANET WILSON - RANDY NELSON ANTRONIE SCOTT - WENDELL CELESTINE - DAVID JOSEPH - CALIN ROQUEMORE - DYZHAWN PERKINS - CHRISTOPHER DAVIS - MARCO LOUD - PETER GAINES - TORREY ROBINSON - DARIUS ROBINSON - KEVIN HICKS - MARY TRUXILLO - DEMARCUS SEMER - WILLIE TILLMAN TERRILL THOMAS - SYLVILLE SMITH - ALTON STERLING - PHILANDO CASTILE - TERENCE CRUTCHER - PAUL O'NEAL - ALTERIA WOODS - JORDAN EDWARDS - AARON BAILEY RONELL FOSTER - STEPHON CLARK - ANTWON ROSE II - BOTHAM JEAN PAMELA TURNER - DOMINIQUE CLAYTON - ATATIANA JEFFERSON - CHRISTOPHER WHITFIELD CHRISTOPHER MCCORVEY - ERIC REASON - MICHAEL LORENZO DEAN - BREONNA TAYLOR**  
**G E O R G E F L O Y D**

<https://www.npr.org/2020/05/29/865261916/a-decade-of-watching-black-people-die>

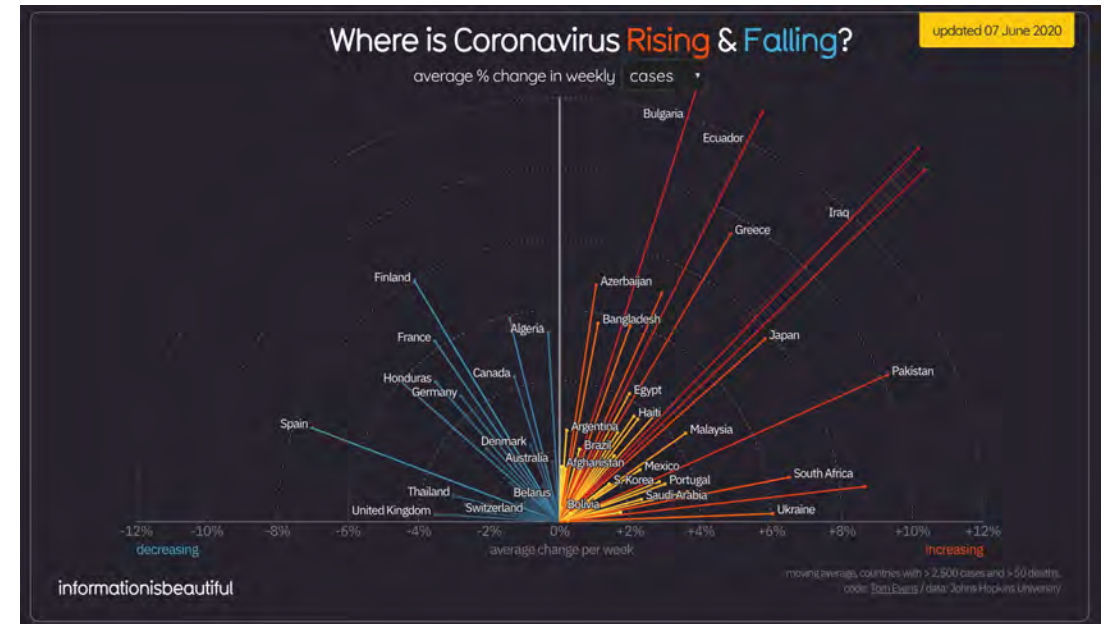
- George Floyd
- Ahmaud Arbery
- Breonna Taylor
- Sandra Bland
- Laquan McDonald
- Eric Garner
- Michael Brown

## What it's like to be black in Naperville, America

<https://www.chicagotribune.com/suburbs/naperville-sun/ct-nvs-being-black-naperville-america-st-0715-20160714-story.html>

# The Covid-19 Pandemic

- The world finds itself in the midst of a pandemic with travel bans and school closings with a lot of uncertainty regarding the future.
- Studies uprooted, career paths diverted, social isolation, ...



