Come join us for our fall speaker series hosted by the Special Interest Group of MAA for Inquiry-Based Learning. Each session is 50 minutes long. Participants will have an opportunity to engage in activities and learn strategies to improve teaching and learning. All are welcome.

Peter Liljedahl
August 29 @ 12 pm EDT
Building Thinking Classrooms

Stephanie Salomone
September 26 @ 12 pm EDT
Inquiry on Inquiry: Questions for Formative Assessment

Laurie Cavey
October 24 @ 3 pm EDT
Video Cases of Student Reasoning for Inquiry-Based Learning about Functions

Luiz Leyva and Kristen Amman
November 19 @ 12 pm EST
Equity in Inquiry-Based Instructional Practices across Gateway Mathematics Courses

Questions?
Lee.Roberson@Colorado.edu

http://sigmaa.maa.org/ibl/
Peter Liljedahl, August 29 @ 12 pm EDT
Building Thinking Classrooms

Abstract: Much of how classrooms look and much of what happens in them today is guided by institutional norms laid down at the inception of an industrial-age model of public education. These norms have enabled a culture of teaching and learning that is often devoid of student thinking. In this session, I present some of the results of over 15 years of research into how teachers can transform their classrooms from a space where students mimic to where students think. The practices discussed will intertwine with, and make extensive references to, the best-selling book, Building Thinking Classrooms in Mathematics (Grades K-12): 14 Teaching Practices for Enhancing Learning.

Bio: Dr. Peter Liljedahl is a Professor of Mathematics Education in the Faculty of Education at Simon Fraser University and author of the best-selling book, Building Thinking Classrooms in Mathematics (Grades K-12): 14 Teaching Practices for Enhancing Learning. Peter is a former high school mathematics teacher who has kept his research interest and activities close to the classroom. He consults regularly with teachers, schools, school districts, and ministries of education on issues of teaching and learning, problem solving, assessment, numeracy, and building thinking classrooms.

Stephanie Salomone, September 26 @ 12 pm EDT
Inquiry on Inquiry: Questions for Formative Assessment

Abstract: We faculty spend so much time centering student achievement in problem-solving and seeking and communicating answers, that we neglect to leverage student-driven curiosity to inform how and what we teach. How do we support students in asking questions and using those questions to frame their learning, given that we want students to develop skills, knowledge, and dispositions that will allow them to define and achieve success? What does it look like to center questioning, rather than answering, in a classroom community, and what impacts does this shift have on student agency? In this session, we will explore questioning as an act of bravery and persistence, as a way to amplify student voice, and as a way to encourage students to practice divergent thinking, convergent thinking, and metacognition all while digging into course content. Participants will engage in a question-generating activity that is applicable to all disciplines and can be altered for use in any course, at any level, and we will work together to create question-generating prompts that can help students understand and achieve learning outcomes.

Bio: Stephanie Salomone is a Professor of Mathematics at the University of Portland and an Associate Director of MAA Project NExT. She currently serves as Co-PI on the NSF-funded Western Regional Noyce Network project, providing professional development and networking opportunities to Noyce scholars and fellows from 14 western states. She also serves as Associate Dean for Faculty in the Shiley School of Engineering at UP, Director of the UP STEM Education and Outreach Center, and Faculty Athletics Representative. She earned her PhD at UCLA in 2005. She lives in Portland OR with her husband, three baseball-playing sons, and three miscreant cats.
Laurie Cavey, October 24 @ 3 pm EDT
Video Cases of Student Reasoning for Inquiry-Based Learning about Functions

Abstract: In this workshop, participants will learn about and experience online curriculum materials designed to engage secondary teacher candidates in analysis of students’ functional reasoning (VCAST). We will explore how video and written evidence of secondary students working on non-standard functional reasoning tasks can serve as an opportunity for college student mathematical inquiry. Specifically, we will (1) observe how a range of secondary students solved the classic bottle filling task, (2) notice how students’ intuitive approaches can be ingenious and challenge our own assumptions about how best to represent covarying quantities in graphical form, and (3) learn how other instructors have implemented the materials in a variety of instructional settings, including precalculus, calculus, as well as math and math-education courses for future teachers. We will close by discussing the role of pedagogical humility in creating an equitable, inclusive classroom.

