

U of A team working on new technique...

# Oh weld, lasers at last

by Don Truckey

Laser research being conducted by a team of U of A engineers may result in a greatly-improved welding technique — possibly applicable to better and safer construction of northern pipelines — if the program receives sufficient funding to continue.

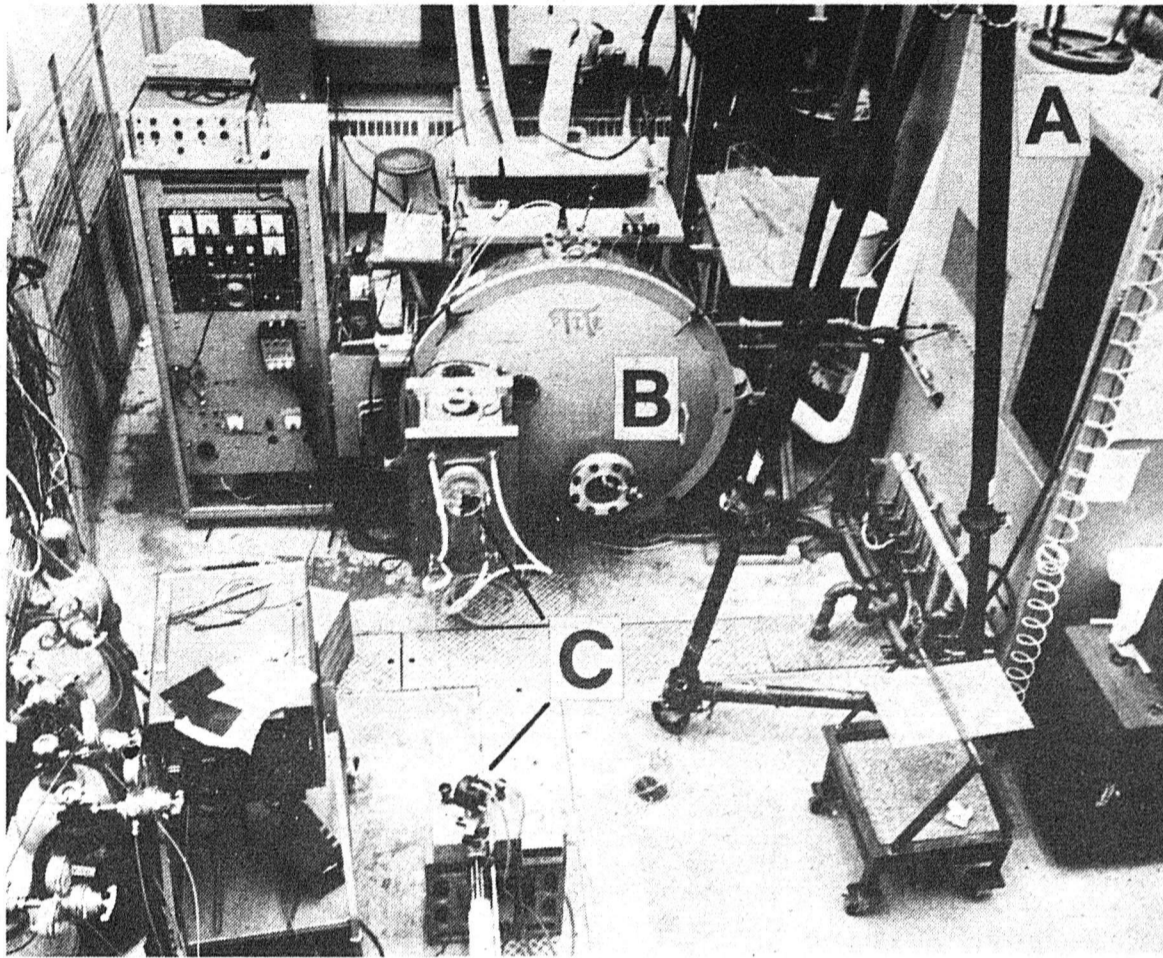
A team of U of A researchers, headed by electrical engineer Dr. Herb Seguin, are attempting to apply the unique characteristics of the laser to practical welding problems.

"The process would produce very high quality welds — much better than conventional arc welding — and would be remarkably faster. We anticipate speeds ranging between 50 and 100 inches per minute," Seguin said in a Wednesday interview.

