

# BI-CO MATHEMATICS COLLOQUIUM

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## "Conjugate solutions to linear equations"

Monday, October 17, 2016

Talk at 4:00 – H109

Tea at 3:30 – KINSC Math Lounge, H208

### Abstract:

For which positive integers  $a, b, c$  (with no common factors) does there exist a solution to the equation  $ax+by+cz=0$ , where  $x, y,$  and  $z$  are conjugate algebraic numbers (i.e. roots of the same irreducible polynomial)? In the 80's Smyth showed that this problem is equivalent to a very simple question about integer solutions to the equation, and conjectured that there is always a solution as long as  $a, b,$  and  $c$  are pairwise relatively prime, and could be the side lengths of a triangle -- that is,  $a$  is at most  $b+c$ ,  $b$  is at most  $a+c$ , etc. This conjecture remains open. We'll talk about why the conjecture seems difficult, both theoretically and computationally, and show that a stronger version can't be true. This contains joint work in progress with Jennifer Berg (Rice).

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