



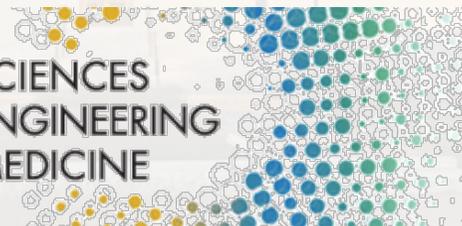
Overview  
US-based EIC Science Assessment  
by the  
National Academy of Sciences

Bernd Sorrow



*The National  
Academies of*

SCIENCES  
ENGINEERING  
MEDICINE





# Outline

# Outline

## National Academy of Sciences Building



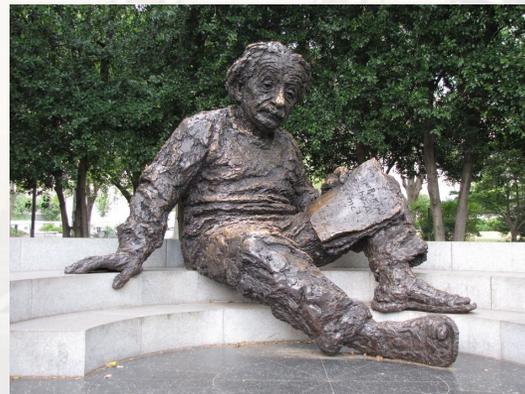
2101 Constitution Ave NW, Washington, DC 20418

# Outline

## National Academy of Sciences Building



2101 Constitution Ave NW, Washington, DC 20418



A. Einstein became an academy member in 1942, two years after he became a naturalized citizen.

Bernd Surrow

# Outline

## National Academy of Sciences Building



2101 Constitution Ave NW, Washington, DC 20418



A. Einstein became an academy member in 1942, two years after he became a naturalized citizen.

Bernd Surrow

# Outline

- Overview: The National Academies of Sciences (NAS) Engineering, and Medicine

National Academy of Sciences Building



2101 Constitution Ave NW, Washington, DC 20418



A. Einstein became an academy member in 1942, two years after he became a naturalized citizen.

Bernd Surrow

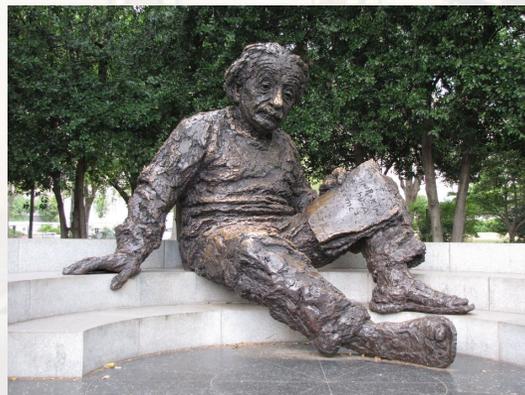
# Outline

- Overview: The National Academies of Sciences (NAS) Engineering, and Medicine
- NAS review of US EIC Science Assessment: Charge / Committee / Timeline / Meetings

National Academy of Sciences Building



2101 Constitution Ave NW, Washington, DC 20418



A. Einstein became an academy member in 1942, two years after he became a naturalized citizen.

Bernd Surrow

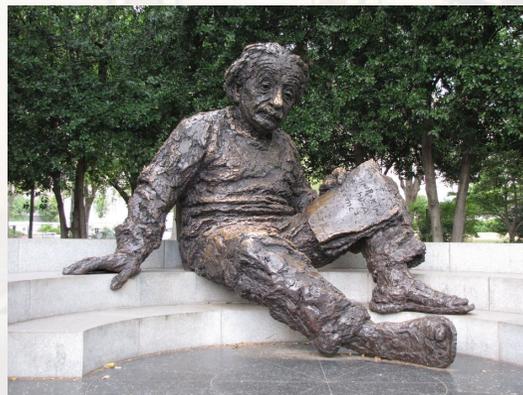
# Outline

- Overview: The National Academies of Sciences (NAS) Engineering, and Medicine
- NAS review of US EIC Science Assessment: Charge / Committee / Timeline / Meetings
- EIC User Group Input

National Academy of Sciences Building



2101 Constitution Ave NW, Washington, DC 20418



A. Einstein became an academy member in 1942, two years after he became a naturalized citizen.

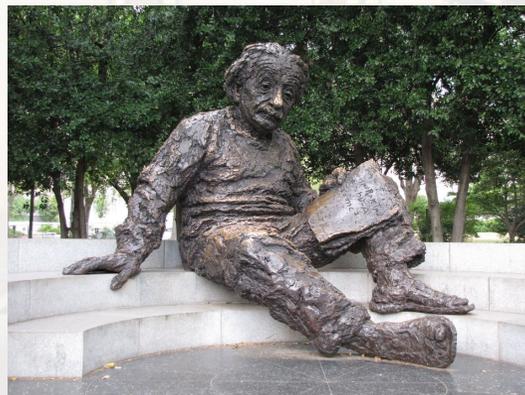
# Outline

- Overview: The National Academies of Sciences (NAS) Engineering, and Medicine
- NAS review of US EIC Science Assessment: Charge / Committee / Timeline / Meetings
- EIC User Group Input
- Summary and Outlook

National Academy of Sciences Building



2101 Constitution Ave NW, Washington, DC 20418



A. Einstein became an academy member in 1942, two years after he became a naturalized citizen.



# Nat. Academy of Sciences, Engineering & Medicine

## □ Overview

<http://www.nationalacademies.org>



# Nat. Academy of Sciences, Engineering & Medicine

## □ Overview

<http://www.nationalacademies.org>

The [National Academy of Sciences](#): Established in 1863 by an Act of Congress, signed by President Lincoln, as a private, non-governmental institution to advise the nation on issues related to science and technology.



# Nat. Academy of Sciences, Engineering & Medicine

## □ Overview

<http://www.nationalacademies.org>

The **National Academy of Sciences**: Established in 1863 by an Act of Congress, signed by President Lincoln, as a private, non-governmental institution to advise the nation on issues related to science and technology.

The **National Academy of Engineering**: Established in 1964 under the charter of the National Academy of Sciences to advise nation on engineering matters.



# Nat. Academy of Sciences, Engineering & Medicine

## □ Overview

<http://www.nationalacademies.org>

The **National Academy of Sciences**: Established in 1863 by an Act of Congress, signed by President Lincoln, as a private, non-governmental institution to advise the nation on issues related to science and technology.

The **National Academy of Engineering**: Established in 1964 under the charter of the National Academy of Sciences to advise nation on engineering matters.

The **National Academy of Medicine** (Formerly the Institute of Medicine): Established in 1970 under the charter of the National Academy of Sciences to advise nation on medical and health issues.



# Nat. Academy of Sciences, Engineering & Medicine

## □ Overview

<http://www.nationalacademies.org>

The **National Academy of Sciences**: Established in 1863 by an Act of Congress, signed by President Lincoln, as a private, non-governmental institution to advise the nation on issues related to science and technology.

The **National Academy of Engineering**: Established in 1964 under the charter of the National Academy of Sciences to advise nation on engineering matters.

The **National Academy of Medicine** (Formerly the Institute of Medicine): Established in 1970 under the charter of the National Academy of Sciences to advise nation on medical and health issues.

Three Academies work together as the National Academies of Sciences, Engineering, and Medicine:



# Nat. Academy of Sciences, Engineering & Medicine

## □ Overview

<http://www.nationalacademies.org>

The **National Academy of Sciences**: Established in 1863 by an Act of Congress, signed by President Lincoln, as a private, non-governmental institution to advise the nation on issues related to science and technology.

The **National Academy of Engineering**: Established in 1964 under the charter of the National Academy of Sciences to advise nation on engineering matters.

The **National Academy of Medicine** (Formerly the Institute of Medicine): Established in 1970 under the charter of the National Academy of Sciences to advise nation on medical and health issues.

Three Academies work together as the National Academies of Sciences, Engineering, and Medicine:

- Provide independent, objective analysis and advice to the nation / Conduct other activities to solve complex problems and inform public policy decisions.
- The National Academies also encourage education and research, recognize outstanding contributions to knowledge, and increase public understanding in matters of science, engineering, and medicine.

# Nat. Academy of Sciences, Engineering & Medicine

□ WWW-page:

The National Academies of SCIENCES ENGINEERING MEDICINE

Contact Us | Current Operating Status

Home About Us Organization Events & Activities Resources Newsroom

**Top News** More News

**NEW REPORT**  
Value of Social, Behavioral, and Economic Sciences to National Priorities

**NEW REPORT**  
Revisiting Brucellosis in the Greater Yellowstone Area

**NEW REPORT**  
Actions Needed to Strengthen U.S. Skilled Technical Workforce

**NEW REPORT**  
Achieving Global Health Security

May 15 - A new National Academies [report](#) identifies global health priorities and makes 14 recommendations to address current and emerging health challenges, while maintaining U.S. status as a world leader in global health.

