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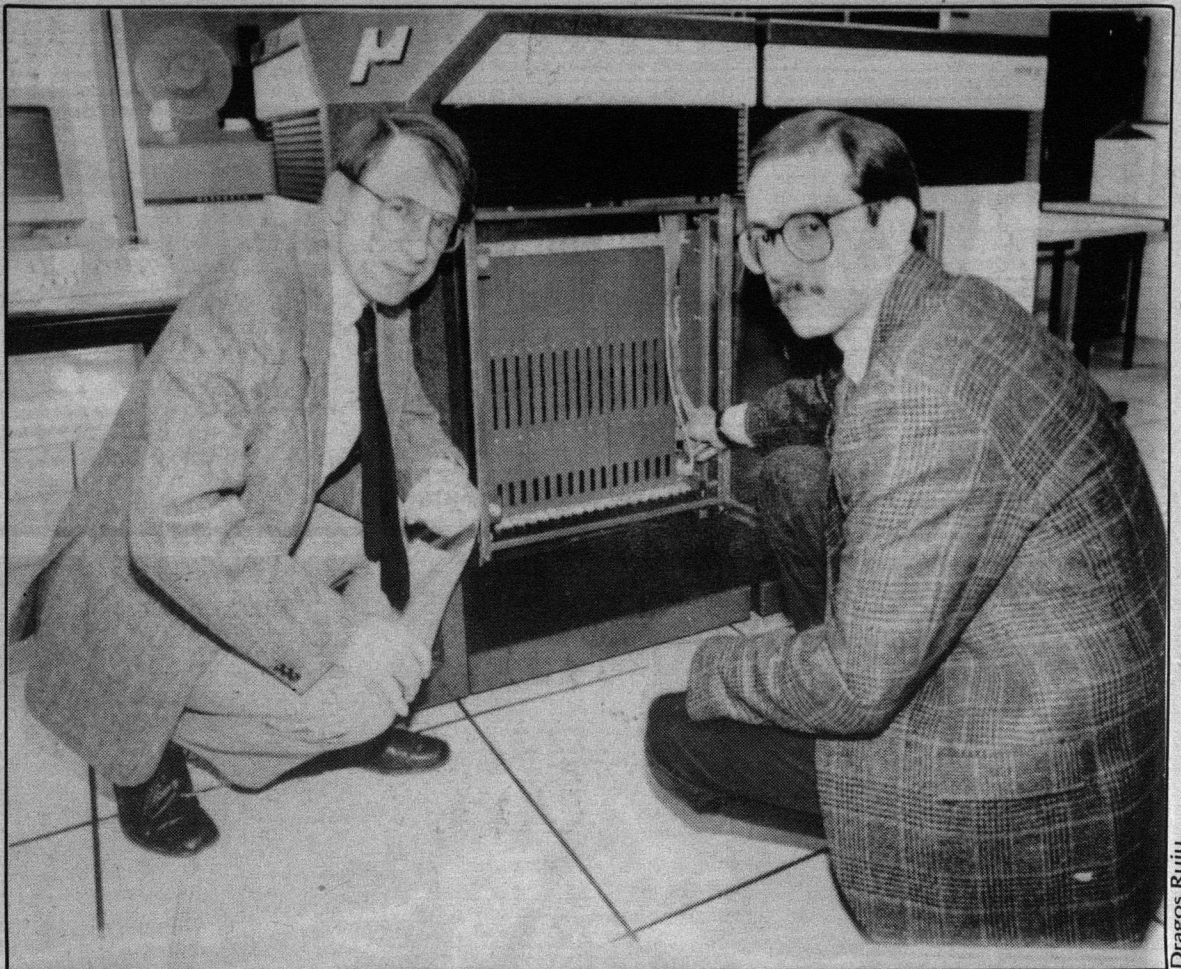
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Computer science professor Dr. Tony Marsland and Myrias Research's Ron Meleshko show the University's new supercomputer.

Supercomputer debuts on campus

by Anil Thaker and Dragos Ruiu

The U of A has a new \$800 thousand supercomputer which was designed and built by an Alberta firm named Myrias Research. The SPS-2 (Scaleable Parallel Supercomputer) was installed last week in the General Services Building and is on loan to the University for the next six months.

This new supercomputer differs from other computers because it has 64 processing units that run programs simultaneously. The Myrias system has many processors working on the same problem at the same time, getting work done much faster than a conventional computer with only one processing unit can.

Edmonton based, Myrias Research Corporation was founded in 1983, and is starting to market its supercomputer line internationally. The U of A installation came about because of a 7.5 million dollar loan from the Alberta Department of Technology, Research and Telecommunications, according to Ken Gordon, director of business development at Myrias. The computers built with this grant were lent to research institutions in Alberta.

The U of A, and the University of Calgary have received 64 processor SPS-2 machines on loan for the purposes of research. Myrias also has a machine installed at Alberta Research Council, and at several other customer sites.

The main concept behind the SPS-2 computers, which range from

64 to 1024 processors, is massively parallel processing. Parallel processing involves taking a large task and dividing it into sub-tasks that run simultaneously. Each sub-task is run by the separate processing units of the SPS-2. Each processing unit is a complete computer in itself.

To assist the user of this new computer, Myrias has developed very sophisticated software that helps programmers easily divide their work into sub-tasks. The system also automatically balances the workload of the processors.

"Scientists and engineers are given a very high performance machine with an operating system that does not require them to re-learn programming," said Gordon. Programmers who wish to use the SPS-2 do not need to learn any exotic languages, and may immediately begin programming in FORTRAN or C languages commonly used in the scientific and engineering communities.

The large amount of processing power of "the SPS-2 is intended for numerical simulation of natural phenomena," said Gordon. One example of this kind of simulation is the research of Dr. Roger Bradbury, who is visiting the U of A from the Australian Institute of Marine Science. Bradbury is using the Myrias system to model starfish outbreaks on the Great Barrier reef, which are threatening the ecology of the reef.

The Great Barrier reef is actually comprised of 3000 component reefs, and according to Dr. Bradbury, you can't get a handle on the star fish problem unless you know what is simultaneously happening in each place. He will use the SPS-2 to

model the reefs and monitor the movement of the starfish outbreaks. He will, "try techniques of controlling the outbreaks that would otherwise be impossible to test."

Bradbury says the SPS-2 can also be used for "a great deal of other similar applications like global warming, and forest management." He was impressed by the Myrias computer because it is "as easy to use as a PC."

Sotiris Kapotas, a graduate student at the seismology lab group has been using the SPS-2 to analyze "things that were unable to be analyzed before because of the amount of computation needed." He hopes the new computer will allow his research to be expanded "one step further."

The new computer will be used mostly by graduate students and professors of the Faculty of Science, according to Paul Sorenson, Chairman of Computer Science. Sorenson says that there are no real plans for undergraduate use of the SPS-2, or for a course using it, but "there may be a course in the second term involving the machine as a lab requirement."

According to many people, parallel computing such as the Myrias machine offers us the wave of the future, and the university has a chance to be pioneering in the field with this machine. It is unclear whether this machine will stay here permanently, but Martin Walker, director of planning at Myrias, summarized it as, "these are the early days of parallel computing. Myrias is offering students at the U of A to get in on the ground floor of computing technology that will be very important to the future."



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