

# AI Hallucinations: *Challenges to Trusted Scientific Advice*

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# A Career in Science Policy and Science Diplomacy

**Associate Professor,**  
*University of Puerto Rico, Mayagüez (2005 - 2014)*

**Visiting Professor, Duke University (Summers 2007, 2008)**

**Mini-Sabbatical, MIT Picower Institute (Summer 2010)**

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**Science Policy Advisor (2012 - 2014)**  
**U.S. Department of State**

**Acting Science Counselor (Summer 2014)**  
**Embassy of the United States, Mexico City**

**Program Director (2014 - 2016)**  
**U.S. National Science Foundation**

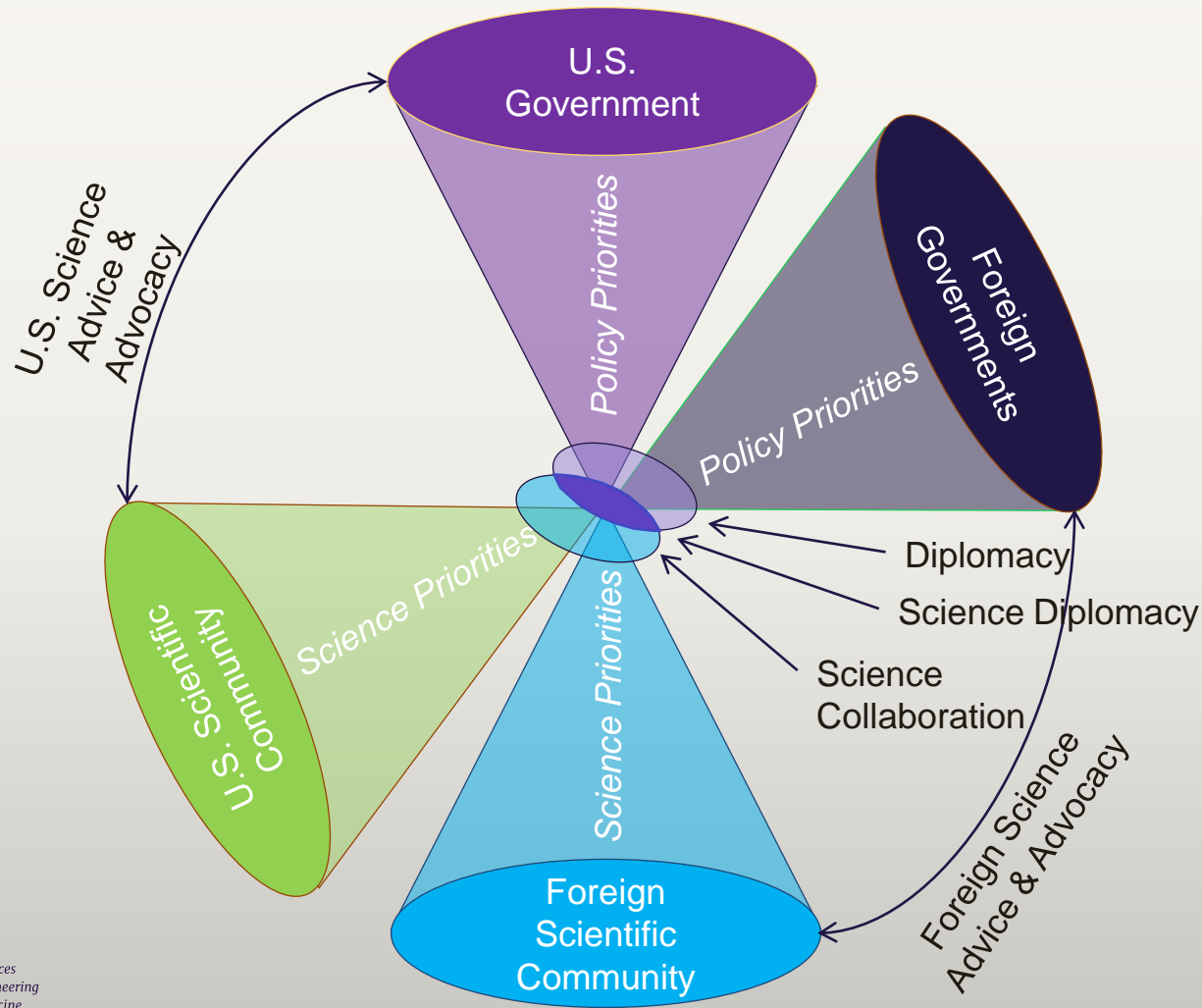
**Deputy Science and Technology Adviser, Acting (2016 - 2018)**  
**U.S. Department of State**