**Visiting Our Two DC Locations**

NAS Building  
2101 Constitution Ave NW

Keck Center  
500 Fifth St NW

**Winners of Design Competition Announced**

The Airport Cooperative Research Program, managed by the Academies' Transportation Research Board, recently announced winners for its University Design Competition for Addressing Airport Needs. The competition encourages students to design innovative and practical solutions to challenges faced by our nation's airports. Students were invited to propose innovations in four technical challenge areas: Airport Operation and Maintenance, Runway Safety/Runway Incursions/Runway Excursions, Airport Environmental Interactions, and Airport Management and Planning. [Read More](#)

**\$1.55 Million Awarded for 21 Research Projects**

The National Academies Keck Futures Initiative and the Gulf Research Program are pleased to [announce](#) recipients of 21 interdisciplinary seed grants, totaling \$1.55 million. These competitive grants support collaborations and investigations resulting from the 14th annual [Futures conference](#).

**Most Downloaded Publications**

The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research

[Download FREE PDF](#)

**Site Highlights**

Scientific research is vital and can bring remarkable results that save and improve lives. A new NAS [series of articles and videos](#) shows concrete examples of why scientific research is valuable.

Read about recent activities and reports of the National Academies of Sciences, Engineering, and Medicine in the [latest issue](#) of *In Focus* magazine.

Stop by the [Koshland Museum](#) for state-of-the-art exhibits, public events, and educational programs.

**PNAS June 6, 2017**

Browse the most recent editions of the [Proceedings of the National Academy of Sciences](#)

**Make a Gift ONLINE**

Follow Us: [RSS](#) [Facebook](#) [Twitter](#) | [E-Newsletters](#)

The National Academies of Sciences, Engineering, and Medicine  
500 Fifth Street, NW | Washington, DC 20001 | T. 202.334.2000  
[Privacy Statement](#) | [DMCA Policy](#) | [Terms of Use](#) | [Site Map](#)

Copyright © 2017 National Academy of Sciences. All rights reserved.

The National Academies of SCIENCES ENGINEERING MEDICINE

<http://www.nationalacademies.org>

# Nat. Academy of Sciences, Engineering & Medicine

□ WWW-page:

The National Academies of SCIENCES ENGINEERING MEDICINE

Home About Us Organization Events & Activities Resources Newsroom

Top News

Current Projects

Upcoming Meetings & Events

Multimedia

International Activities

Awards & Honors

Fellowships & Postdocs

Koshland Science Museum

Cultural Programs

REPORT  
of Social, Behavioral, and Economic  
nces to National Priorities

REPORT  
siting Brucellosis in the Greater  
wstone Area

REPORT  
ons Needed to Strengthen U.S.  
ad Technical Workforce

NEW REPORT  
Achieving Global Health Security

Visiting Our Two DC Locations

Keck Center  
500 Fifth St NW

NAS Building  
2101 Constitution Ave NW

May 15 - A new National Academies report identifies current challenges and makes 14 recommendations to address current challenges, while maintaining U.S. status as a world leader in global health.

Winners of Design Competition Announced

The Airport Cooperative Research Program, managed by the Academies' Transportation Research Board, recently announced winners for its University Design Competition for Addressing Airport Needs. The competition encourages students to design innovative and practical solutions to challenges faced by our nation's airports. Students were invited to propose innovations in four technical challenge areas: Airport Operation and Maintenance, Runway Safety/Runway Incursions/Runway Excursions, Airport Environmental Interactions, and Airport Management and Planning. [Read More](#)

\$1.55 Million Awarded for 21 Research Projects

The National Academies Keck Futures Initiative and the Gulf Research Program are pleased to [announce](#) recipients of 21 interdisciplinary seed grants, totaling \$1.55 million. These competitive grants support collaborations and investigations resulting from the 14th annual [Futures conference](#).

Discovering the Deep Blue Sea  
Research - Innovation - Social Engagement

MOST DOWNLOADED PUBLICATIONS

Teaching About Evolution and the Nature of Science

Download FREE PDF

Site Highlights

Scientific research is vital and can bring remarkable results that save and improve lives. A new [NAS series of articles and videos](#) shows concrete examples of why scientific research is valuable.

Read about recent activities and reports of the National Academies of Sciences, Engineering, and Medicine in the [latest issue](#) of *In Focus* magazine.

Stop by the [Koshland Museum](#) for state-of-the-art exhibits, public events, and educational programs.

PNAS June 6, 2017

Browse the most recent editions of the [Proceedings of the National Academy of Sciences](#)

Make a Gift ONLINE

Follow Us: RSS Facebook Twitter | E-Newsletters

The National Academies of Sciences, Engineering, and Medicine  
500 Fifth Street, NW | Washington, DC 20001 | T. 202.334.2000  
[Privacy Statement](#) | [DMCA Policy](#) | [Terms of Use](#) | [Site Map](#)

Copyright © 2017 National Academy of Sciences. All rights reserved.

The National Academies of SCIENCES ENGINEERING MEDICINE

<http://www.nationalacademies.org>



# Nat. Academy of Sciences, Engineering & Medicine

□ WWW-page:

<http://www.nationalacademies.org>

**CURRENT PROJECTS** System

The National Academies of SCIENCES ENGINEERING MEDICINE

Search FullText Search

**Navigation Menu**

- Home
- Search for Projects
- View Projects
  - by Project Title
  - by Subject/Focus Area
  - by Board/Committee
  - by Major Unit
  - Provisional Committee Appointments Open for Formal Public Comment
  - by Last Update
- Meeting Information
- Conflict of Interest Policy
- Committee Appointment Process
- FAQ

**Welcome to the Current Projects System**

The Current Projects System (CPS) provides information about our current committee activities that are subject to the requirements of [Section 15 of the Federal Advisory Committee Act Amendments of 1997 \(FACA\)](#). Information in CPS includes descriptions of project scope, names and affiliations of committee members and statements of their qualifications, notice of data-gathering meetings of committees, summaries of closed committee meetings or sessions, and titles of committee reports at the time that they are publicly released. We have established a [Public Access Records Office](#) to provide access to project materials available to the public.

Please note that not all activities of the National Academies are listed in CPS. Information on these other activities may be found by using the [Search](#) feature on the homepage of the National Academies or at the web sites of our major units such as the [Transportation Research Board](#). We have taken comprehensive efforts to implement CPS as a reliable, user-friendly system. Nevertheless, unforeseen circumstances and matters beyond our control could temporarily disrupt the system. In the event you experience any disruption, please contact our Public Access Records Office at 202-334-3543

Follow Us: | [E-Newsletters](#)

The National Academies of Sciences, Engineering, and Medicine  
 500 Fifth Street, NW | Washington, DC 20001 | T. 202.334.2000  
[Privacy Statement](#) | [DMCA Policy](#) | [Terms of Use](#) | [Site Map](#)

Copyright © 2017 National Academy of Sciences. All rights reserved.

The National Academies of SCIENCES ENGINEERING MEDICINE



# Nat. Academy of Sciences, Engineering & Medicine

□ WWW-page:

<http://www.nationalacademies.org>

**CURRENT PROJECTS** System

The National Academies of SCIENCES ENGINEERING MEDICINE

Search FullText Search

**Navigation Menu**

- Home
- Search for Projects
- View Projects
  - by Project Title
  - by Subject/Focus Area
  - by Board/Committee
  - by Major Unit
  - Provisional Committee Appointments Open for Formal Public Comment
  - by Last Update
- Meeting Information
- Conflict of Interest Policy
- Committee Appointment Process
- FAQ

**Welcome to the Current Projects System**

The Current Projects System (CPS) provides information about our current committee activities that are subject to the requirements of [Section 15 of the Federal Advisory Committee Act Amendments of 1997 \(FACA\)](#). Information in CPS includes descriptions of project scope, names and affiliations of committee members and statements of their qualifications, notice of data-gathering meetings of committees, summaries of closed committee meetings or sessions, and titles of committee reports at the time that they are publicly released. We have established a [Public Access Records Office](#) to provide access to project materials available to the public.

Please note that not all activities of the National Academies are listed in CPS. Information on these other activities may be found by using the [Search](#) feature on the homepage of the National Academies or at the web sites of our major units such as the [Transportation Research Board](#). We have taken comprehensive efforts to implement CPS as a reliable, user-friendly system. Nevertheless, unforeseen circumstances and matters beyond our control could temporarily disrupt the system. In the event you experience any disruption, please contact our Public Access Records Office at 202-334-3543

Follow Us: [RSS](#) [Facebook](#) [Twitter](#) | [E-Newsletters](#)

The National Academies of Sciences, Engineering, and Medicine  
 500 Fifth Street, NW | Washington, DC 20001 | T. 202.334.2000  
[Privacy Statement](#) | [DMCA Policy](#) | [Terms of Use](#) | [Site Map](#)

Copyright © 2017 National Academy of Sciences. All rights reserved.

