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## EDITORIAL

# Science and Nature: A Welcome Diversion from Politics

**Gary Breed**  
Editorial Director



Although the exercise of democratic elections is a privilege I value highly, I admit to having grown weary after the long Presidential campaign. Yes, there are important issues like Homeland Security and terrorism, the national economy and jobs, health care costs and the integrity of the candidates, but they have been discussed sufficiently for my information needs!

Thankfully, Mother Nature's power and mankind's scientific exploits have also been in the news, providing a fascinating alternative to all the political hyperbole.

Like all engineers, I have a deep appreciation and personal interest in nature and science. After all, as a baby boomer, I grew up in the 1950s and 1960s, when even modest science and technology news made it to the front page of our newspapers and got plenty of coverage on television. Today, similar news may not reach the headlines, but I often find it to be more interesting than it was 40 years ago.

Recently, science and nature *did* reach the headlines—a record-breaking hurricane season, new eruptions of Mt. St. Helens, this year's Nobel Prizes and the successful achievement of privately-developed space flight. In addition to being interesting, these things also affect our jobs.

Observing and dealing with natural phenomena involves technology at many levels. In the Caribbean, Florida and the Southeast US, emergency communications has relied on satellite links and good old two-way radio after power outages, wind and flooding take out everyday wireline systems. Those terrible hurricanes are monitored by satellites from space, sending their data by radio link back to forecasters and researchers on earth. Radio carries telemetry from "hurricane hunter" aircraft and the instrumentation packages they drop into the storms.

At Mt. St. Helens, a GPS-based system monitors the swelling of the lava dome and sends its data via a telemetry link. A series of monitors placed around the volcano collect their readings, then use satellite links and deliver them to the USGS and university scientists who study the geologic activity (and hopefully predict future eruptions). The dramatic video of the steam and ash clouds are often relayed to the television production centers using satellite links.

Over the past couple years, the increased solar activity at the peak of the sun's 11-year activity cycle also made the news. The number and intensity of solar flares and Coronal Mass Ejections (CMEs) exceeded all previ-

ous observations. Fortunately, the largest X-Class flares sent their energy elsewhere in the solar system, but a few major events damaged communications satellites and either disrupted or enhanced terrestrial radio communications, depending on the operating frequency. There were several events where long-distance HF (short-wave) communications was completely obliterated for minutes or hours—yet another reminder that Nature’s power greatly exceeds that of mere mortals like us.

### **Scientific Achievements**

Recently, the Nobel Prize winners for 2004 were announced. In physics, the prize went to two scientists who made great strides in understanding the forces that operate at the sub-atomic level. This sounds esoteric, but this kind of understanding has everyday practical value when it is used for the development of smaller, higher-performance integrated circuits.

Finally, my favorite event of the year is the successful flight into space by a private spacecraft. The legendary Burt Rutan and his team at Scaled Composites, funded mainly by Microsoft co-founder Paul Allen, developed the remarkable SpaceShipOne. After pilots Michael Melvill and Brian Binnie

each took the craft beyond 62 miles altitude in flights just five days apart, it was declared to be the winner of the Ansari X Prize, a \$10 million award created in 1996 as an incentive for private development of space travel. This is an incredible story for science nuts like me!

Nature, man’s scientific understanding of natural laws, and the application of that knowledge through technology is what drives most engineers in this industry and elsewhere. Hopefully, news of these events will motivate the next generation of engineers.

### **E-mail Notes**

E-mail is the mode of choice for communications in this industry! The *High Frequency Electronics* staff receives hundreds of e-mails each day—the expected mix of industry news, new product announcements, professional and business correspondence and, of course, plenty of scams and spam.

On occasion, we hear, “Didn’t you get my e-mail?” If you have sent us an e-mail and not gotten a response—send it again and perhaps follow up with a phone call. Spam filters, a full mailbox, or sheer volume sometimes results in a lost or misplaced message. We definitely want to hear from you—keep trying!