



Physics Division ESH Bulletin 02-4

LASER POINTER SAFETY

- Laser pointers are sold by a variety of companies with little or no restriction.
- Each laser has a sticker stating its classification and instructions (do not look directly into laser!).
- Lasers at ORNL are to be operated under guidelines of the American National Standard Institute (ANSI standard).
- The ANSI standard sets the Maximum Permissible Exposure (MPE mWatts/cm²) for both the eye and skin for various laser wavelengths, power levels, and pulse widths. For visible wavelengths, one assumes a maximum exposure of 0.25 seconds (aversion response of the eye).
- $MPE = 2.6 \text{ mWatt/cm}^2$ for ocular exposure.

ARE LASER POINTERS SAFE?

- Class II (< 1 mWatt) safe if used without collection optics
- Class IIIa (< 5 mWatt) Model BWGP-30 (B&Q Tek sold by Edmund Scientific) green laser pointer used in Physics Division

Specifications from Manufacturer

Power level 1-3 mWatt
Beam diameter 0.8 mm
Wavelength = 532 nm
Divergence 1-2 mRad
(Output levels only approximate)

At a power level of 2 mWatt, the radiation does not drop below the MPE until the beam diameter is 8.5 mm, which occurs at a distance of 6 meters. (The eye focuses a beam of up to 7 mm onto the retina.)

- **RECOMMENDATION:** Class IIIa laser pointers should not be used in the Physics Division in our conference rooms. The manufacturer has agreed to accept the return of Class IIIa pointers and will adjust them so that the output is <1 mWatt (Class II). Several customers concerned with complying with the ANSI standard have already requested this service. Future orders should specify the adjustment procedure (\$40 cost).