

Midwest Big Data Innovation Hub

Collaboration Cafe

May 2022



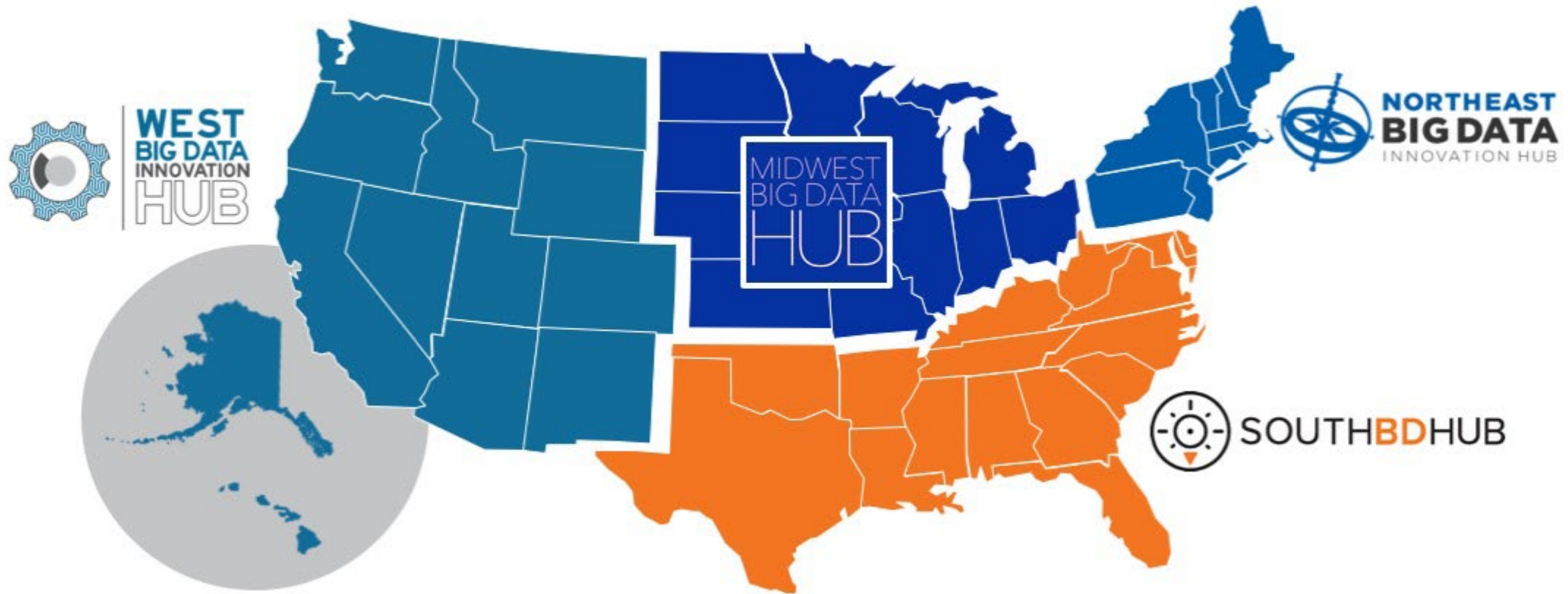
IOWA STATE
UNIVERSITY



supported by NSF [1916613](#)



Four Hubs, One Mission



What We Do

Engage communities, share resources, and build partnerships that harness data science to address societal and scientific challenges.



