



UC IRVINE LASER SAFETY NEWSLETTER

VOLUME VII, #2

June 15, 2007

Editor: Rick Mannix; EH&S - UC Irvine Laser Safety Officer

The purpose of this newsletter is to keep laser operators on campus informed regarding laser safety news, bargains on laser safety equipment (including protective eyewear), methods for controlling laser hazards, lessons learned from laser accidents, and other tips to improve safety. These newsletters are distributed approximately every 6 months or whenever a laser safety issue with significant urgency arises. For past issues of this newsletter, please visit the UC Irvine Environmental Health & Safety website (www.ehs.uci.edu) and look under "Radiation & Laser Safety".



ON-THE JOB/HANDS-ON LASER SAFETY TRAINING

EH&S provides general laser safety training to new laser users on campus via a *Laser Safety Online* course (www.ted.uci.edu). The other important component of laser safety training is the on-the-job/hands-on training provided by the new laser user's supervisor or another experienced laser operator in the lab. It is that training which provides the nuts and bolts practical information on how to operate specific lasers safely.

EH&S training gives new laser users basic knowledge about laser hazards and safety controls. However, any novice who goes directly from EH&S laser safety training into a laser lab believing that he/she is ready to perform laser work safely is making a serious mistake. It is the hands-on instruction that is, in fact, the more critical component of laser safety training; augmenting the general laser safety information provided by EH&S. The two trainings combined provide new laser users with all of the laser safety and laser operational information they need to perform their studies safely.

June 15, 2007



MEDICAL/CLINICAL LASER SAFETY

The use of lasers in medical and clinical applications is becoming more common with lasers now used in eye surgery (LASIK, PRK), skin resurfacing, endoscopic surgery, skin lesion removal, dental surgery, urological surgery, veterinary surgery, snoring mitigation, and hair removal -- in addition to many other emerging applications. Attendant to this increased use has been the need to train the physicians, nurses, and technicians who operate lasers or who work in surgical rooms in which they are operated regarding laser safety principles.

A document entitled *Laser Safety in Medical & Clinical Applications at UC Irvine* is now posted on the EH&S website at the URL below. It includes information on medical/clinical laser beam-related safety controls (including protective eyewear), controls for non-beam hazards such as laser-generated air contaminants, emergency procedures, a pre-surgical safety checklist, a list of lasers often used in medical applications, and some other useful safety items:

<http://www.ehs.uci.edu/programs/radiation/LaserSafety-Medical&ClinicalApps.pdf>



PUMPING LASERS FOR TI:SAPPHIRE LASERS

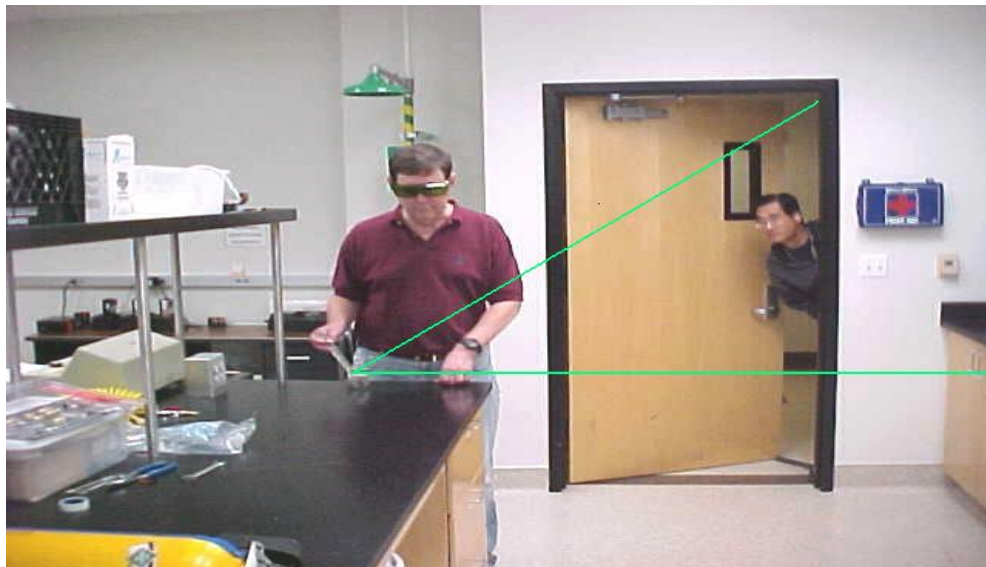
It is quite common for labs to use frequency-doubled Nd:YAG lasers (532 nm; green visible light) to pump Ti:Sapphire lasers (~ 700 - 850 nm; near-infrared radiation). During a few recent laser safety inspections, I have noted that some laser users were wearing eyewear protective for the Ti:Sapphire laser beams but had overlooked the need to also be protected against the 532 nm light. Please keep in mind that if your laser setup has sizable open-beam segments of 532 nm light then protection at that wavelength is also needed. There is reasonably priced (~ \$190) eyewear available that protects against the beams from both lasers with M-rated protection for the ultrafast Ti:Sapphire pulses. Please contact me for more information about this eyewear.



MEMORABLE QUOTE

"In all science, error precedes the truth, and it is better it should go first than last."

Hugh Walpole, English novelist, 1894-1941



POOR LASER SAFETY HABITS

Take a look at the picture above and see if you can find all of the laser safety problems. If you need help, they are: 1) a laser beam is crossing a walkway; 2) the laser operator has a reflective tool in his hand which is reflecting the beam and causing dangerous stray radiation; 3) access to the room was not carefully controlled during potentially dangerous open-beam laser work; 4) the window in the door is not covered with a material suitable to block laser radiation from exiting the room; and 5) this is hard to notice but a green beam laser is being used and the operator is wearing green protective eyewear. Wearing eyewear the same color as the beam is always wrong – see the following article for more information on this topic.



PROTECTIVE EYEWEAR COLOR

The color of the protective eyewear should never be the same color as the beam since light of that color is what is being transmitted! For example, blue eyewear is made for red beam lasers (HeNe, visible diode), orange eyewear covers blue and green beam lasers (argon, frequency-doubled Nd:YAG), and purple eyewear is made for yellow-beam lasers (pulsed dye). Eyewear for use with near-infrared radiation only is often green and eyewear that covers many wavelength bands is generally amber (because of a mixture of laser radiation-absorbing dyes) such as eyewear protective for all of the Nd:YAG harmonics (ultraviolet, visible, and near-infrared radiation are all possible). *Always check your eyewear to make sure it is appropriate for the laser procedures you will be performing. The wavelengths for protection and the optical densities (ODs; OD = degree of eye protection afforded) are always imprinted on the eyewear.*



MEMORABLE QUOTE

"One of the advantages of being disorderly is that one is constantly making exciting discoveries".

A. A. Milne, English author, 1882-1956

If you have any questions concerning laser safety, please contact Rick Mannix from EH&S (949-824-6098; rcmannix@uci.edu).

 **BE SAFE!**