

Intensive Research Period  
May – July 2011



# KNOTS & APPLICATIONS

Workshop  
Topological Quantum Information  
16-17 May, 2011

Mathematical Research Centre (CRM) “Ennio De Giorgi”  
Scuola Normale Superiore – Pisa, Italy

URL: <http://www.crm.sns.it/hpp/events/event.html?id=146>

The objectives of this workshop are to facilitate better communication in this field by bringing together the many diverse groups of quantum information scientists and topologists currently working on topological information science, and to isolate and to delineate the key issues involved in ultimately building a quantum computer based on a quantum system with inherently built-in topological obstructions to decoherence. Some examples of some of the topics discussed in this workshop are: Unitary representations of the braid group derived from recoupling theory and topological quantum field theory; implementations of quantum systems based on anyons, especially those based on the fractional quantum Hall effect; the application of quantum knots and quantum braids to the design and analysis of quantum systems with built-in topological obstructions to decoherence; the application of topological invariants to the design and analysis of quantum systems with topological obstructions to decoherence, the design and analysis of quantum error avoiding codes; the quantum computation of topological invariants, such as for example the Jones polynomial and Khovanov homology; applications of category theory in quantum information.

## Invited Speakers

Samson Abramsky, Oxford U., UK  
Dorit Aharonov\*, Hebrew U., Israel  
Padmanabhan Aravind, Worcester Polytechnic Institute, USA  
Alioscia Hamma, Perimeter Institute, Canada  
Louis Kauffman, U. Illinois Chicago, USA  
Greg Kuperberg, U. California at Davis, USA  
Samuel Lomonaco, U. Maryland Baltimore County, USA  
John Myers, Harvard U., USA  
Jiannis Pachos, U. Leeds, UK  
Vincenzo Tamma, U. Maryland Baltimore County, USA

\* To be confirmed

Participants wishing to contribute a talk are encouraged to submit title and abstract to Lou Kauffman at [kauffman@uic.edu](mailto:kauffman@uic.edu) or to Sam Lomonaco at [lomonaco@umbc.edu](mailto:lomonaco@umbc.edu). The local expenses of speakers will be covered by the organization.

**Registration:** Required via the website above.

**Financial support:** Prospective participants should seek grant/university support towards travel expenses. Limited funding towards participant local expenses may be provided by CRM and INdAM upon application. Participants seeking support should send their CV and list of publications to [kauffman@uic.edu](mailto:kauffman@uic.edu) or [lomonaco@umbc.edu](mailto:lomonaco@umbc.edu), before **13 April, 2011**.