Priority Areas and Cross-cutting Themes



- Advanced Materials and Manufacturing
 - **Big Data in Health**
 - Digital Agriculture
 - Smart & Resilient Communities
 - Water Quality
-
- Data Science Education and Workforce Development
 - **Cyberinfrastructure and Data Sharing**



Collaboration Cafe webinar series

Goals:

- Building regional capacity for large-scale proposal response
- Growing a cross-disciplinary network of data science collaborators
- Elevating early career researchers
- Creating a more diverse data science community by actively engaging with non-R1 institutions, including minority-serving institutions (MSIs), tribal colleges and universities (TCUs), and predominantly undergraduate institutions (PUIs)
- Partnering with industry, government, nonprofits, and civic organizations to support translational research and transition-to-practice activities

Regular segments:

- Funding opportunity walkthroughs
- Lessons learned from prior awardees
- Researcher lightning talks
- Speed networking
- Small group discussions

Collaboration Cafe resources

- [MBDH website](#)
 - Web page with upcoming sessions
 - Short form for engagement
- [Slack community](#)
 - Networking
 - Input on future sessions
 - New solicitations
- [Shared Google Drive](#)
 - Running notes doc
 - Relevant prior awards to Midwest institutions
- [YouTube playlist](#) of webinar recordings

Cafe Ground Rules

- Multi-disciplinary team science is a core focus here - all proposal ideas are welcome for discussion
- Research proposals are competitive; some people may not be willing to discuss the details of their projects in this venue
- Private conversations in breakout rooms or Slack private messages are private
- Participating in Collaboration Cafe activities falls under our [NSF Code of Conduct](#)

MBDH engagement on proposals

There are multiple opportunities to have MBDH participate on proposals for this program, or other projects:

- Engagement partner: Communications, outreach, community assessments, participation in Hub events and activities
 - Non-exclusive Letter of Collaboration
 - Minimal to no funding to MBDH
- Collaborative partner: Engagement roles + involvement in developing and managing project activities
 - Non-exclusive Letter of Collaboration, subaward, co-PI roles, etc.
 - Funding to recover costs of MBDH staff time and other expenses
- **Note:** The MBDH is a neutral party and often provides non-exclusive Letters of Collaboration to multiple proposers to a solicitation

May Solicitation: NSF/NIH SCH program

“Smart Health and Biomedical Research in the Era of Artificial Intelligence and Advanced Data Science”

NSF 21-530	Proposals due: November 10, 2022 [Program overview]
Program goals	<ul style="list-style-type: none"> “Support the development of transformative high-risk, high-reward advances in computer and information science, engineering, mathematics, statistics, behavioral and/or cognitive research to address pressing questions in the biomedical and public health communities.”
Size and duration (max)	<ul style="list-style-type: none"> Up to \$1,200,000 over 4 years (\$300k/yr)
Number of awards (est)	<ul style="list-style-type: none"> 10-16 per year
LOI/preproposal?	No, but consider contacting a Program Officer to discuss the expectations of the NSF Directorate or NIH Institute most aligned with your research
Eligibility limits & other guidance	<ul style="list-style-type: none"> Participation on no more than 2 proposals per 12-month period as Principal Investigator (PI), co-PI, Project Director (PD), Senior Personnel or Consultant May not duplicate other pending NSF or NIH proposals, or those submitted to NIH in the past 37 months that are “essentially the same” (with some exceptions) Open to IHEs + other non-profit, non-academic organizations



NSF/NIH SCH program guidance

- Multi-Directorate at NSF
- Multi-Institute at NIH
- “the work to be funded by this solicitation must make fundamental contributions to two or more disciplines” to address the integrative, convergent, interdisciplinary approaches desired
- Proposals may address:
 - “computational, algorithmic, data fusion and systemic level issues in biomedical data science research”
 - “human perceptual, cognitive, or behavioral factors that impact the effectiveness of technology and data science research in generating change.”
 - *“Traditional disease-centric medical, clinical, pharmacological, biological or physiological studies and evaluations are outside the scope of this solicitation.”*
 - Engagement with human participants is allowed, but randomized controlled trials (RCTs) are out of scope

NSF/NIH SCH proposal guidance (from the solicitation)

- Research themes of interest (but not restricted to):
 - 1) Information Infrastructure
 - 2) Transformative Data Science
 - 3) Novel multimodal sensor system hardware
 - 4) Effective Usability
 - 5) Automating Health
 - 6) Medical image interpretation
 - 7) Unpacking health disparities

