



# Number Theory Seminar

## Regular ternary $m$ -gonal forms

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### Abstract

For  $m \geq 3$  and  $x \in \mathbb{Z}$ , we denote the  $x$ -th generalized  $m$ -gonal number by  $p_m(x) := ((m-2)x^2 - (m-4)x)/2$  and for  $(a, b, c) \in \mathbb{N}^3$ , we define the ternary  $m$ -gonal forms by  $\Delta_{m,(a,b,c)}(x, y, z) := ap_m(x) + bp_m(y) + cp_m(z)$ . An  $m$ -gonal form  $\Delta_{m,(a,b,c)}$  is said to be regular if it globally represents all rational numbers that are locally represented by  $\Delta_{m,(a,b,c)}$ . In 1939, based on Dickson's work, Jones and Pall classified all the regular quadratic forms  $\Delta_{4,(a,b,c)} = ax^2 + by^2 + cz^2$ . In 2015, Chan and Ricci showed that for each  $m \geq 3$ , there are finitely many regular ternary  $m$ -gonal forms  $\Delta_{m,(a,b,c)}$ . Recently, M. Kim and B.-K. Oh completed the classification of regular ternary triangular forms  $\Delta_{3,(a,b,c)}$ .

In this talk, we will review backgrounds and results on regular  $m$ -gonal form. Then we will clarify Dickson's idea in the classification of regular quadratic forms and show that there are no regular ternary  $m$ -gonal forms  $\Delta_{m,(a,b,c)}$  when  $m$  is sufficiently large by extending his idea.

This is a joint work with Dr. Ben Kane.

Date:	June 5, 2019 (Wednesday)
Time:	3:00 – 4:00pm
Venue:	Room 210, Run Run Shaw Bldg., HKU

*All are welcome*