

# Relativistic Quantum Information 4 Workshop

Lady Theiss Room, Customs House, Brisbane  
22<sup>nd</sup> – 24<sup>th</sup> November 2010



## Programme

### Monday 22nd

9:00 *Introductory remarks*

9:15 **Using Berry's phase to detect the Unruh effect at lower accelerations**  
Ivette Fuentes, University of Nottingham, UK

10:00 **Projective measurement in a relativistic quantum field**  
Shih-Yuin Lin, National Changhua University of Education, Taiwan

10:45 ---Morning Tea---

11:15 **The entangling side of the Unruh effect**  
Eduardo Martin-Martinez, Instituto de Física Fundamental, CSIC, Spain

12:00 **Transport of massive fermion qubits in curved space-time**  
Maki Takahashi, University of Sydney, Australia

12:45 ---Lunch---

2:00 **Gravity probe Q or what Mach's principle implies for photons?**  
Daniel Terno, Macquarie University, Australia

2:45 **Photon polarisation quantum transport in curved spacetime**  
Matt Palmer, University of Sydney, Australia

3:30 ---Afternoon Tea---

4:00 **The general relativistic notion of energy**  
Vincent Lam, University of Queensland, Australia

4:45 ----end of day----

Tuesday 23<sup>rd</sup>

9:00 **Qubit entanglement under acceleration**

Jason Doukas, Yukawa Institute for Theoretical Physics, Kyoto University, Japan

9:45 **Quantum accelerometer: distinguishing inertial Bob from his accelerated twin Rob by a local measurement**

Andrzej Dragan, University of Nottingham, UK

10:30 ---Morning Tea---

11:00 **Relativistic QKD**

Paul Kwiat, University of Illinois, USA

11:45 **Past/Future entanglement in the Minkowski vacuum**

Jay Olson, University of Queensland, Australia

12:30 ---Lunch---

2:00 **The Preparation Problem**

Nicolas Menicucci, Perimeter Institute, Canada

2:45 **Quantum Mechanics in the Presence of Closed Timelike Curves**

Tim Ralph, University of Queensland, Australia

3:30 ---Afternoon Tea---

4:00 **Quantum Limited Measurement of the space-time metric tensor**

Tony Downes, University of Queensland, Australia

4:45 ----end of day----

Wednesday 24<sup>th</sup>

9:00 **Localised quantum information in Rindler space**

Jorma Louko, University of Nottingham, UK

9:45 **Effects of black hole evaporation on the quantum entangled state**

David Ahn, University of Seoul, Republic of Korea

10:30 ---Morning Tea---

11:00 **QKD between non-inertial parties**

Nathan Walk, University of Queensland

11:45 **Quantum Information Theory in Curved Spacetimes**

Hans Westman, University of Sydney, Australia

12:30 ---Lunch---

2:00 *Discussion:* CTCs, P-CTCs or no CTCs

3:00 ----end of workshop----

Workshop Organizers: Tim Ralph Gerard Milburn Tony Downes

**Sponsor**

