

PLANETARY SCIENCE

Blowing a Hole in the Ocean

Dedicated searches are locating and tracking all kilometer-sized asteroids in near-Earth orbit in order to assess and anticipate potential impact hazards. To date, only asteroid 1950 DA (1.1 km diameter) has been accorded any chance of hitting Earth with up to a 0.3% probability of colliding on 16 March 2880 (see Reports, 5 April 2002, p. 132).

Ward and Asphaug modeled the impact cavity and tsunami that would be created by 1950 DA traveling at 17 km/s into the Atlantic Ocean at 35°N and 70° W. The asteroid would blow a hole through the entire ocean to a depth of ~5 km and excavate the seafloor. Waves would propagate in a circular pattern; about an hour after impact, observers on the eastern shore of the United States would start to see small waves, which would increase in

ing technique to pattern the device structure directly. Fabricating a distributed feedback structure with micrometer-sized features in less than 2 min, they confirm the quality of the material by demonstrating lasing by optical pumping. The flexibility of the micromolding technique offers the ability to mass-fabricate a wide range of other photonic and optoelectronic devices. — ISO

Appl. Phys. Lett. **82**, 4023 (2003).

BIOMEDICINE

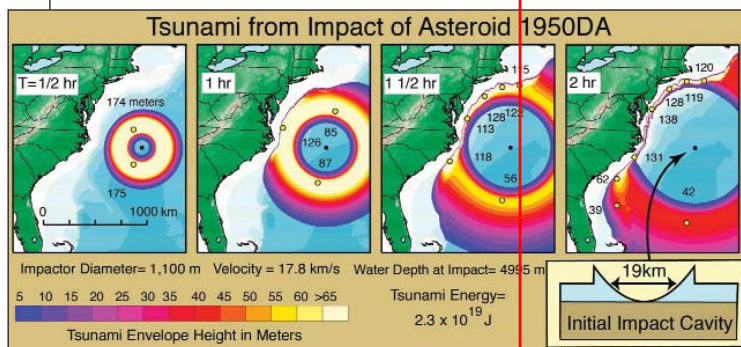
A Robust Revelation in Lupus

Systemic lupus erythematosus (SLE) is a potentially fatal autoimmune disease that affects multiple organ systems and is characterized by a range of symptoms, including kidney disease, arthritis, cardiopulmonary abnormalities, and skin photosensitivity. Autoantibodies against cellular macromolecules such as chromatin, phospholipids, and ribosomes have been identified in SLE patients, suggesting that the formation of immune complexes may lead to tissue inflammation and damage.

Xue *et al.* report that mice lacking an RNA-binding protein called Ro (a known SLE autoantigen) develop antibodies against

ribosomes and chromatin. These mice display glomerulonephritis and skin photosensitivity reminiscent of the human disease even though their immune systems appear normal. Previous work in the frog *Xenopus* and worm *Caenorhabditis elegans* revealed that Ro may be a component of a ribosomal quality-control pathway in which misfolded 5S ribosomal RNA (rRNA) molecules are degraded before they become incorporated into ribosomes. In addition, Ro helps the bacterium *Deinococcus radiodurans* to withstand ultraviolet irradiation and *C. elegans* to withstand environmental stress. These authors propose that loss of Ro in mice may lead to incorporation of misfolded 5S rRNAs into ribosomes, resulting in the presentation of hidden epitopes to the immune system, the formation of antibodies to ribosomes, and the development of autoimmune disease. — OMS

Proc. Natl. Acad. Sci. U.S.A. **10**, 10731/pnas.0832411100 (2003).



height to a maximum of about 100 m in another hour. Successive tsunamis would cause scouring of ocean sediments and submarine landslides, and possibly gas hydrate decompression. On the bright side, tsunami run-up on land would be limited to 4 km because the waves have short periods. Still, not be a good day to be at the beach. — LR

Geophys. J. Int. **153**, F6 (2003).

APPLIED PHYSICS

Stamping Out Polymer Lasers

Simplified fabrication and processing techniques for organic semiconducting polymers mean that realizing cheap integrated optoelectronic devices is feasible. However, most of the processes incorporate a high-temperature step, which usually leads to a deterioration of the optoelectronic properties of the polymer, limiting its performance. Lawrence *et al.* circumvent this heating problem by using a solvent-assisted mold-