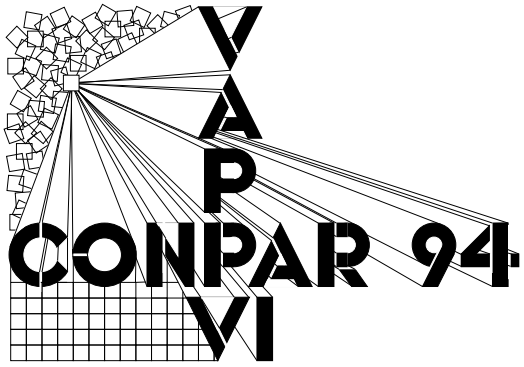

Final Program
September 6–8, 1994
Johannes Kepler University
Linz, Austria

Program Structure

1. Day	**2. Day**	**3. Day**
Keynote Address	Keynote Address	Keynote Address
Streams A+B+C	Streams A+B+C	Streams A+B+C
Poster Session	Industrial Session	
Conference Reception	Panel Discussion	
	Conference Dinner	

Stream A **Lecture Hall HS 1**	**Stream B** **Lecture Hall HS 2**	**Stream C** **Lecture Hall HS 3**
Performance Analysis and Monitoring	Parallel Program Development	Parallel Algorithms and Complexity Models
Parallel Architectures and Abstract Machines	Parallel Languages and Compiler Technology	Scheduling in Distributed Memory Systems
Networks and Routing		

Invited Speakers

Kai Hwang (University of Southern California)
Ian Foster (Argonne National Laboratory)
Monica Lam (Stanford University)

Panel Discussion

Parallel Computation: Past Expectations and Current Predictions —
A comparison with CONPAR 1981.

Tuesday, September 6

7.30 Registration Desk Opens

8.30–9.00 Opening Address (HS 1)

9.00–10.00 Keynote Address (HS 1)

Kai Hwang (University of Southern Calfornia, USA) *Scalability and Programmability of Massively Parallel Processors*

10.00–10.15 Break

10.15–11.45 Parallel Sessions (HS 1,2,3)

A: Performance Analysis and Monitoring I (HS 1)

Chair: J. Volkert (Johannes Kepler University, Linz, Austria)

Bernd Mohr, Darryl Brown, Allen Malony (University of Oregon, Eugene, Oregon, USA) *TAU: A Portable Parallel Program Analysis Environment for pC++*

H. Wabnig, G. Haring, D. Kranzlmüller, J. Volkert (University of Vienna, Austria) *Communication Pattern based Performance Prediction on the nCUBE 2 Multiprocessor System*

A. Ferscha, J. Johnson (University of Vienna, Austria) *Performance Oriented Development of SPMD Programs Based on Task Structure Specifications*

B: Parallel Program Development I (HS 2)

Chair: F. Andre (IRISA, Campus de Beaulieu, Rennes, France)

Luc Bouge, Yann Le Guyadec, Gil Utard, Bernard Virot (Ecole Normale Superieure de Lyon, France) *On the Expressivity of a Weakest Preconditions Calculus for a Simple Data-Parallel Programming Language*

Eric Violard, Guy-Rene Perrin (University of Franche-Comte, Besancon, France) *Reduction in PEI*

D. K. Arvind, B. R. J. McConnell (University of Edinburgh, UK) *Towards the Synthesis of Asynchronous Concurrent Programs*

C: Parallel Algorithms and Complexity Models I (HS 3)

Chair: S. G. Sedukhin (University of Aizu, Japan)

M. Amor, M. J. Martin, D. Blanco, O. G. Plata, F. F. Rivera, F. Arguello (Universidad de Santiago, Spain) *Vectorization of the Radix r Self-Sorting FFT*

M. Clint, J. S. Weston, J. B. Flannagan (Queen's University of Belfast, UK) *Efficient Gram-Schmidt Orthogonalisation on an Array Processor*

