M E M O R A N D U M

DATE: 02/05/2024

TO: Faculty and Students

FROM: Professor(s)   Jack Spielberg
          Chair/Co-Chairs of   Samantha Brooker
          Defense for the   PhD   in   Mathematics
          Committee Members
                                          John Quigg
                                          Julien Paupert
                                          Konrad Aguilar
                                          Steven Kaliszewski

DEFENSE ANNOUNCEMENT

Candidate: Samantha Brooker

Defense Date: Friday, April 12, 2024

Defense Time: 9:00 AM

Virtual Meeting Link: https://asu.zoom.us/j/8724279044 or Wexler Hall A104 (Tempe)

 Title: Spectral triples on a non-standard presentation of Effros-Shen AF algebras

Please share this information with colleagues and other students, especially those studying in similar fields. Faculty and students are encouraged to attend. The defending candidate will give a 40-minute talk, after which the committee members will ask questions. There may be time for questions from those in attendance. However, guests are invited to attend as observers and will be excused when the committee begins its deliberations or if the committee wishes to question the candidate privately.

ABSTRACT
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ABSTRACT

The Effros-Shen algebra corresponding to an irrational number θ can be de- scribed by an inductive sequence of direct sums of matrix algebras, where the continued fraction expansion of θ encodes the dimensions of the summands, and how the matrix algebras at the nth level fit into the summands at the $(n + 1)$th level. In recent work, Mitscher and Spielberg present an Effros-Shen algebra as the C^*-algebra of a category of paths – a generalization of a directed graph – deter- mined by the continued fraction expansion of θ. With this approach, the algebra is realized as the inductive limit of a sequence of infinite-dimensional, rather than finite-dimensional, subalgebras. In this thesis, the author defines a spectral triple in terms of the category of paths presentation of an Effros-Shen algebra, drawing on a construction by Christensen and Ivan. This thesis describes categories of paths, the example of Mitscher and Spielberg, and the spectral triple construction.