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GRAPE, A Dedicated Supercomputer for Astronomy

In the 1980s, Yoshihiro Chikada at the National Astronomical Observatory of Japan, developed a digital spectrometer for millimeter-wave interferometers and as an application of this specialized hardware, proposed a many-body problems meter applying a pipeline system for many-body simulations. In response to this idea, from the end of the 1980s, Daiichiro Sugimoto's group at Tokyo University continued to develop GRAPEs, special-purpose computers for gravitational many-body problems. These GRAPEs include: GRAPE-1 (1989), GRAPE-2 (1990), GRAPE-3 (1991), HAPR-1 (1993), GRAPE-4 (1995), GRAPE-5 (1998), GRAPE-6 (2002), GRAPE-7 (2006), and GRAPE-DR (2006). Among others, GRAP-4, GRAP-5, and GRAP-6 received Gordon Bell Prizes. In addition, the development of a MD-GRAPE system was also developed for many-body problems specialized on molecular dynamics.

GRAPE: Gravity PipE

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ELIS/TAO

ELIS was a LISP machine developed by Yasushi Hibino, et al. at Nippon Telegraph and Telephone Public Corporation. They started the study in 1978, realized it in 1985, and published it as an AI workstation in 1986, releasing it as ELIS-800 in 1987. ELIS featured list processing functions fit for LISP processing, tag processing functions, character processing functions and a memory general-purpose register MGR.

At the same time, the TAO computer language was developed. TAO was the language to process three programming paradigms—function type (LISP), theory type, object-oriented type—by uniting them by S system construction. The processing system was developed by Ikuo Takeuchi, et al., and was run on ELIS in September 1983.

About 400 units of commercial ELIS series have been manufactured.

ELIS: Ecl LISt processor

LISP: LISt Processor