**Senior Director, Global Policy and Development (2018 - present)**  
**U.S. National Academy of Sciences, Engineering and Medicine**



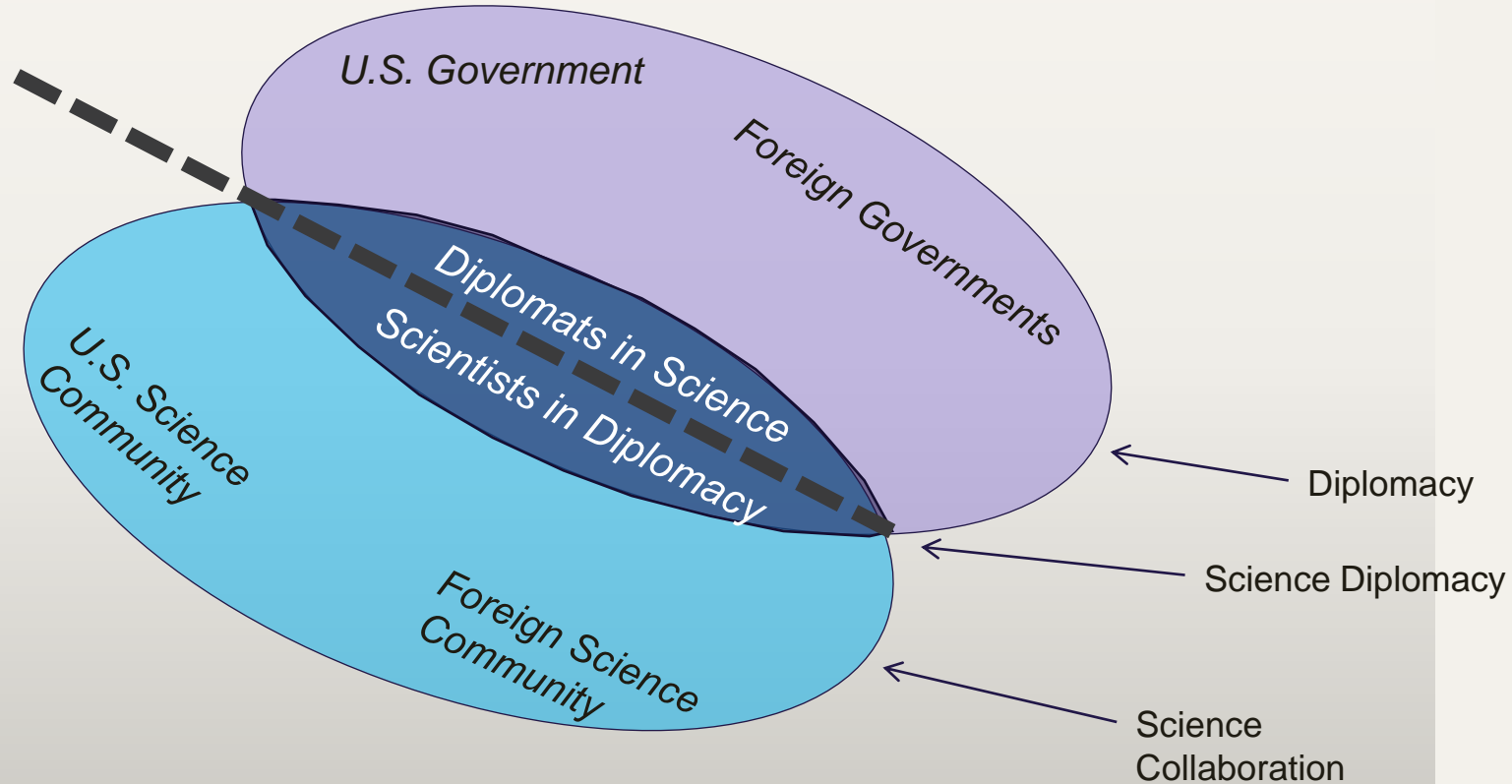
# Convergence

Science and Technology, Policy Advice and Foreign Relations



# PRACTICE OF SCIENCE DIPLOMACY

*BRINGING LEADERS TOGETHER TO FACILITATE INTERNATIONAL SCIENCE ADVISE*



# The National Academies: Advisors to the Nation

The National Academy of Sciences was established in 1863 by an Act of Congress, signed by President Lincoln, as a private, nongovernmental institution to advise the nation on issues related to science and technology. Members are elected by their peers for outstanding contributions to research

