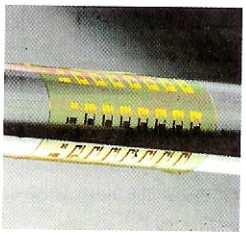
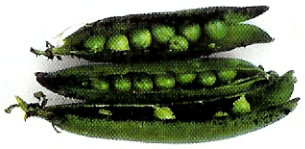
JULY NEWSBRIEFS

> A COLLECTION OF NEWS ITEMS FROM THE FRONTIERS OF SCIENCE.
— COMPILED BY ALEX HUTCHINSON

Finding Friendlier Fireworks

Pyrotechnic displays are staples of America's birthday and other celebrations, but the chemicals that produce their eye-catching effects are nothing to cheer about. Researchers in Germany are developing cleaner combustible materials to replace the current lineup of heavy metals, dioxins and carbon monoxide that result when carbon-based fuels are oxidized. The dense, nitrogen-based chemicals under consideration yield fewer particles and less smoke without sacrificing explosive power or intensity of color. Green fireworks are particularly toxic. These rely on barium compounds that are harmful to the heart and lungs for their hue. By replacing the barium with copper, scientists hope to preserve the color while reducing the toxicity. The new chemicals will safeguard the workers who make fireworks as well as the neck-craning public.





Peas Dividend

Plants produce many chemicals that humans find useful—and sometimes researchers have to get rough to obtain more of the goods. Researchers at the University of Arizona found that jolting pea plants with electric current made them produce 13 times more pisatin, an antifungal agent. The stress of the shocks mimics an infection and prompts the useful response, without damaging the plants.

Go Master 2.0

One of humanity's oldest board games has finally been mastered by artificial intelligence. Go, believed to date to the 5th century B.C., has simple rules—two opposing players place black and white stones on a grid in a bid to control more of the board—but with nearly endless strategic combinations, it outstrips chess in complexity. During an officially sanctioned tournament in Paris, an AI program named MoGo, developed by a French research institute, defeated Romanian Go master Catalin Taranu in one of three matches. MoGo's creators say the intuitive software can be adapted to create resource management programs able to react to constant change.

Stretchable Silicon

Researchers at the University of Illinois have developed silicon circuits that can be folded and stretched into useful shapes (left). While applications such as flexible displays already incorporate bendable electronics, the single-crystal silicon used to make computer chips was thought to be too rigid for similar treatment. This new process builds flexibility into the material by depositing an ultrathin plastic coating with an integrated circuit on prestretched rubber. When the rubber is released, the silicon layer buckles in such a way that the geometry of the circuitry allows it to be stretched in any direction. This could enable the use of microchips in mechanical sensors, "smart" clothes and medical implants. One early proposed use: Study epilepsy by wrapping patients' brains with a circuit-studded sheet.

Amped-Up River Currents

Hydropower may be a renewable energy source, but the massive dams it requires disrupt riverine ecosystems. New York–based Verdant Power is developing "kinetic hydropower" by planting turbines on river bottoms. A project in Canada's St. Lawrence River, expected to be completed in 2012, will generate 15 megawatts of

electricity, enough to power 11,000 homes. Six turbines are already installed in New York's East River as part of a tidal power demonstration (Tech Watch, April '07). The new project is the first in which turbines are driven by river currents.

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