M. K. Stojcev, E. I. Milovanovic, M. D. Mihajlovic, I. Z. Milovanovic (University of Nis, Serbia) *Parallel Algorithm for Inverting Tridiagonal Matrix on Linear Array Processor*

11.45–13.15 Lunch

13.15–14.15 Poster Session (Hallway)

14.15–14.30 Break

14.30-16.00 Parallel Sessions (HS 1,2,3)

A: Performance Analysis and Monitoring II (HS 1)

Chair: A. Ferscha (University of Vienna, Austria)

Siegfried Grabner, Dieter Kranzlmüller (Johannes Kepler University, Linz, Austria) *Monitoring for Detecting Bugs and Blocking Communication*

L. J. Levrouw, K. M. R. Audenaert (University of Gent, Belgium) *Minimizing the Log Size for Execution Replay of Shared-Memory Programs*

Wolfgang Kastner, Stefan Stöckler, Rene Zeitlberger (Technical University of Vienna, Austria) *GOLD MINE: Specification Language for Event-based Monitoring*

B: Parallel Program Development II (HS 2)

Chair: F. Andre (IRISA, Campus de Beaulieu, Rennes, France)

A. M. Geerling (University of Nijmegen, The Netherlands) *Formal Derivation of SIMD Parallelism from Non-linear Recursive Specifications*

S. Fitzpatrick, T. J. Harmer, J. M. Boyle (Queen's University, Belfast, UK) *Deriving Efficient Parallel Implementations of Algorithms Operating on General Sparse Matrices using Automatic Program Transformation*

Stephan Kindermann (University of Erlangen-Nürnberg, Germany) *Flexible Program and Architecture Specification for Massively Parallel Systems*

C: Parallel Algorithms and Complexity Models II (HS 3)

Chair: S. G. Sedukhin (University of Aizu, Japan)

Tudor Jebelean (Johannes Kepler University, Linz, Austria) *Systolic Algorithms for Long Integer GCD Computation*

Beniamino Di Martino, Giulio Iannello (Universita "Federico II" di Napoli, Italy) *Parallelization of Non-simultaneous Iterative Methods for Systems of Linear Equations*

Thomas Rauber, Gudula Rünger (University of the Saarland, Saarbrücken, Germany) *Hypercube Implementation and Performance Analysis for Extrapolation Models*

16.00–16.15 Break

16.15–17.45 Parallel Sessions (HS 1,2,3)

A: Parallel Architectures and Abstract Machines I (HS1)

Chair: K. Hwang (University of Southern California, USA)

Mateo Valero, Montse Peiron, Eduard Ayguade (Universitat Politecnica de Catalunya, Barcelona, Spain) *Memory Access Synchronization in Vector Multiprocessors*

Mazin S. Yousif, C. R. Das, M. J. Thazhuthaveetil (Louisiana Tech University, Ruston, USA) *A Switch Cache Design for Min-Based Shared Memory Multiprocessors*

R. Kattner, M. Eger, C. Müller-Schloer (University of Hannover, Germany) *Modeling Cache Coherence Overhead with Geometric Objects*

B: Parallel Program Development III (HS 2)

Chair: K.-D. Reinartz (University of Erlangen, Germany)

S. G. Sedukhin, I. S. Sedukhin (University of Aizu, Japan) *Systematic Approach and Software Tool for Systolic Design*

Lawrence Lau, Mike Rezny, John Belward, Kevin Burrage, Bert Pohl (ETH Zuerich, Switzerland) *ADVISE — Agricultural Developmental Visualization Interactive Software Environment*

Ulich Detert, Michael Gerndt (Research Centre Jülich (KFA), Germany) *TOP^2 Tool Suite for the Development and Testing of Parallel Applications*

C: Parallel Algorithms and Complexity Models III (HS 3)

Chair: N. Mirenkov (University of Aizu, Japan)

Wolf Zimmermann, Welf Löwe (University of Karlsruhe, Germany) *An Approach to Machine-Independent Parallel Programming*

