

Contents

Participants	V
Preface	IX

Opening Address

R. Theenhaus	3
--------------	---

Keynote Address

Science, Industry and the New Japanese Challenge Kenneth G. Wilson	9
---	---

Part 1. Hardware Systems

1.1 Large-Scale and High-Speed Multiprocessor System For Scientific Applications: CRAY X-MP Series. Steve S. Chen	59
1.2 Simplicity and Flexibility in Concurrent Computer Architecture Wolfgang Händler	69
1.3 Distributed Array Processor, Architecture and Performance S. F. Reddaway	89
1.4 Japanese Project on Fifth Generation Computer Systems Tohru Moto-oka	99
1.5 Japanese Super-Speed Computer Project Hiroshi Kashiwagi	117
1.6 FACOM Vector Processor VP-100/VP-200 Kenichi Miura Keiichiro Uchida	127
1.7 Latency and HEP Burton J. Smith	139
1.8 The S-1 Mark II A Supercomputer P. Michael Farmwald	145

Part 2. Performance and Capabilities
of Computer Systems

2.1 Performance of Parallel Computers	159
R. W. Hockney	
2.2 Performance Modelling and Evaluation For Concurrent Computer Architectures	177
Ulrich Herzog	
2.3 A Performance Survey of the CYBER 205	191
M. J. Kascic, Jr.	
2.4 Benchmark Results on Physical Flow Problems	211
W. Gentzsch	
2.5 Parallel Processing of Sparse Structures	229
David J. Kuck Daniel D. Gajski	

Part 3. Algorithms and Applications

3.1 Experience in Exploiting Large Scale Parallelism	247
D. Parkinson	
3.2 Design and Performance of Algorithms for MIMD Parallel Computers	257
J. S. Kowalik R. E. Lord S. P. Kumar	
3.3 Vectorization of Scientific Software	277
K. W. Neves	
3.4 The Solution of Sparse Linear Equations on the CRAY-1	293
Iain S. Duff	

3.5 On Two Numerical Algorithms for Multiprocessors		
	A. Sameh	311
3.6 A Parallel First-Order Method For Parabolic Partial Differential Equations		
	Garry Rodrigue	329
3.7 Some Vector and Parallel Implementations For Preconditioned Conjugate Gradient Algorithms		
	A. Lichnewsky	343
3.8 Data Processing in High Energy Physics and Vector Processing Computers		
	T. Bloch	
	D. Lellouch	361
3.9 A Methodology for Exploiting Parallelism in the Finite Element Process		
	Loyce M. Adams	
	Robert G. Voigt	373
3.10 The Evolution of MSC/NASTRAN and the Supercomputer for Enhanced Performance		
	J. F. Gloudeman	
	C. W. Hennrich	
	J. C. Hodge	393
3.11 Fast Fourier Transforms on the CYBER 205		
	Clive Temperton	403
3.12 Plasma Simulation and Fusion Calculation		
	B. L. Buzbee	417
3.13 Molecular Dynamics on CRAY, CYBER and DAP		
	H. J. C. Berendsen	
	W. F. van Gunsteren	
	J. P. M. Postma	425
Names and Address of Participants		439