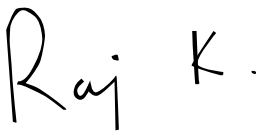
FROM THE EDITOR

It Is Elemental, My Dear Watson!

The science and technology world has seen some exciting events unfold during the past couple of months. Coupled with the Mars exploration, President Bush's January 14 announcement of a new space program and the projected infusion of funds (in the $12 billion range over a five-year period), all portend a healthy future for America's space program. The Apollo and Sputnik programs spawned a new generation of scientists and engineers in the 1960s, and science and engineering were highly respected (perhaps even "cool") career choices then. The technological spin-offs from the space program were enormous, and many of the advances in semiconductor science/technology, fuel cells, communications, solar cells, and the like can be traced back to the investments made in the space program during the late 1950s and 1960s. We can anticipate similar fallout from the new initiatives in human space travel and it is interesting that countries like China have jumped into the fray. Perhaps the spin-offs this time will be in the life sciences area with discovery of new chemical elements and new sources of precious metals being important bonuses. The implications for finding new energy sources are also far-reaching as the "Free Radicals" column in this issue illustrates.

A team of American and Russian scientists recently reported the discovery of two new chemical elements bearing the atomic numbers 113 and 115. Of course there were no atomic numbers in Dmitry Mendeleyev's original periodic table, only atomic weights and element groupings based on their known properties. (Recall that the electronic structure of atoms was not known then.) Yet his predictions turned out to be remarkably prescient as new elements continued to be discovered in the early decades of the 20th century. Discovery of the so-called "super-heavy" trans-actinides (or elements beyond lawrencium) will similarly continue to plug up holes at the lower right-hand side of the periodic table. While most of us in our everyday research lives will not routinely traverse this portion of the table (or for that matter, elements in period 7), it is obviously important to push the frontiers of scientific discovery even if the practical uses of such an endeavor may not be readily evident. Who knows, a sixth- or seventh-grader may even find these discoveries to be "cool!"

Chemical elements also lie at the core of the focus of this issue of *Interface*, namely, molecular electronics. While reports of the demise of silicon may be greatly exaggerated (and we will examine this topic in a future issue of this magazine), the many advantages associated with the use of molecules in electronic circuits (*e.g.*, size, recognition, self-assembly, synthetic flexibility, stereochemistry) can hardly be discounted, although the challenges are equally daunting. Indeed as pointed out by James Heath and Mark Ratner (*Physics Today,* May 2003, p. 43), these advantages were recognized by Richard Feynman as early as in 1959 in a famous speech titled, "There is Plenty of Room at the Bottom." We have assembled four feature articles on this topic and kudos to Rick McCreery, Guest Editor, for shaping this special issue. Stay tuned.



Krishnan Rajeshwar
Editor

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