## Our Volunteers

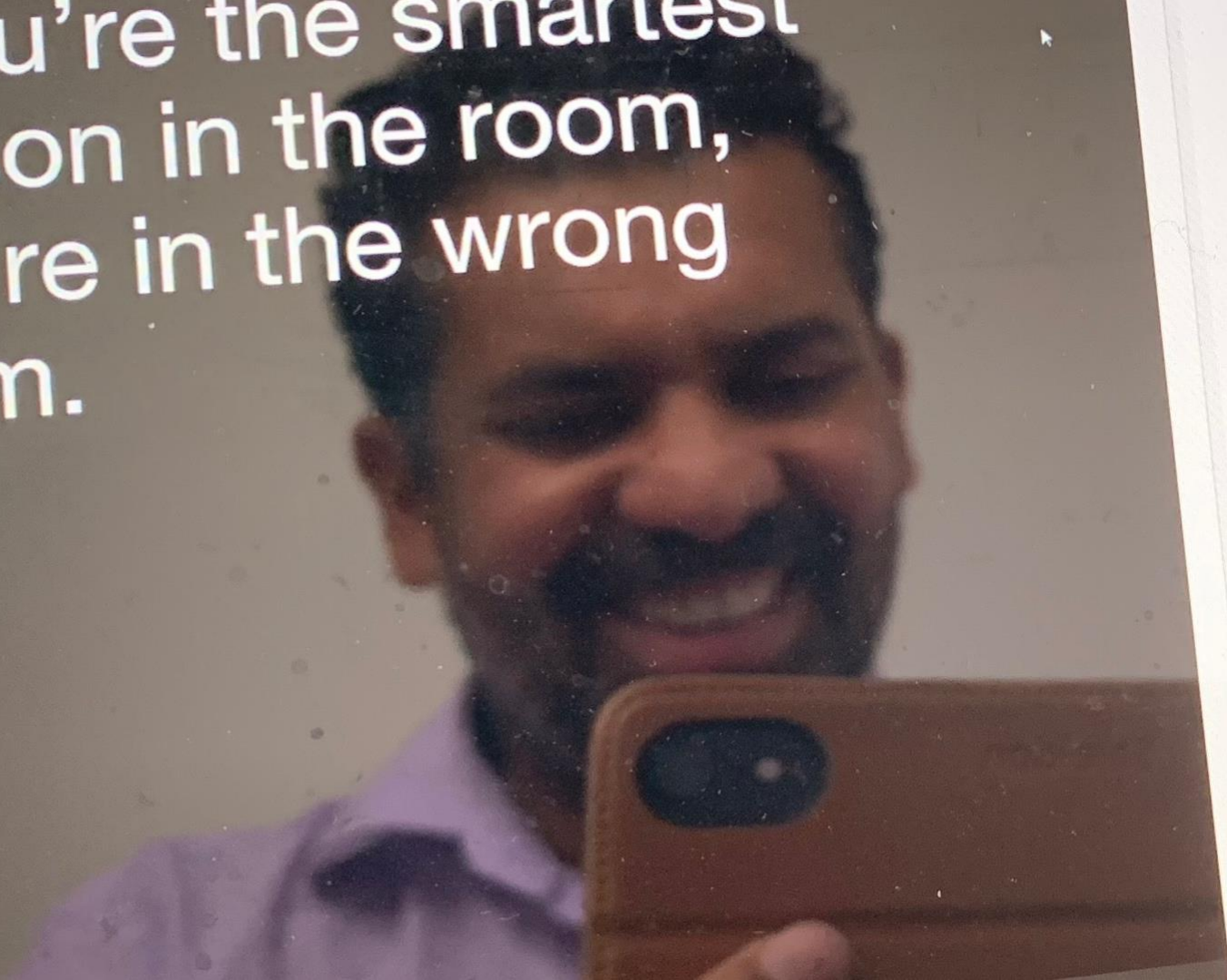
Each year, approximately 6,000 top experts in their fields — including but not limited to members of the Academies — *volunteer their time and extensive knowledge to conduct our policy studies, workshops, symposia, and other activities.*

*The National Academies of*  
SCIENCES • ENGINEERING • MEDICINE





If you're the smartest  
person in the room,  
you're in the wrong  
room.



# Artificial Intelligence

The simulation of human intelligence processes by machines, especially computer systems

## AI Hallucinations

When AI produce false outputs that look as if they might be true

*Facts vs opinions?*



# AI Amplify Hallucinations

It has been shown that language models not only hallucinate but also amplify hallucinations, even those designed to minimize hallucinations

# Scientists and Engineers in Exile or Displaced (SEED) program

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ABOUT

FOR APPLICANTS



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Key Dates

Description

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Through the Scientists and Engineers in Exile or Displaced (SEED) program, the National Academies of Sciences (NAS) will support forcibly displaced and at-risk scientists and researchers around the world and promote the development of vulnerable science and research networks of exiled and displaced scientists, engineers, and researchers to enhance employment opportunities and connections to the global scientific community. As part of this program, NAS is collaborating with the Polish Academy of Sciences to award grants to facilitate the pursuit of research projects by Ukrainian scientists and researchers.



