



The Abdus Salam  
**International Centre  
for Theoretical Physics**



## Joint ICTP-VAST-APCTP Regional School and Conference on Theoretical Physics in Topological Phases and Quantum Computation

Cosponsor(s): ICTP, VAST, IOP-VAST, VNUH, APCTP, TWAS and IUPAP  
Organizer(s): Tran Minh Tien (IOP, Hanoi), Ho Trung Dung (IOP-HCM, Ho Chi Minh City), G. Mussardo (SISSA, Trieste), A. Scardicchio (ICTP, Trieste) and P.B. Wiegmann (Chicago). Local Organizers: Nguyen Hong Quang (VAST, Hanoi) and Nguyen Ai Viet (IOP-VAST, Hanoi) .  
Hanoi - Viet Nam, 09 - 20 December 2013

### Preliminary Programme

**Monday, 9 December 2013 (Hanoi, Vietnam)**

**9 December 2013**

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|----------------------|---|
| <b>09:00 - 10:00</b> | <b>Registration and Welcome Remarks</b>   |
| <b>10:00 - 11:00</b> | <b>Daniel NAGAJ / Faculty of Physics, Wien, Austria<br/>Introduction to Quantum Computing - part I</b>  |
| <b>11:00 - 11:30</b> | --- Break ---   |
| <b>11:30 - 12:30</b> | <b>Giuseppe MUSSARDO / SISSA, Trieste, Italy<br/>Introduction to Anyon Systems - part I</b>   |
| <b>12:30 - 14:00</b> | --- Lunch break ---   |
| <b>14:00 - 15:00</b> | <b>Andreas LAUCHLI / Universitaet Innsbruck, Institut fuer Theoretische Physik, Austria<br/>Computational Approaches to Quantum Many Body Systems - part I</b>  |
| <b>15:00 - 16:00</b> | <b>Andreas LAUCHLI / Universitaet Innsbruck, Institut fuer Theoretische Physik, Austria<br/>Computational Approaches to Quantum Many Body Systems - part II</b> |

**Tuesday, 10 December 2013 (Hanoi, Vietnam)**

**10 December 2013**

- 09:00 - 10:00**      **Giuseppe MUSSARDO / SISSA, Trieste, Italy**  
**Introduction to Anyon Systems - part II**
- 10:00 - 11:00**      **Giuseppe MUSSARDO / SISSA, Trieste, Italy**  
**Introduction to Anyon Systems - part III**
- 11:00 - 11:30**      --- Break ---
- 11:30 - 12:30**      **Andreas W.W. LUDWIG / Physics Dept., University of California at Santa Barbara, U.S.A.**  
**Aspects of Topological Phases - part I**
- 12:30 - 14:00**      --- Lunch break ---
- 14:00 - 15:00**      **Leong Chuan KWEK / Center for Quantum Technologies, National University of Singapore**  
**Entanglement Theory - part I**
- 15:00 - 16:00**      **Xin WAN / Zhejiang Institute of Modern Physics, Hangzhou, People's Republic of China**  
**Anyons and Quantum Computation in Quantum Hall Systems - part I**
- 16:00 - 16:30**      --- Break ---
- 16:30 - 17:30**      **Daniel NAGAJ / Faculty of Physics, Wien, Austria**  
**Introduction to Quantum Computing - part II**

**Wednesday, 11 December 2013 (Hanoi, Vietnam)**

**11 December 2013**

- 09:00 - 10:00**      **Leong Chuan KWEK / Center for Quantum Technologies, National University of Singapore**  
**Entanglement Theory - part II**
- 10:00 - 11:00**      **Daniel NAGAJ / Faculty of Physics, Wien, Austria**  
**Introduction to Quantum Computing - part III**
- 11:00 - 11:30**      --- Break ---
- 11:30 - 12:30**      **Andreas W.W. LUDWIG / Physics Dept., University of California at Santa Barbara, U.S.A.**  
**Aspects of Topological Phases - part II**
- 12:30 - 14:00**      --- Lunch break ---
- 14:00 - 15:00**      **Andreas LAUCHLI / Universitaet Innsbruck, Institut fuer Theoretische Physik, Austria**  
**Computational Approaches to Quantum Many Body Systems - part III**
- 15:00 - 16:00**      **Xin WAN / Zhejiang Institute of Modern Physics, Hangzhou, People's Republic of China**  
**Anyons and Quantum Computation in Quantum Hall Systems - part II**

