16th International Parallel & Distributed Processing Symposium
April 15-19, 2002 • Marriott Marina Fort Lauderdale
Sponsored by IEEE Computer Society
Technical Committee on Parallel Processing
www.ipdps.org

ADVANCE PROGRAM

Rev 25 Feb 2002

International Parallel & Distributed Processing Symposium
April 15-19, 2002
Marriott Marina
Fort Lauderdale, Florida - USA

This downloadable version of the IPDPS 2002 program has been updated as of 25 Feb 2002 and should reflect changes and corrections from the previous edition. Authors listed here are welcome to contact info@ipdps.org regarding any further corrections. These will be incorporated in the final on-site program.

Note Re Rev 25 Feb 2002 Edition: The workshop numbering has changed from previous edition so as to match the publication order of each workshop in the proceedings. These numbers – as well as acronyms – will be used on site at IPDPS 2002. Workshops 1-11 will be held on Monday and 12-19 on Friday.

IPDPS 2002
MONDAY, APRIL 15

IPDPS 2002 WORKSHOPS
All Day Monday

1	• Heterogeneous Computing Workshop
2	• Workshop on Parallel and Distributed Real-Time Systems
3	• Workshop on High-Level Parallel Programming Models & Supportive Environments
4	• Workshop on Java for Parallel and Distributed Computing
5	• Workshop on Parallel and Distributed Computing in Image Processing, Video Processing, and Multimedia
7	• Workshop on Advances in Parallel and Distributed Computational Models
8	• Reconfigurable Architectures Workshop
9	• Workshop on Communication Architecture for Clusters
10	• NSF Next Generation Systems Program Workshop
11	• Workshop on High Performance Computational Biology

Note: Workshops are open to all IPDPS 2002 registrants. Detailed program schedules will be available on-site. See individual advance program schedules for each workshop on their web sites which may be accessed by link from www.ipdps.org. Proceedings for workshops are part of the Symposium Proceedings available to all registrants on site.

SYMPOSIUM TUTORIAL
Monday Afternoon

Grid Computing: Concepts, Technologies, and Applications

Instructor: Ian Foster, Argonne National Laboratory & University of Chicago

Abstract: The paradigm of Grid computing is currently being deployed to solve some of our most challenging computing problems. The tutorial will explore – largely through first-hand examples – how to apply Grid techniques to complex problems in scientific and engineering computation. The tutorial provides a pragmatic overview of the Grid concept, based on the latest models of Grid architecture. It surveys several technologies that can be used to construct Grids, focusing on the Globus Toolkit, Condor, and the new Open Grid Services Architecture. It illustrates the accomplishments, plans, and challenges faced by large Grid projects in the U.S., Europe, and Asia, including Grid Physics Network, Particle Physics Data Grid, NASA Information Power Grid, Network for Earthquake Engineering Simulation Grid, EU DataGrid, and Earth Systems Grid. It also includes a brief review of major research challenges in Grid computing and current research efforts to extend the scope, utility, and ease of grid computing.

Audience: This tutorial is for people interested in getting acquainted with Grid computing concepts, technologies, and approaches and in exploring how to apply Grid technologies to their own large-scale computing problems. It will also be of interest to those with previous exposure to the concept who seek an update on how Grid techniques have matured and solidified in the past two years.

Instructor: Dr. Ian Foster is Senior Scientist and Associate Director of the Mathematics and Computer Science Division at Argonne National Laboratory, Professor of Computer Science at the University of Chicago, and Senior Fellow in the Argonne/U.Chicago Computation Institute. He currently co-leads the Globus project as well as a number of other major Grid initiatives, including the DOE-funded Earth System Grid and the NSF-funded GriPhyN and GRIDS Center projects. He co-edited the book ``The Grid: Blueprint for a New Computing Infrastructure."

Note: This tutorial – offered as part of the IPDPS 2002 registration – gives attendees an opportunity to start off the week with an expert briefing on Grid Computing. Tutorial notes will be available for purchase on-site. Visit www.ipdps.org to reserve your copy now.

