



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

# Biological and Environmental Research

**BER Advisory Committee (BERAC)**

**Fall Meeting**

**October 22-23, 2020**

*Sharlene Weatherwax*

*Associate Director*

# BER Staff Changes

## *NEW Staff*



**Dr. Christiana Stan**

Earth and Environmental System Modeling  
IPA from George Mason University



**Dr. Brian Benscoter**

Environmental System Science  
IPA from Florida Atlantic University



**Dr. Wayne Kontur**

BSSD - AAAS Fellow

## *Exiting Staff*



**Dr. Rick Petty**

ARM Program Manager  
(Retired)



**Dr. Sujata Emani**

BSSD – AAAS Fellow  
(USDA)

# BER Researchers Recognized

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**Dr. Jennifer Doudna**

*Professor at UC Berkeley and  
Faculty Scientist at Lawrence Berkeley National  
Laboratory*

Co-winner of the 2020 Nobel Prize in Chemistry for  
“the development of a method for genome editing.”

## 2020 Nobel Prize in Chemistry



# 2020 BER Early Career Research Program (ECRP) Focus Areas

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## 1. Fundamental systems biology-driven research on the roles of microbiomes in biogeochemical cycling processes

- Systems biology and 'omics driven basic research on the contribution of microbial communities to biogeochemical cycling in terrestrial soil environments.
- Focus on innovative approaches to understand regulatory, metabolic, and/or signaling networks of environmental microbes and microbiomes.

## 2. Earth and Environmental Systems Modeling (EESM)








### a) Regional and Global Model Analysis

Use a multi-model and a hierarchical modeling approach, including E3SM simulations and output, to examine the role of sequential or compounding extreme events on natural components of the coastal system.

### b) Earth System Model Development

Conduct model development activities that improve the ability of global coupled earth system models to produce useful and credible simulations and predictions of Earth system behavior appropriate for coastal systems.

# 2020 BER ECRP Selectees

PI Name	Institution	Topic Area	Proposal Title
 Joanne Emerson	UC Davis	BSSD – Systems Biology	Infective viruses and inert virions: illuminating abundant unknowns in terrestrial biogeochemical cycles
 Trevor Keenan	UC Berkeley	EESSD – Coastal	Extreme drought, heat and wildfire impacts on coastal water relations
 Christina Patricola	Iowa State University	EESSD – Coastal	Variability and Change in Tropical Cyclone Characteristics: Coupled Atmosphere-Ocean Drivers and Coastal Impacts
 Matthew Hoffman	LANL	EESSD – Coastal	Creating a Sea-Level-Enabled E3SM: A critical capability for predicting coastal impacts
 Erin Nuccio	LLNL	BSSD – Systems Biology	Crosstalk: Interkingdom interactions in the mycorrhizal hyphosphere and ramifications for soil C cycling
 Simon Roux	LBLN (JGI)	BSSD – Systems Biology	Characterizing virus-driven alterations of microbial metabolism in model soil ecosystems
 Benjamin Sulman	ORNL	EESSD – Coastal	Simulating estuarine wetland function: Nitrogen removal, carbon sequestration, and greenhouse gas fluxes at the river-land-ocean interface

# 2021 Early Career Research Program (ECRP)

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**Released on October 20, 2020**

**(1) Systems biology research to advance sustainable bioenergy crop development**

Technical Contact: Pablo Rabinowicz, [pablo.rabinowicz@science.doe.gov](mailto:pablo.rabinowicz@science.doe.gov)

- Applications are requested for systems biology-driven, basic research on the fundamental principles of sustainable bioenergy feedstocks in relationship to their ecosystem context.

**(2) Aerosol-Cloud Processes**

Technical Contact Shaima Nasiri, [shaima.nasiri@science.doe.gov](mailto:shaima.nasiri@science.doe.gov)

- Applications are sought that will improve fundamental understanding of aerosol-cloud processes through analysis of BER observational data.