The National Academies of SCIENCES ENGINEERING MEDICINE

Select Subject / Focus Area (846 projects!)



# Nat. Academy of Sciences, Engineering & Medicine

WWW-page:

<http://www.nationalacademies.org>

CURRENT PROJECTS System The National Academies of SCIENCES ENGINEERING MEDICINE

Search FullText Search

- Navigation Menu**
- [Home](#)
  - [Search for Projects](#)
  - [View Projects](#)
    - [by Project Title](#)
    - [by Subject/Focus Area](#)
    - [by Board/Committee](#)
    - [by Major Unit](#)
    - [Provisional Committee Appointments Open for Formal Public Comment](#)
    - [by Last Update](#)
  - [Meeting Information](#)
  - [Conflict of Interest Policy](#)
  - [Committee Appointment Process](#)
  - [FAQ](#)

## Project Information

by Subject/Focus Area  
601 - 620 of 846 result(s)

[<< Previous](#) [Next >>](#)

### Math, Chemistry and Physics

- Peer Review and Design Competition Related to Nuclear Weapons
- Prospects for Inertial Confinement Fusion Energy Systems
- Reducing the Threat of Improvised Explosive Device Attacks by Restricting Access to Chemical Explosive Precursors
- Research Frontiers in Bioinspired Energy: Molecular-level learning from Natural Systems -- A Workshop
- Societal Benefits from Condensed Matter and Materials Research
- Space Radiation Effects Testing Infrastructure for the U.S. Space Program
- Strategies for Identifying and Addressing Biodefense Vulnerabilities Posed by Synthetic Biology
- Technical Assessment of the Feasibility and Implications of Quantum Computing
- The Current Status and Future Direction of High Magnetic Field Science in the United States
- The Future of Atmospheric Chemistry Research
- U.S.-Based Electron Ion Collider Science Assessment
- Views on the World Radiocommunication Conference 2015
- Women in Science and Engineering: A Guide to Maximizing their Potential

### National Security and Defense

- Army Research Laboratory Technical Assessment Board
- Army Research Laboratory Technical Assessment Board
- Assessing the Impacts of Climate Change on Social and Political Stresses
- Assessment of the Governance Structure of the NNSA National Security Laboratories
- Assuring a Future US-based Nuclear Chemistry Expertise
- Ballistic Missile Defense in the Context of Strategic Stability
- Counter-Unmanned Aircraft System (CUAS) Capability for Battalion-and-Below Operations

Follow Us: | [E-Newsletters](#)

The National Academies of Sciences, Engineering, and Medicine  
 500 Fifth Street, NW | Washington, DC 20001 | T. 202.334.2000  
[Privacy Statement](#) | [DMCA Policy](#) | [Terms of Use](#) | [Site Map](#)

Copyright © 2017 National Academy of Sciences. All rights reserved.

The National Academies of SCIENCES ENGINEERING MEDICINE



# Nat. Academy of Sciences, Engineering & Medicine

WWW-page:

http://www.nationalacademies.org

**CURRENT PROJECTS** System

The National Academies of SCIENCES ENGINEERING MEDICINE

Search FullText Search

**Project Information**  
by Subject/Focus Area  
601 - 620 of 846 result(s) << Previous Next >>

**Math, Chemistry and Physics**

- Peer Review and Design Competition Related to Nuclear Weapons
- Prospects for Inertial Confinement Fusion Energy Systems
- Reducing the Threat of Improvised Explosive Device Attacks by Restricting Access to Chemical Explosive Precursors
- Research Frontiers in Bioinspired Energy: Molecular-level learning from Natural Systems -- A Workshop
- Societal Benefits from Condensed Matter and Materials Research
- Space Radiation Effects Testing Infrastructure for the U.S. Space Program
- Strategies for Identifying and Addressing Biodefense Vulnerabilities Posed by Synthetic Biology
- Technical Assessment of the Feasibility and Implications of Quantum Computing
- The Current Status and Future Direction of High Magnetic Field Science in the United States
- The Future of Atmospheric Chemistry Research
- U.S.-Based Electron Ion Collider Science Assessment**
- Views on the World Radiocommunication Conference 2015
- Women in Science and Engineering: A Guide to Maximizing their Potential

**National Security and Defense**

- Army Research Laboratory Technical Assessment Board
- Army Research Laboratory Technical Assessment Board
- Assessing the Impacts of Climate Change on Social and Political Stresses
- Assessment of the Governance Structure of the NNSA National Security Laboratories
- Assuring a Future US-based Nuclear Chemistry Expertise
- Ballistic Missile Defense in the Context of Strategic Stability
- Counter-Unmanned Aircraft System (CUAS) Capability for Battalion-and-Below Operations

Follow Us: | E-Newsletters

The National Academies of Sciences, Engineering, and Medicine  
500 Fifth Street, NW | Washington, DC 20001 | T. 202.334.2000  
[Privacy Statement](#) | [DMCA Policy](#) | [Terms of Use](#) | [Site Map](#)

Copyright © 2017 National Academy of Sciences. All rights reserved.

The National Academies of SCIENCES ENGINEERING MEDICINE

U.S.-Based Electron Ion Collider Science Assessment



U.S.-Based Electron Ion Collider Science Assessment



# Nat. Academy of Sciences, Engineering & Medicine

WWW-page:

http://www.nationalacademies.org

**CURRENT PROJECTS** System
The National Academies of SCIENCES ENGINEERING MEDICINE

**Navigation Menu**

- Home
- Search for Projects
- View Projects
  - by Project Title
  - by Subject/Focus Area
  - by Board/Committee
  - by Major Unit
  - Provisional Committee Appointments Open for Formal Public Comment
  - by Last Update
- Meeting Information
- Conflict of Interest Policy
- Committee Appointment Process
- FAQ

## Project Information

<b>Project Title:</b>	U.S.-Based Electron Ion Collider Science Assessment
<b>PIN:</b>	DEPS-BPA-15-01
<b>Major Unit:</b>	Division on Engineering and Physical Sciences
<b>Sub Unit:</b>	Board on Physics & Astronomy DEPS
<b>RSO:</b>	Lancaster, James
<b>Subject/Focus Area:</b>	Math, Chemistry and Physics

**Project Scope**  
 The committee will assess the scientific justification for a U.S. domestic electron ion collider facility, taking into account current international plans and existing domestic facility infrastructure. In preparing its report, the committee will address the role that such a facility could play in the future of nuclear physics, considering the field broadly, but placing emphasis on its potential scientific impact on quantum chromodynamics.

In particular, the committee will address the following questions:

- What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?
- What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?
- What are the benefits to U.S. leadership in nuclear physics if a domestic electron ion collider were constructed?
- What are the benefits to other fields of science and to society of establishing such a facility in the United States?

---

**Project Duration:** 18 months

Provide **FEEDBACK** on this project.

Contact the **Public Access Records Office** to make an inquiry, request a list of the public access file materials, or obtain a copy of the materials found in the file.

Follow Us: | [E-Newsletters](#)

The National Academies of Sciences, Engineering, and Medicine  
 500 Fifth Street, NW | Washington, DC 20001 | T. 202.334.2000  
[Privacy Statement](#) | [DMCA Policy](#) | [Terms of Use](#) | [Site Map](#)

Copyright © 2017 National Academy of Sciences. All rights reserved.

**Printer Friendly Version**

**Committee Membership**  
 \*Committee Membership

**Meetings**  
 ▶ Meeting 1 - 02/01/2017  
 ▶ Meeting 2 - 04/19/2017

**Reports**  
*Reports having no URL can be seen at the Public Access Records Office*



# Nat. Academy of Sciences, Engineering & Medicine

WWW-page:

http://www.nationalacademies.org

CURRENT PROJECTS System

The National Academies of  
**SCIENCES  
ENGINEERING  
MEDICINE**

FullText Search

**Navigation Menu**

- Home
- Search for Projects
- View Projects
  - by Project Title
  - by Subject/Focus Area
  - by Board/Committee
  - by Major Unit
  - Provisional Committee Appointments Open for Formal Public Comment
  - by Last Update
- Meeting Information
- Conflict of Interest Policy
- Committee Appointment Process
- FAQ

## Project Information

<b>Project Title:</b>	U.S.-Based Electron Ion Collider Science Assessment	Project Title
<b>PIN:</b>	DEPS-BPA-15-01	
<b>Major Unit:</b>	Division on Engineering and Physical Sciences	
<b>Sub Unit:</b>	Board on Physics & Astronomy DEPS	
<b>RSO:</b>	Lancaster, James	
<b>Subject/Focus Area:</b>	Math, Chemistry and Physics	

**Project Scope**  
 The committee will assess the scientific justification for a U.S. domestic electron ion collider facility, taking into account current international plans and existing domestic facility infrastructure. In preparing its report, the committee will address the role that such a facility could play in the future of nuclear physics, considering the field broadly, but placing emphasis on its potential scientific impact on quantum chromodynamics.

