

## Department of Mathematics Colloquium

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### Lessons learned from reinvention studies on limits in calculus



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3:30 - 4:30pm  
DERR 329

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We conducted a study to generate insights into how students might leverage their intuitive understandings of sequence convergence to develop more formal reasoning. Our aim was not to avoid standard misconceptions about definitions and proofs, rather to identify and engage challenges derived from their initial intuitive conceptions to necessitate and enable their construction of productive resolutions. We engaged six pairs of students, none of whom had previously seen a formal definition of sequence convergence, to collaboratively construct a definition using mathematical notation and quantification equivalent to the conventional definition. I outline several of the problems and solutions developed by many pairs of students in developing their formal definition. I then discuss their extension of these definitions to pointwise convergence and students' reconstructions of their definition six months later.