THE NATIONAL ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE

Reproducibility and Replicability in Science

Inaugural meeting of the Committee

Joan Ferrini-Mundy

COO, NSF

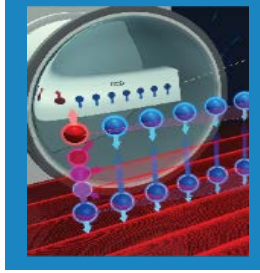
RESEARCH IDEAS

Harnessing Data for 21st Century Science and Engineering

The Future of Work at the Human-Technology Frontier

Navigating the New Arctic

Windows on the Universe:
The Era of Multi-messenger Astrophysics



The Quantum Leap:
Leading the Next Quantum Revolution

Understanding the Rules of Life:
Predicting Phenotype

PROCESS IDEAS

Mid-scale Research Infrastructure

NSF 2026

Growing Convergent Research at NSF

NSF INCLUDES: Enhancing STEM through Diversity and Inclusion

Purpose of the Study



- Origins: The House Committee for Science, Technology and Space asked the National Science Foundation and the National Academies to look into the issues surrounding reproducibility in science, AICA 116.

- Rationale: concerns that some published research findings cannot be reproduced or replicated by other research groups and weakening of the general public's trust in the prevailing scientific processes.

- Importance: opportunity to start a constructive dialogue within the scientific community on how best to improve scientific processes and ensure that confidence in the scientific enterprise is retained.

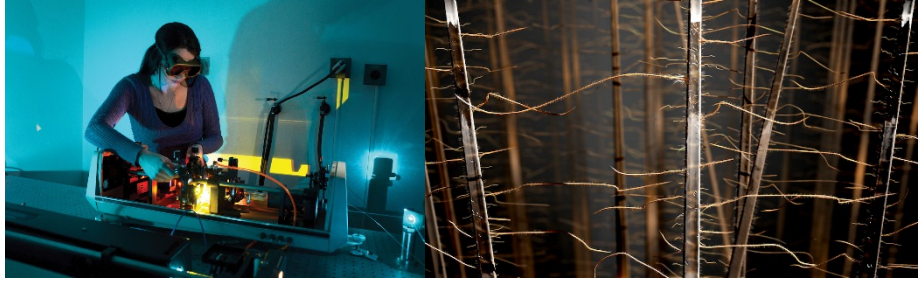
- Timeline: Congress envisioned a one-year time line. Due to delays surrounding startup, the expectation is that the prepublication release will occur in late November of 2018.

Issues of Particular Interest to NSF (from project scope statement)

- What are issues of reproducibility and replicability across the diverse fields of science and engineering?

- If there are problems with the lack of replication and reproducibility, what does it mean for overall health of science and engineering fields and the public's perception of these?

Relevant NSF Activities



- Requiring data management plans as an integral part of each proposal: specific guidelines developed by cognizant communities
- NSF Director sponsored a symposium on Robust and Reliable Science: The Path Forward (in 2015)
- Workshops (started in 2014), e.g.,
  - Robust Research in the Social, Behavioral and Economic Sciences
  - Robustness, Reliability and Reproducibility in Science
  - IEEE Workshop on Research Curation and Research Reproducibility
- Dear Colleague Letters to advise community about developments and opportunities