But the research hasn't actually produced a welding laser yet, and Seguin said if the National Research Council doesn't re-new a grant that funded the project for the past two years, the laser welder may never be a reality. At least not here.

"The process has been done elsewhere in a simple form," Seguin said. "A few private American companies have produced laboratory laser welders and their results are very encouraging. Such work is highly proprietary and difficult to get information on what is a very competitive field."

To be a viable welding technique, Seguin said, a laser welder must be relatively inexpensive to build, efficient in operation, and compact enough to be easily transported to the jobsite, power supply included.



**Electrical Eng. laser facility**  
This apparatus, set up in the basement of the Civ. Elec. Engineering Bldg., produces a medium-strength research laser. The power source (A), connected to the laser generating device (B), produces a beam across the gap indicated at (C).

Such units, Seguin said, could hopefully perform the thousands of welds required on a major northern pipeline faster, cheaper and safer than conventional methods.

"The quality of arc welding is directly proportional to the skill of the worker," he said. "The laser has potential for an automatic

process that could eliminate the human error factor. Obviously, one would like to get as close to zero failure probability as possible.

"Some of the problems encountered in field welding, like working in a trench, could probably be overcome with mirror systems," he said.

"The quality control necessary for pipeline welding in the north is extremely high. You simply cannot afford the ecological consequences of a failure.

"Laser welding would solidly join square edges of pipe (not bevelled, as in arc welding) with heat fusion, utilizing the pure light energy of the beam. And the same laser could be used at

various intensities to cut, clean and heat-treat the pipe (alter the characteristics of the steel).

"Laser welding could significantly cut contamination in the weld. Arc welding uses a foreign material to join two pieces of metal, which can introduce impurities. And dirt, dust, wind and rain all affect the quality of the weld."

Arc welding often weakens the area of pipe surrounding the joint, Seguin said, because the heat necessary for welding is also conducted sideways along the pipe and weakens the crystal structure of the metal.

Laser welding, he remarked, would be somewhat like fusing two pieces of plastic with a hot knife so quickly the material on either side of the joint would not be affected by the heat at all.

The steel industry is interested in the process, Seguin said, because each piece of pipe has an arc weld running the full length which takes far more time to seal with an arc than it would with a laser.

"If we can come up with a process that's even twice as fast as arc welding, it would double the output of a steel mill," Seguin remarked.

In answer to a question on jurisdictional problems in respect to pipelines, Seguin commented he's confident a pipeline through northern Canada will be built and expressed optimism on the question of native land claims.

"I think the issues will be settled, like they were in James Bay and Churchill Falls where the native people did very well. I'm sure they'll do very well in the north too — energy is expensive and we're going to have to pay for pipelines and land claims if we are going to get it."

## GFC—debate, defer

Decisions made Monday by General Faculties Council (GFC) ranged from putting off a vote on changing procedures for departure from final exam schedules to putting off the end of the term of office of GFC student members.

The motion on departures from the final exam schedule was put forward by Ken McFarlane (SU vp academic). He said that he has received complaints from several students that they have been hurt by changes in the final exam schedule made by their classes in the final part of the term. He said that the final exam schedule set out in the calendar is like an informal contract with every student. He recommended that, in order for a final exam to be moved, every student registered for credit in a class must independently send his written consent to the change to the dean's office.

McFarlane said that under the present system, where the only condition is approval by the faculty council, many students had been forced by peer pressure into signing a petition not in their best interests.

When several members said that the procedures as set out in the motion would make any changes impossible, the motion was tabled for further study.

A motion to make it compulsory that final examinations in half-year courses given in the second term be limited to two hours was defeated. In arguing for the motion, Marilyn Lee pointed out that, from practical considerations, exams can only be two hours in the first term, so that, for equity, second-term half-year finals should be limited to two hours.

In other business: since

many student positions on GFC for next year remain unclaimed, and since several items felt to be important to students will be

discussed next month, the term of office for present student members was extended by one month.

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RAPE in Edmonton is reaching alarming proportions. Its effects on the victim, the police, the therapist, and the rapist are all explored in a 90 minute television special "Rape in Reality", using dramatized sequences acted out and then analysed by a live audience. Following the presentation there will be an open line on CBC Radio 740. Call 469-5050 or 466-0444.

**SAT. APRIL 2  
AT 9:30 P.M.**