Steven Prestwich (ECRC, Munich, Germany) *On Logic Program Parallelisation Strategies*

S. G. Akl, L. Fava Lindon (Queen's University, Kingston, Ontario, Canada) *Paradigms Admitting Superunitary Behaviour in Parallel Computation*

17.45–19.00 Break

19.00 Welcome Reception

Wednesday, September 7

9.00-10.00 Keynote Address (HS 1)

Ian Foster (Argonne National Laboratory, Illinois, USA) *Language Constructs and Runtime Systems for Compositional Parallel Programming*

10.00–10.15 Break

10.15–11.45 Parallel Sessions (HS 1,2,3)

A: Parallel Architectures and Abstract Machines II (HS 1)

Chair: K. Hwang (University of Southern California, USA)

Stefan Lüpke (Technical University Hamburg-Harburg, Germany) *Accelerated Access to Shared Distributed Arrays on Distributed Memory Systems by Access Objects*

Rudolf Berrendorf, Michael Gerndt, Zakaria Lahjomri, Thierry Priol (Research Center Jülich (KFA), Germany) *A Comparism of Shared Virtual Memory and Message Passing Programming Techniques Based on a Finite Element Application*

Renate Dohmen (Max-Planck-Institute for Plasma Physics, Garching, Germany) *Comparison between a Message Passing and a Global Shared Memory Parallel Computer by Means of a Concrete Monte-Carlo Algorithm*

B: Parallel Languages and Compiler Technology I (HS 2)

Chair: H. Burkhart (University of Basel, Switzerland)

Nikolay Mirenkov (University of Aizu, Japan) *VIM Language Paradigm*

M. D. Feng, Y. Q. Gao, C. K. Yuen (National University of Singapore, Kent Ridge, Singapore) *Distributed Linda Tuplespace Algorithms and Implementations*

Peter Bailey, Malcolm Newey, David Sitsky, Robin Stanton (Australian National University, Canberra, Australia) *Supporting Coarse and Fine Grain Parallelism in an Extension of ML*

C: Parallel Algorithms and Complexity Models IV (HS 3)

Chair: B. Buchberger (Johannes Kepler University, Linz, Austria)

Carla Limongelli, Roberto Pirastu (Johannes Kepler University, Linz, Austria) *Exact Solution of Linear Equation Systems over Rational Numbers by Parallel p-adic Arithmetic*

Hoon Hong, Hans-Wolfgang Loidl (Johannes Kepler University, Linz, Austria) *Parallel Computation of Modular Multivariate Polynomial Resultants on Shared Memory Machine*

Yoshio Tanaka, Shogo Matsui, Atsushi Maeda, Masakazu Nakanishi (Keio University, Japan) *Partial Marking GC*

11.45–13.15 Lunch

13.15–15.15 Parallel Sessions (HS 1,2,3)

A: Parallel Architectures and Abstract Machines III (HS 1)

Chair: H. Burkhart (University of Basel, Switzerland)

R. Milikowski, W. G. Vree (University of Amsterdam, The Netherlands) *Non-homogeneous Parallel Memory Operations in a VLIW Machine*

T. Bülck, A. Held, W. Kluge, S. Pantke, C. Rathsack, S.-B. Scholz, R. Schröder (Christian-Albrechts University, Kiel, Germany) *Experience with the Implementation of a Concurrent Graph Reduction System on an nCube/2 Platform*

Patrick Lincoln, Jose Meseguer, Livio Ricciulli (SRI International, Menlo Park, California, USA) *The Rewrite Rule Machine Node Architecture and its Performance*

Kevin Hammond, Jim Mattson, Simon L. Peyton Jones (University of Glasgow, UK) *Automatic Spark Strategies and Granularity for a Parallel Functional Language Reducer*

B: Parallel Languages and Compiler Technology II (HS 2)

Chair: I. Foster (Argonne National Laboratory, Illinois, USA)

