



Convening Theme

Learning technology researchers have long spoken of broader horizons, broad teamwork, broadening participation, broader impacts, and more. Our theme engages the importance of thinking critically and strategically about the meaning of “broad” as our field conducts future-oriented research on learning and teaching technologies. Our prior CL19 convening revealed WHY broadening the diversity, equity, and inclusion efforts within our research projects is so important.

This meeting, CIRCLS’21, will provide multiple, highly interactive opportunities for attendees to work together on HOW the field can make stronger progress by examining and remaking “broad.” How can this familiar word become more meaningful and specific, leading to greater intellectual merit and impacts?

If you have questions about the event, contact the CIRCLS convening staff: circls-contact@digitalpromise.org



Remake Broadening

CIRCLS'21 Convening

September 13 & 14, 2021

Day 1

*All times are Eastern Standard Time

| | |
|----------------|---|
| 1:00 - 1:17 PM | Welcome from Henry Kautz and Karen Marrongelle + Meeting Overview |
| 1:20 - 2:00 PM | Discuss Research at Roundtables |
| 2:05 - 2:45 PM | Proposals and Opportunities Join 1 of 5 |
| 2:45 PM | Break |
| 3:00- 3:35 PM | Towards Identity-Inclusive Computing Education Keynote by Nicki Washington |
| 3:35-3:55 PM | Open Discussion about Keynote and Emerging Themes |
| 4:00 PM | Expertise Connections: Learn and Network with Colleagues Join 1 of 12 |
| 5:00 PM | End of Day 1 |
| 6:30 - 8:00 PM | After Hours: Meet and Connect with Colleagues |



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Day 2

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|----------------|--|
| 1:00 - 1:18 PM | Opening Remarks from Erwin Gianchandani & Andruid Kerne + Today's Goals |
| 1:20 - 1:55 PM | View and Discuss Projects at Gallery Walk |
| 2:00 - 2:35 PM | Remaking Broadening: From Why to How Keynote by Craig Watkins |
| 2:35 - 2:55 PM | Open Discussion about Keynote and Emerging Themes |
| 3:00 - 4:15 PM | Strategy Sessions: Make a Plan to Remake Broadening Join 1 of 10 |
| 4:20 PM | Remake Broadening: Town Hall with NSF Program Officers |
| 5:00 PM | Closing |



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1:00pm **Welcome from Henry Kautz and Karen Marrongelle Meeting Overview**

- **Amy Baylor and Tanya Korelsky**, NSF RETTL Program Officers
- **Henry Kautz**, NSF IIS Division Director
- **Karen Marrongelle**, NSF COO (formerly AD of EHR)

1:20pm **Discuss Research at Roundtables**

1. AI to Support Student Collaboration
 - a. Discussion Tracker: Applying Human Language Technologies to Improve The Teaching of Collaborative Argumentation | **Amanda Godley & Diane Litman**
 - b. FACT: Formerly an Intelligent Classroom Orchestration System | **Kurt Vanlehn**
2. Educational Virtual Reality
 - a. UniVRsal Access: Broadening Participation in Informal Stem Learning Through Virtual Reality | **Ibrahim Dahlstrom-Hakki**
 - b. VR for Learning: Sharing The Promise and Refining The Potential | **Matthew Boyer**
3. AI to Support Literacy
 - a. NLP for Writing and Reading Assistants | **Wei Xu**
 - b. Parent-EMBRACE: Intelligent Support Of Parent-child Dialogic Reading | **Erin Walker**



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1:20pm **Discuss Research at Roundtables Cont.**

4. Learning Analytics Applications For Remote Learning Environments
 - a. Visualizing Student Engagement Analytics To Inform Online Classroom Practice | **Mahir Akgun**
 - b. Multimodal Learning Analytics In Virtual Learning Environments | **Roghayeh Barmaki**
5. AI to Improve The Design of Online Learning Opportunities
 - a. Towards a Realization of Self-improving Online Courseware | **Noboru Matsuda**
 - b. Indexing Class Videos to Enable Contextual Help Seeking | **Perry Samson**
6. Early Childhood STEM Education
 - a. Young Academic Music and Computational Thinking | **Susan Courey**
 - b. Can Preschoolers Engage in Data Collection and Analysis With a Digital Tool? Initial Findings and Lessons Learned | **Ashley Lewis Presser**
7. Novel Instructional Approaches in Computer Science and Cybersecurity
 - a. Introduction to the K-12 Cybersecurity Learning Standards | **Chuck Gardner**
 - b. Two Cases Of Documentation for Learning: Makercards | **Marti Louw**



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1:20pm **Discuss Research at Roundtables Cont.**

