

SCIENCE & TECHNOLOGY
CONCENTRATES

What makes blue LEDs bright

Blue-light-emitting diodes were a novelty just a few years ago. Nowadays, the devices, which are based on GaN and related materials containing Al and In, are widely used in advanced display technologies and other applications, in part because of their extreme brightness. Yet the origin of the brightness has puzzled scientists. Because of the way the materials are prepared, GaN films typically contain 1 million times more lattice defects than do AlGaAs and other conventional LED films, which should limit the emission intensity. Now, Shigefusa F. Chichibu of the University of Tsukuba, in Japan, and coworkers in Japan and the U.S. propose that small chainlike structures of In–N–In–N–In lie at the heart of the puzzling brightness (*Nat. Mater.*, DOI: 10.1038/nmat1726). The team explains that the

tiny structures, which they probed with positron annihilation spectroscopy, preferentially capture positive-charge carriers and are the sites of the light emission.