

Vlad Gheorghiu

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Carnegie Mellon University
Department of Physics
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Education and Work Experience

- 2011 – on leave (September 1st) to Institute for Quantum Information Sciences at the University of Calgary, AB, Canada.
- 2010 – currently, Postdoctoral Research Associate, **Carnegie Mellon University**, Pittsburgh, PA 15213, USA, working with Prof. Robert B. Griffiths.
- 2004 – 2010, PhD in Theoretical Physics, Quantum Information Theory, **Carnegie Mellon University**, Pittsburgh, PA 15213, USA. Dissertation Title: “Separable Operations, Graph Codes and the Location of Quantum Information”. Thesis advisor: Prof. Robert B. Griffiths.
- 1999 – 2003, B.S. in Theoretical Physics, **University of Bucharest**, Romania. Graduated with a GPA of 9.81 on a scale from 1 to 10. Diploma Thesis Title: “Adiabatic Perturbation Theory in Quantum Mechanics”. Thesis advisor: Prof. Gheorghe Nenciu.

Honors and Awards

- 2011–2012, Pacific Institute for Mathematical Sciences (PIMS) Postdoctoral Fellowship under the PIMS Collaborative Research Group (CRG) in Mathematics of Quantum Information, University of Calgary node, Canada.
- 2004–2010, University Tuition Scholarship, Carnegie Mellon University, USA.
- 1994, 1997, 1998, Romanian National Physics Olympiad Laureate.

Publications

2011

- Patrick J. Coles, Li Yu, *Vlad Gheorghiu* and Robert B. Griffiths, “**Information Theoretic Treatment of Tripartite Systems and Quantum Channels**”, arXiv:1006.4859 [quant-ph], Physical Review A **83**, 062338 (2011).
- *Vlad Gheorghiu*, “**Standard Form of Qudit Stabilizer Groups**”, arXiv:1101.1519 [quant-ph], Submitted to Physical Review A.

2010

- *Vlad Gheorghiu*, “**Separable Operations, Graph Codes and the Location of Quantum Information**”, Carnegie Mellon University PhD thesis, arXiv:1006.4888 [quant-ph], also available at ProQuest Dissertation & Theses under Publication No. AAT 3470169, ISBN 9781124122816.
- *Vlad Gheorghiu*, Li Yu and Scott M. Cohen, “**Local Cloning of Entangled States**”, Physical Review A **82**, 022313 (2010).

- *Vlad Gheorghiu* and Shiang Yong Looi, “**Construction of Equally Entangled Bases in Arbitrary Dimensions via Quadratic Gauss Sums and Graph States**”, *Physical Review A* **81**, 062341 (2010).
- *Vlad Gheorghiu*, Shiang Yong Looi and Robert B. Griffiths, “**Location of Quantum Information in Additive Graph Codes**”, *Physical Review A* **81**, 032326 (2010).

2008

- *Vlad Gheorghiu* and Robert B. Griffiths, “**Separable Operations on Pure States**”, *Physical Review A* **78**, 020304 (Rapid Communication) (2008).
- Shiang Yong Looi, Li Yu, *Vlad Gheorghiu* and Robert B. Griffiths, “**Quantum Error Correcting Codes Using Qudit Graph States**”, *Physical Review A* **78**, 042303 (2008).

2007

- *Vlad Gheorghiu* and Robert B. Griffiths, “**Entanglement Transformations Using Separable Operations**”, *Physical Review A* **76**, 032310 (2007).

Research Interests

The following areas in Quantum Information

- LOCC, separable operations and the role of entanglement as a physical resource
- Graph states and graph codes, applications to quantum error correction
- Location of quantum information in multipartite quantum systems, relations between quantum channels and their complement

Professional Activity

Refereed for:

- Physical Review Letters.
- Physical Review A.
- Physics Letters A.

Conferences/Workshops/Summer Schools/Talks

- Contributed poster, **Conceptual Foundations and Foils for Quantum Information Processing**, Perimeter Institute, Canada, 9 May 2011 – 13 May 2011: Vlad Gheorghiu, “Information-theoretical study of collisional decoherence of chiral molecules in a gas”.
- Invited Talk, **University of Bristol**, Bristol, UK, 13 January 2010 – “Location of Quantum Information in Additive Graph Codes”, hosted by Prof. Richard Jozsa.
- Invited Talk, **Max-Planck-Institut für Quantenoptik**, Garching, Germany, 12 January 2010 – “Location of Quantum Information in Additive Graph Codes”, hosted by Prof. Ignacio Cirac.
- Poster presentation, **The Thirteen Workshop on Quantum Information Processing (QIP 2010)**, 18-22 January 2010, Zürich, Switzerland: Vlad Gheorghiu, Scott M. Cohen and Robert B. Griffiths, “Most Entangled States Cannot be Locally Cloned”.

- Poster presentation, **The Twelfth Workshop on Quantum Information Processing (QIP 2009)**, 12-16 January 2009, Santa Fe NM, USA: Vlad Gheorghiu, Shiang Yong Looi and Robert B. Griffiths, "Location of Quantum Information in Additive Quantum Codes".
- Poster presentation, **3-rd International Conference on Quantum Information (ICQI 2008)**, 13-16 July 2008, Boston MA, USA: Vlad Gheorghiu and Robert B. Griffiths, "Separable Operations on Pure States".
- Participant, **2-nd International Conference on Quantum Information (ICQI 2007)**, June 13-15, 2007, Rochester, NY, USA.
- Presented more than 40 seminars/talks at the **CMU Quantum Information Seminar**, during 2005 – present. Titles/summaries/talks available at <http://quantum.phys.cmu.edu/QIP/index.html>.

Academic Experience

- Fall 2006 – Spring 2010, Carnegie Mellon University, Research Assistant, Prof. Robert B. Griffiths.
- Fall 2004, Spring 2005, Fall 2005, Spring 2006, Carnegie Mellon University, Teaching Assistant for 33-106 Physics for Engineering Students I (recitations + homework grading).

Computer Skills

- C/C++, Java, MATLAB, Mathematica (extensive knowledge).
- UNIX/Linux, Windows (extensive knowledge).
- Ruby, Python, HTML, Perl, PHP (fair knowledge).

Foreign Languages

- English: Excellent reading/writing/speaking.
- French: Good reading/writing, fair speaking.
- Romanian (native language).

Other Interests

- Mathematics, Reading, Hiking, Pool, Soccer, Tennis.

References (research)

- **Prof. Robert B. Griffiths**, Carnegie Mellon University
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- **Prof. Scott M. Cohen**, Duquesne University
Email: cohensm@duq.edu
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- **Prof. Edward Gerjuoy**, University of Pittsburgh
Email: gerjuoy@pitt.edu
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References (teaching)

- **Prof. Helmut Vogel**, Carnegie Mellon University
Email: vogel@heps.phys.cmu.edu
Phone: +1-(412) 268-2757

- **Prof. James Russ**, Carnegie Mellon University
Email: russ@heps.phys.cmu.edu
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