8. Conducting Research with Digital Learning Platforms
 - a. How Can Platforms Like Assistments Be Used To Improve Research | **Neil Heffernan**
 - b. Quick Red Fox: Optimizing Classroom Interviews with SRL And Affect Detection | **Ryan Baker**
9. Conducting Research with Digital Learning Platforms
 - a. How Can Platforms Like Assistments Be Used to Improve Research | **Neil Heffernan**
 - b. Quick Red Fox: Optimizing Classroom Interviews with Srl and Affect Detection | **Ryan Baker**
10. Detecting Learning Errors and Problems
 - a. Graspable Math: Examining Perceptual Learning Through Technology | **Erin Ottmar**
 - b. Predicting Student Behavior Through Face And Gesture Detection | **Beverly Woolf**
11. Informal STEM Education
 - a. Data Science to Support Youth Advocacy | **Rosta Farzan**
 - b. Revealing Mathematical Learning in Non-formal Spaces | **Caro Williams-Pierce**
12. Equity and Edtech
 - a. From Avoidant to Aware: Automating Feedback in Simulations on Equity in Computer Science Education | **Joshua Littenberg-Tobias**
 - b. Fairness in Educational Technologies | **Huzefa Rangwala**



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2:05pm **Proposals and Opportunities Sessions**

1. RETTL Proposals: **Amy Baylor & Tanya Korelsky**
2. NSF Support for Emerging Scholars: **Stephanie Teasley and Dalila Dragnic-Cendric**
3. IES Opportunities: **Christina Chhin**
4. NSF Racial Equity Program: **Narcrisha Norman**
5. Three AI Institutes in Education:
 - a. AI Institute for Student-AI Teaming (iSAT) | **Sidney D'Mello and Thomas Philips**
 - b. NSF AI Institute for Adult Learning & Online Education (AI-ALOE) | **Ashok Goel**
 - c. NSF AI Institute for Engaged Learning (AIEngage.org) | **Cindy Hmelo-Silver and James Lester**

4:00pm **Expertise Connections: Learn and Network**

1. Computational Thinking with an Equity Lens
2. Learning Environments and Platforms
3. Talking With an AI: What is Possible?
4. What Can a Learning Scientist Do with AI?
5. AI & Education Policy
6. Equity and Ethics Considerations for AI
7. Learning Analytics - Data Visualizations and Representations
8. Top Things to Know About Motivation and Engagement
9. Equity and Accessibility - Inclusive Design
10. What is Design-Based Research?
11. Learning Sciences and Learning Theories in RETTL Work
12. Learning Environments and Platforms - Augmented/Virtual/Mixed Reality



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6:30 -
8:00pm

After Hours: Meet and Connect with Colleagues

Join us "After Hours" to connect and chat with other CIRCLS'21 attendees. We will gather virtually for a casual, interactive meet-up. Drop in at any time and make connections. More details to come!



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1:00pm **Opening Remarks from Erwin Gianchandani & Android Kerne + Today's Goals**

- **Erwin Gianchandani**, NSF CISE, AI Initiatives
- **Android Kerne**, NSF Fairness in AI & Human-Centered Computing
- **Jeremy Roschelle**, CIRCLS

1:20pm **View and Discuss Projects at the Gallery Walk**

1. Introduction to The K-12 Cybersecurity Learning Standards
2. Young Academic Music And Computational Thinking
3. The Value of an Anonymous Backchannel in Introductory Courses
4. Artificial Intelligence in Education: Trends And Innovations in K-12
5. Autoscoring Open-ended Reading Comprehension Questions for Formative Assessment
6. An Affective Class Report Card and Dashboard
7. ASL + VR: Lessons From the First Three Years Of Signing Avatars and Immersive Learning (SAIL)
8. VRFE: Virtual Reality Field Experiences
9. Explicit And Implicit Feedback in Computer Assisted Pronunciation Training
10. A Framework for Conducting Remote Classroom Research
11. From Avoidant to Aware: Automating Feedback in Simulations on Equity in Computer Science Education



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1:20pm **View and Discuss Projects at the Gallery Walk**

12. A Tool To Support Peer Critique and Automated Debriefing for Simulation-based Training of Paramedics
13. The Preschool Data Toolbox: A Teacher-mediated Tool to Engage Preschoolers In Learning About Data
14. Scaffolds and Supports For Teaching Computational Thinking to Neurodiverse Learners
15. Visual Behaviour Analysis for Collaborative Learning
16. Teacher Moments: Digital Clinical Simulations for Equitable Teaching Practice in K-12 CS Classrooms
17. EDFair: Studying Fairness in Educational Mining Algorithms
18. ProWrite: Process-focused Feedback on Writing Using Biometric Technologies
19. Remote Virtual Reality Training for Behavioral Health in Nursing Education
20. Controllable Text Simplification
21. Did Online Flipped Learning Improve Through Preclass Adaptive Lessons
22. Helping Students Learn to Program with Automated, Data-Driven Support
23. How to Broaden Participation In Cyberlearning Projects to Ensure Access to People with Disabilities
24. UbiCoS: Supporting Peer Help-giving Across Middle School Mathematics Contexts
25. Mapping Learners Sensemaking