# Death of a Quantum Man

- US-Trade war brings undue pressure on our Asian colleagues

**Stanford physics professor Zhang Shoucheng, a potential Nobel laureate, was among the first casualties of the U.S.-China trade war.**



<https://www.thewirechina.com/2020/05/03/the-quantum-man/>

# ORNL's Commitment: "Mission first, people always."

- These are very unsettling times.
- All of us at the laboratory are committed to ensuring a diverse and inclusive work environment where everyone feels safe, heard, and appreciated. We
  - **Are open for dialogue.**
  - **Are respectful of all our colleagues.**
  - **Are committed to creating an inclusive environment.**

Resources:

<https://ornl.sharepoint.com/sites/benefits/SitePages/Behavioral%20Health%20Program.aspx>

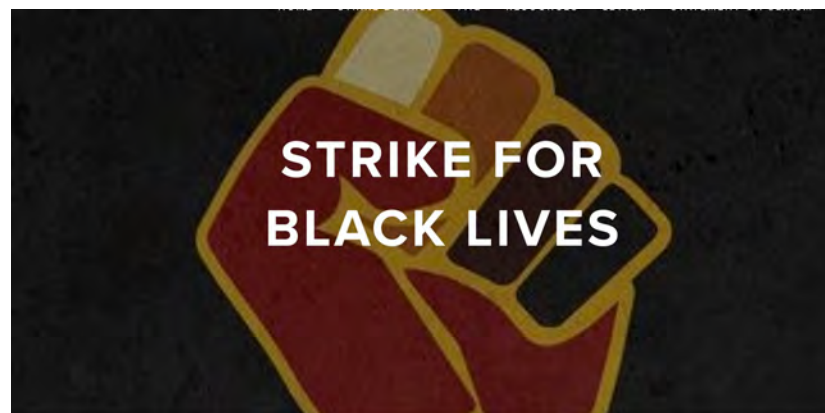


# My Commitment: “People always.”

- People always, the rest is secondary ...
- As collaborator on COHERENT and as host of the experiment, I strive for the Division to be your second home, where you feel welcome, safe and supported at all times.
- We are one extended family of physicists and we lead by example.

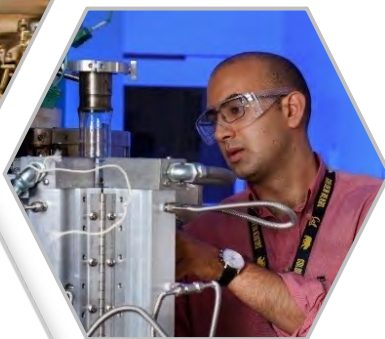
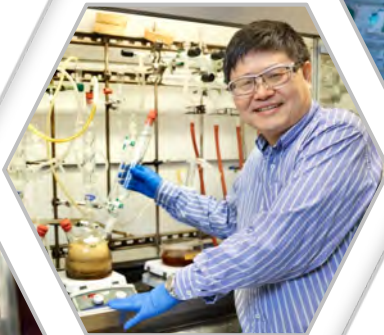
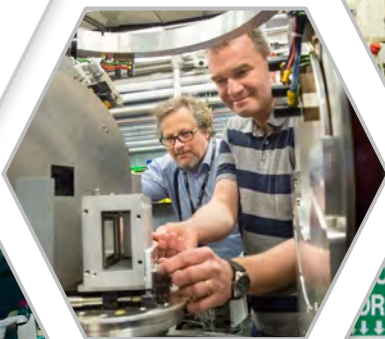
# Personal Perspective: What Can You Do?

- Often actions can be attributed to ignorance. There is a large segment of the population that is uninformed or poorly informed and very gullible.
- We are scientists and follow the scientific method; fact based.
- Expose the facts, teach critical thinking, encourage a questioning attitude, be open-minded, let your voice be heard, .... lead by example. **Know that you're not alone.**





# Our vision is to be the world's premier research institution



Focus on the most difficult problems

Conduct world-leading research

Relentlessly pursue institutional effectiveness

Ensure the nation's energy future

Deliver innovative breakthroughs

Strengthen national security

# Reimagining ORNL

Figuring out what we need to change to realize our vision

What compelling problems are we uniquely equipped to solve?

What opportunities lie ahead?

How can we best enable our staff to conduct world-leading research?

How can we deliver the maximum impact in science, energy, and security?





