

Mathematics Colloquium

Andreea Nicoara

University of Pennsylvania

**The Non-Noetherianity
of the
Denjoy-Carleman Classes**

Abstract: The Denjoy-Carleman classes are subrings of the ring of smooth functions defined by bounds on the growth of their derivatives. Initially studied by analysts, these functions also have fascinating algebraic properties such as they fail to satisfy Weierstrass division and yet resolution of singularities holds. The failure of Weierstrass division makes it impossible to prove or disprove Noetherianity by the usual algebraic methods. I will discuss work in progress with Liat Kessler (MIT) using model theory that shows these Denjoy-Carleman rings are not Noetherian. Therefore, these rings constitute examples of non-excellent rings on which resolution of singularities holds. No background is assumed. I will explain the analysis, algebra, and model theory required for the proof.

Wednesday, September 30

**4:00-5:00 pm
204 Smith Hall**