Meeting: 1004, Bowling Green, Kentucky, SS 11A, Special Session on Commutative Ring Theory

1004-13-115 **Michael R Winders*** (mwinders@worcester.edu), 486 Chandler St., Worcester, MA 01602-2597. *Idealization.*

Let R be a commutative ring and M an R-module. The idealization $R(+)M$ of M in R is given by $R(+)M = \{(r,m)|r \in R, m \in M\}$. If (r,m) and (s,n) are two elements of $R(+)M$, we define a) $(r,m) = (s,n)$ if $r = s$ and $m = n$, b) $(r,m) + (s,n) = (r+s, m+n)$, and c) $(r,m)(s,n) = (rs, rn+sm)$. With these definitions $R(+)M$ becomes a commutative ring with identity. In this talk we survey known results about $R(+)M$ and give some new ones. Ideals of $R(+)M$, especially those of the form $I(+)C$, where I is an ideal of R and C is a submodule of M, are studied. Certain distinguished elements of $R(+)M$ are also found. Conditions of R and M are determined to make $R(+)M$ Noetherian, Artinian, a valuation ring, a chained ring, a PIR, and a graded ring. We also define a functor from the category of R-modules to the category of R-algebras given by $F(M) = R(+)M$. (Received January 20, 2005)