IPDPS 2002
TUESDAY, APRIL 16

8:30-9:30
KEYNOTE SPEAKER

Seamus Blackley, Microsoft
Unknowing Research Subjects: Game Artists as Parallel Programmers

9:30-10:00 Break

10:00-12:00 Session 1 –
Signal Processing and Image Processing

Compression-Domain Parallel Rendering
Tulika Mitra, National University of Singapore, Tzi-cker Chiueh, State University of New York at Stony Brook

Parallel JPEG2000 Image Coding on Multiprocessors
Peter Meerwald, Roland Norcen, and Andreas Uhl, University of Salzburg

A Parallel Ultra-High Resolution MPEG-2 Video Decoder for PC Cluster Based Tiled Display System
Han Chen and Kai Li, Princeton University, Bin Wei, AT&T Laboratories Research

An Efficient Technique for Corner-Turn in SAR Image Reconstruction by Improving Cache Access
Hideyuki Izumi, Kazushi Sasaki, Katsuto Nakajima, and Hiroyuki Sato, Mitsubishi Electric Corporation

Parallel Wavelet Transform for Large Scale Image Processing
D. Chaver, M. Prieto, L. Piñuel, and F. Tirado, Complutense University

10:00-12:00 Session 2 –
Network Interface

Using Programmable NICs for Time-Warp Optimization
Ranjit Noronha and Nael Abu-Ghazaleh, State University of New York

A Strategy to Compute the Infiniband Arbitration Tables
Francisco J. Alfaro and José L. Sánchez, Universidad de Castilla-La Mancha, José Duato, Universidad Politécnica de Valencia, Chita R. Das, Pennsylvania State University

Incorporating Quality-of-Service in the Virtual Interface Architecture
Shailabh Nagar, Chun Liu, Gokul Kandiraju, Anand Sivasubramaniam, and Natarajan Gautam, Pennsylvania State University

GNBD/VIA: A Network Block Device Over Virtual Interface Architecture on LINUX
Kangho Kim, Jin-Soo Kim, Sungin Jung

Can User Level Protocols Take Advantage of Multi-CPU NICS?
Piyush Shivam, The Ohio State University, Pete Wyckoff, Ohio Supercomputer Center, Dhabaleswar Panda, The Ohio State University

Model-based Fault Detection in Powerline Networking
Anish Arora, Rajesh Jagannathan, and Yi-Min Wang, The Ohio State University

10:00-12:00 Session 3 –
Scheduling

A Metric and Mixed-Integer-Programming-Based Approach for Resource Allocation in Dynamic Real-Time Systems
Sethavidh Gertphol, Yang Yu, Shriram B. Gundala, and Viktor K. Prasanna, University of Southern California, Shoukat Ali and Jong-Kook Kim, Purdue University, Anthony A. Maciejewski and H.J. Siegel, Colorado State University

A Prediction-based Real-Time Scheduling Advisor
Peter A. Dinda, Northwestern University

Adaptive Scheduling Under Memory Pressure on Multiprogrammed SMPs
Dimitrios S. Nikolopoulos and Constantine D. Polychronopoulos, University of Illinois at Urbana-Champaign

Scheduling Multiple Data Visualization Query Workloads on a Shared Memory Machine
Henrique Andrade, University of Maryland at College Park, Tahsin Kurc, The Ohio State University, Alan Sussman, University of Maryland at College Park, Joel Saltz, The Ohio State University and University of Maryland at College Park

Preemptive Multiprocessor Scheduling Anomalies
Björn Andersson and Jan Jonsson, Chalmers University of Technology, Sweden

12:00-1:30 Lunch

1:30-3:30 Session 4 –
Financial Applications , Datamining, Databases, and Logic Programming

Parallel and Distributed Computing Issues in Pricing Financial Derivatives Through Quasi Monte Carlo
Ashok Srinivasan, Florida State University

One-Phase Distributed Commit Protocol for Main Memory Database Systems
Inseon Lee and Heon Y. Yeom, Seoul National University

An Adaptive Hash Join Algorithm on a Network of Workstations
Kenji Imasaki and Sivarama Dandamudi, Carleton University

Parallel Incremental 2D-Discretization on Dynamic Datasets
Srinivasan Parthasarathy and Arun Ramakrishnan, The Ohio State University

Achieving Scalability in Parallel Tabled Logic Programs
Ricardo Rocha, Fernando Silva, and Vítor Santos Costa, University of Porto

1:30-3:30 Session 5 –
Compilation

Compiling Several Classes of Communication Patterns on a Multithreaded Architecture
Rishi Kumar, University of Delaware, Gagan Agrawal, The Ohio State University, Guang Gao, University of Delaware

Compiler and Runtime Support for Irregular Reductions on a Multithreaded Architecture
Gary Zoppetti, University of Delaware, Gagan Agrawal, The Ohio State University, Rishi Kumar, University of Delaware

