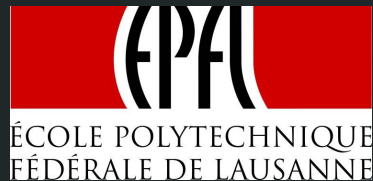# Cray-1

Emerson Kim & Leonardo Aoun

Background

- Seymour Cray worked on the CDC 8600, a successor of the CDC 6600
- He left CDC and started Cray Research
- After 4 years of development, the 80 MHz Cray-1 was announced in 1975
  - NCAR paid $8.86 million for serial number 3
- The Cray-1 was very successful, selling over 80 units for $5-8M each
- Later succeeded by the Cray X-MP and Cray-2

Internals of the Cray-1

- B and T registers in memory hierarchy
- The Cray-1 was the first Cray design to use Integrated Circuits (ICs)
- 64-bit system
- C-shape to maximize performance
- The Cooling System was meticulously worked on:
  - Copper sheets between each two circuit boards
  - Freon liquid in the stainless pipes
  - New welding techniques to seal the tubing
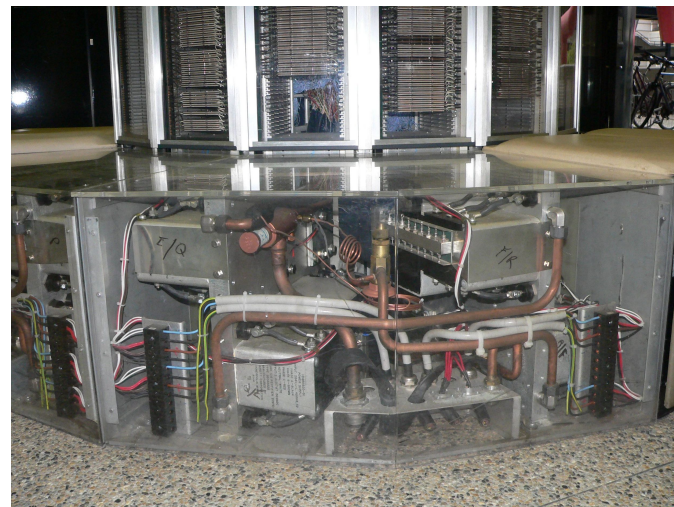
STAR	Cray
Vector machine -> less fetches and decodes	Relied on registers
Memory to Memory, only memory accesses for arrays are set-up	Repeated operation on already-read elements
Variable length of vectors	Registers are expensive so fixed number
Very long pipelines	Separation of pipelines