

PREFACE

The symposium of which you are now holding the proceedings was held in July 2001 in Tokyo, two and a half years after the scientific organizing committee was formed which recommended its structure as a confluence of three distinct strands. One strand was the study of the dynamics of dense stellar systems and especially that of globular clusters, a topic that had been at the center of three previous IAU symposia, No. 69 in Besançon in 1974, No. 113 in Princeton in 1984, and No. 174 in Tokyo in 1995. While some talks in the last one addressed other dense stellar systems, such as the nucleus of our galaxy, the current proceedings includes several talks on the dynamics of galactic nuclei as well as on star forming regions, the third area of interest in the study of dense stellar systems.

The second strand woven into the symposium concerns the use of the GRAPE family of special-purpose supercomputers. The day before the meeting the latest member of the family was unveiled, the GRAPE-6, running at 32 Teraflops, which made it the fastest computer ever built at the time of the symposium. In the proceedings a large number of papers report GRAPE calculations for structure formation on vastly different scales, all the way from protoplanetary formation through star formation and star cluster dynamics to interactions between galaxies and galaxy formation in the context of large-scale structure formation in the Universe.

The third strand consists of cosmological simulations. Unlike the study of dense stellar systems, which typically require large processing power and only modest memory use, cosmological simulations are often memory limited. Therefore, they are generally performed on traditional supercomputers as well as clusters of smaller computers. The title of the symposium, "Astrophysical Supercomputing using Particle Simulations," was chosen to capture the spirit of all three strands.

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