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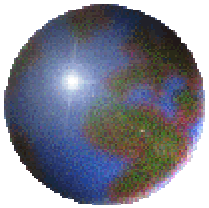
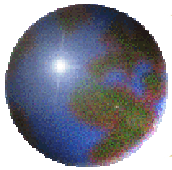


The Changing Face of Mathematical Software

IFIP Working Group 2.5
National Institute of Standards and Technology
George Washington University

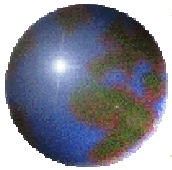
Ronald F. Boisvert, Chair



International Federation for Information Processing (IFIP)

- Founded 1961 (UNESCO)
- Promotes international cooperation in the R&D of information technologies
- 60 member societies
- Biennial World Computer Congress
- 12 Technical Committees

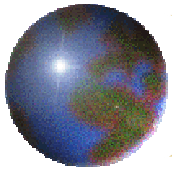
http://www.ifip.org/



IFIP TC 2

- Software: Theory and Practice
- 10 working groups
  - WG 2.1 Algorithmic Languages and Calculi
  - WG 2.2 Formal Description of Programming Concepts
  - WG 2.3 Programming Methodology
  - WG 2.4 Software Implementation Technology
  - WG 2.5 Numerical Software
  - WG 2.6 Database
  - WG 2.7 (= WG 13.4) User Interface Engineering
  - WG 2.8 Functional Programming
  - WG 2.9 Software Requirements Engineering
  - WG 2.10 Software Architecture

http://www.ifip-tc2.org/



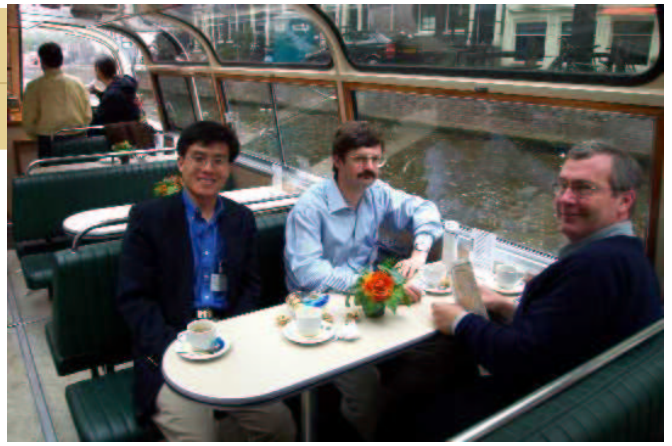
IFIP Working Group 2.5

- Numerical Software
- ~29 years old
- Aim: to improve the quality of numerical computation by promoting the development and availability of sound numerical software
- ~30 members from 13 countries
  (plus 18 affiliates)

Yearly Meetings

- Recent venues
  - Ottawa, Canada, 2000
  - Amsterdam, The Netherlands, 2001
  - Portland, Oregon, USA, 2002
  - Strobl, Austria, 2003
- Associated "regional" workshop
  - Opportunity to advertise WG 2.5 work and to hear about local activities, concerns

Activities



- Information exchange
- Participation in programming language standardization/improvement processes
- Current project: joint book on *Accuracy and Reliability in Scientific Computing*
- Working Conferences