In particular, the committee will address the following questions:

- What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?
- What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?
- What are the benefits to U.S. leadership in nuclear physics if a domestic electron ion collider were constructed?
- What are the benefits to other fields of science and to society of establishing such a facility in the United States?

---

**Project Duration:** 18 months

Provide **FEEDBACK** on this project.

Contact the **Public Access Records Office** to make an inquiry, request a list of the public access file materials, or obtain a copy of the materials found in the file.

Follow Us: | [E-Newsletters](#)

The National Academies of Sciences, Engineering, and Medicine  
 500 Fifth Street, NW | Washington, DC 20001 | T. 202.334.2000  
[Privacy Statement](#) | [DMCA Policy](#) | [Terms of Use](#) | [Site Map](#)

Copyright © 2017 National Academy of Sciences. All rights reserved.

**Printer Friendly Version**

**Committee Membership**  
 \*Committee Membership

**Meetings**  
 ▶ Meeting 1 - 02/01/2017  
 ▶ Meeting 2 - 04/19/2017

**Reports**  
*Reports having no URL can be seen at the Public Access Records Office*



# Nat. Academy of Sciences, Engineering & Medicine

WWW-page:

http://www.nationalacademies.org

CURRENT PROJECTS System

---

**Navigation Menu**

- Home
- Search for Projects
- View Projects
  - by Project Title
  - by Subject/Focus Area
  - by Board/Committee
  - by Major Unit
  - Provisional Committee Appointments Open for Formal Public Comment
  - by Last Update
- Meeting Information
- Conflict of Interest Policy
- Committee Appointment Process
- FAQ

## Project Information

<b>Project Title:</b>	U.S.-Based Electron Ion Collider Science Assessment	<b>Project Title</b>	
<b>PIN:</b>	DEPS-BPA-15-01		
<b>Major Unit:</b>	Division on Engineering and Physical Sciences		
<b>Sub Unit:</b>	Board on Physics & Astronomy DEPS		
<b>RSO:</b>	Lancaster, James		
<b>Subject/Focus Area:</b>	Math, Chemistry and Physics		

**Project Scope**  
The committee will assess the scientific justification for a U.S. domestic electron ion collider facility, taking into account current international plans and existing domestic facility infrastructure. In preparing its report, the committee will address the role that such a facility could play in the future of nuclear physics, considering the field broadly, but placing emphasis on its potential scientific impact on quantum chromodynamics.

In particular, the committee will address the following questions:

- What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?
- What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?
- What are the benefits to U.S. leadership in nuclear physics if a domestic electron ion collider were constructed?
- What are the benefits to other fields of science and to society of establishing such a facility in the United States?

**Project Duration:** 18 months

Provide **FEEDBACK** on this project.

Contact the **Public Access Records Office** to make an inquiry, request a list of the public access file materials, or obtain a copy of the materials found in the file.

Follow Us: | [E-Newsletters](#)

The National Academies of Sciences, Engineering, and Medicine  
500 Fifth Street, NW | Washington, DC 20001 | T. 202.334.2000  
[Privacy Statement](#) | [DMCA Policy](#) | [Terms of Use](#) | [Site Map](#)

Copyright © 2017 National Academy of Sciences. All rights reserved.

**Printer Friendly Version**

**Committee Membership**  
\*Committee Membership

**Meetings**  
➤ Meeting 1 - 02/01/2017  
➤ Meeting 2 - 04/19/2017

**Reports**  
*Reports having no URL can be seen at the Public Access Records Office*

Charge



# Nat. Academy of Sciences, Engineering & Medicine

WWW-page:

http://www.nationalacademies.org

**CURRENT PROJECTS** System

The National Academies of SCIENCES ENGINEERING MEDICINE

Search FullText Search

Printer Friendly Version

**Navigation Menu**

- Home
- Search for Projects
- View Projects
  - by Project Title
  - by Subject/Focus Area
  - by Board/Committee
  - by Major Unit
  - Provisional Committee Appointments Open for Formal Public Comment
  - by Last Update
- Meeting Information
- Conflict of Interest Policy
- Committee Appointment Process
- FAQ

**Project Information**

**Project Title:** U.S.-Based Electron Ion Collider Science Assessment **Project Title**

**PIN:** DEPS-BPA-15-01

**Major Unit:** Division on Engineering and Physical Sciences

**Sub Unit:** Board on Physics & Astronomy DEPS

**RSO:** Lancaster, James

**Subject/Focus Area:** Math, Chemistry and Physics

**Committee Membership**  
 \*Committee Membership

**Meetings**  
 Meeting 1 - 02/01/2017  
 Meeting 2 - 04/19/2017

**Reports**  
 Reports having no URL can be seen at the Public Access Records Office

**Project Scope**  
 The committee will assess the scientific justification for a U.S. domestic electron ion collider facility, taking into account current international plans and existing domestic facility infrastructure. In preparing its report, the committee will address the role that such a facility could play in the future of nuclear physics, considering the field broadly, but placing emphasis on its potential scientific impact on quantum chromodynamics.

In particular, the committee will address the following questions:

- What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?

- What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?

- What are the benefits to U.S. leadership in nuclear physics if a domestic electron ion collider were constructed?

- What are the benefits to other fields of science and to society of establishing such a facility in the United States?

**Charge**

**Project Duration:** 18 months **Duration**

Provide **FEEDBACK** on this project.

Contact the **Public Access Records Office** to make an inquiry, request a list of the public access file materials, or obtain a copy of the materials found in the file.

Follow Us: | [E-Newsletters](#)

The National Academies of Sciences, Engineering, and Medicine  
 500 Fifth Street, NW | Washington, DC 20001 | T. 202.334.2000  
[Privacy Statement](#) | [DMCA Policy](#) | [Terms of Use](#) | [Site Map](#)

Copyright © 2017 National Academy of Sciences. All rights reserved.

The National Academies of SCIENCES ENGINEERING MEDICINE

# Nat. Academy of Sciences, Engineering & Medicine

WWW-page:

http://www.nationalacademies.org

CURRENT PROJECTS System

The National Academies of SCIENCES ENGINEERING MEDICINE  
 Search FullText Search

**Navigation Menu**

- Home
- Search for Projects
- View Projects
  - by Project Title
  - by Subject/Focus Area
  - by Board/Committee
  - by Major Unit
  - Provisional Committee Appointments Open for Formal Public Comment
  - by Last Update
- Meeting Information
- Conflict of Interest Policy
- Committee Appointment Process
- FAQ

## Project Information

<b>Project Title:</b>	U.S.-Based Electron Ion Collider Science Assessment	<b>Project Title</b>	<b>Committee</b>	<b>Committee Membership</b> *Committee Membership
<b>PIN:</b>	DEPS-BPA-15-01			<b>Meetings</b> ? Meeting 1 - 02/01/2017 ? Meeting 2 - 04/19/2017
<b>Major Unit:</b>	Division on Engineering and Physical Sciences			<b>Reports</b> <i>Reports having no URL can be seen at the Public Access Records Office</i>
<b>Sub Unit:</b>	Board on Physics & Astronomy DEPS			
<b>RSO:</b>	Lancaster, James			
<b>Subject/Focus Area:</b>	Math, Chemistry and Physics			

**Project Scope**  
 The committee will assess the scientific justification for a U.S. domestic electron ion collider facility, taking into account current international plans and existing domestic facility infrastructure. In preparing its report, the committee will address the role that such a facility could play in the future of nuclear physics, considering the field broadly, but placing emphasis on its potential scientific impact on quantum chromodynamics.

In particular, the committee will address the following questions:

- What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?
- What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?
- What are the benefits to U.S. leadership in nuclear physics if a domestic electron ion collider were constructed?
- What are the benefits to other fields of science and to society of establishing such a facility in the United States?

**Project Duration:** 18 months **Duration**

Provide **FEEDBACK** on this project.

Contact the **Public Access Records Office** to make an inquiry, request a list of the public access file materials, or obtain a copy of the materials found in the file.

Follow Us: | [E-Newsletters](#)

The National Academies of Sciences, Engineering, and Medicine  
 500 Fifth Street, NW | Washington, DC 20001 | T. 202.334.2000  
[Privacy Statement](#) | [DMCA Policy](#) | [Terms of Use](#) | [Site Map](#)

Copyright © 2017 National Academy of Sciences. All rights reserved.

