Meeting: 1003, Atlanta, Georgia, SS 25A, AMS Special Session on Complex and Functional Analysis, I

1003-32-1147 **Evgeny A Poletsky*** (eapolets@syr.edu), Department of Mathematics, 215 Carnegie Hall, Syracuse University, Syracuse, NY 13244. *Transcendence measures and algebraic growth of entire functions.*

In this joint work with Dan Coman we obtain estimates for certain transcendence measures of an entire function f. Using these estimates, we prove Bernstein, doubling and Markov inequalities for a polynomial $P(z,w)$ in $\mathbb{C}^2$ along the graph of f. These inequalities provide, in turn, estimates for the number of zeros of the function $P(z,f(z))$ in the disk of radius r, in terms of the degree of P and of r.

Our estimates hold for arbitrary entire functions f of finite order, and for a subsequence $\{n_j\}$ of degrees of polynomials. But for special classes of functions, including the Riemann ζ-function, they hold for all degrees and are asymptotically best possible. From this theory we derive lower estimates for a certain algebraic measure of a set of values $f(E)$, in terms of the size of the set E. (Received October 04, 2004)