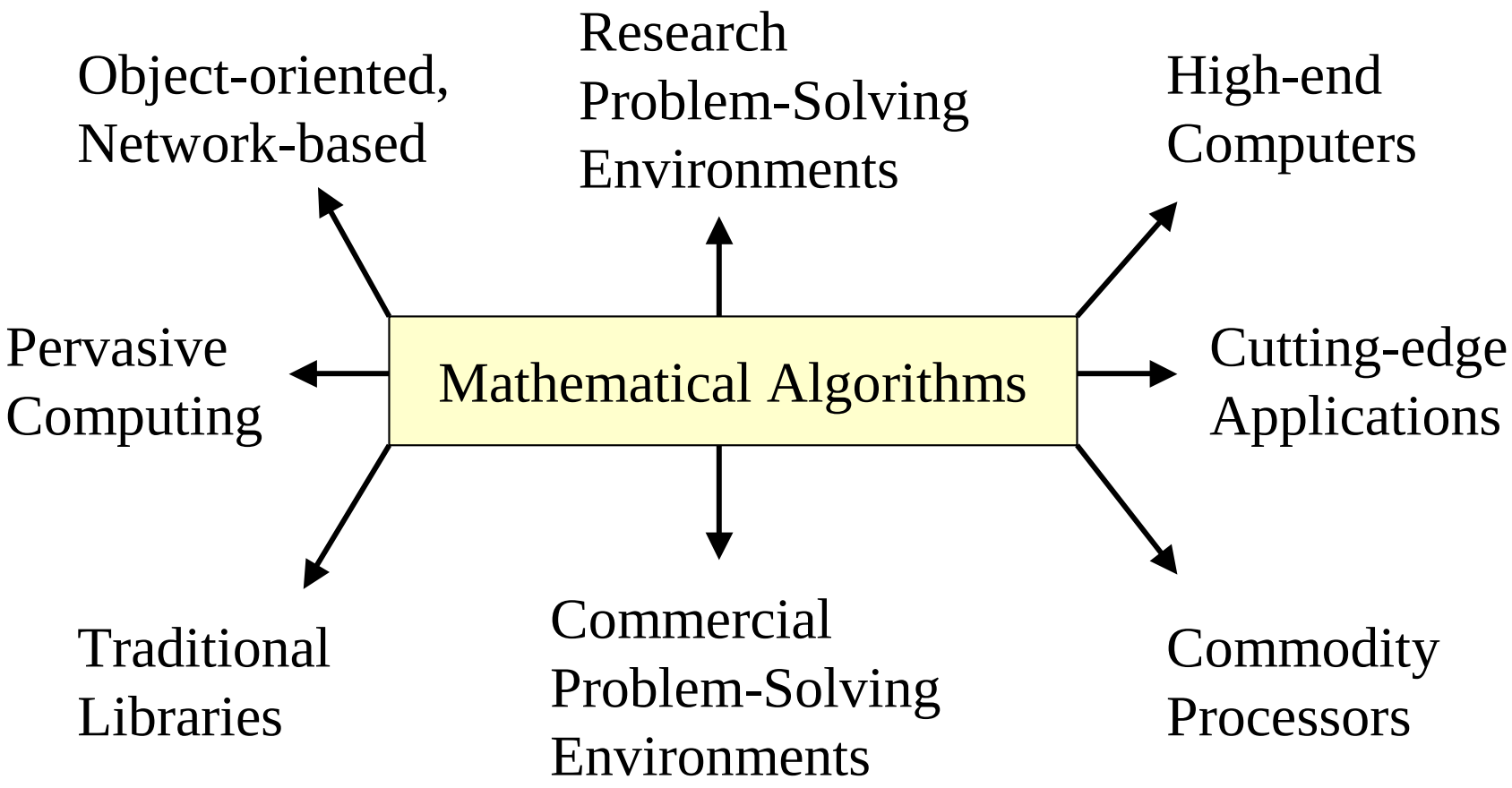
Working Conferences

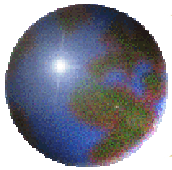
- Eight held
- Topical, recent examples …
  - *The Quality of Numerical Software: Assessment and Enhancement*, Oxford, 1996
  - The *Architecture of Scientific Software*, Ottawa, Canada, 2000
- Published proceedings (IFIP Press)

For more information on WG 2.5, see

http://www.nsc.liu.se/wg25/

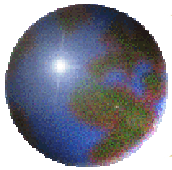
Changing Face of Math Software





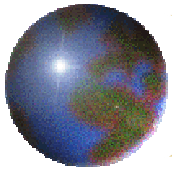
Changing Face of Math Software

- New environment changes
  - Users of mathematical algorithms
  - How algorithms are delivered
  - Expectations for performance, quality
- How are developers of mathematical algorithms and software coping with this new environment?
- *Are we up to the challenge?*



