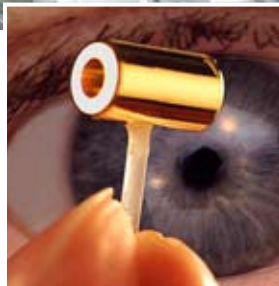




LLNL

The NIF laser bay comprised of 192 lasers. Inset: The fusion target: a small metal cylinder, called a hohlraum, surrounding a capsule containing a tiny amount of deuterium-tritium fuel.



### NIF, WORLD'S LARGEST LASER, READY FOR FUSION!

The National Ignition Facility (NIF) at Lawrence Livermore National Laboratory (LLNL), which was begun in 1995, expects to reach ignition in 2010, when it begins firing its 192 laser beams at the tiny target of deuterium-tritium fusion fuel. The infrared energy from the beams will be converted to 1.8 million joules of ultraviolet energy, delivered to the millimeter-size target (see inset) in a pulse that lasts only 25 billionths of a second. This is equivalent to 1,000 times the electrical generating power of the United States in the same brief time period!

To achieve fusion, the beams compress a hollow shell filled with the hydrogen isotopes deuterium and tritium, to up to 100 times the density of lead, resulting in temperatures more than 100 million degrees celsius and pressures about 100 billion times the Earth's atmosphere. The fusion fuel implodes, releasing much more energy than the amount deposited by the laser beams.

The NIF ignition experiments also will provide data for astrophysics research and the nation's weapons program. For more on NIF, see <https://lasers.llnl.gov/>.

Anticipating success with NIF, LLNL scientists are planning a next step: a fusion-fission hybrid power plant based on a laser fusion source that would drive a blanket of fission material (used fission fuel) surrounding the fusion reactor core. The reactor concept is known as LIFE, for Laser Inertial Fusion-Fission Energy. The timetable is for a pilot plant in 2020 and a demonstration LIFE reactor by 2030. Watch an animation of the LIFE plant at [https://lasers.llnl.gov/missions/energy\\_for\\_the\\_future/life/](https://lasers.llnl.gov/missions/energy_for_the_future/life/).

### KOREAN NUCLEAR PLANTS EACH UPPED PER CAPITA INCOME BY \$1,000

During the 1950s after the Korean War, South Korea's per capita income was a meager \$876. Since the beginning of the nuclear power era in Korea, during the 1970s, this figure rose to \$1,597 per capita and by 2007, the nation's GDP was at an astonishing \$20,000 per capita! This was the message Korean nuclear pioneer Dr. Jong H. Kim conveyed to a student audience at a Malaysian University in May.

According to our student correspondent, Professor Kim explained that economic growth is directly proportional to nuclear development. More electricity enables more factories to be opened and a higher standard of living for the population. This then generates diverse science and high technology-driven sectors coupled with even better living standards for all. Korea now has 20 nuclear plants, with 6 in construction, producing 17,716 megawatts.

The message for Malaysia became clear, our correspondent wrote, Malaysia has to follow South Korea's example and go nuclear! For more on Korea's nuclear program, see [http://www.21stcenturysciencetech.com/Articles%202008/Korea\\_Nuclear.pdf](http://www.21stcenturysciencetech.com/Articles%202008/Korea_Nuclear.pdf).



Courtesy of Argonne National Laboratory

RFID project manager Dr. Yung Liu examines data on his laptop from the radio frequency identification device, which allows users to track nuclear materials, and remotely monitor environmental and physical conditions such as temperature and humidity.

### RADIO FREQUENCY TECHNOLOGY TO MONITOR NUCLEAR MATERIALS

Argonne National Laboratory has developed a unique radio frequency identification (RFID) device that can track and monitor the environmental and physical conditions of containers of nuclear materials in storage and transportation. The system is comprised of active transponders, or tags with long-life batteries, and also has applications outside the nuclear field.

"The Argonne system can simultaneously monitor thousands of drums 24 hours a day, seven days a week. Any abnormal situation, such as a loss of seal, a sudden shock, a rise in temperature or humidity, can trigger an alarm for immediate action," said Dr. Yung Liu, Argonne senior nuclear engineer and manager of the RFID project. The Department of Energy will use the technology, expected to be patented, to modernize its existing management systems for tens of thousands of radioactive and fissile material packages to ensure safety.

### MALTHUSIANS RALLY TO BAN DDT—AND INCREASE DEATH RATES AGAIN

The anti-DDT Malthusians within the World Health Organization and the United Nations Environment Program announced a new campaign in May to thwart the use of DDT in spraying the inside walls of houses to stop the spread of malaria. The stated aim is to cut the use of DDT by 30 percent by 2014 and then phase it out entirely. Instead, non-chemical methods of mosquito control and bednets are proposed—with no mention of the fact that these methods have failed over the past 10 years to “roll-back malaria.”

