In Defense of the Term ICME

As Burlaga [2001] correctly points out, the term "cloud" has been used for many years to describe solar wind disturbances. "Plasma cloud," "magnetized plasma cloud," and now "magnetic cloud" have all been used. While the first two terms were rather inclusive in their definition, the last one is rather restrictive [Burlaga et al., 1941]. A magnetic cloud has to have a particular duration, a smooth rotation, a strong magnetic field, and a low-proton temperature. Thus, we are forced into adopting a separate name for many structures that do not fit this restrictive scheme. The term "ejecôte" could be used, but there are two types of ejecta: flare ejecta and coronal mass ejecta. The latter term has been used extensively for the disturbance seen on 1 AU that arises in response to a coronal mass ejection (CME) detected at the Sun. This usage has led to some difficulties, because one line of research in this field is to compare the properties of CMEs in the corona with the disturbance seen later in the interplanetary medium. Both cannot be simply called CMEs, or confusion reigns. Thus arise the practice of using the term ICME for the interplanetary counterpart of a CME [e.g., Linsdell et al., 1999; Mulligan et al., 1999a, b]. This term includes a wide variety of structures in particular, structures lacking one feature of a magnetic cloud, but clearly being associated with a CME on the Sun. While not every ICME detected has been identified with a specific CME, enough have that we can be confident of the association [e.g., Linsdell et al., 1999].

In short, we believe that the term ICME has many advantages over the many other terms listed by Burlaga, and encourage its continued use. We certainly agree with Burlaga's statement that "scientific language evolves as knowledge grows" and agree that a common vocabulary is desirable. But we also believe that the path to such a common vocabulary is through continued hypothesis testing and deeper understanding of the phenomenon itself, rather than premature attempts to confine the nomenclature to a restricted set of terms. It is often the case that prescribed terms—for example, the AGU index terms—are obsolete shortly after they have been defined.

Author
C.T. Russell
Institute of Geophysics and Planetary Physics and Department of Earth and Space Sciences, University of California, Los Angeles, California, USA.

References