Plan for Workshop

- Thursday
  - 09:15 - 10:45 Talks
  - 10:45 - 11:00 Break
  - 11:00 - 12:30 Talks
  - 12:30 - 14:00 Lunch
  - 14:00 - 15:30 Talks
  - 15:30 - 16:00 Break
  - 16:00 - 17:30 Talks
  - Dinner on own
- Friday
  - 09:00 - 10:30 Talks
  - 10:30 - 11:00 Break
  - 11:00 - 12:30 Talks
  - 13:00 Adjourn

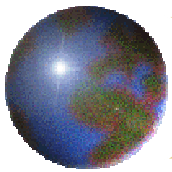


Logistics

- Breakfast, refreshments provided during breaks
  - Additional snacks available on 5th floor
  - Outdoor terrace open near elevators
- Lunch, dinner -- on your own
  - many choices within walking distance
  - see information packet for suggestions

Thanks

- Our sponsors
  - IFIP Working Group 2.5
  - National Institute of Standards and Technology
  - George Washington University
- People
  - Robin Bickel, NIST
  - Abdou Youssef, GWU



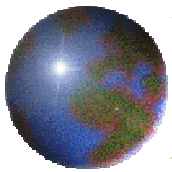
Thursday, June 3

09:15 *Numerical Algorithms for Posterity*
Brian Ford (NAG Ltd.)

10:00 *MATRAN - A Fortran 95 Wrapper for Matrix Operations*
Pete Stewart (University of Maryland)

10:45 Break

Resume at 11:00



Thursday, June 3

11:00 *Performance Evaluation of Java for Numerical Computing*

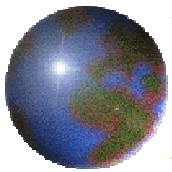
Roldan Pozo (NIST)

11:45 *The ACTS Collection: Functionality and Lessons Learned*

Tony Drummond (Lawrence Berkeley Lab)

12:30 Lunch (attendees on own)

Resume at 14:00



Thursday, June 3

14:00 *Standard Problems and Public Code for Micromagnetics*

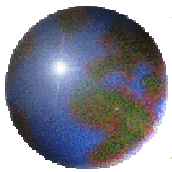
Michael Donahue (NIST)

14:45 *OOF: Object-Oriented Modeling of Material Microstructure*

Stephen Langer (NIST)

15:30 Break (with refreshments)

Resume at 16:00



Thursday, June 3

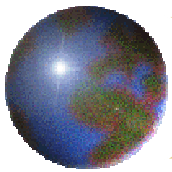
16:00 *Software for Solving Elliptic PDEs with Parallel Adaptive Multi-level Methods*

William Mitchell (NIST)

16:45 *Network/Grid Computing: Modeling, Algorithm, and Software*

Mo Mu (Hong Kong Univ. of Sci. & Tech.)

17:30 Adjourn for day



Friday, June 4

09:00 *Software for Differential Equations: Accurate Approximate Solutions are Often Not Enough*

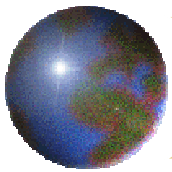
Wayne Enright (University of Toronto)

09:45 *Solving Singularly Perturbed ODE Boundary Value Problems using Symbolic/Numeric Techniques*

Ian Gladwell (Southern Methodist University)

10:30 Break

Resume at 11:00



Friday, June 4

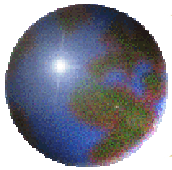
11:00 *Representing Mathematical Knowledge in the Digital Library of Mathematical Functions*

Bruce Miller (NIST)

11:45 *Search in Mathematical Databases*

Abdou Youssef (George Washington Univ.)

12:30 Closing Remarks/Discussion



Thanks for Participating!

- IFIP WG 2.5 appreciates the interactions with speakers and attendees
- Contact me if you want to communicate issues, concerns to the Working Group
  - Boisvert@nist.gov
  - http://nsc.liu.se/wg25/
- Have a safe trip home.