Provide feedback on  
this project

# ChatGPT hallucinates our SEED Program

## Introduction:

The Science, Engineering, and Education for Sustainability (SEED) program at the National Academy of Sciences is a pioneering initiative dedicated to advancing sustainability across various domains of science, engineering, and education....

## Mission:

The SEED program's mission is to foster sustainability through research, education, and engagement. It aims to promote responsible stewardship of the planet's resources and to develop the next generation of leaders and thinkers who can drive transformative change towards a more sustainable future.

## Notable Achievements:

- **Interdisciplinary Research Grants:** SEED has provided substantial funding for interdisciplinary research projects that have led to groundbreaking discoveries in sustainability science.
- **Educational Initiatives:** SEED's educational programs have reached thousands of students and educators, instilling a deep understanding of sustainability principles and practices.
- **Policy Impact:** Through its policy and advocacy efforts, SEED has influenced the development of sustainability policies at local, national, and international levels.

For more information, visit [National Academy of Sciences - SEED Program](#).





## Scientists without borders: lessons from Ukraine

Walter Wolfsberger<sup>1,+</sup>, Karishma Chhugani<sup>2,+</sup>, Khrystyna Shchubelka<sup>1</sup>, Alina Frolova<sup>3</sup>, Yuriy Salyha<sup>4</sup>, Oksana Zlenko<sup>5</sup>, Mykhailo Arych<sup>6</sup>, Dmytro Dziuba<sup>7</sup>, Andrii Parkhomenko<sup>8</sup>, Volodymyr Smolanka<sup>9</sup>, Zeynep H. Gümüş<sup>10</sup>, Efe Sezgin<sup>11</sup>, Alondra Diaz-Lameiro<sup>12</sup>, Viktor R. Toth<sup>13</sup>, Megi Maci<sup>14</sup>, Eric Bortz<sup>15</sup>, Fyodor Kondrashov<sup>16</sup>, Patricia M. Morton<sup>17</sup>, Paweł P. Łabaj<sup>18</sup>, Veronika Romero<sup>19</sup>, Jakub Hlávka<sup>20,21</sup>, Serghei Mangul<sup>2,22,\*†</sup> and Taras K. Oleksyk<sup>1,23,\*†</sup>

DEPARTMENT OF BIOLOGICAL SCIENCES

# Global collaborative led by OU shows ways to support Ukraine's scientific community

July 27, 2023

In the wake of Russia's unprovoked invasion of Ukraine, the global scientific community rallied to support Ukraine's scientists, offering paid positions, education programs, funding programs and other assistance.

While these resources were sorely needed, most required



From left: Walter Wolfsberger, Khrystyna Shchubelka, Volodymyr

## The human element

Need to continue our strategic engagement with the scientific community to inform initiatives and advice

# Science Advise and AI: Challenges and Opportunities

- Minimize (further) erosion of public trust in science and its institutions
  - Nobel Prize Summit 2023: Trust, Trust and Hope
    - <https://www.nobelprize.org/events/nobel-prize-summit/2023/>



Photos by Karen Sayre; ©Nobel Prize Outreach

Nobel Prize Summit Fuels Initiatives to Combat Misinformation and Disinformation and Build Trust in Science

Feature Story | June 22, 2023



# Science Advise, AI and Our Brains: *A Big Challenge*

## **Dopamine hit!!**

- Dopamine can provide an intense feeling of reward.
- Dopamine is most notably involved in helping us feel pleasure as part of the brain's reward system.

# Science Advise, AI and Our Brains: *A Big Challenge*

Creation and implantation of “memories”

## **Galaxy brain: The neuroscience of how fake news grabs our attention, produces false memories, and appeals to our emotions**

*Pathos* (the appeal to emotion): persuade an audience by purposely evoking certain emotions to make them feel the way the author wants them to feel. Use of deliberate word choices, meaningful language, use examples, and stories, etc. to evoke emotion.

# Science Advise and AI: Challenges and Opportunities

- To regulate or not to regulate: THAT is the question
  - An electric analogy
- According to ChatGPT, *I do not exist*.
  - Implications for diversity, equity and inclusion
- Public perceptions of credibility and reliability
  - The balance between democratization of information and spreading of mis-, dis- and mal-information



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