the shapes of which would mimic the electron-beam density profile. Then by use of a transfer etching process that etches the substrate faster than it etches the resist, either the pattern of holes or a pattern comprising the narrow, lowest portions of the dimples would be imparted to the substrate. Having been thus patterned, the substrate would be cleaned. The resulting holes or dimples in the substrate would serve as nucleation sites for the growth of quantum dots of controlled size in the following steps. The substrate would be cleaned, then placed in a molecular-beam-epitaxy (MBE) chamber, where native oxide would be thermally desorbed and the quantum dots would be grown.

This work was done by Sarath Gunapala, Daniel Wilson, Cory Hill, John Liu, Sumith Bandara, and David Ting of Caltech for NASA’s Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1). NPO-41236

Microrectenna: A Terahertz Antenna and Rectifier on a Chip
Microscopic rectennas would supply DC power to microdevices.

NASA’s Jet Propulsion Laboratory, Pasadena, California

A microrectenna that would operate at a frequency of 2.5 THz has been designed and partially fabricated. The circuit is intended to be a prototype of an extremely compact device that could be used to convert radio-beamed power to DC to drive microdevices (see Figure 1).

The microrectenna (see Figure 2) circuit consists of an antenna, a diode rectifier and a DC output port. The antenna consists of a twin slot array in a conducting ground plane (denoted the antenna ground plane) over an enclosed quarter-wavelength-thick resonant cavity (denoted the reflecting ground plane). The circuit also contains a planar high-frequency low-parasitic Schottky-barrier diode, a low-impedance microstrip transmission line, capacitors, and contact beam leads. The entire 3-D circuit is fabricated monolithically from a single