C. Calvin, L. Colombet, P. Michallon, D. Trystram, F. Desprez, B. Tourancheau, B. Jargot (LMC-IMAG, Grenoble, France) *Towards Mixed Computation / Communication in Parallel Scientific Libraries*

Ross A. Bagley, Philip A. Wilsey, Nael B. Abu-Ghazaleh (University of Cincinnati, Ohio, USA) *Composing Functional Unit Blocks for Efficient Interpretation of MIMD Code Sequences on SIMD Processors*

Josep Llosa, Mateo Valero, Jose Fortes, Eduard Ayguade (Universitat Politecnica de Catalunya, Barcelona, Spain) *Using Sacks to Organize Registers in VLIW Machines*

C: Parallel Algorithms and Complexity Models V (HS 3)

Chair: H. Hong (Johannes Kepler University, Linz, Austria)

Stavros D. Nikolopoulos (University of Cyprus, Nicosia, Cyprus) *Parallel Recognition and Location Algorithms for Chordal Graphs using Distance Matrices*

Michele Dion, Marc Gengler, Stephane Ubeda (Ecole Normale Superieure, Lyon, France) *Comparing two Probabilistic Models of the Computational Complexity of the Branch and Bound Algorithm*

Jingsen Chen (Lulea University, Sweden) *Parallel Heap Construction Using Multiple Selection*

15.15–15.30 Break

15.30–17.00 Industrial Session (HS 2)

17.00–17.15 Break

17.15–18.45 Panel Discussion (HS 1)
Chair: B. Buchberger (Johannes Kepler University, Linz, Austria)

Parallel Computation: Past Expectations and Current Predictions — A comparison with CONPAR 1981.

Panelists: To be announced.

18.45–20.00 Break

20.00 Conference Dinner

Thursday, September 8

9.00–10.00 Keynote Address (HS 1)

Monica Lam (Stanford University, California, USA) *Locality Optimizations for Parallel Machines*

10.00–10.15 Break

10.15–11.45 Parallel Sessions (HS 1,2,3)

A: Parallel Architectures and Abstract Machines IV (HS 1)

Chair: O. Lange (Technical University Hamburg-Harburg, Germany)

Wolfgang Schreiner (Johannes Kepler University, Linz, Austria) *Virtual Tasks for the PACLIB Kernel*

Jean-Yves Le Gall, Francois Simon (Alcatel Alsthom Recherche, Marcoussis, France) *MUSE: a Message Passing Concurrent Computer for On-Board Space Systems*

R. S. Hogg, D. W. Lloyd, W. I. Hughes (Sheffield Hallam University, England) *Self-Timed Communication Strategies for Massively Parallel Architectures*

B: Parallel Languages and Compiler Technology III (HS 2)

Chair: I. Foster (Argonne National Laboratory, Illinois, USA)

Jean-Yves Berthou (Universite de Versailles - St Quentin, France) *Design of a Meta-Parallelizer for Large Scientific Applications*

Barbara Chapman, Piyush Mehrotra, John Van Rosendale, Hans Zima (University of Vienna, Austria) *A Software Architecture for Multidisciplinary Applications: Integrating Task and Data Parallelism*

Martin Griebl, Christian Lengauer (University of Passau, Germany) *On Scanning Space-time Mapped WHILE Loops*

C: Parallel Algorithms and Complexity Models VI (HS 3)

Chair: R. Wait (University of Liverpool, United Kingdom)

Ian Gorton, Toong Shoon Chan, Innes Jelly (University of New South Wales, Kensington, Australia) *Engineering High Quality Parallel Software Using PARSE*

Alfred Spalt, Edith Spiegl, Thomas Meikl (Johannes Kepler University, Linz, Austria) *Massively Parallel Volume Rendering*

W. Stürzlinger, C. Wild (Johannes Kepler University, Linz, Austria) *Parallel Visibility Computations for Parallel Radiosity*