Charge



# Nat. Academy of Sciences, Engineering & Medicine

WWW-page:

http://www.nationalacademies.org

**CURRENT PROJECTS** System
The National Academies of SCIENCES ENGINEERING MEDICINE

FullText Search

**Navigation Menu**

- Home
- Search for Projects
- View Projects
  - by Project Title
  - by Subject/Focus Area
  - by Board/Committee
  - by Major Unit
  - Provisional Committee Appointments Open for Formal Public Comment
  - by Last Update
- Meeting Information
- Conflict of Interest Policy
- Committee Appointment Process
- FAQ

## Project Information

<b>Project Title:</b>	U.S.-Based Electron Ion Collider Science Assessment	<b>Project Title</b>		
<b>PIN:</b>	DEPS-BPA-15-01			
<b>Major Unit:</b>	Division on Engineering and Physical Sciences		<b>Committee</b>	Committee Membership *Committee Membership
<b>Sub Unit:</b>	Board on Physics & Astronomy DEPS		<b>Meetings</b>	Meetings ➤ Meeting 1 - 02/01/2017 ➤ Meeting 2 - 04/19/2017
<b>RSO:</b>	Lancaster, James			<b>Reports</b> <small>Reports having no URL can be seen at the Public Access Records Office</small>
<b>Subject/Focus Area:</b>	Math, Chemistry and Physics			

**Project Scope**  
The committee will assess the scientific justification for a U.S. domestic electron ion collider facility, taking into account current international plans and existing domestic facility infrastructure. In preparing its report, the committee will address the role that such a facility could play in the future of nuclear physics, considering the field broadly, but placing emphasis on its potential scientific impact on quantum chromodynamics.

In particular, the committee will address the following questions:

- What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?
- What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?
- What are the benefits to U.S. leadership in nuclear physics if a domestic electron ion collider were constructed?
- What are the benefits to other fields of science and to society of establishing such a facility in the United States?

**Charge**

**Project Duration:**
18 months

**Duration**

Provide **FEEDBACK** on this project.

Contact the **Public Access Records Office** to make an inquiry, request a list of the public access file materials, or obtain a copy of the materials found in the file.

Follow Us:| E-Newsletters

The National Academies of Sciences, Engineering, and Medicine  
 500 Fifth Street, NW | Washington, DC 20001 | T. 202.334.2000  
[Privacy Statement](#) | [DMCA Policy](#) | [Terms of Use](#) | [Site Map](#)

Copyright © 2017 National Academy of Sciences. All rights reserved.

Printer Friendly Version

# NAS review of US EIC Science Assessment

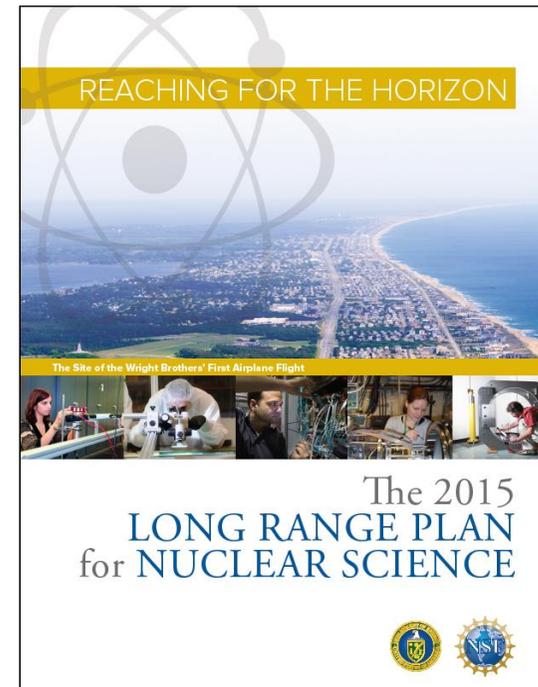
## □ NSAC Long-Range Plane 2015

T. Hallman

### The 2015 Long Range Plan for Nuclear Science

#### Recommendations:

1. Capitalize on investments made to maintain U.S. leadership in nuclear science.
2. Develop and deploy a U.S.-led ton-scale neutrino-less double beta decay experiment.
3. Construct a high-energy high-luminosity polarized electron-ion collider (EIC) as the highest priority for new construction following the completion of FRIB.
4. Increase investment in small-scale and mid-scale projects and initiatives that enable forefront research at universities and laboratories.



The FY 2018 Request supports progress in important aspects of the 2015 LRP Vision

# NAS review of US EIC Science Assessment

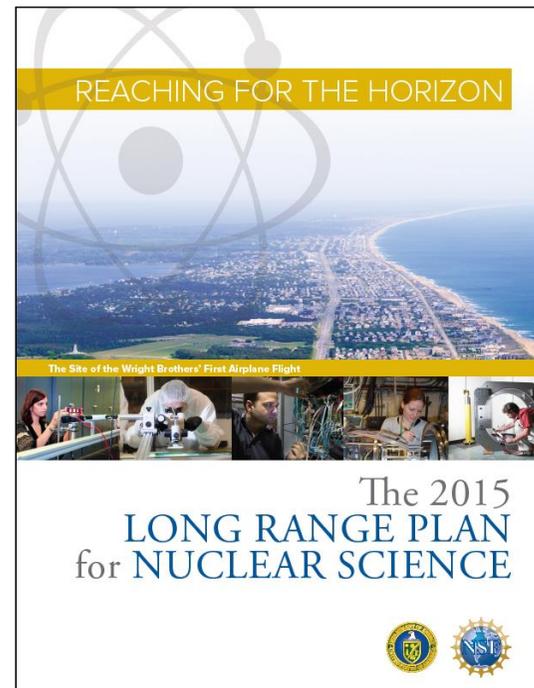
## □ NSAC Long-Range Plane 2015

T. Hallman

### The 2015 Long Range Plan for Nuclear Science

#### Recommendations:

1. Capitalize on investments made to maintain U.S. leadership in nuclear science.
2. Develop and deploy a U.S.-led ton-scale neutrino-less double beta decay experiment.
3. Construct a high-energy high-luminosity polarized electron-ion collider (EIC) as the highest priority for new construction following the completion of FRIB.
4. Increase investment in small-scale and mid-scale projects and initiatives that enable forefront research at universities and laboratories.



The FY 2018 Request supports progress in important aspects of the 2015 LRP Vision

# NAS review of US EIC Science Assessment

## □ NAS review request

T. Hallman

### Next Formal Step on the EIC Science Case is Continuing

#### **THE NATIONAL ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE**

Division on Engineering and Physical Science

Board on Physics and Astronomy

#### **U.S.-Based Electron Ion Collider Science Assessment**

##### ***Summary***

The National Academies of Sciences, Engineering, and Medicine (“National Academies”) will form a committee to carry out a thorough, independent assessment of the scientific justification for a U.S. domestic electron ion collider facility. In preparing its report, the committee will address the role that such a facility would play in the future of nuclear science, considering the field broadly, but placing emphasis on its potential scientific impact on quantum chromodynamics. The need for such an accelerator will be addressed in the context of international efforts in this area. Support for the 18-month project in the amount of \$540,000 is requested from the Department of Energy.

“U.S.-Based Electron Ion Collider Science Assessment” is now getting underway. The Chair will be Gordon Baym. The rest of the committee, including a co-chair, will be appointed in the next couple of weeks. The first meeting is being planned for January, 2017



# NAS review of US EIC Science Assessment

- NAS review charge and timeline (1)



## NAS review of US EIC Science Assessment

### □ NAS review charge and timeline (1)

The committee will assess the **scientific justification for a U.S. domestic electron ion collider facility**, taking into account current international plans and existing domestic facility infrastructure. In preparing its report, the committee will address the **role that such a facility could play in the future of nuclear physics**, considering the field broadly, but placing emphasis on its **potential scientific impact on quantum chromodynamics**.

Duration: 18 months



# NAS review of US EIC Science Assessment

- NAS review charge and timeline (2)



# NAS review of US EIC Science Assessment

## □ NAS review charge and timeline (2)

**Questions 1:** What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?



# NAS review of US EIC Science Assessment

## □ NAS review charge and timeline (2)

**Questions 1:** What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?

**Question 2:** What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?

# NAS review of US EIC Science Assessment

## □ NAS review charge and timeline (2)

**Questions 1:** What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?

**Question 2:** What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?

**Question 3:** What are the benefits to U.S. leadership in nuclear physics if a domestic electron ion collider were constructed?



# NAS review of US EIC Science Assessment

## □ NAS review charge and timeline (2)

**Questions 1:** What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?

**Question 2:** What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?

**Question 3:** What are the benefits to U.S. leadership in nuclear physics if a domestic electron ion collider were constructed?

