MEMORANDUM

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

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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The Effros-Shen algebra corresponding to an irrational number $\theta$ can be described by an inductive sequence of direct sums of matrix algebras, where the continued fraction expansion of $\theta$ encodes the dimensions of the summands, and how the matrix algebras at the $n$th 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 – determined by the continued fraction expansion of $\theta$. 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.