

NON-NOETHERIAN PERSPECTIVES ON A CLASS OF NOETHERIAN RINGS

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ABSTRACT. The defining property of Noetherian commutative rings, that their ideals satisfy the ascending chain condition, is one of the richest and most powerful definitions in algebra. As originally intended by Emmy Noether, it captures important features of polynomial rings and their factor rings. But it is also broad enough to encompass other classes of rings not arising from polynomial rings or number rings, and over the last 75 years many such classes have been exhibited and studied. We discuss how a circle of ideas involving differential algebra, generic formal fibers and non-Noetherian module theory, gives rise to one such class of “bad” Noetherian rings.