Bio: Laurie Cavey is a professor in the Department of Mathematics at Boise State University and 2022 winner of the Distinguished College or University Teaching of Mathematics for the Pacific Northwest Section of the MAA. She specializes in mathematical knowledge for teaching concepts related to algebra, functions, and mathematical modeling at the secondary levels. She investigates the ways that instructors think about students’ mathematical ideas and how a focus on student thinking might transform the ways in which we think about mathematics instruction. Prior to her career in teacher education, she taught high school mathematics at the North Carolina School of Science and Mathematics. Whether teaching high school or college-level mathematics, inquiry-based instruction has been a persistent focus, especially as it relates to creating equitable opportunities for mathematical learning.
Luiz Leyva and Kristen Amman, November 19 @ 12 pm EST
Equity in Inquiry-Based Instructional Practices across Gateway Mathematics Courses

Abstract: Gateway mathematics courses for STEM majors, including elementary statistics and calculus, are sites of racial and gendered oppression for historically marginalized student populations. Efforts to enhance equity through instruction across these courses often include adoption of practices from inquiry-based learning (IBL).

This workshop engages participants in activities that involve analyzing Black and Latin* students’ perceptions of instructional practices from gateway mathematics courses aligned with IBL principles. These practices include discussions of mathematical thinking and groupwork. Student perceptions come from two NSF-funded projects examining instructional features that promote and limit equity in gateway courses, which did not necessarily adopt IBL as a pedagogical approach. Throughout the workshop, we highlight findings based on analyses of Black and Latin* students’ perceptions for each instructional practice. Workshop participants will gain insight into how instructional practices perceived as supportive and motivating inquiry for all students may fall short in ensuring equitable access to content and classroom participation. Black and Latin* students’ perspectives convey how instruction must explicitly challenge racialized and gendered forces (e.g., stereotypes of ability) in order for generally supportive practices aligned with IBL to promote equitable learning. We conclude with implications for equity-oriented instruction, including IBL use in and beyond gateway courses.

Bios:
Luis Antonio Leyva is an Associate Professor of Mathematics Education & STEM Higher Education in the Department of Teaching & Learning at Vanderbilt University – Peabody College of Education & Human Development. He directs the Power, Resistance & Identity in STEM Education (PRISM) Research Lab. His research examines and seeks to disrupt how interlocking systems of power, including racism and cis-heteropatriarchy, shape classroom teaching and student support in undergraduate mathematics and STEM higher education broadly. He centers undergraduate STEM students’ narratives of oppression, agency, and support to uncover how educational practices limit and expand learning opportunities that affirm their identities across intersections of race, gender, sexuality, and other social differences. His research has been supported by the Bill & Melinda Gates Foundation (Mindset Scholars Network), National Academy of Education/Spencer Foundation, and National Science Foundation. Leyva has published his research in the American Educational Research Journal, Cognition & Instruction, The Journal of Higher Education, Journal for Research in Mathematics Education, and Notices of the American Mathematical Society. He holds experience with editorial leadership in the International Journal of Qualitative Studies in Education, Journal for Research in Mathematics Education, and Journal of Diversity in Higher Education. Prior to his faculty appointment, Leyva was certified as a high school mathematics teacher and worked in several student support programs for historically marginalized populations in STEM, including the STEM Talent Expansion Program and the TRIO Upward Bound Math-Science program.

Kristen Amman is an Assistant Professor of Mathematics in the Department of Mathematics at the University of Nebraska-Lincoln. She studies student perceptions of their learning experiences across the undergraduate mathematics curriculum. Her current work investigates how student perceptions of familiarity influence their learning of content they have seen before (relearning) in contexts such as College Algebra, Calculus courses, or mathematics content courses for future teachers. She earned her Ph.D. in Mathematics Education from Rutgers University and serves as a committee member for the University of Nebraska-Lincoln’s annual Nebraska Conference for Undergraduate Women in Mathematics (NCUWM). Her most recent NSF grant investigates the learning experiences of math majors that begin their undergraduate work in community colleges. This project seeks to focus on the resources and strengths that two-year college mathematics majors bring to college regardless of their access to prior high-quality mathematics educational experiences. In alignment with Amman’s commitment to equity and social justice in undergraduate mathematics education, the project also aims to elicit two-year college mathematics majors’ perspectives on the ways that existing instruction, college culture, and institutional structures do or do not provide them the resources needed to obtain a mathematics degree.