While we are waiting to begin the webinar, please review the **Synopsis of the Program below**, copied from the solicitation.

The purpose of the ***Research on Emerging Technologies for Teaching and Learning (RETTL)*** program is to fund exploratory and synergistic research in emerging technologies (to include, but not limited to, artificial intelligence (AI), robotics, and immersive or augmenting technologies) for teaching and learning in the future. The program accepts proposals that focus on learning, teaching, or a combination of both. The scope of the program is broad, with special interest in diverse learner/educator populations, contexts, and content, including teaching and learning in science, technology, engineering, and mathematics (STEM) and in foundational areas that enable STEM (e.g., self-regulation, literacy, communication, collaboration, creativity, and socio-emotional skills). Research in this program should be informed by the convergence (synthesis) of multiple disciplines: e.g., learning sciences; discipline-based education research; computer and information science and engineering; design; and cognitive, behavioral, and social sciences. Within this broad scope, the program also encourages projects that investigate teaching and learning related to futuristic and highly technological work environments.

FY21 Changes from prior (Cyberlearning) Solicitation

- The Cyberlearning program is updated with a new name that highlights broad scope of program
- There is a new additional focus on Teaching
- The budget is increased to $850k
- An individual may participate as **PI, co-PI, or Senior Personnel in no more than a total of one (1)** proposal in response to this solicitation.
- If you are planning to have an Advisory Board, **do not contact** any potential members until after project is awarded

Brief history of NSF research programs in advanced learning technologies

- The new RETTL program continues to fund projects in advanced learning technologies for STEM and other foundational areas that enable STEM learning

- Background: NSF Cross-directorate programs in advanced learning technologies

  - Cyberlearning program (2011-2020). From (FY18 –FY20) there was a new focus to solicit projects related to Work at the Human-Technology Frontier, aligned with NSF "Big Idea"

  - Advanced Learning Technologies (2005-), and other initiatives such as "Learning and Intelligent Systems" "Collaborative Research in Learning Technologies (CRLT)" 1996

- Also please see "Ambitious Mashups" report by CIRCLS, the **Resource Center for the PI Community**

  - And more later about CIRCLS…

CIRCLS | Center for Integrative Research in Computing and Learning Sciences

Scope of RETTL

- RETTL maintains the same spirit of the former Cyberlearning program
  - *The program **continues to fund research in advanced learning technologies** in any content area with any participants and in any context
    - Welcomes projects that are related to the future of work at the human-technology frontier
    - Includes a new focus on Teaching
- *A key requirement is that projects should be exploratory, experimental; those that are risky and potentially transformative are highly encouraged
- Projects should be highly interdisciplinary
- Projects that advance broadening participation are strongly encouraged

A cross-directorate effort

- ▶ CISE – Computer and Information Science and Engineering
- ▶ EHR – Education and Human Resources
- ▶ ENG – Engineering
- ▶ SBE – Social, Behavioral and Economic Sciences

Projects must have innovations in **both** teaching/learning and technology research

- Projects should have clear research objectives that integrate teaching/learning and technology.

- **RETTL is unique to other NSF programs regarding the requirement for research advances in both areas.**

- **Teaching and/or learning innovation**

  - For teaching, this includes new teaching processes and approaches, as integrated with the proposed technology in an educational setting,

  - For learning, this includes new learning processes, principles, and theories (e.g., cognitive, behavioral, affective, socio-cultural, social, epistemological, problem-based, project-based, developmental, and other perspectives) relevant for how the proposed technology will be situated in a learning setting, to include home, school, or workplace.

- **Technology innovation**

  - This includes new and emerging technologies within the teaching and learning context (e.g., AI-driven technologies; virtual, immersive, embodied, interactive, or augmented environments; multimodal modeling/sensing of cognitive or affective states; language and speech processing; learning analytics and dashboards; and robotics).

  - The technology innovation should advance fields involving computer science, information science, and/or engineering.

Project Description

▶ Project Descriptions **must** include the following content:

1. A description of the vision, beyond the current state-of-the-art, to include

    1. learning and/or teaching innovation; and

    2. technology innovation (to include, as relevant, addressing issues of privacy and bias regarding diverse people, organizations, and settings).

2. A description of the proposed methodology, including:

    • research questions, based on interdisciplinary foundations, addressing issues in teaching/learning sciences; and computer, information and engineering sciences; and

    • a research plan articulating the research design, data collection, and analysis methods.

Advisory Boards

- Funds may be allocated for an External Advisory Board; however, potential advisory board members should not be approached or identified in the proposal.

CAREER proposals

▶ We accept CAREER proposals

▶ Same requirements for CAREERs as for regular RETTL proposals

  ▶ Must be highly interdisciplinary with innovations in both technology and learning

▶ Important to send a 1-2 page summary of the project to the RETTL co-leads to determine whether the project is a fit

What is **<u>not</u>** within the scope of RETTL

► Incremental advances in existing technologies or deployment/implementation of existing technologies in novel learning contexts will not be funded through this program.

► Additionally, this program will **not** fund projects that:

- aim simply to implement and evaluate a software application or technology in a learning setting;

- promote student competency development in using technology (e.g., computer literacy); or

- primarily assess educational impact with current technology (that is, technology implementation projects).

► In contrast to the above, proposals in this program **must be future-oriented** and focus on the design or refinement of new and emerging learning technology innovations.

Other relevant programs

Sample Programs	Key requirements
EHR: **DRK12**: Discovery Research K–12 **IUSE**: Improving Undergraduate STEM Education **AISL**: Advancing Informal STEM Learning	Learning domain is STEM disciplines Contexts include K--12 (DRK12), undergraduate (IUSE), or informal learning (AISL). These programs focus on research that addresses current challenges.
ITEST: Innovative Technology Experiences for Students and Teachers	Learning aims towards creating technology--literate STEM workforce.
ECR: EHR Core Research	Foundational research on STEM--related learning environments.
CISE: **HCC**: Human-Centered Computing	Research on humans and computing, not necessarily learning focused—contributes to literatures such as human--computer interaction
RI, III, and other CISE programs	Focus on computer science research (which includes CS that may have application to education) e.g., AI,/ML, NLP, etc.
SBE: **SL:** Science of Learning and Augmented Intelligence	Basic and applied research on learning in all domains.
Cross-Directorate: **NRI:** National Robotics Initiative	Includes research on robotics in education
CS4All (joint with EHR)	Focuses on computer science and computational thinking education

General guidelines for selecting a program

- Send 1-2 page concept paper to Program Leads to confirm whether the project is within scope
- For RETTL, please send to Amy Baylor & Tatiana Korelsky

CIRCLS.org is a network for RETTL researchers

▶ PIs: Jeremy Roschelle, Judi Fusco, Erin Walker, Sarita Pillai

▶ Provides resources that can be helpful for proposal writing

▶ Can suggest new colleagues to help you build your team

▶ Serves both RETTL projects and those with similar missions by building a networked community

▶ See the report "Ambitious Mashups" with useful history and recommendations

▶ See "5 Ways CIRCLS Can Help You" on their circls.org website

Questions