Introduction to commutative algebra and algebraic geometry.

Abstract. The goal of this mini-course is to introduce the basics of commutative algebra and algebraic geometry from scratch, with emphasis on the dictionary between the two languages. The philosophy is that commutative algebra and algebraic geometry are two sides of the same coin, especially once one adopts the language of affine schemes: results in commutative algebra can be illustrated by pictures and, conversely, theorems in algebraic geometry can usually be reduced to ones from commutative algebra. We will assume the knowledge of the definitions of field and ring. Apart from that the course aims to be self-contained: the rest of the basic notions such as ideal, affine scheme, singularity, etc., will be defiend from first principles.

Time permitting, we will cover localization, Hilbert's Nullstellensatz, primary decomposition, dinension theory and some material related to singularities and their resolution.