Meeting: 1003, Atlanta, Georgia, AMS CP 1, AMS Contributed Paper Session

1003-11-742 **Todorka Nedeva Nedeva*** (nedeva@ms.uky.edu), University of Kentucky, Dept. of Mathematics, 702 Patterson Office Tower, Lexington, KY 40506. *Rings of polynomials and power series in (x/k)'s.* Preliminary report.

The binomial polynomials as well as the binomial coefficients and their generalizations can be found in different branches of mathematics e.g. in algebra, analysis, combinatorics and in topology. The question of finding the remainder when dividing (n/k) by a prime (Lucas' theorem 1878) leads to base p expansion of binomial coefficients and the consideration of integer valued polynomials with rational coefficients. And although the study of these polynomials goes back to the seventeen century the study of this set as a ring began in 1936 by Skolem. More generally the bijective correspondence between the set of functions defined on the set of non-negative integers and the series $av(0) + av(1)(x/1) + av(2)(x/2) + ?$ (Mahler 1958) is used in the field of p-adic analysis and naturally leads to the expansion of Skolem's approach and the definition of $Z[[(x/1),(x/2),...]]$ or in fact of $R[[(x/1),(x/2),...]]$ (with R any ring). Iwasawa (1969) used such series in connection with the p-adic L-functions but without considering the ring. We consider some of the algebraic properties of this ring as well as the subring $Z[(x/1),(x/2),...]$ and $R[(x/1),(x/2),...]$ in general. We also consider some topological properties and combinatorial applications. (Received September 28, 2004)