



## UCD School of Mathematics and Statistics Colloquium Seminar

**Title:** From Algebra to General Relativity and Astrophysics

**Speaker:** Professor DMITRY KHAVINSON (University of South Florida)

**Date:** Fri 5th May 2023 at 2:00PM

**Location:** Seminar Room SCN 1.25

**Abstract:** According to the Fundamental Theorem of Algebra the complex analytic polynomial of degree  $n$  has  $n$  complex roots counted with multiplicities. What if the polynomial is a non-analytic polynomial, say has a term with  $z^*$ ? What if instead of a polynomial we take a rational function of  $z$  and  $z^*$ ? Will we have a “fundamental” new theorem of new algebra? Another question. Imagine the light from a distant star or a galaxy is deflected by several, say  $n$ , very concentrated masses, point-masses. How many images of the light sources we might detect?(Similarly to when a light bulb is reflected in several mirrors in a dark room.) What is the Einstein ring? And what in God’s name these questions have in common? Well, turns out they do and are essentially equivalent. Yet, many open problems remain. The talk will be accessible to undergraduate students and no knowledge of general relativity is needed to understand the heart of the matter and the open problems.