Prime ideals in Noetherian rings

Sylvia Wiegand, University of Nebraska

Miniconference on Commutative Algebra
August 13 – 14, 2016
IPM, Tehran, Iran

For a commutative Noetherian ring R we consider the set $\mathrm{Spec}(R)$ of prime ideals of R as a partially ordered set, ordered by inclusion. Around 1950 Irving Kaplansky asked, "Which partially ordered sets arise as $\mathrm{Spec}(R)$ for some Noetherian ring R?" This question is still open, even when restricted to two-dimensional integral domains. Over the intervening years many mathematicians, such as Hochster, Heitmann, McAdam, Nagata, Ratliff and R. Wiegand, have worked on it.

After a brief introduction to the topic, we discuss our current project with former students Ela Celikbas and Christina Eubanks-Turner: Describe prime spectra that occur for two-dimensional rings of polynomials and power series.