

Centre de recherches mathématiques
Université de Montréal

École d'été SMS-OTAN Advanced Study Institute 2010
“École avancée d'informatique et de cryptographie quantiques”
Du 21 juin au 2 juillet 2010

SMS-NATO Summer School Advanced Study Institute 2010
“Advanced school in quantum information processing and quantum
cryptography”
June 21 - July 2, 2010

HORAIRE / PROGRAM

Le lundi 21 juin 2010 / *Monday, June 21, 2010*

08:30 - 10:00 Inscription et Café (1221) / *Registration and Coffee (1221)*

10:00 - 10:30 Introduction / *Opening remarks*

10:30 - 11:30 **Alain Tapp** (Université de Montréal)

“Quantum algorithms and the mathematics of quantum information processing - I”

11:30 - 12:30 **Alain Tapp** (Université de Montréal)

“Quantum algorithms and the mathematics of quantum information processing - II”

12:30 - 14:30 Pause-déjeuner / *Lunch break*

14:30 - 15:30 **Alain Tapp** (Université de Montréal)

“Quantum algorithms and the mathematics of quantum information processing - III”

15:30 - 16:00 Pause-café / *Coffee break*
(Salle / *Room 1221*)

16:00 - 17:00 **Renato Renner** (ETH Zürich)

“Security proofs in quantum cryptography - I”

17:00 - 20:00 Cocktail de bienvenue (6245) / *Welcoming reception (6245)*

Le mardi 22 juin 2010 / *Tuesday, June 22, 2010*

08:30 - 09:00 Café croissants (1221) / *Coffee & Croissants (1221)*

09:00 - 10:00 **Renato Renner** (ETH Zürich)
“Security proofs in quantum cryptography - II”

10:00 - 10:30 Pause-café / *Coffee break*
(Salle / *Room* 1221)

10:30 - 11:30 **Renato Renner** (ETH Zürich)
“Security proofs in quantum cryptography - III”

11:30 - 12:30 **Barbara Terhal** (IBM Research)
“Hamiltonian problems in quantum complexity - I”

12:30 - 14:30 Pause-déjeuner / *Lunch break*

14:30 - 15:30 **Barbara Terhal** (IBM Research)
“Hamiltonian problems in quantum complexity - II”

15:30 - 16:00 Pause-café / *Coffee break*
(Salle / *Room* 1221)

16:00 - 17:00 **Barbara Terhal** (IBM Research)
“Hamiltonian problems in quantum complexity - III”

Le mercredi 23 juin 2010 / *Wednesday, June 23, 2010*

08:30 - 09:00 Café croissants (1221) / *Coffee & Croissants (1221)*

09:00 - 10:00 **Barry Sanders** (University of Calgary)
“Implementations of quantum information - I”

10:00 - 10:30 Pause-café / *Coffee break*
(Salle / *Room 1221*)

10:30 - 11:30 **Barry Sanders** (University of Calgary)
“Implementations of quantum information - II”

11:30 - 12:30 **Barry Sanders** (University of Calgary)
“Implementations of quantum information - III”

Le jeudi 24 juin 2010 / *Thursday, June 24, 2010*

08:30 - 09:00 Café croissants (1221) / *Coffee & Croissants (1221)*

09:00 - 10:00 **Scott Aaronson** (MIT)
“*Quantum complexity theory - I*”

10:00 - 10:30 Pause-café / *Coffee break*
(Salle / *Room* 1221)

10:30 - 11:30 **Scott Aaronson** (MIT)
“*Quantum complexity theory - II*”

11:30 - 12:30 **Scott Aaronson** (MIT)
“*Quantum complexity theory - III*”

12:30 - 14:30 Pause-déjeuner / *Lunch break*

14:30 - 15:30 **Gilles Brassard** (Université de Montréal)
“*Non QKD cryptography - I*”

15:30 - 16:00 Pause-café / *Coffee break*
(Salle / *Room* 1221)

16:00 - 17:00 **Gilles Brassard** (Université de Montréal)
“*Non QKD cryptography - II*”

Le vendredi 25 juin 2010 / *Friday, June 25, 2010*

08:30 - 09:00 Café croissants (1221) / *Coffee & Croissants (1221)*

09:00 - 10:00 **Gilles Brassard** (Université de Montréal)
“Non QKD cryptography - III”

10:00 - 10:30 Pause-café / *Coffee break*
(Salle / *Room* 1221)

10:30 - 11:30 **Daniel Gottesman** (Perimeter Institute)
“Proving the threshold theorem for fault tolerant quantum computation - I”

11:30 - 12:30 **Daniel Gottesman** (Perimeter Institute)
“Proving the threshold theorem for fault tolerant quantum computation - II”

12:30 - 14:30 Pause-déjeuner / *Lunch break*

14:30 - 15:30 **Daniel Gottesman** (Perimeter Institute)
“Proving the threshold theorem for fault tolerant quantum computation - III”

15:30 - 16:00 Pause-café / *Coffee break*
(Salle / *Room* 1221)