**Thursday, 12 December 2013 (Hanoi, Vietnam)**

**12 December 2013**

- 09:00 - 10:00**     **Andreas LAUCHLI** / *Universitaet Innsbruck, Institut fuer Theoretische Physik, Austria*  
**Computational Approaches to Quantum Many Body Systems - part IV**
- 10:00 - 11:00**     **Andreas W.W. LUDWIG** / *Physics Dept., University of California at Santa Barbara, U.S.A.*  
**Aspects of Topological Phases - part III**
- 11:00 - 11:30**     --- Break ---
- 11:30 - 12:30**     **Leong Chuan KWEK** / *Center for Quantum Technologies, National University of Singapore*  
**Entanglement Theory - part III**
- 12:30 - 14:00**     --- Lunch break ---
- 14:00 - 15:00**     **Xin WAN** / *Zhejiang Institute of Modern Physics, Hangzhou, People's Republic of China*  
**Anyons and Quantum Computation in Quantum Hall Systems - part III**
- 15:00 - 16:00**     **Xin WAN** / *Zhejiang Institute of Modern Physics, Hangzhou, People's Republic of China*  
**Anyons and Quantum Computation in Quantum Hall Systems - part IV**

#### Friday, 13 December 2013 (Hanoi, Vietnam)

13 December 2013

- 09:00 - 10:00**     **Daniel NAGAJ** / *Faculty of Physics, Wien, Austria*  
**Introduction to Quantum Computing - part IV**
- 10:00 - 11:00**     **Leong Chuan KWEK** / *Centre for Quantum Technologies, National University of Singapore*  
**Entanglement Theory - part IV**
- 11:00 - 11:30**     --- Break ---
- 11:30 - 12:30**     **Andreas LAUCHLI** / *Universitaet Innsbruck, Institut fuer Theoretische Physik, Austria*  
**Computational Approaches to Quantum Many Body Systems - part V**
- 12:30 - 14:00**     --- Lunch break ---

#### Monday, 16 December 2013 (Ba Vi National Park, Vietnam)

16 December 2013

- 09:00 - 10:00**     **Opening Session**
- 10:00 - 11:00**     **Andreas LAUCHLI** / *Universitaet Innsbruck, Institut fuer Theoretische Physik, Austria*  
**To be announced**
- 11:00 - 11:30**     --- Break ---
- 11:30 - 12:30**     **Contributed Talks**
- 12:30 - 14:00**     --- Lunch break ---
- 14:00 - 14:45**     **Daniel NAGAJ** / *Faculty of Physics, Wien, Austria*  
**To be announced**

**Tuesday, 17 December 2013 (Ba Vi National Park, Vietnam)**

**17 December 2013**

- 09:00 - 10:00**     **Andrea CAPPELLI** / *Dipt. Fisica INFN, Polo Scientifico, Firenze, Italy*  
**To be announced**
- 10:00 - 11:00**     **Paul WIEGMANN** / *University of Chicago, IL, U.S.A.*  
**To be announced**
- 11:00 - 11:30**     --- Break ---
- 11:30 - 12:30**     **Xin WAN** / *Zhejiang Institute of Modern Physics, Zhejiang Univ., Hangzhou, P.R. China*  
**To be announced**
- 12:30 - 14:00**     --- Lunch break ---
- 14:00 - 15:30**     **Round Table Discussions**

**Wednesday, 18 December 2013 (Ba Vi National Park, Vietnam)**

**18 December 2013**

- 09:00 - 10:00**     **Vincent E. SACKSTEDER** / *Nanyang Technological University, Singapore*  
**To be announced**
- 10:00 - 11:00**     **Antonello SCARDICCHIO** / *ICTP, Trieste, Italy*  
**To be announced**
- 11:00 - 11:30**     --- Break ---
- 11:30 - 12:30**     **Andrei BERNEVIG** / *Princeton University, Center for Theoretical Science, Princeton, NJ, U.S.A.*  
**Fractional Quantum Hall Matrix Product States For Interacting Conformal Field Theories**
- 12:30 - 14:00**     --- Lunch break ---
- 14:00 - 15:30**     **POSTER SESSION**

**Thursday, 19 December 2013 (Ba Vi National Park, Vietnam)**

**19 December 2013**

- 09:00 - 10:00**     **Michele BURRELLO** / *Theory Division, MPI fuer Quantenoptik, Munich, Germany*  
**Parafermionic Modes in Topological Systems**
- 10:00 - 11:00**     **Roderich MOESSNER** / *MPI fuer Physik Komplexer Systeme, Dresden, Germany*  
**To be announced**
- 11:00 - 11:30**     --- Break ---
- 11:30 - 12:30**     **Christopher R. LAUMANN** / *University of Washington, Dept. of Physics, Seattle, WA, U.S.A.*  
**To be announced**
- 12:30 - 14:00**     --- Lunch break ---

**Friday, 20 December 2013 (Ba Vi National Park, Vietnam) --- FREE DAY. Departure to Hanoi**