COLLOQUIUM

Speaker: Daniel Bossaller, Ohio University Department of Mathematics

Title: Algebras Having Bases Consisting Solely of Strongly Regular Elements

Date: Friday, November 3, 2017

Room/Time: Meet-n-Greet: 2:30 p.m. Room 222 MM
Talk: 3:00 p.m. Room 224 MM

Host: Dr. Xiaoyu Liu

ABSTRACT:

Various recent papers deal with the so-called "invertible algebras", those algebras over arbitrary (not necessarily commutative) unital rings which have bases that consists solely of invertible elements. Somewhat surprisingly, many familiar algebras satisfy this property, including all finite dimensional algebras over fields other than $\mathbb{F}_2$ It is also known precisely which finite-dimensional algebras over $\mathbb{F}_2$ are invertible. We introduce the concept of a locally invertible algebra, that is, an algebra A having a basis $\mathcal{B}$ such that, for every $b \in \mathcal{B}$, there exists some idempotent e with b is a unit in the corner ring eAe. We show that this property is equivalent to the property that A has a basis consisting solely of strongly von Neumann regular elements. Among other results, we show that this family of algebras is strictly larger than that of invertible algebras. In particular, we show that it includes all finite dimensional algebras over arbitrary fields, as well as all clean algebras. Most importantly, the new notion opens this type of enquiry to the consideration of non-unital algebras; we will show various examples of non-unital locally invertible algebras and, if time permits, I will survey come current results in our work of determining which Leavitt Path Algebras that have locally invertible bases.

SPEAKER BIO:

Daniel Bossaller is a current PhD student at Ohio University studying non-commutative ring theory under the supervision Sergio Lopez-Permouth. His principal area of research is in Leavitt path algebras, and he is also interested in linear algebra and operator theory. Daniel is a very enterprising and methodical young man. He is getting ready to graduate this year, and has decided that he wants to have ample opportunities to lecture and share his discoveries with other people as part of the final stretch of his doctoral studies.