NSF/NIH SCH proposal elements

- Standard elements (Project Summary, Project Description, Budget, etc.)
- Supplementary Documents
 - “a Collaboration Plan is required for ALL proposals”
 - Human Subjects / Vertebrate Animals Protection plans (if needed)
 - Data Management Plan
 - Documentation of Collaborative Arrangements of Significance to the Proposal through Letters of Collaboration
 - Funded collaborators
 - Unfunded collaborators (PAPPG template LoCs vs letters of support)
 - List of Project Personnel and Partner Institutions
 - Postdoctoral Mentoring Plan (if applicable)
- Proposal Preparation Checklist – includes required information for the Project Description and other elements
- FastLane vs Grants.gov submission?

NSF/NIH SCH review guidance (from the solicitation)

- Standard NSF “Merit Review Principles and Criteria” section
- Additional Review Criteria for SRC proposals
 - Collaboration and Management: “The collaboration plan should demonstrate the extent to which the group is integrated, has a common focus and the quality of the plan for management and collaboration.”
- Additional NIH Review Criteria (see full details in solicitation)
 - Overall Impact
 - Significance
 - Investigator(s)
 - Innovation
 - Approach
 - Environment
 - Protection for Human Subjects
 - Inclusion of Women, Minorities, and Children
 - Vertebrate Animals
 - Biohazards
 - Budget and Period of Support
 - “For proposals that are selected for funding consideration by participating NIH Institutes, the NIH will ask the applicant(s) to resubmit the proposal in an NIH-approved format directly to the Center for Scientific Review (CSR)”



SMART HEALTH AND BIOMEDICAL RESEARCH IN THE ERA OF ARTIFICIAL INTELLIGENCE AND ADVANCED DATA SCIENCE

Aka: Smart Health (SCH)

Fenglou Mao, Ph.D.

Office of Data Science Strategy (ODSS)

National Institutes of Health (NIH)

Special Track on ISMB 2022: NIH-NSF Smart Health Program

Hosted by ODSS, NIH

[ISMB 2022](#) – Madison, WI, July 10-14, 2022

[ISMB 2022 Schedule](#) – Smart Health track is scheduled on July 12

Featured topics in the Smart Health track:

- PI presentations on how to develop a responsive SCH proposal
- Mock review
- Panel Discussion

NIH Data Science Strategic Plan

Data Infrastructure	Modernized Data Ecosystem	Data Management, Analytics, and Tools	Workforce Development	Stewardship and Sustainability
<ul style="list-style-type: none">•Optimize data storage and security•Connect NIH data systems	<ul style="list-style-type: none">•Modernize data repository ecosystem•Support storage and sharing of individual datasets•Better integrate clinical and observational data into biomedical data science	<ul style="list-style-type: none">•Support useful, generalizable, and accessible tools and workflows•Broaden utility of and access to specialized tools•Improve discovery and cataloging resources	<ul style="list-style-type: none">•Enhance the NIH data-science workforce•Expand the national research workforce•Engage a broader community	<ul style="list-style-type: none">•Develop policies for a FAIR data ecosystem•Enhance stewardship

Implementation Tactics:

- Adopt and adapt emerging and specialized methods, algorithms, tools, software, and workflows.
- Promote innovative contributions to biomedical data science from allied fields such as mathematics, statistics, computer science, engineering, and physics (see text box, “NSF/NIGMS Mathematical Biology Program,” below).
- Promote development and adoption of better mobile-device and data-interface tools through APIs that integrate with certified health information technology to pull data and support data analysis.
- Support research to develop improved methods for clinical informaticists and other scientists to use [certified electronic health records](#) and other clinical data securely and ethically for medical research.