**Question 4:** What are the benefits to other fields of science and to society of establishing such a facility in the United States?



# NAS review of US EIC Science Assessment

- NAS review committee (1)



# NAS review of US EIC Science Assessment

## □ NAS review committee (1)

### [Dr. Ani Aprahamian \(Co-Chair\)](#)

ANI APRAHAMIAN is a professor of experimental nuclear physics in the Department of Physics at the University of Notre Dame.

### [Dr. Gordon A. Baym \(Co-Chair\)](#)

GORDON BAYM (NAS) is professor emeritus at the University of Illinois at Urbana-Champaign. Professor Baym is a member of the National Academy of Sciences (where he served as Chair of the Physics Section from 1995-1998)



# NAS review of US EIC Science Assessment

## □ NAS review committee (1)

### Dr. Ani Aprahamian (Co-Chair)

ANI APRAHAMIAN is a professor of experimental nuclear physics in the Department of Physics at the University of Notre Dame.

### Dr. Gordon A. Baym (Co-Chair)

GORDON BAYM (NAS) is professor emeritus at the University of Illinois at Urbana-Champaign. Professor Baym is a member of the National Academy of Sciences (where he served as Chair of the Physics Section from 1995-1998)

### Dr. Christine Aidala

CHRISTINE AIDALA is an associate professor of physics at the University of Michigan.



# NAS review of US EIC Science Assessment

## □ NAS review committee (1)

### Dr. Ani Aprahamian (Co-Chair)

ANI APRAHAMIAN is a professor of experimental nuclear physics in the Department of Physics at the University of Notre Dame.

### Dr. Gordon A. Baym (Co-Chair)

GORDON BAYM (NAS) is professor emeritus at the University of Illinois at Urbana-Champaign. Professor Baym is a member of the National Academy of Sciences (where he served as Chair of the Physics Section from 1995-1998)

### Dr. Christine Aidala

CHRISTINE AIDALA is an associate professor of physics at the University of Michigan.

### Dr. Peter Braun-Munzinger

PETER BRAUN-MUNZINGER is the Scientific Director of the ExtreMe Matter Institute (EMMI) at GSI.

# NAS review of US EIC Science Assessment

## □ NAS review committee (1)

### Dr. Ani Aprahamian (Co-Chair)

ANI APRAHAMIAN is a professor of experimental nuclear physics in the Department of Physics at the University of Notre Dame.

### Dr. Gordon A. Baym (Co-Chair)

GORDON BAYM (NAS) is professor emeritus at the University of Illinois at Urbana-Champaign. Professor Baym is a member of the National Academy of Sciences (where he served as Chair of the Physics Section from 1995-1998)

### Dr. Christine Aidala

CHRISTINE AIDALA is an associate professor of physics at the University of Michigan.

### Dr. Peter Braun-Munzinger

PETER BRAUN-MUNZINGER is the Scientific Director of the ExtreMe Matter Institute (EMMI) at GSI.

### Dr. Haiyan Gao

HAIYAN GAO is a professor in physics and the Vice Chancellor for academic affairs at Duke University.

# NAS review of US EIC Science Assessment

## □ NAS review committee (1)

### Dr. Ani Aprahamian (Co-Chair)

ANI APRAHAMIAN is a professor of experimental nuclear physics in the Department of Physics at the University of Notre Dame.

### Dr. Gordon A. Baym (Co-Chair)

GORDON BAYM (NAS) is professor emeritus at the University of Illinois at Urbana-Champaign. Professor Baym is a member of the National Academy of Sciences (where he served as Chair of the Physics Section from 1995-1998)

### Dr. Christine Aidala

CHRISTINE AIDALA is an associate professor of physics at the University of Michigan.

### Dr. Peter Braun-Munzinger

PETER BRAUN-MUNZINGER is the Scientific Director of the ExtreMe Matter Institute (EMMI) at GSI.

### Dr. Haiyan Gao

HAIYAN GAO is a professor in physics and the Vice Chancellor for academic affairs at Duke University.

### Dr. Kawtar Hafidi

KAWTAR HAFIDI is the associate chief scientist for Laboratory Directed Research and Development at Argonne National Laboratory.

# NAS review of US EIC Science Assessment

## □ NAS review committee (1)

### Dr. Ani Aprahamian (Co-Chair)

ANI APRAHAMIAN is a professor of experimental nuclear physics in the Department of Physics at the University of Notre Dame.

### Dr. Gordon A. Baym (Co-Chair)

GORDON BAYM (NAS) is professor emeritus at the University of Illinois at Urbana-Champaign. Professor Baym is a member of the National Academy of Sciences (where he served as Chair of the Physics Section from 1995-1998)

### Dr. Christine Aidala

CHRISTINE AIDALA is an associate professor of physics at the University of Michigan.

### Dr. Peter Braun-Munzinger

PETER BRAUN-MUNZINGER is the Scientific Director of the ExtreMe Matter Institute (EMMI) at GSI.

### Dr. Haiyan Gao

HAIYAN GAO is a professor in physics and the Vice Chancellor for academic affairs at Duke University.

### Dr. Kawtar Hafidi

KAWTAR HAFIDI is the associate chief scientist for Laboratory Directed Research and Development at Argonne National Laboratory.

### Dr. Wick C. Haxton

WICK HAXTON (NAS) is a professor of physics at University of California, Berkeley.



# NAS review of US EIC Science Assessment

- NAS review committee (2)



# NAS review of US EIC Science Assessment

- NAS review committee (2)

Dr. John Jowett

JOHN JOWETT is a senior accelerator physicist at CERN.



# NAS review of US EIC Science Assessment

## □ NAS review committee (2)

**Dr. John Jowett**

JOHN JOWETT is a senior accelerator physicist at CERN.

**Dr. Larry McLerran**

LARRY MCLERRAN is the Director of the Institute for Nuclear Theory at the University of Washington.



# NAS review of US EIC Science Assessment

## □ NAS review committee (2)

### Dr. John Jowett

JOHN JOWETT is a senior accelerator physicist at CERN.

### Dr. Larry McLerran

LARRY MCLERRAN is the Director of the Institute for Nuclear Theory at the University of Washington.

### Dr. Zein-Eddine Meziani

ZEIN-EDDINE MEZIANI is a professor of physics at Temple University.



# NAS review of US EIC Science Assessment

## □ NAS review committee (2)

### Dr. John Jowett

JOHN JOWETT is a senior accelerator physicist at CERN.

### Dr. Larry McLerran

LARRY MCLERRAN is the Director of the Institute for Nuclear Theory at the University of Washington.

### Dr. Zein-Eddine Meziani

ZEIN-EDDINE MEZIANI is a professor of physics at Temple University.

### Dr. Richard G. Milner

RICHARD MILNER is a professor of physics at MIT and director of MIT's Laboratory for Nuclear Science (LNS).



# NAS review of US EIC Science Assessment

## □ NAS review committee (2)

### Dr. John Jowett

JOHN JOWETT is a senior accelerator physicist at CERN.

### Dr. Larry McLerran

LARRY MCLERRAN is the Director of the Institute for Nuclear Theory at the University of Washington.

### Dr. Zein-Eddine Meziani

ZEIN-EDDINE MEZIANI is a professor of physics at Temple University.

### Dr. Richard G. Milner

RICHARD MILNER is a professor of physics at MIT and director of MIT's Laboratory for Nuclear Science (LNS).

### Dr. Thomas Schaefer

THOMAS SCHAEFER is a professor of physics at North Carolina State University,



# NAS review of US EIC Science Assessment

## □ NAS review committee (2)

### Dr. John Jowett

JOHN JOWETT is a senior accelerator physicist at CERN.

### Dr. Larry McLerran

LARRY MCLERRAN is the Director of the Institute for Nuclear Theory at the University of Washington.

### Dr. Zein-Eddine Meziani

ZEIN-EDDINE MEZIANI is a professor of physics at Temple University.

### Dr. Richard G. Milner

RICHARD MILNER is a professor of physics at MIT and director of MIT's Laboratory for Nuclear Science (LNS).

### Dr. Thomas Schaefer

THOMAS SCHAEFER is a professor of physics at North Carolina State University,

### Dr. Ernst Sichtermann

ERNST SICHTERMANN is a senior scientist at Lawrence Berkeley National Laboratory.

# NAS review of US EIC Science Assessment

## □ NAS review committee (2)

### Dr. John Jowett

JOHN JOWETT is a senior accelerator physicist at CERN.

### Dr. Larry McLerran

LARRY MCLERRAN is the Director of the Institute for Nuclear Theory at the University of Washington.

### Dr. Zein-Eddine Meziani

ZEIN-EDDINE MEZIANI is a professor of physics at Temple University.

### Dr. Richard G. Milner

RICHARD MILNER is a professor of physics at MIT and director of MIT's Laboratory for Nuclear Science (LNS).