16:00 - 17:00 **Patrick Hayden** (McGill University)
“Decoupling: a building block for quantum information theory - I”

Le lundi 28 juin 2010 / *Monday, June 28, 2010*

08:30 - 09:00 Café croissants (1221) / *Coffee & Croissants (1221)*

09:00 - 10:00 **Patrick Hayden** (McGill University)

“Decoupling: a building block for quantum information theory - II”

10:00 - 10:30 Pause-café / *Coffee break*

(Salle / *Room* 1221)

10:30 - 11:30 **Patrick Hayden** (McGill University)

“Decoupling: a building block for quantum information theory - III”

11:30 - 12:30 **Ronald de Wolf** (CWI)

“Quantum computing as a proof tool - I”

12:30 - 14:30 Pause-déjeuner / *Lunch break*

14:30 - 15:30 **Ronald de Wolf** (CWI)

“Quantum computing as a proof tool - II”

15:30 - 16:00 Pause-café / *Coffee break*

(Salle / *Room* 1221)

16:00 - 17:00 **Ronald de Wolf** (CWI)

“Quantum computing as a proof tool - III”

Le mardi 29 juin 2010 / Tuesday, June 29, 2010

08:30 - 09:00 Café croissants (1221) / *Coffee & Croissants (1221)*

09:00 - 10:00 **John Watrous** (University of Waterloo)
“Semidefinite programming in quantum computation - I”

10:00 - 10:30 Pause-café / *Coffee break*
(Salle / Room 1221)

10:30 - 11:30 **John Watrous** (University of Waterloo)
“Semidefinite programming in quantum computation - II”

11:30 - 12:30 **John Watrous** (University of Waterloo)
“Semidefinite programming in quantum computation - III”

12:30 - 14:30 Pause-déjeuner / *Lunch break*

14:30 - 15:30 **Raymond Laflamme** (University of Waterloo)
“NMR quantum computer - I”

15:30 - 16:00 Pause-café / *Coffee break*
(Salle / Room 1221)

16:00 - 17:00 **Raymond Laflamme** (University of Waterloo)
“NMR quantum computer - II”

17:00 - 20:00 Cocktail (6245) / *Reception (6245)*

Le mercredi 30 juin 2010 / *Wednesday, June 30, 2010*

08:30 - 09:00 Café croissants (1221) / *Coffee & Croissants (1221)*

09:00 - 10:00 **Raymond Laflamme** (University of Waterloo)
“NMR quantum computer - III”

10:00 - 10:30 Pause-café / *Coffee break*
(Salle / *Room 1221*)

10:30 - 11:30 **Richard E. Cleve** (University of Waterloo)
“Quantum nonlocality and communication complexity - I”

11:30 - 12:30 **Richard E. Cleve** (University of Waterloo)
“Quantum nonlocality and communication complexity - II”

12:30 - 14:30 Pause-déjeuner / *Lunch break*

Le jeudi 1 juillet 2010 / *Thursday, July 1, 2010*

08:30 - 09:00 Café croissants (1221) / *Coffee & Croissants (1221)*

09:00 - 10:00 **Richard E. Cleve** (University of Waterloo)
“Quantum nonlocality and communication complexity - III”

10:00 - 10:30 Pause-café / *Coffee break*
(Salle / *Room* 1221)

10:30 - 11:30 **Miklos Santha** (Université Paris Sud)
“Quantum walks and algorithms - I”

11:30 - 12:30 **Miklos Santha** (Université Paris Sud)
“Quantum walks and algorithms - II”

12:30 - 14:30 Pause-déjeuner / *Lunch break*

14:30 - 15:30 **Miklos Santha** (Université Paris Sud)
“Quantum walks and algorithms - III”

15:30 - 16:00 Pause-café / *Coffee break*
(Salle / *Room* 1221)

16:00 - 17:00 **Alain Tapp** (Université de Montréal)
“Non locality, a computer science perspective - I”

17:00 - 20:00 Réception (6245) / *Cocktail (6245)*

Le vendredi 2 juillet 2010 / *Friday, July 2, 2010*

08:30 - 09:00 Café croissants (1221) / *Coffee & Croissants (1221)*

09:00 - 10:00 **Alain Tapp** (Université de Montréal)
“Non locality, a computer science perspective - II”

10:00 - 10:30 Pause-café / *Coffee break*
(Salle / *Room* 1221)

10:30 - 11:30 **Alain Tapp** (Université de Montréal)
“Non locality, a computer science perspective - III”

11:30 - 12:30 **Stefan Wolf** (Université de Montréal)
Esther Hänggi (ETH Zürich)
“Device independent cryptography - I”

12:30 - 14:30 Pause-déjeuner / *Lunch break*

14:30 - 15:30 **Stefan Wolf** (Université de Montréal)
Esther Hänggi (ETH Zürich)
“Device independent cryptography - II”

15:30 - 16:00 Pause-café / *Coffee break*
(Salle / *Room* 1221)

16:00 - 17:00 **Stefan Wolf** (Université de Montréal)
Esther Hänggi (ETH Zürich)
“Device independent cryptography - III”