# Coherent Elastic Neutrino Nucleus Scattering

A new portal to (non)standard particle and nuclear physics  
... small but **multicolor** !

new  $\nu$  properties  
dark matter  
supernovae  
solar neutrinos  
sterile neutrinos  
new detectors  
EW precision tests  
nuclear form factors  
new interactions

**CEvNS**

24

Slide from opening plenary talk by Eligio Lisi at NuInt 2018  
<https://indico.cern.ch/event/703880/>

Dinosaur heretic looks for redemption p. 1088 | Increase inclusion to increase STEM diversity p. 1101 | Fluorescent or magnetic cotton fibers p. 1118

**Science** \$15  
15 SEPTEMBER 2017  
sciencemag.org AAAS

**SPOTTING A GHOST**  
A compact detector spies neutrinos scattering from nuclei  
pp. 1098 & 1123

Akimov et al. *Science*  
Vol 357 (6356), Sept. 2017

# Coherent Elastic Neutrino Nucleus Scattering

A new portal to (non)standard particle and nuclear physics  
... small but **multicolor** !

**CEvNS**

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dark matter  
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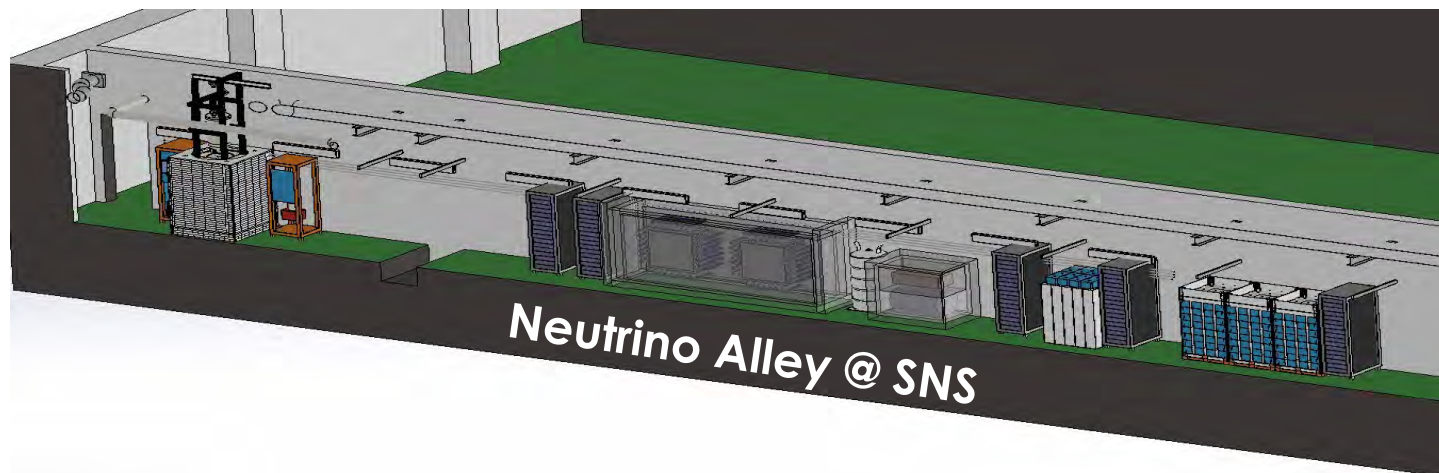
As the Higgs is a tool for discovery CEvNS is a tool for probing a broad spectrum of unique physics complementary and supportive of the LBNF/DUNE program

**Goal: a lab supported research program to develop an OHEP supported neutrino science program at the FTS and STS**

Slide from opening plenary talk by Eligio Lisi at NuInt 2018  
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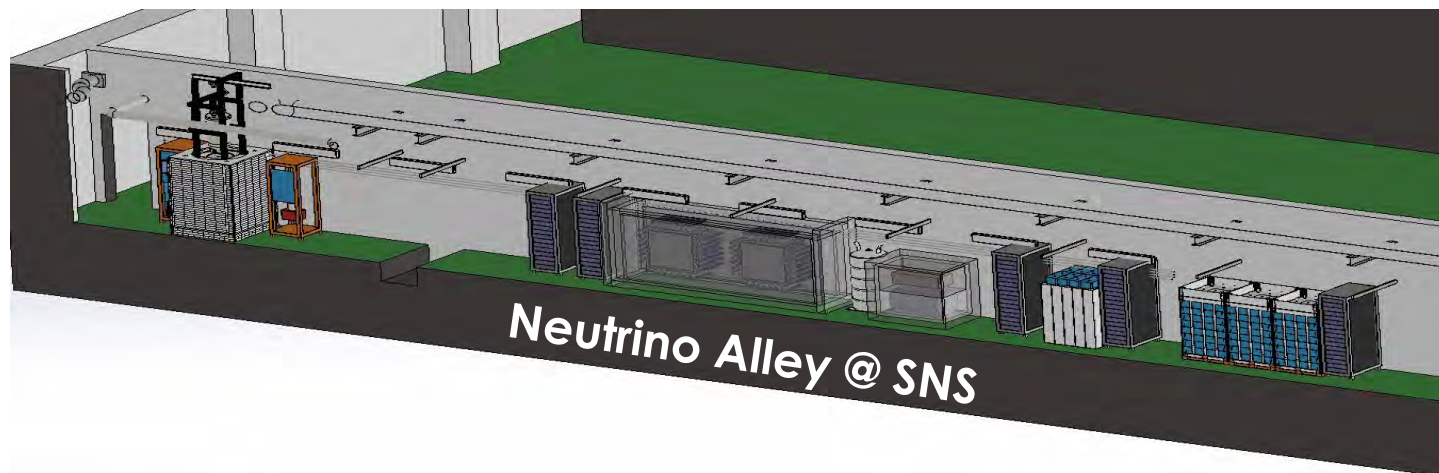