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1:20pm **View and Discuss Projects at the Gallery Walk**

27. Plant 3D Models by High School Interns for Virtual and Augmented Reality
28. Wearable Learning Cloud Platform
29. Computer History Museum
30. Mixed-reality Metaverse – A Collaborative Platform for Social Learning, Social Emotional Intelligence, and Work-based Learning
31. Two Cases of Documentation for Learning: Makercards and the Sdl Evidence Kit
32. Connections Of Earth and Sky With Augmented Reality (CEASAR): Transforming Collaborative Learning Practices with Shared and Embedded Digital Models

3:00pm **Remake Broadening: Strategy Sessions**

1. Broadening in Research Methods: Research for Inclusive Design
2. Broadening in Research Methods: New Human-technology Interactions
3. Broadening in Research Methods: Learning Analytics
4. Broadening in Research Methods: Talking With an AI
5. Broadening in Research Impacts: AI & Education Policy
6. Broadening in Research Impacts: Communication & Dissemination
7. Broadening in Research Impacts: Diversity Equity and Inclusion
8. Broadening in Research Lifecycle: Proposals
9. Broadening in Research Lifecycle: Projects
10. Broadening in Convergence Research: Forming New Collaborations for AI & Ed Futures
11. Broadening in Convergence Research: Ambitious Mashups
12. How Do I Choose a Strategy Session?

FAQ

1. Who can attend this meeting?

Researchers with NSF projects with a RETTL theme as well as teachers, informal educators, foundation program directors, technologists, designers, graduate students, and other stakeholders. Participants must apply, be accepted, and register for the event in order to attend.

2. Can I attend part of the meeting?

CIRCLS'21 will be a working meeting. Participants should commit to the 2 full days of the meeting. The meeting activities are designed to first help people learn about the community members, the research being done, the wider field and culminate in activities that may inform future projects, proposals, and the field. If you can, please block the days and times on your calendar now. The meeting is just 2 half-days.

3. I applied to attend; when will I learn if I'm accepted? And why do I have to both apply AND register?

CIRCLS'21 is an convening for NSF PIs as well as others who are involved in RETTL-related work (kind of a PI-meeting-plus). We have an application process to gather input on topics of interest to attendees and to help us prioritize acceptance if more people apply than we can accommodate (i.e., PIs get priority if we have more applicants than space allows).

4. How do I see the webcast?

Portions of the event will be webcast. When you register for the webcast, you will receive an email with instructions. We invite you to also read and post tweets to the event hashtag, [#CIRCLS21](#).

5. When will Registration be open?

Registration will be open around the beginning of August. Please stay tuned to our tweets or check back here for more information.

6. What if I have a question before the event?

If you have any questions, please [contact the CIRCLS convening staff](#).



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Organizers and Sponsors

CIRCLS 2021 is sponsored by the National Science Foundation and hosted by CIRCLS. CIRCLS is chartered by NSF to support the Research on Emerging Technologies for Teaching and Learning (RETTL) research community.

Program Committee Members

Heather Pon-Barry, Mount Holyoke College

Erin Ottmar, Worcester Polytechnic Institute

David Lockett, School of Applied Computational Sciences, Meharry Medical College

Yoav Bergner, New York University

Matt Bernacki, University of North Carolina at Chapel Hill

Vitaliy Popov, University of Michigan

Monica Miao Xia Chan, Columbia University

Melissa Rasberry, University of Michigan

Nonye Alozie, SRI International

Brian Smith, Boston College

The CIRCLS staff thanks the program committee for their innovative ideas and thoughtful input into the agenda for this meeting.



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CIRCLS Staff

Jeremy Roschelle, Digital Promise

Judith Fusco, Digital Promise

Shari Gardner, SRI International

Sarita Pillai, Education Development Center

Wendy Martin, Education Development Center

Erin Walker, University of Pittsburgh

Leah Friedman, University of Pittsburgh

Carly Chillmon, Digital Promise

Dalila Dragnić-Cindrić, Digital Promise

Jonathan Pittman, Digital Promise

Pati Ruiz, Digital Promise

Technical Facilitators for Expertise Connections and Strategy Sessions

Nilavra Bhattacharya

Tugba Boz

Rachel Dickler

Sreecharan Sankaranarayanan

Kristin Stephens-Martinez

The CIRCLS staff thanks our tech facilitators for their help in having this convening run smoothly.