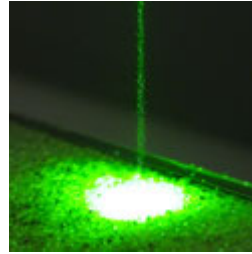




**WINNER**



## **2003 R&D 100 Awards Winner**

### **CARISS: Integrated Elemental and Compositional Analysis**

CARISS (Compositional Analysis by Raman-Integrated Spark Spectroscopy) is the only field-deployable instrument that provides a complete chemical analysis (elemental and compositional) of a material at close, stand-off, and remote distances. CARISS uses two laser beams to conduct such analyses. The rugged instrumentation, highly adaptable to real-world analysis situations, provides rapid—less than two minutes per sample—“hands-off,” measurement, reducing analysis time and cost by at least a factor of 100. Designed for analysis in the field, CARISS can fit into a briefcase or a lunchbox, depending on the application. The versatility and portability of the instrument will allow it to sample Martian surface materials from a Mars rover; verify the composition of bobsled runners at the Olympic Games to enforce international rules and regulations; and detect carbon in soil for use in terrestrial carbon sequestration programs aimed at reducing global warming.

#### **Applications**

- Carbon detection (organic and inorganic) in soil
- Soil monitoring for the presence of toxic metals and harmful organic compounds
- Chemical agent detection for homeland defense and customs surveillance efforts
- Identification of materials used in weapons of mass destruction
- Industrial process control and mining operations