**Pre-apps due: Nov 20, 2020**

**Pre-app response date: December 17, 2020**

**Proposals due: February 16, 2020**

# National QIS Research Centers

- First large-scale QIS effort that crosses the technical breadth of SC
- Scope built on extensive community-wide RFI inputs— from technical scope to partnership model to management construct
- Seamlessly integrates the S&T innovation chain to accelerate progress in QIS R&D
- Maximizes teaming flexibility and options (TIAs, cooperative agreements, field work authorizations, interagency agreements) to foster direct participation by academics, national/federal labs, and for-profits
- Leverages other federal agency investments such as NSF's Quantum Leap Challenge Institutes and the NIST Quantum Economic Development Consortium (QED-C)

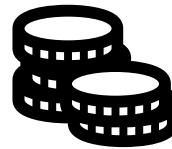


**January 10<sup>th</sup>, 2020:** [FOA Issued](#)

**February 10<sup>th</sup>, 2020:** Pre-apps Due

**March 10<sup>th</sup>, 2020:** Pre-apps Response

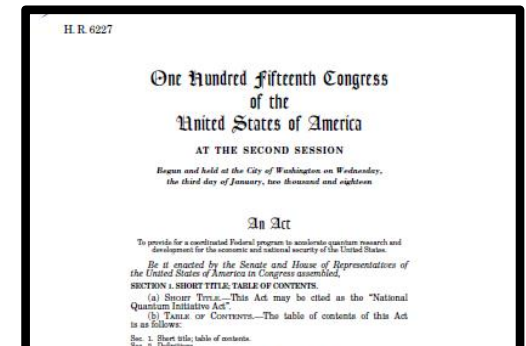
**April 17<sup>th</sup>, 2020:** Proposals Due



**2-5 Awards**

**\$10-25M/Year/Center**

**Up to \$625M in 5 Years**



National Quantum Initiative Act

# FIVE National QIS Research Centers

Q-NEXT • Next Generation  
Quantum Science and  
Engineering  
(David Awschalom, ANL)



C<sup>2</sup>QA • Co-design Center for  
Quantum Advantage  
(Steve Girvin, BNL)



SQMS • Superconducting  
Quantum Materials and  
Systems Center  
(Anna Grassellino, FNAL)



- ✓ Significant National Impact
- ✓ Major Cross-Cutting Challenge
- ✓ Science and Technology Innovation Chain
  - ✓ QIS Ecosystem Stewardship
  - ✓ Multi-Disciplinary Leadership
- ✓ Collaborative Management Structure
- ✓ Well-Structured Plan and Metrics



QSA • Quantum System  
Accelerator  
(Irfan Siddiqi, LBNL)