Compiler-Directed I/O Optimization
Mahmut Kandemir, Penn State University, Alok Choudhary, Northwestern University

The R-LRPD Test: Speculative Parallelization of Partially Parallel Loops
Francis Dang, Hao Yu, Lawrence Rauchwerger, Texas A&M University

A SIMD Vectorizing Compiler for Digital Signal Processing Algorithms
Franz Franchetti, Technical University of Vienna, Markus Püschel, Carnegie-Mellon University

1:30-3:30 Session 6 –
Distributed Systems

Virtual Machine Based Heterogeneous Checkpointing
Adnan Agbaria and Roy Friedman, Technion-Israel Institute of Technology

Fine-Grain Access Control for Securing Shared Resources in Computational Grids
Ali Raza Butt, Sumalatha Adabala, and Nirav H. Kapadia, Purdue University, Renato Figueiredo, Northwestern University, José A. B. Fortes, University of Florida

Enforcing Resource Sharing Agreements Among Distributed Server Clusters
Tao Zhao and Vijay Karamcheti, New York University

Design and Evaluation of a Reliable and Scalable Peer-to-Peer Web Document Sharing Service
Li Xiao, Xiaodong Zhang, College of William and Mary, Zhichen Xu, Hewlett-Packard Labs

Finding Good Peers in Peer-to-Peer Networks
Murali Krishna Ramanathan, Purdue University, Vana Kalogeraki and Jim Pruyne, Hewlett-Packard Laboratories

Modeling and Evaluating Peer-to-Peer Storage Architectures
Hung-Chang Hsiao, Chung-Ta King, National Tsing-Hua University

3:30-4:00 Break

4:00-6:00 PANEL DISCUSSION

Whatever happened to automatic parallelization ?

Moderator:
David Padua, University of Illinois at Urbana-Champaign
Panel Members:
Frances Allen, IBM Research
David Kuck, Intel Corporation
Monica Lam, Stanford University
Keshav Pingali, Cornell University
William Pugh, Universty of Maryland

IPDPS 2002
WEDNESDAY, APRIL 17

8:30-9:30
KEYNOTE SPEAKER

Daniel Sabbah, IBM
Perspectives in Building Commercial Infrastructure for the Internet

9:30-10:00 Break

10:00-12:00
Best Papers Session

Generalized Multipartitioning for Multi-Dimensional Arrays
Daniel Chavarría-Miranda, Alain Darte, Robert Fowler, and John Mellor-Crummey, Rice University

Routing Permutations in Partitioned Optical Passive Star Networks
Alessandro Mei, University of Rome "La Sapienza", Romeo Rizzi, University of Trento

Quantifying and Resolving Remote Memory Access Contention on Hardware DSM Multiprocessors
Dimitrios S. Nikolopoulos, University of Illinois at Urbana-Champaign

Communication Characteristics of Large-Scale Scientific Applications for Contemporary Cluster Architectures
Jeffrey S. Vetter, Lawrence Livermore National Laboratory, Frank Mueller, North Carolina State University

12:00-1:30 Lunch

1:30-3:30 Session 7 –
Performance and Benchmarks

Performance Characterization of a Molecular Dynamics Code on PC Clusters—Is there any easy parallelism in CHARMM?
Michela Taufer, Egon Perathoner, Andrea Cavalli, Amedeo Caflisch, and Thomas Stricker, ETH-Zurich

Memory-Intensive Benchmarks: IRAM vs. Cache-Based Machines
Brian R. Gaeke, University of California at Berkeley, Parry Husbands, Xiaoye S. Li, Leonid Oliker, Lawrence Berkeley National Laboratory, Katherine A. Yelick, University of California at Berkeley, Rupak Biswas, NASA Ames Research Center

Comparing the Memory System Performance of DSS Workloads on the HP V-Class and the SGI Origin 2000
Rong Yu, Texas A&M University, Laxmi Bhuyan, University of California at Riverside, Ravi Iyer, Intel Corporation

Distribution Sweeping on Clustered Machines with Hierarchical Memories
Frank Dehne, Stefano Mardegan, Andrea Pietracaprina, Giuseppe Prencipe

Optimizing Graph Algorithms for Improved Cache Performance
Joon-Sang Park, Michael Penner, and Viktor K. Prasanna, University of Southern California

