

1163-13-1431 **Neil Epstein*** (nepstei2@gmu.edu). *The Ohm-Rush content function and its applications.*

For an R -algebra S , the (Ohm-Rush) *content* $c(f)$ of an element $f \in S$ is the intersection of all ideals I such that $f \in IS$. If there is always a smallest such ideal (i.e. $f \in c(f)S$), we call S an *Ohm-Rush algebra*. Further content-related properties carry their own names and implications. The theory examines algebraic properties of polynomial extensions $R \rightarrow R[x]$ and what can be generalized from them.

I will report on some results regarding the Ohm-Rush content function, along with applications to apparently disparate areas of commutative algebra. For instance,

- a new criterion for regularity in Noetherian reduced local rings of characteristic p .
- Given a regular field extension L/K , a Noetherian K -algebra R , and a zero-divisor $g \in S := L \otimes_K R$, some nonzero element of R kills g .
- (w/Shapiro) With R, S be as above, if S is locally a UFD, so is R .
- (w/Shapiro) $R \rightarrow \hat{R}$ (R Noetherian local) is Ohm-Rush if and only if every ideal of \hat{R} is extended from R .
- (w/Carchedi) for any ring map $R \rightarrow S$, an algebraic characterization of when the map of topological spaces $\text{Spec } S \rightarrow \text{Spec } R$ is open

(Received September 15, 2020)