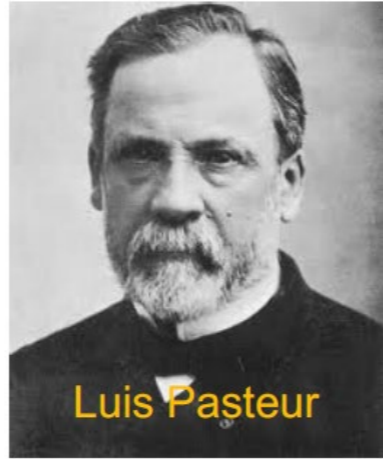
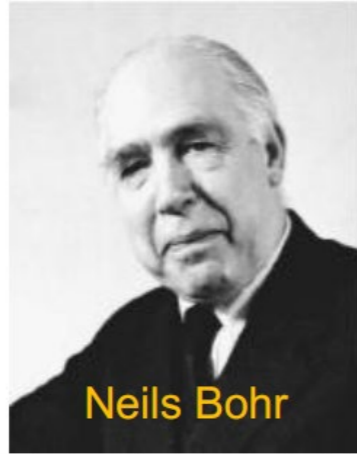
SCH: A NIH-NSF Interagency Trans-NIH Program

Purpose:

- To develop transformative high-risk, high-reward advances in **computer and information science, engineering, mathematics, statistics, behavioral and/or cognitive research** to address pressing questions in the **biomedical and public health** communities.
- To support **interdisciplinary teams** that develop novel methods to intuitively and intelligently collect, sense, connect, analyze and interpret data from individuals, devices and systems to enable discovery and optimize health.

Pasteur's Quadrant

Quest for Basic Understanding



Low

High

Application Inspired: Consideration of Use

Smart Health

Donald E. Stokes, *Pasteur's Quadrant – Basic Science and Technological Innovation*,
Brookings Institution Press, 1997

Key Requirements

The work to be funded by this solicitation must

- **Make fundamental contributions to two or more disciplines**, such as computer or information sciences, engineering, mathematical sciences, social, behavioral, biomedical, cognitive or economic sciences
- **Improve fundamental understanding** of biomedical and health related processes
- **Address a key health problem**

- **Budget: up to \$300K/year for up to 4 years**

History of SCH

FY2013, 6 NIH ICOs

- NSF 13-543, Smart and Connected Health (SCH)

FY2016, 7 NIH ICOs

- NSF 16-601, Smart and Connected Health (SCH)

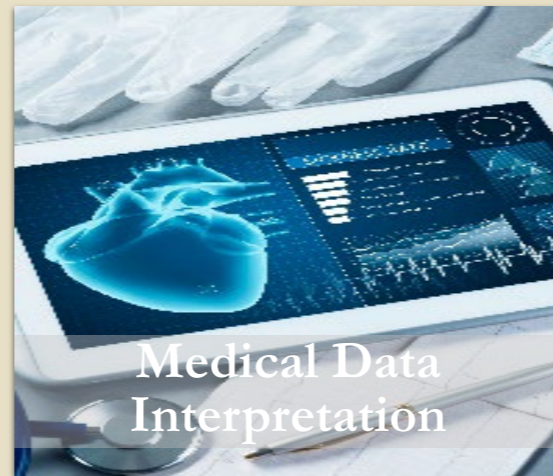
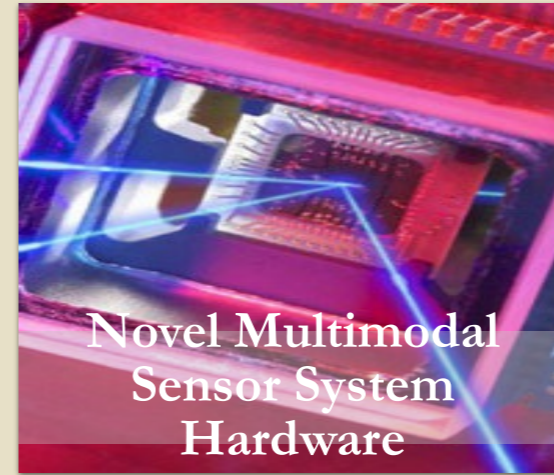
FY2018, 10 NIH ICOs

- NSF 18-541, NOT-OD-18-149, Smart and Connected Health (SCH): Connecting Data, People and Systems

