

# World-Class Technologies FOR R&D AND BEYOND

The 44th Annual R&D 100 Awards honor the world's best innovators and their innovations.

**T**he editors of R&D Magazine are proud to announce the winners of the 44th Annual R&D 100 Awards. This annual competition recognizes excellence in innovation—on a global scale.

Indeed, the technologies and techniques highlighted in the following pages are among the most innovative ideas from today's technology powerhouses in academia, government, and industry, worldwide.

Selection of R&D 100 winners is a sophisticated process, lasting nearly a full year, and involving a judging panel of almost 50 independent technical experts who lend their expertise in evaluating the details of the product entries compared to other existing products and technologies.

This year's winners will be honored at a Black Tie Awards Gala in the Grand Ballroom of Chicago's Navy Pier on

October 19th. This event is in conjunction with a public exhibition showcasing a sample of this year's winning technologies.

From analytical instruments to lasers, to life science to x-ray devices, the winners of the 2006 R&D 100 Awards will have a definitive impact on research, industry, and daily life.

We recognize the development teams that have made these technologies possible. We invite you to join this elite group of scientists and engineers in the 2007 R&D 100 Awards Competition—it's never too early to enter. Visit [www.rdmag.com](http://www.rdmag.com) for details. Congratulations to all of this year's winners!

— The Editors of R&D Magazine

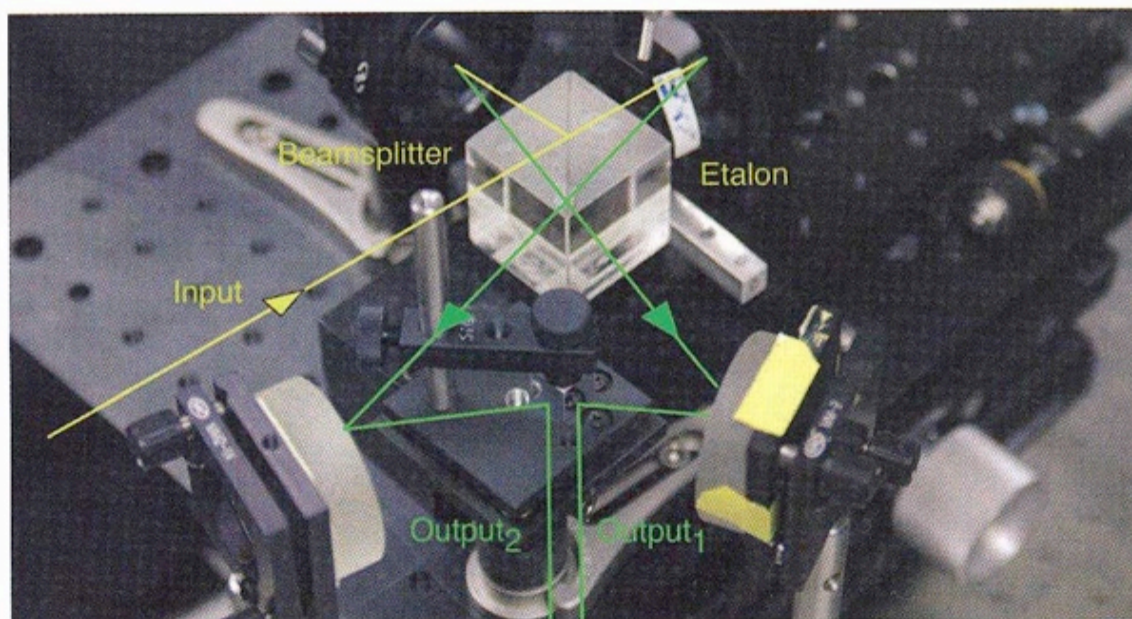
To view a full archive of past R&D 100 winners, visit:  
[www.rdmag.com/rd100ach](http://www.rdmag.com/rd100ach)

## Finding a Planet in the Stars

One of the most exciting and recent applications of high-resolution spectroscopy has been in the search for planets around distant stars through the measurement of stellar spectra. This Doppler Planet Search has been fully realized with the development of the **Externally Dispersed Interferometry (EDI)** by David Erskine at the Lawrence Livermore National Laboratory, Calif., and Jerry Edelstein in the Space Sciences Laboratory at the Univ. of California, Berkeley.

EDI is dramatically less expensive (\$14,000 vs. \$4 million) for making the highly precision measurements required that will enable the hundreds of medium-sized (~1-m) telescopes around the world to participate in the Doppler Planet Search. Already, EDI has detected the planet around 51 Pegasi and discovered a new planet in the constellation Virgo.

The tugging of a planet orbiting a star causes the star to wobble, with a period of a few days, weeks, or months and an ampli-



tude of 10 to 100 m/sec. This creates a small Doppler shift in the wavelength of the stellar spectrum that acts like a fingerprint relative to a spectral reference. The EDI has the precision to detect this precision through its combination of a wide-angle fixed-delay interferometer and a dispersive spectro-

graph. The Doppler measurement is performed by the interferometer which creates non-overlapping fringes that are embedded in the spectrum created, thus resulting in a Doppler measurement that is up to 10,000 times more robust than competing systems.

► More info: [www.llnl.gov](http://www.llnl.gov)