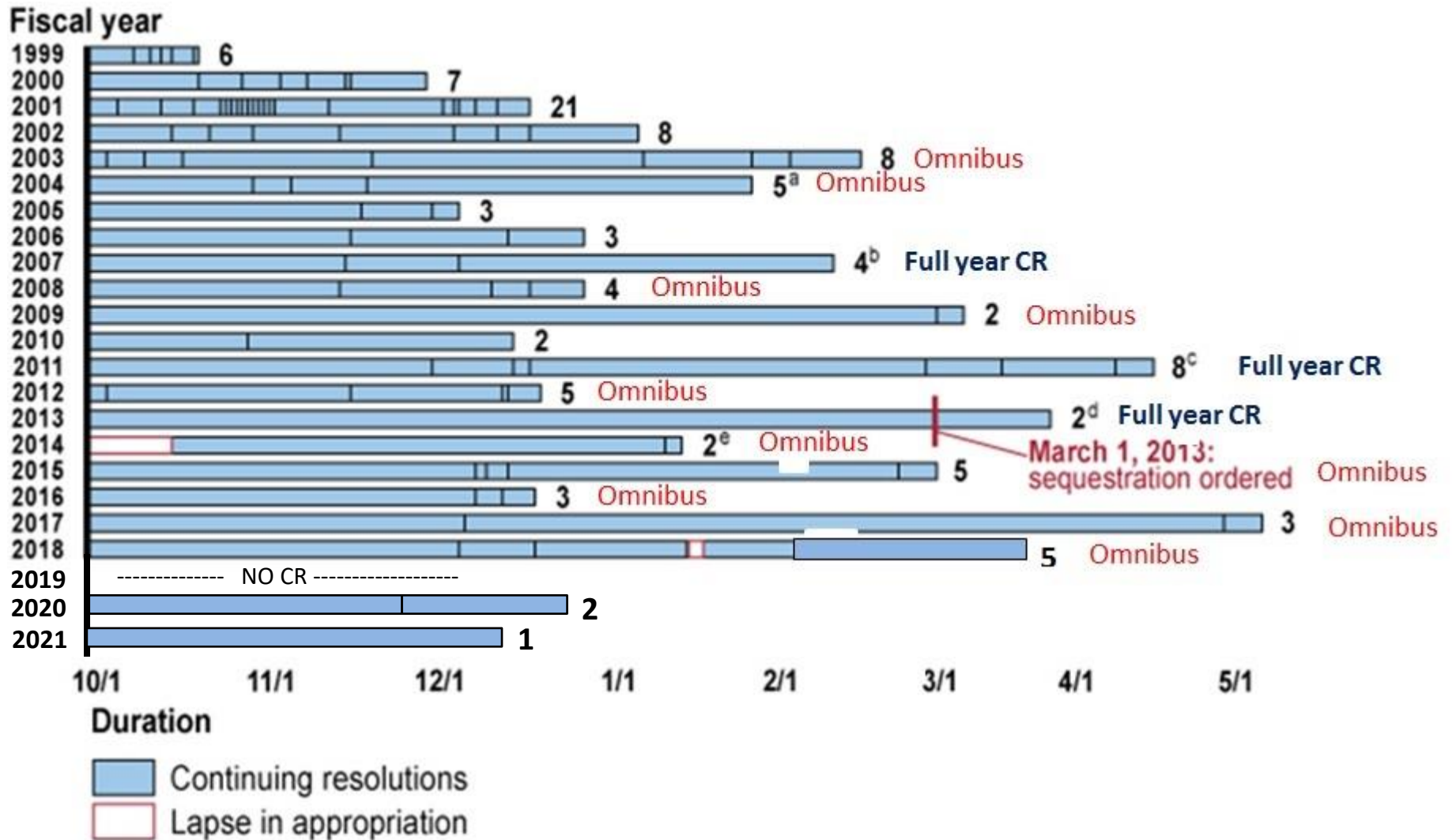


QSC • The Quantum Science  
Center  
(David Dean, ORNL)

<https://science.osti.gov/Initiatives/QIS>





# Budget: Duration and Number of Continuing Resolutions



Edited from: GAO-18-368T, GAO Analysis of Congressional Research Service data.

# FY 2022 Administration Research & Development Priorities

For FY2022, the five R&D budgetary priorities in this memorandum ensure that America remains at the global forefront of S&T discovery and innovation. The lotF-AI, quantum information sciences (QIS), advanced communication networks/SO, advanced manufacturing, and biotechnology-remain the Administration's top R&D priority. This includes fulfilling President Trump's commitment to double non-defense AI and QIS funding by FY2022.





EXECUTIVE OFFICE OF THE PRESIDENT  
WASHINGTON, D.C.

August 14, 2020

M-20-29

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: RUSSELL T. VOUGHT   
DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET

DR. KELVIN K. DROEGEMEIER   
DIRECTOR, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

SUBJECT: Fiscal Year (FY) 2022 Administration Research and Development Budget Priorities and Cross-cutting Actions

*"We look at tomorrow and see unlimited frontiers just waiting to be explored. Our brightest discoveries are not yet known. Our most thrilling stories are not yet told. Our grandest journeys are not yet made..."*

President Donald J. Trump, 2020 State of the Union Address

- Infectious Disease Modeling, Prediction, and Forecasting
- Bioeconomy
- Artificial Intelligence
- Quantum Information Science
- Earth System Predictability and Meteorological Services
- Arctic

# COVID-19 Flexibilities and SC Actions

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## Flexibilities:

Investigators, staff, and students may continue to charge salaries and benefits to SC awards if the recipient institution permits salaries to continue to be paid in the event of emergencies or disasters.

## Office of Science (SC) Actions:

- Solicitation deadlines were extended in March and April.
- No-cost extensions awarded promptly.
- Q&A posted to <https://science.osti.gov/grants/Policy-and-Guidance/COVID>.
- Director's Memo: Delays in research progress are understood and will not be penalized.
- Over the past several months SC has been engaging scientific professional societies, university associations, and other Federal agencies to obtain up-to-date information on the impacts to institutions and research communities to help inform an open, transparent, and equitable response by SC within the resources available.
- SC-wide PI survey to be issued to understand areas of impact and plan for the future.

# SC PI Survey on COVID-19 Related Impacts

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- SC intends to issue a voluntary survey to all PIs of current financial assistance research awards (**awardees at academic institutions**).
- Questions will focus on understanding the **impacts to research progress**, particularly the sources of research impacts; and **impacts to award personnel** (primarily graduate students, postdocs).
- Principal Investigators (PIs) will be asked to roll up impacts associated with subawards/subcontracts on the primary award.
- Anticipated to be issued in November.
- Notifications will be issued to PIs by email through PAMS.
- SC is partnering with the Oak Ridge Institution for Science and Education (ORISE) to conduct the survey. The survey will be open for 2 -3 weeks.
- All responses will be anonymous to SC; information will be provided to SC in aggregate form.

**Please respond if you receive the SC PI Survey Request!**

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