Building on work related to his'technical aide' position at 3M, **Luke Riveness** investigated the optical properties of acrylic and polycarbonate to see which is a better material to use as a light guide. LCD screens on TV's, laptops, and cell phones are all lit from behind using a light source (usually an LED these days) in combination with a light guide that 'pipes' the light to each spot behind the display - producing a uniform illumination. Luke built and polished cylindrical light guides and tested the amount of light that came out the exit face and the sides of the guides. Acrylic was the clear winner, as it guided more of the light to the end, and absorbed very little of the light along the way.

In the Advanced Lab course this year, **Kyle Jero** and **Katelyn Schramke** used Scotch tape to produce X-rays. Following up on some recent research by a group at UCLA, they used a motor to peel the tape in a vacuum, and detected the weak production of x-rays. When the tape is peeled, the breaking polymers in the adhesive cause the tape roll and the peeled tape to obtain opposite charges. Electrons released from the breaking bonds are accelerated by this electric field and produce both light and (when in a vacuum) X-rays when they interact with the atoms in the peeled tape. Future students will be able to extend the project to enhance the X-ray production as well as characterize the X-rays and the light produced.

Preco Donates CO_2 Laser and X-Y Motion Table to UWRF

Last fall, Jason Thoen (2004) came back to campus in order to talk to the Advanced Lab class about the usefulness of the skills he learned in the class and also to give some job seeking advice. Jason has worked at Preco in Somerset, WI, since before he graduated from UWRF, and has been involved with the design of numerous laser machining systems over that time.

In this year's Advanced Lab class was Joe Fredericks, who has worked as a machinist for several years and who had an interest in learning more about machining with lasers. After Jason and Joe met, Jason thought that he might be able to arrange for Preco to donate a laser system to UWRF so that Joe (and future students) could gain experience with a small industrial laser system.

After working through the donation process at Preco, Jason found and donated both a CO_2 laser and a X-Y table, for positioning parts beneath the laser, to the UWRF Physics department. The value of the equipment exceeds $15,000. Joe recruited Luke Riveness to help him put together the power supply, cooling system, and control electronics needed to get the laser up and running in order to make preliminary tests of the beam quality and power of the laser.

Separately for his senior seminar project, Joe worked through the control requirements for the X-Y table, and began constructing a system to control its motion. He made great progress, and now the system awaits the next group of interested students to finish the job and put both items together into a functioning laser machining system. This sort of hands-on experience with state-of-the-art equipment is invaluable for our students as they head out into the job market. We are very grateful to both Preco and Jason for this donation.

[Editor's Note: The UWRF Physics department is always interested in possible equipment donations. If you or the company you work for has equipment that you think we might find useful, please contact us. We cannot accept every donation, because we have very limited space in the department. Also, the equipment must be functioning, as we do not have the resources to repair donated items. Items of particular interest: small vacuum chambers and high vacuum pumps, lithography equipment, test equipment, and solid state lasers.]

Right: Joe Fredericks stands beside the donated X-Y table after giving his Senior Seminar presentation. [We only wish students would dress like this on a normal day!] Below: The CO_2 laser, which produces an invisible beam, heats a brick until it glows white hot.