11.45–13.15 Lunch

13.15–14.45 Parallel Sessions (HS 1,2,3)

A: Networks and Routing I (HS 1)

Chair: O. Sykora (Slovak Academy of Sciences, Bratislava, Slovakia)

Sabine R. Öhring, Sajal K. Das, Dirk H. Hohndel (University of Würzburg, Germany) *Asymptotically Optimal Communication Algorithms on Faulty Folded Petersen Networks*

Roman Trobec, Izidor Jerebic (University of Ljubljana, Slovenia) *Optimization of Diagnostic Examination*

G. Chen, F. C. M. Lau (University of Hong Kong) *Laying Out Midimew Networks with Constant Dilation*

B: Parallel Languages and Compiler Technology IV (HS 2)

Chair: M. Lam (Stanford University, California, USA)

Mourad Raji Werth, Paul Feautrier (University of Versailles, France) *Optimizing Communications for Compiler Parallelized Programs*

Rumen Andonov, Sanjay Rajopadhye (IRISA, Campus de Beaulieu, Rennes, France) *Optimal Tiling*

Vincent Bouchitte, Pierre Boulet, Alain Darte, Yves Robert (Ecole Normale Superieure de Lyon, France) *Evaluating Array Expressions on Massively Parallel Machines with Communication/Computation Overlap*

C: Scheduling in Distributed Memory Systems I (HS 3)

Chair: K.-D. Reinartz (University of Erlangen, Germany)

Ismail Haritaoglu, Cevdet Aykanat (Bilkent University, Ankara, Turkey) *An Efficient Mapping Heuristic for Mesh-Connected Parallel Architectures Based on Mean Field Annealing*

Markus Schwehm, Thomas Walter (University of Erlangen-Nürnberg, Germany) *Mapping and Scheduling by Genetic Algorithms*

Jürgen W. Meyer (Technical University Hamburg-Harburg, Germany) *Self-Organizing Processes*

14.45-15.00 Break

15.00-16.30 Parallel Sessions (HS 1,2,3)

A: Networks and Routing II (HS 1)

Chair: O. Sykora (Slovak Academy of Sciences, Bratislava, Slovakia)

Pierre Fraigniaud, Cyril Gavoille (Ecole Normale Superieure de Lyon, France) *Optimal Interval Routing*

A. Ferreira, A. Goldman vel Lejbman, S. Song (Ecole Normale Superieure de Lyon, France) *Broadcasting in Bus Interconnection Networks*

D. Deserable (INSA, Rennes, France) *Broadcasting in the Arrowhead Torus*

B: Parallel Languages and Compiler Technology V (HS 2)

Chair: M. Lam (Stanford University, California, USA)

S. P. Johnson, M. Cross, P. F. Leggett (University of Greenwich, UK) *User Interaction and Symbolic Extensions to Dependence Analysis*

Vadim Maslov, William Pugh (University of Maryland, College Park, Maryland, USA) *Simplifying Polynomial Constraints Over Integers to Make Dependence Analysis More Precise*

R. Govindarajan, Erik R. Altman, Guang R. Gao (McGill University, Montreal, Canada) *A Framework for Rate-Optimal Resource-Constrained Software Pipelining*

C: Scheduling in Distributed Memory Systems II (HS 3)

Chair: A. Ferscha (University of Vienna, Austria)

Thierry Le Sergent, Bernard Berthomieu (University of Edinburgh, UK) *Balancing Load under Large and Fast Load Changes in Distributed Computing Systems — A Case Study*

A. Elleuch, R. Kanawati, T. Muntean, E.-G. Talbi (IMAG, University of Grenoble, France) *Dynamic Load Balancing Mechanisms for a Parallel Operating System Kernel*

J. L. Roch, A. Vermeerbergen, G. Villard (IMAG, University of Grenoble, France) *A New Load-Prediction Scheme Based on Algorithmic Cost Functions*

16.30 Conference Ends