1:30-3:30 Session 8 –
Distributed Systems and Middleware

Predicting the Performance of Wide Area Data Transfers
Sudharshan Vazhkudai, Jennifer Schopf, Ian Foster, Argonne National University

Faster Collective Output Through Active Buffering
Xiaosong Ma, Marianne Winslett, Jonghyun Lee, and Shengke Yu, University of Illinois at Urbana-Champaign

nfsp: A Distributed NFS Server for Clusters of Workstations
Pierre Lombard and Yves Denneulin, IMAG

Design and Implementation of a Pluggable Fault-Tolerant CORBA Infrastructure
W. Zhao, L. E. Moser, and P. M. Melliar-Smith, University of California at Santa Barbara

Improving the Performance of Distributed CORBA Applications
Shivakant Mishra, University of Colorado, Nija Shi, University of Wyoming

JAVA Mirrors: Building Blocks for Remote Interaction
Yuan Chen, Karsten Schwan, and David W. Rosen, Georgia Institute of Technology

1:30-3:30 Session 9 –
Routing

A Recursion-Based Broadcast Paradigm in Wormhole Routed Mesh/Torus Networks
Xiaotong Zhuang and Vincenzo Liberatore, Georgia Institute of Technology

Fault-Tolerant Broadcasting in Wormhole-Routed Torus Networks
Seungjin Park and Steven Seidel, Michigan Tech University, Jong-Hoon Youn, Oregon State University

Short Cut Eulerian Routing of Datagrams in All Optical Point-to-Point Networks
Christian Laforest and Sandrine Vial, Université d'Evry

A Performance Model for K-Ary N-Cubes with Self-Similar Traffic
Geyong Min and Mohamed Ould-Khaoua, University of Glasgow

Average-Case Scalability Analysis of Parallel Computations on k-ary d-cubes
Keqin Li, State University of New York

3:30-4:00 Break

4:00-6:00 PANEL DISCUSSION

Network Security and Distributed System Security: Basic Concepts

Moderator:
Stephen Kent, BBN Technologies
Panel Members:
Michael Reiter, Carnegie-Mellon University
Steve Tuecke, Argonne National Laboratory
Others (tba)

6:30 BANQUET

Invited Speaker
Steve Wallach, Chiaro Networks
Petaflop Computing

Note

Tickets for the banquet are included in non-student registration. Tickets for students and guests may purchased on site on Monday & Tuesday but availability on the day of the banquet is not guaranteed. A brief reception will precede seating for the banquet, & the buffet menu will accommodate vegetarian attendees.

IPDPS 2002
THURSDAY, APRIL 18

8:30-9:30
KEYNOTE SPEAKER

David P. Anderson, United Devices, Inc.
SETI@home and Internet-Scale Distributed Systems

9:30-9:50 Break

Note: The Thursday schedule* differs from the previous two days. Contributed Paper Sessions all start at 10 minutes before the hour. Breaks are somewhat shorter but one has been added to the afternoon and refreshments will be available throughout the day.

9:50-11:30 Session 10 –
Numerical Algorithms and Applications

A Parallel Numerical Algorithm for Boundary-Value FIDES on a PC Cluster
R. E. Shaw, L. E. Garey, D. J. Lizotte

A Parallel Cloth Simulator Using Multilevel Algorithms
R. Lario, C. García, M. Prieto, and F. Tirado, Universidad Complutense

Blending of Composite Panel Designs Using Genetic Algorithms
David B. Adams, Layne T. Watson, and Zafer Gürdal, Virginia Polytechnic Institute and State University

Fast Inductance Extraction of Large VLSI Circuits
Hemant Mahawar, Vivek Sarin, and Weiping Shi, Texas A&M University

A High Performance Algorithm for Incompressible Flows Using Local Solenoidal Functions
Sreekanth R. Sambavaram and Vivek Sarin, Texas A&M University

9:50-11:30 Session 11 –
Communication Protocols

Minimum Average Transmission Power Routing in CDMA Ad Hoc Networks Utilizing the Blind Multiuser Detection
Zhijun Cai, Mi Lu, and Xiaodong Wang, Texas A&M University

The End-To-End Performance Effects of Parallel TCP Sockets on a Lossy Wide-Area Network
Thomas J. Hacker, Brian D. Athey, and Brian Noble, University of Michigan

Enhancing Data Migration Performance Via Parallel Data Compression
Jonghyun Lee, Marianne Winslett, Xiaosong Ma, and Shengke Yu, University of Illinois at Urbana-Champaign