### Dr. Thomas Schaefer

THOMAS SCHAEFER is a professor of physics at North Carolina State University,

### Dr. Ernst Sichtermann

ERNST SICHTERMANN is a senior scientist at Lawrence Berkeley National Laboratory.

### Dr. Michael S. Turner

MICHAEL TURNER (NAS) is the Bruce V. Rauner Distinguished Service Professor at University of Chicago and director of the PFC and the Kavli Institute for Cosmological Physics (KICP).



# NAS review of US EIC Science Assessment

## □ NAS review committee (2)

### Dr. John Jowett

JOHN JOWETT is a senior accelerator physicist at CERN.

### Dr. Larry McLerran

LARRY MCLERRAN is the Director of the Institute for Nuclear Theory at the University of Washington.

### Dr. Zein-Eddine Meziani

ZEIN-EDDINE MEZIANI is a professor of physics at Temple University.

### Dr. Richard G. Milner

RICHARD MILNER is a professor of physics at MIT and director of MIT's Laboratory for Nuclear Science (LNS).

### Dr. Thomas Schaefer

THOMAS SCHAEFER is a professor of physics at North Carolina State University,

### Dr. Ernst Sichtermann

ERNST SICHTERMANN is a senior scientist at Lawrence Berkeley National Laboratory.

### Dr. Michael S. Turner

MICHAEL TURNER (NAS) is the Bruce V. Rauner Distinguished Service Professor at University of Chicago and director of the PFC and the Kavli Institute for Cosmological Physics (KICP).

### Dr. Lia Merminga

LIA MERMINGA is the Associate Laboratory Director, Accelerator Directorate, at SLAC National Accelerator Laboratory, a position she has held since 2015.



# NAS review of US EIC Science Assessment

- NAS review meetings I: February 1, 2017 - February 2, 2017, Washington, DC

## Open Session: Day 1 / February 1, 2017

Open Session:

11:30 European perspectives on an EIC facility, Peter Braun-Munzinger, GSI, Committee member

12:00 PM Lunch

1:00 The 2015 NSAC Long Range Plan, Donald Geesaman, Argonne National Lab

1:45 RHIC Cold QCD Plan for 2017 to 2023, Christine Aidala, U. Michigan, Committee Member

2:30 Discussion with Congressional staff, Adam Rosenberg, House Science & Technology Committee Energy Subcommittee

3:00 Break

3:15 Discussion with NSF Physics, Denise Caldwell, NSF PHY

4:00 Electron-Ion Collider: The next QCD frontier, Richard Milner, MIT, Committee Member

4:45 Discussion

5:00 Break

## Open Session: Day 2. February 2, 2017

Open Session:

8:00 AM Breakfast available in meeting room

9:00 Discussion with DOE Nuclear Physics, Tim Hallman, DOE NP

10:00 Continued discussion with DOE

10:30 Break

11:00 Discussion with DOE Office of Science, Steve Binkley, DOE Office of Science

11:30 Continued discussion with DOE

12:00 PM Lunch



# NAS review of US EIC Science Assessment

## □ NAS review meetings II: April 19, 2017 - April 20, 2017, Irvine, CA

### Open Session: Day 1 / April 19, 2017

10:00 Physics of gluon saturation  
Jean-Paul Blaizot, IPhT CEA-Saclay

10:45 Break

11:00 Heavy ion physics at CERN  
Peter Braun-Munzinger, GSI (committee member)

11:45 Lunch

12:45 Deep inelastic scattering  
Amanda Cooper-Sarkar, Oxford University

1:30 Theoretical Perspectives on EIC Science  
Xiangdong Ji, University of Maryland/Shanghai Jiao Tong University

2:15 Break

2:30 JLAB 5-year physics agenda  
Zein-Eddine Meziani, Temple University (committee member)

3:15 Science potential of a U.S.-based EIC  
Abhay Deshpande, Stony Brook University

4:00 Discussion

5:00 Break

### Open Session: Day 2. April 20, 2017

9:00 Discussion:  
- Preliminary conclusions and recommendations  
- Report outline  
- Writing responsibilities  
- Further information gathering

10:45 Break

11:00 Discussion, continued

12:00 PM Lunch

1:00 Discussion: future meetings, assignments, and schedule

2:00 Adjourn



## EIC User Group Input

- **Questions 1:** What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?

# EIC User Group Input

- **Questions 1:** What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?

[http://www.eicug.org/web/sites/default/files/Charge\\_1\\_041917.pptx](http://www.eicug.org/web/sites/default/files/Charge_1_041917.pptx)

← EICUG response

## EIC User Group Input

- **Questions 1:** What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?
- An EIC facility will allow profound new insight into the dynamics and structure of matter emerging through fundamental interactions among quarks and gluons

[http://www.eicug.org/web/sites/default/files/Charge\\_1\\_041917.pptx](http://www.eicug.org/web/sites/default/files/Charge_1_041917.pptx)

← EICUG response

# EIC User Group Input

- **Questions 1:** What is the merit and significance of the science that could be addressed by an electron ion collider facility and what is its importance in the overall context of research in nuclear physics and the physical sciences in general?
  - An EIC facility will allow profound new insight into the dynamics and structure of matter emerging through fundamental interactions among quarks and gluons
  - An EIC facility is the required facility with versatile operation in terms of energy, polarization and luminosity to image quarks and gluons and explore strong color fields among quarks and gluons

[http://www.eicug.org/web/sites/default/files/Charge\\_1\\_041917.pptx](http://www.eicug.org/web/sites/default/files/Charge_1_041917.pptx)

← EICUG response



## EIC User Group Input

- **Question 2:** What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?

## EIC User Group Input

- **Question 2:** What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?

[http://www.eicug.org/web/sites/default/files/Charge\\_2\\_061417.pptx](http://www.eicug.org/web/sites/default/files/Charge_2_061417.pptx)

← EICUG response

## EIC User Group Input

- **Question 2:** What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?
- **Large center-of-mass energy range:** Access to wide kinematic range overlapping various other experimental programs

[http://www.eicug.org/web/sites/default/files/Charge\\_2\\_061417.pptx](http://www.eicug.org/web/sites/default/files/Charge_2_061417.pptx)

← EICUG response



## EIC User Group Input

- **Question 2:** What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?
  - **Large center-of-mass energy range:** Access to wide kinematic range overlapping various other experimental programs
  - **Polarized electron and hadron beams:** Spin structure and 3D imaging

[http://www.eicug.org/web/sites/default/files/Charge\\_2\\_061417.pptx](http://www.eicug.org/web/sites/default/files/Charge_2_061417.pptx)

EICUG response

## EIC User Group Input

- **Question 2:** What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?
  - **Large center-of-mass energy range:** Access to wide kinematic range overlapping various other experimental programs
  - **Polarized electron and hadron beams:** Spin structure and 3D imaging
  - **Nuclear beams:** Access high gluon density region

[http://www.eicug.org/web/sites/default/files/Charge\\_2\\_061417.pptx](http://www.eicug.org/web/sites/default/files/Charge_2_061417.pptx)

← EICUG response

## EIC User Group Input

- **Question 2:** What are the capabilities of other facilities, existing and planned, domestic and abroad, to address the science opportunities afforded by an electron-ion collider? What unique scientific role could be played by a domestic electron ion collider facility that is complementary to existing and planned facilities at home and elsewhere?
  - **Large center-of-mass energy range:** Access to wide kinematic range overlapping various other experimental programs
  - **Polarized electron and hadron beams:** Spin structure and 3D imaging
  - **Nuclear beams:** Access high gluon density region
  - **High luminosity:** Access to rare probes / Detailed studies of 3D imaging

[http://www.eicug.org/web/sites/default/files/Charge\\_2\\_061417.pptx](http://www.eicug.org/web/sites/default/files/Charge_2_061417.pptx)

EICUG response



## EIC User Group Input

- **Question 3:** What are the **benefits to U.S. leadership in nuclear physics** if a domestic electron ion collider were constructed?



## EIC User Group Input

- **Question 3:** What are the **benefits to U.S. leadership in nuclear physics** if a domestic electron ion collider were constructed?

[http://www.eicug.org/web/sites/default/files/Charge\\_3\\_061517.pptx](http://www.eicug.org/web/sites/default/files/Charge_3_061517.pptx)

← EICUG response



## EIC User Group Input

- **Question 3:** What are the **benefits to U.S. leadership in nuclear physics** if a domestic electron ion collider were constructed?
- **Developing and building the accelerator infrastructure** will contribute to **leadership in accelerator technology.**

[http://www.eicug.org/web/sites/default/files/Charge\\_3\\_061517.pptx](http://www.eicug.org/web/sites/default/files/Charge_3_061517.pptx)

← EICUG response



## EIC User Group Input

- **Question 3:** What are the **benefits to U.S. leadership in nuclear physics** if a domestic electron ion collider were constructed?
  - Developing and building the accelerator infrastructure will contribute to leadership in accelerator technology.
  - Constructing the detectors to realize the EIC science will contribute to leadership in detector technology.