The anti-DDT lobby was unhappy that in September 2006, WHO’s malaria chief, Dr. Arata Kochi, reversed a 30-year policy against DDT, advocating its use in indoor residual spraying because, as he stated, “Of the dozen or so insecticides WHO has approved as safe for house spraying, the most effective is DDT.” DDT not only kills mosquitoes, but repels them, so that even DDT-resistant mosquitoes will avoid entering a house that has been sprayed.

The anti-DDT scientists meanwhile continue to claim that their tendentious studies show that DDT is harmful to human beings. In two separate U.S. studies, we are told that DDT causes lack of infant development and leads to obesity in children, respectively. Meanwhile, one child in Africa dies every 30 seconds from malaria. *21st Century* will have more on this subject in the Summer issue. See also <http://www.21stcenturysciencetech.com/DDT.html>.

### ANIMAL RESEARCH NECESSARY TO SAVE HUMAN LIVES!

The Foundation for Biomedical Research has launched a new video campaign to let people know why animal research is necessary in fighting disease, featuring real medical researchers telling their stories. You can watch “Jen’s story” at <http://www.youtube.com/watch?v=NT4ILIDsjGA> and Gail’s story at <http://www.youtube.com/watch?v=oqzhH7DfKsY>. The foundation website offers other short videos, including “Survivor Tales,” a series for television that highlights the impact of translational research on both human and animal health.

### GROCERY MANUFACTURERS ASSOC. ISSUES FOOD IRRADIATION REPORT

The Grocery Manufacturers Association has published an 18-page pamphlet on food irradiation, available electronically, which summarizes the state of the research, safety, and world use of irradiation: [http://www.gmabrands.com/publications/SPP\\_Irradiation5.pdf](http://www.gmabrands.com/publications/SPP_Irradiation5.pdf). Intended for consumers, suppliers, and policy-makers, the report includes scientific references, many with electronic links. Each year millions of Americans are sickened by foodborne pathogens, and the U.S. Agriculture Department estimates that at least 5,000 of these people die. Medical costs and losses in productivity from the seven most common pathogens are estimated at between \$6.6 billion and \$37.1 billion annually.

### NEW VIDEO TAKES STUDENTS BEHIND THE SCENES OF THE ARES ROCKET

The Futures Channel released a new documentary in May, “Designing and Engineering Rockets,” the third in a series produced to show students what’s involved in building the next generation of rockets that will take man back to the Moon and on to Mars. The film stars the engineers at NASA’s Marshall Space Flight Center who are designing and building the new Ares Launch Vehicle, a 325-foot, 2-million-pound rocket that will go from 0 to 1,000 miles per hour in less than 60 seconds.

The first two documentaries have already been shown in 4,000 classrooms. You can watch the new video at [http://www.thefutureschannel.com/dockets/space/engineering\\_rockets/](http://www.thefutureschannel.com/dockets/space/engineering_rockets/). We recommend “Revisiting the Moon,” with planetary scientist Dr. Paul Spudis, as another Futures Channel feature that conveys a sense of scientific optimism. The Futures Channel was founded in 1999 with the goal linking the “scientists, engineers, explorers and visionaries who are shaping the future, and today’s learners who will one day succeed them.”

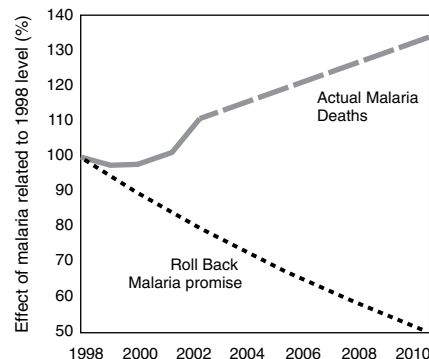


NASA



The Futures Channel

Engineers in front of a model of the Ares launch vehicle. Inset: Artist’s drawing of a launch vehicle in flight.



### MALARIA DEATHS INCREASED UNDER THE 'ROLL BACK MALARIA' PROGRAM,

*The new anti-DDT Malthusian policy means more malaria deaths: The Roll Back Malaria program, a partnership of WHO and UN organizations, has pointedly avoided any use of DDT, and has been an abysmal failure. Since the RBM founding in 1998, deaths from malaria have steadily increased.*

Source: Adapted from the *British Medical Journal*, May 8, 2004