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THE COVER

The National Ignition Facility (NIF) in California is a 192-beam laser that can produce 500 trillion watts of power in pulses that last 20 billionths of a second. Inside NIF's target chamber (on the cover), the focused pulses will heat and compress a capsule, causing nuclear fusion, for the purpose of energy and astrophysical research. With this year heralding the 50th anniversary of the invention of the laser, physicist Todd Ditmire recounts in "High-power Lasers" (pages 394-401) the technological advances that have taken lasers from their first modest beams to the immense operations such as NIF that exist today. By compressing beams to minuscule durations, physicists can boost a pulse's peak power to more than the entire output of the United States electrical grid, if only for a tiny fraction of a second. Scientists are now aiming to push the power of laser to even higher levels in the near future. (Cover image courtesy of Lawrence Livermore National Laboratory)."