Fault Recovery for a Distributed SP-based Delay Constrained Multicast Routing Algorithm
Hasan Ural and Keqin Zhu, University of Ottawa

A New Approach to Fault-Tolerant Wormhole Routing for Mesh-Connected Parallel Computers
Ching-Tien Ho and Larry Stockmeyer, IBM

9:50-11:30 Session 12 –
Scheduling and Load Balancing

Optimal Remapping in Dynamic Bulk Synchronous Computations Via a Stochastic Control "Approach"
George Yin, Cheng-Zhong Xu, and Le Yi Wang, Wayne State University

On QoS-Based Scheduling of a Meta-Task With Multiple QoS Demands in Heterogeneous Computing
Atakan Doğan and Fusun Özgüner, The Ohio State University

The Least Choice First Scheduling Method for High-Speed Network Switches
Nils Gura and Hans Eberle, Sun Microsystems Laboratories

Cluster Load Balancing for Fine-Grain Network Services
Kai Shen, University of California at Santa Barbara, Tao Yang, University of California at Santa Barbara and Ask Jeeves, Inc., Lingkun Chu, University of California at Santa Barbara

Load Balancing in Distributed Systems: An Approach Using Cooperative Games
Daniel Grosu, Anthony T. Chronopoulos, and Ming-Ying Leung, University of Texas at San Antonio

11:30-1:00 Lunch

IPDPS 2002
THURSDAY, APRIL 18

1:00-2:30
Industrial Track
Chair: Kiran Bondalapati

Company: Hewlett-Packard
Peppermint and Sled: Tools for Evaluating SMP Systems Based on IA-64 (IPF) Processors
Sujoy Basu, Sumit Roy and Raj Kumar, Hewlett-Packard Laboratories
Tom Fisher and Bruce E. Blaho, Hewlett-Packard Technical Computing Division

Company: Linux NetworX
Issues Concerning Linux Clustering: Cluster Management and Application Porting
Joshua Harr and Greg Denault, Linux NetworX

Company: YottaYotta
Creating a National Lab Shared Storage Infrastructure
Wayne Karpoff, VP R&D and CTO of YottaYotta

Company: Entropia
Architecture of the Entropia Distributed Computing System
Andrew Chien, Entropia CTO & SAIC Chair of CS&E at UCSD

2:30-2:50 Break

2:50-4:30 Session 13 –
Tools and Run-Time Support

A Prototypical Self-Optimizing Package for Parallel Implementation of Fast Signal Transforms
Kang Chen and Jeremy Johnson, Drexel University

Compile/Run-Time Support for Thread Migration
Hai Jiang, Wayne State University, Vipin Chaudhary, Wayne State University and Cradle Technologies

Capturing Causality by Compressed Vector Clock in Real Time Group Editors
Chengzheng Sun, Griffith University, Wentong Cai, Nanyang Technological University

A Multithreaded Concurrent Garbage Collector Parallelizing the New Instruction in JAVA
Chia-Tien Dan Lo, Witawas Srisa-an, and J. Morris Chang, Illinois Institute of Technology

Efficient Support for Two-Dimensional Data Distributions in Distributed Shared Memory Systems
David K. Lowenthal, University of Georgia, Vincent W. Freeh, University of Notre Dame, David Miller, University of Georgia

2:50-4:30 Session 14 –
Architecture

A Novel Approach to Reduce L2 Miss Latency in Shared-Memory Multiprocessors
Manuel E. Acacio, Jose González, and José M. García, Universidad de Murcia, José Duato, Universidad Politécnica de Valencia

A Feasibility Study of Hierarchical Multi-Threading
Mohamed M. Zahran and Manoj Franklin, University of Maryland

Hybrid Predication Model for Instruction Level Parallelism
Amr M. M. Ashmawy, Suez Canal University, Howaida Farouk Ismail, Aly Hassan Fahmy, Cairo University

Hierarchical Interconnects for On-Chip Clustering
Aneesh Aggarwal and Manoj Franklin, University of Maryland at College Park

DEM-1: A Particle Simulation Machine for Efficient Short-Range Interaction Computations
Ryo Takata, Kenji Kise, Hiroki Honda, and Toshitsugu Yuba, University of Electro-Communications