FY2021, 23 NIH ICOs

- NSF 21-530, NOT-OD-21-011, Smart Health and Biomedical Research in the Era of Artificial Intelligence and Advanced Data Science

SCH Highlighted Themes



The Leadership Team



Dr. Wendy Nilsen,
Acting Deputy Division Director,
Information and Intelligent
Systems (IIS) Division,
NSF



Dr. Dana Wolff-Hughes,
Program Director,
Epidemiology and Genomics
Research Program,
NCI/NIH



Dr. Fenglou Mao,
Program Officer,
Office of Data Science Strategy,
DPCPSI/OD/NIH



Dr. Natalia Komissarova,
Scientific Review Officer,
Division of Translational and
Clinical Sciences,
CSR/NIH

Previous leadership team members:

Dr. Partha Bhattacharyya, Program Director, NIA/NIH

Dr. Maria Nurminskaya, SRO, CSR/NIH, currently Program Officer in NICHD

The Entire SCH Team*

The NSF Smart Health Team

- Wendy Nilsen, CISE/IIS
- Scott T. Acton, CISE/CCF
- Balakrishnan (Prabha) Prabhakaran, CISE/IIS
- Steven J. Breckler, SBE/BCS
- Fay Cobb Payton, CISE/CNS
- Wei Ding, CISE/IIS
- Georgia-Ann Klutke, ENG/CMMI
- Tatiana (Tanya) Korelsky, CISE/IIS
- Sylvia Spengler, CISE/IIS
- Betty K. Tuller, SBE/BCS
- Albert Z. Wang, ENG/ECCS
- Huixia (Judy) Wang, MPS/DMS
- John X.J. Zhang, ENG/ECCS

The NIH Smart Health Team

- Fenglou Mao, ODSS
- Dana Wolff-Hughes, NCI
- James Gao, NEI
- Heather Colley, NHGRI,
- Erin Iturriaga, NHLBI
- Partha Bhattacharyya, NIA
- Steve Tsang, NIAID
- Anthony Kirilusha, NIAMS
- Qi Duan, NIBIB
- Samantha Calabrese, NICHD
- Susan Wright, NIDA
- Roger Miller, NIDCD
- Emir Khatipov, NIDCR

- Xujing Wang, NIDDK
- Christopher Duncan, NIEHS
- Paul Brazhnik, NIGMS
- Adam Haim, NIMH
- Deborah Duran, NIMHD
- Sahana Kukke, NINDS
- Kristopher Bough, NINR
- Yanli Wang, NLM

* Names were captured in 2020/12 with a few known updates

SCH Review and Award Making Process - NIH

Review preparation - NSF

Panel review – NSF & NIH

NIH applications selection

Transferring of applications to NIH

NIH council meetings preparation

NIH award making

NIH ODSS' Role in SCH Program

- Provide coordination between NIH and NSF, and between NIH ICs and CSR
- Provide co-funding of up to \$150K each to ~8 SCH awards

Discussion

- Prior experiences with SCH proposals?
 - What would you do differently (or the same)?
 - What should new proposers be aware of?
 - What was most challenging for you?
 - How has your award influenced your research and collaborations?
- Opportunities for Midwest collaborations
 - Many awards - Where are the gaps?
 - What are the key challenges over the next 5 years?
- Other questions

Get involved

- <https://midwestbigdatahub.org/cafe>
- info@midwestbigdatahub.org

June 16, 2022

3:00–4:00 p.m. CT / 4:00–5:00 p.m. ET

- Topic: CI research funding for early-career / underresourced institutions
- Solicitation: NSF Computer and Information Science and Engineering Research Initiation Initiative (CRII) (21-591)



Get Involved ▾

MBDH Collaboration Cafe

Community Development and Engagement Program

Community Advisory Panel

Midwest Carpentries Community

Data Science Student Community

Regional Activities

Event in a Box Tool Kit

Explore Funding Opportunities

Join a Working Group