# Goal: Neutrino Program at the SNS (FTS and STS) and HFIR

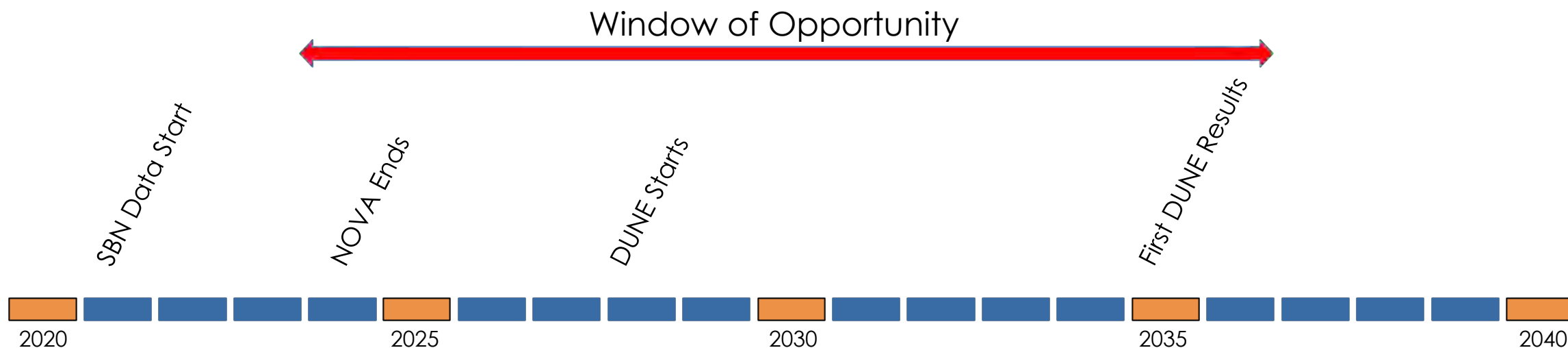


- Neutrinos at ORNL address three of the five P5 science drivers:
  - Pursue the physics associated with neutrino mass.
  - Identify the new physics of dark matter.
  - Explore the unknown: new particles, interactions, & physical principles.

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Physical Sciences Directorate

**SCIENTIFIC  
ADVISORY  
COMMITTEE  
MEETING**

November 5-7, 2019



- At the science advisory committee of the PSD directorate a plan for a fundamental neutrino program at the SNS was presented.
- The advice of the committee to the lab director at the close-out was: “must do”.
- We continue to work on establishing a strategic LDRD program to grow the neutrino program at the SNS

# ORNL and Snowmass

- ORNL co-conveners of the various working groups:
  - Neutrino Interaction Cross Sections Jason Newby
  - $n$ - $\bar{n}$  oscillations: L. Broussard
  - Accelerators for Neutrinos John Galambos
  - Accelerator Technology R&D Charlotte Barbier
  - Quantum computing Travis Humble
- Many of our collaborators are conveners of the Snowmass frontiers or topics groups.
- We need need to work together to make a strong case for a thriving fundamental neutrino physics program at ORNL.

# Concluding Remarks

- These are unsettling times; **together** we can and will rise above this challenge for the better.
- Neutrino physics at ORNL is exceedingly compelling.
- We, at ORNL are committed to help building the case for a strong neutrino science program at the SN<sup>2</sup>S and continue to work on creating a strategic LDRD program.
- Together with the collaboration we can develop a strong science case as input to the Snowmass process.
- **Thank you all very much for helping build the science case!**



# QUESTIONS