2:50-4:30 Session 15 –
Scheduling and Task Allocation

Graph Partitioning for Parallel Applications in Heterogeneous Grid Environments
Shailendra Kumar, Sajal K. Das, University of Texas at Arlington, Rupak Biswas, NASA Ames Research Center

Clustering Algorithm for Scheduling Parallel Programs with Synchronization Requirements at the Application Level on NOWs
Bassel R. Arafeh

Bandwidth-Centric Allocation of Independent Tasks on Heterogeneous Platforms
O. Beaumont, A. Legrand, and Y. Robert, ENS Lyon, L. Carter and J. Ferrante, University of California at San Diego

Toward Optimal Diffusion Matrices
Robert Elsäesser, Burkhard Monien, Guenther Rote, and Stefan Schamberger, Universität Paderborn

A New Clustering Algorithm for Scheduling Task Graphs with Large Communication Delays
R. Lepère and D. Trystram, IMAG Institute

4:30-4:50 Break

4:50-6:30 Session 16 –
Numerical and Out-of-Core Algorithms

Twiddle-Factor-Based FFT Algorithm with Reduced Memory Access
Yingtao Jiang, University of Nevada, Las Vegas, Ting Zhou, Gennum Corporation, Canada, Yiyan Tang and Yuke Wang, University of Texas at Dallas

A Parallel Two-Level Hybrid Method for Diagonal Dominant Tridiagonal Systems
Xian-He Sun and Wu Zhang, Illinois Institute of Technology

High-Performance Parallel and Distributed Computing for the BMI Eigenvalue Problem
Kento Aida, Tokyo Institute of Technology and JST, Yoshiaki Futakata, IBM Japan, Shinji Hara., Tokyo Institute of Technology and The University of Tokyo

Parallel Out-of-Core Matrix Inversion
Eddy Caron, Gil Utard

An Out-of-Core Sorting Algorithm for Clusters With Processors at Different Speed
Christophe Cérin, Université de Picardie Jules Verne

4:50-6:30 Session 17 –
Algorithms and Theory

Accountable Web-Computing
Arnold L. Rosenberg, University of Massachusetts

Deleting Keys of B-Trees in Parallel
Heejin Park, Kunsoo Park, and Yookun Cho, Seoul National University

Buckets Strike Back: Improved Parallel Shortest Paths
Ulrich Meyer, Max-Planck-Institut für Informatik

Detecting Temporal Logic Predicates on Happened-Before Model
Alper Sen and Vijay K. Garg, The University of Texas at Austin

4:50-6:30 Session 18 –
Task Allocation and Synchronization

A New Model for Static Mapping of Parallel Applications with Task and Data Parallelism
C. Roig, University of Lleida, A. Ripoll, M. A. Senar, University of Autònoma of Barcelona, F. Guirado, University of Lleida, E. Luque, University of Autònoma of Barcelona

Static Mapping Heuristics for Tasks with Dependencies, Priorities, Deadlines, and Multiple Versions in Heterogeneous Environments
Tracy D. Braun, Noemix, H.J. Siegel and Anthony A. Maciejewski, Colorado State University

Task Allocation for Distributed Multimedia Processing on Wirelessly Networked Handheld Devices
Zhiyuan Li, Cheng Wang, and Rong Xu, Purdue University

Models and Scheduling Mechanisms for Global Computing Applications
Derrick Kondo, Henri Casanova, Eric Wing, and Francine Berman, University of California at San Diego

Barrier Synchronization on a Loaded SMP Using Two-Phase Waiting Algorithms
Dan Tsafrir and Dror G. Feitelson, The Hebrew University

IPDPS 2002 WORKSHOPS
All Day Friday

12	• International Workshop on Parallel and Distributed Computing Issues in Wireless Networks and Mobile Computing
13	• Workshop on Fault-Tolerant Parallel and Distributed Systems
14	• Workshop on Biologically Inspired Solutions to Parallel Processing Problems
15	• Workshop on Formal Methods for Parallel Programming
16	• Workshop on Internet Computing and E-commerce
17	• Workshop on Parallel and Distributed Scientific and Engineering Computing with Applications
18	• Workshop on Massively Parallel Processing
19	• Workshop on Performance Modeling, Evaluation, and Optimization of Parallel and Distributed Systems

Note: Workshops are open to all IPDPS 2002 registrants. Detailed program schedules will be available on-site. See individual advance program schedules for each workshop on their web sites which may be accessed by link from www.ipdps.org. Proceedings for workshops are part of the Symposium Proceedings available to all registrants on site.