[http://www.eicug.org/web/sites/default/files/Charge\\_3\\_061517.pptx](http://www.eicug.org/web/sites/default/files/Charge_3_061517.pptx)

← EICUG response



## EIC User Group Input

- **Question 3:** What are the **benefits to U.S. leadership in nuclear physics** if a domestic electron ion collider were constructed?
  - Developing and building the accelerator infrastructure will contribute to leadership in accelerator technology.
  - Constructing the detectors to realize the EIC science will contribute to leadership in detector technology.
  - Developing the scope of the science program will contribute to leadership in QCD theory.

[http://www.eicug.org/web/sites/default/files/Charge\\_3\\_061517.pptx](http://www.eicug.org/web/sites/default/files/Charge_3_061517.pptx)

← EICUG response



## EIC User Group Input

- **Question 3:** What are the **benefits to U.S. leadership in nuclear physics** if a domestic electron ion collider were constructed?
  - Developing and building the accelerator infrastructure will contribute to leadership in accelerator technology.
  - Constructing the detectors to realize the EIC science will contribute to leadership in detector technology.
  - Developing the scope of the science program will contribute to leadership in QCD theory.
  - Bringing the expertise of an international users' group to the US will contribute to leadership and visibility as a hub of the nuclear physics community.

[http://www.eicug.org/web/sites/default/files/Charge\\_3\\_061517.pptx](http://www.eicug.org/web/sites/default/files/Charge_3_061517.pptx)

← EICUG response



## EIC User Group Input

- **Question 3:** What are the **benefits to U.S. leadership in nuclear physics** if a domestic electron ion collider were constructed?
  - Developing and building the accelerator infrastructure will contribute to leadership in accelerator technology.
  - Constructing the detectors to realize the EIC science will contribute to leadership in detector technology.
  - Developing the scope of the science program will contribute to leadership in QCD theory.
  - Bringing the expertise of an international users' group to the US will contribute to leadership and visibility as a hub of the nuclear physics community.
  - Delivering on the science program of an EIC will lead to landmark discoveries in nuclear physics.

[http://www.eicug.org/web/sites/default/files/Charge\\_3\\_061517.pptx](http://www.eicug.org/web/sites/default/files/Charge_3_061517.pptx)

EICUG response



## EIC User Group Input

- **Question 4:** What are the **benefits to other fields of science and to society** of establishing such a facility in the United States?



## EIC User Group Input

- **Question 4:** What are the **benefits to other fields of science and to society** of establishing such a facility in the United States?

[http://www.eicug.org/web/sites/default/files/Charge\\_4\\_061417.pptx](http://www.eicug.org/web/sites/default/files/Charge_4_061417.pptx)

← EICUG response



## EIC User Group Input

- **Question 4:** What are the **benefits to other fields of science and to society** of establishing such a facility in the United States?
  - **Education and Training:** Individuals going to other sectors benefitting society / Relevance for Medical Science / Ambassadorship of Nuclear Scientists

[http://www.eicug.org/web/sites/default/files/Charge\\_4\\_061417.pptx](http://www.eicug.org/web/sites/default/files/Charge_4_061417.pptx)

← EICUG response

## EIC User Group Input

- **Question 4:** What are the **benefits to other fields of science and to society** of establishing such a facility in the United States?
  - **Education and Training:** Individuals going to other sectors benefitting society / Relevance for Medical Science / Ambassadorship of Nuclear Scientists
  - **Technology - Accelerator, detector, data science and data management:** Benefits to society outside of academic research and other fields of academic research

[http://www.eicug.org/web/sites/default/files/Charge\\_4\\_061417.pptx](http://www.eicug.org/web/sites/default/files/Charge_4_061417.pptx)

← EICUG response

## EIC User Group Input

- **Question 4:** What are the **benefits to other fields of science and to society** of establishing such a facility in the United States?
  - **Education and Training:** Individuals going to other sectors benefitting society / Relevance for Medical Science / Ambassadorship of Nuclear Scientists
  - **Technology - Accelerator, detector, data science and data management:** Benefits to society outside of academic research and other fields of academic research
  - **Science:** Scientific advances driven by the EIC will benefit other fields in science

[http://www.eicug.org/web/sites/default/files/Charge\\_4\\_061417.pptx](http://www.eicug.org/web/sites/default/files/Charge_4_061417.pptx)

← EICUG response

# EIC User Group Input

- **Question 4:** What are the **benefits to other fields of science and to society** of establishing such a facility in the United States?
  - **Education and Training:** Individuals going to other sectors benefitting society / Relevance for Medical Science / Ambassadorship of Nuclear Scientists
  - **Technology - Accelerator, detector, data science and data management:** Benefits to society outside of academic research and other fields of academic research
  - **Science:** Scientific advances driven by the EIC will benefit other fields in science
  - **Economic impact:** Increase in overall economic output based on economic studies at BNL and JLab

[http://www.eicug.org/web/sites/default/files/Charge\\_4\\_061417.pptx](http://www.eicug.org/web/sites/default/files/Charge_4_061417.pptx)

← EICUG response



# Summary / Outlook

# Summary / Outlook

- **EIC project review** by the **National Academy of Sciences** is well under way which started early in 2017 by a high-profile committee

# Summary / Outlook

- **EIC project review** by the **National Academy of Sciences** is well under way which started early in 2017 by a high-profile committee
- Duration: 18 Months

# Summary / Outlook

- **EIC project review** by the **National Academy of Sciences** is well under way which started early in 2017 by a high-profile committee
- Duration: 18 Months
- Charge: The committee will assess the **scientific justification for a U.S. domestic electron ion collider facility**, taking into account current international plans and existing domestic facility infrastructure. In preparing its report, the committee will address the **role that such a facility could play in the future of nuclear physics**, considering the field broadly, but placing emphasis on its **potential scientific impact on quantum chromodynamics**.

# Summary / Outlook

- **EIC project review** by the **National Academy of Sciences** is well under way which started early in 2017 by a high-profile committee
- Duration: 18 Months
- Charge: The committee will assess the **scientific justification for a U.S. domestic electron ion collider facility**, taking into account current international plans and existing domestic facility infrastructure. In preparing its report, the committee will address the **role that such a facility could play in the future of nuclear physics**, considering the field broadly, but placing emphasis on its **potential scientific impact on quantum chromodynamics**.
- Writing process has started judging from 2nd meetings agenda

# Summary / Outlook

- EIC project review by the National Academy of Sciences is well under way which started early in 2017 by a high-profile committee
- Duration: 18 Months
- Charge: The committee will assess the scientific justification for a U.S. domestic electron ion collider facility, taking into account current international plans and existing domestic facility infrastructure. In preparing its report, the committee will address the role that such a facility could play in the future of nuclear physics, considering the field broadly, but placing emphasis on its potential scientific impact on quantum chromodynamics.
- Writing process has started judging from 2nd meetings agenda
- Additional input on Questions 2-4 will be submitted to the co-chairs within the next two weeks by the EIC Users' group

# Summary / Outlook

- **EIC project review** by the **National Academy of Sciences** is well under way which started early in 2017 by a high-profile committee
- Duration: 18 Months
- Charge: The committee will assess the **scientific justification for a U.S. domestic electron ion collider facility**, taking into account current international plans and existing domestic facility infrastructure. In preparing its report, the committee will address the **role that such a facility could play in the future of nuclear physics**, considering the field broadly, but placing emphasis on its **potential scientific impact on quantum chromodynamics**.
- Writing process has started judging from 2nd meetings agenda
- Additional input on Questions 2-4 will be submitted to the co-chairs within the next two weeks by the EIC Users' group
- Outlook: Expect that NAS report should be available in spring 2018, i.e. by the time of the 2018 AGS/RHIC Users Meeting!

# Summary / Outlook

- **EIC project review** by the **National Academy of Sciences** is well under way which started early in 2017 by a high-profile committee
- Duration: 18 Months
- Charge: The committee will assess the **scientific justification for a U.S. domestic electron ion collider facility**, taking into account current international plans and existing domestic facility infrastructure. In preparing its report, the committee will address the **role that such a facility could play in the future of nuclear physics**, considering the field broadly, but placing emphasis on its **potential scientific impact on quantum chromodynamics**.
- Writing process has started judging from 2nd meetings agenda
- Additional input on Questions 2-4 will be submitted to the co-chairs within the next two weeks by the EIC Users' group
- Outlook: Expect that NAS report should be available in spring 2018, i.e. by the time of the 2018 AGS/RHIC Users Meeting!

Stay tuned!