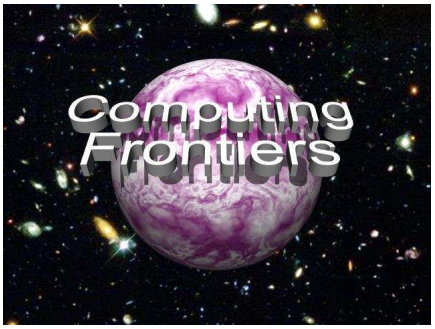

RC'05: The First Int'l. Workshop on

Reversible Computing

A Key Challenge for 21st Century Computing

http://www.eng.fsu.edu/~mpf/CF05/RC05.htm

a special session at

ACM Computing Frontiers 2005 (CF'05)

Ischia, Italy, May 4-6, 2005

http://www.computingfrontiers.org

Call for Participation

Raw digital computing performance per unit of power consumption cannot improve for very many orders of magnitude beyond present levels, unless we can develop computing technologies that dissipate arbitrarily small fractions of signal energies (and generate arbitrarily little new entropy) with each logic operation performed. Although it has never been proven to be impossible to approach the limit of thermodynamically reversible operation in practical machines, skepticism and misconceptions regarding this subject abound, and will likely persist until complete, concrete, and competitive reversible computing systems have been built and demonstrated.

This workshop will attempt to gather together leading experts in the field of reversible computing, to identify and discuss the important open technical problems in reversible computing, while also addressing the social, political and educational issues that threaten to prevent the practical realization of reversible computing within our lifetimes. The goal of the discussion will be to reach a consensus regarding what concrete steps we as researchers can take in the near future to help the field to overcome these barriers.

The session will begin with a short introductory tutorial on reversible computing, continue with paper presentations (emphasizing big-picture issues and new developments), and conclude with a panel discussion framed to debate the key issues, and attain a group consensus, together with a plan for further action.

Paper submissions are due by the CF '05 conference deadline of Dec. 6, 2004. See the CF '05 website (link above) for instructions for authors. Until further notice, submissions to this session should also be emailed to the session organizer, Michael P. Frank (mpf@eng.fsu.edu).

Session Organizer:

- Michael P. Frank, FSU

Co-organizers:

- Sarah Frost, Notre Dame

Tentative speakers include:

- Dmitri Averin, SUNY
- Charles H. Bennett, IBM
- Erik DeBenedictis, Sandia
- Erik Forsberg, KTH
- Edward Fredkin, CMU West
- Wolfgang Porod, Notre D.
- Vasili Semenov, SUNY
- Tom Toffoli, Boston U.
- Paul Vitanyi, CWI
- Colin Williams, NASA JPL

Program committee:

- Cristian Calude, Auckland
- Konstantin Likharev, SUNY
- Tom Toffoli, Boston U.

Topics of interest include:

- Theoretical foundations
- Reversible logic networks
- Reversible processor architectures
- Physics of reversible device implementations
- Clocking, synchronization, and energy recovery issues
- Systems engineering for reversible computing
- Technical objections to reversible computing, and answers to them
- Cultural barriers to reversible computing