MOHSEN SHIRI, Ph.D.

Work:

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Education

2004, Ph.D **Georgia Institute of Technology,** Atlanta, GA
School of Physics
Advisor: Prof. David Finkelstein

1997, M.S. **University of Akron,** Akron, OH
Master of Science, Department of Physics
Advisor: Prof. Gregory E. Townsend

1993, B.S. **Tehran Polytechnic,** Tehran, Iran
Bachelor of Science, Department of Physics

Teaching and Professional Positions

July 2005-Present	**Assistant Professor**	Department of Chemistry & Physical Sciences Pace University Pleasantville, NY
Sep. 2006-May 2007	**Visiting Fellow**	Department of Physics Harvard University Cambridge, MA
Aug. 2002-Present	**Assistant Editor**	International Journal of Theoretical Physics
Aug. 2004-May 2005	**Instructor of Physics**	Department of Chemistry and Physics Augusta State University Augusta, GA
Spring 04, Fall 03, Summer 99	**Course Instructor** (Graduate Student)	School of Physics, Georgia Institute of Technology Atlanta, GA
1997-2004	**Teaching Assistant**	School of Physics, Georgia Institute of Technology Atlanta, GA

1995-1997	**Teaching Assistant**	Department of Physics University of Akron Akron, OH

Research Experience

2005-Present **Department of Chemistry and Physical Sciences**
Pace University
Studying the general quantization process based on principle of algebraic simplicity and developing a finite quantum theory of the gauge fields (and specifically of gravity). Also studying the philosophical foundations of a quantum theory of space-time focusing on the quantum physical investigation into the causal and logical order and the physical basis of possibility.

2006-2007 **Department of Physics**
Harvard University
Studied the philosophical and physical foundations of a quantum theory of space-time based on Segal's principle of algebraic simplicity. Studied the foundations of string theory and explore its successes and challenges as a theory promising to unify gravity and quantum theory. Worked on a historical survey of quantum logic and works of David Finkelstein as one of its pioneers.

2005-2006 **Department of Chemistry and Physics**
Augusta State University
Worked on developing the time-dependent finite quantum theory of the harmonic oscillator as a major step toward developing a finite quantum theory of gauge fields.

1998-2004 **School of Physics**
Georgia Institute of Technology
Worked on a unified post-quantum theory, applying a regularization process to the non-semi-simple Heisenberg algebra of quantum theory. Work involved Segal's idea of stabilizing physical theories by introducing regularization constants so that the group of the theory becomes (semi)simple. As an example, studied the stabilized theory of the time-independent quantum harmonic oscillator.

1995-1997 **Department of Physics**
University of Akron
Studied the ray picture of light in general theory of relativity. Developed a formal "quantum" theory for light rays in curved space-time manifolds and explored the "classical" limit of this theory. Applied this theory to the case of a uniform gravitational field.

1989-1993 **Department of Physics**
Tehran Polytechnic
Studied possible cosmological models based on the mass density of the universe. Studied the rotational curves of the spiral galaxies and investigated the possible candidates for the unobservable cosmological mass (the Dark Matter) that causes unexpected behaviors in these curves.

Courses Taught

Pace University
General Physics sequence (calculus based, lecture and lab), Astronomy, Electromagnetism, Classical Mechanics, History and Philosophy of Science, Thermodynamics and Statistical Physics, Planet Earth.

Augusta State University
Life Sciences Physics sequence (Algebra based, lecture and lab), Introductory Physics sequence (calculus based, lecture and labs).

Georgia Institute of Technology
Course Instructor: General Physics (Algebra based and calculus based, lecture), Mathematical Physics (upper-division undergraduate).
Graduate Teaching Assistant: Lab instructor (Introductory physics labs), Grader (Graduate level Quantum Mechanics, Electrodynamics and Classical Mechanics).

University of Akron
Lab instructor (Introductory physics labs), Grader (Graduate level Quantum Mechanics). Also taught parts of graduate level Quantum Mechanics.

Publications, Presentations

- **Mohsen Shiri-Garakani** and Joe Genser, *Structure of Physical Evolutions*, To present in APS Annual Meeting, Berkeley, California, Oct. 26-27. (in preparation)
- David R. Finkelstein and **Mohsen Shiri-Garakani,** *Finite Quantum Dynamics***,** To appear in J. Math. Phys. 2007. *arXiv: quant-ph/0602122.*
- **Mohsen Shiri-Garakani** and David Ritz Finkelstein. *Finite Quantum Kinematics of the Harmonic Oscillator*. J. Math. Phys., **47**, 032105 March 2006. *arXiv: quant-ph/0411203.*
- David R. Finkelstein, **M. Shiri-Garakani**, *Expanded Quantum Linear Harmonic Oscillator*. Proceedings of the 3rd International Symposium on Quantum Theory and Symmetries (QTS3), Cincinnati, Ohio, September 2003.
- J. Baugh, D. R. Finkelstein, A. Galiautdinov, and **M. Shiri-Garakani**. *Transquantum Dynamics*. Foundations of Physics, **33**, 1267 (2003). *arXiv: hep-th/0304031 (Under the title Ultraquantum Dynamics).*
- James Baugh, David Ritz Finkelstein, Andrei Galiautdinov, Heinrich Saller and **Mohsen Shiri**, *Transquantum Space-Time*. Proceedings of the 5th International Symposium of Fundamental Physics, Birla Science Center, Hyderabad, January 2003.
- James Baugh, Andrei Galiautdinov, David Ritz Finkelstein, **Mohsen Shiri-Garakani** and Heinrich Saller and, *Elementary operation*, Based on a talk given at the 5th International Quantum Structure Association Conference, Cesena, Italy, 2001. To appear in the International Journal of Theoretical Physics. *arXiv: quant-ph/0411213.*
- M. Brown, D. R. Finkelstein, M. Good, H. Saller and **M. Shiri-Garakani**, *Clifford-Algebraic Electromagnetic Stress-Energy Tensor*, in preparation.
- James Baugh, David Ritz Finkelstein, **M. Shiri-Garakani**, Heinrich Saller, *Quantum Space-Time-Gravity,* in preparation.
- Dennis W. Marks, Andrei Galiautdinov, **Mohsen Shiri,** James Baugh, , David R. Finkelstein, William Kallfelz, and Zhong Tang, *Field Theory as Degenerate Limit of Quantum Network*

Dynamics, Presented at the American Physical Society Centennial Meeting, Atlanta, Georgia, March 20-26, 1999.

- Andrei Galiautdinov, **Mohsen Shiri,** James Baugh, , David R. Finkelstein, William Kallfelz, Zhong Tang and Dennis W. Marks, *Chronon Size,* Presented at the American Physical Society Centennial Meeting, Atlanta, Georgia, March 20-26, 1999.
- **Mohsen Shiri,** James Baugh, , David R. Finkelstein, William Kallfelz, Zhong Tang, Dennis W. Marks and Andrei Galiautdinov, *Compton Limit to Localization,* Presented at the American Physical Society Centennial Meeting, Atlanta, Georgia, March 20-26, 1999.
- James Baugh, , David R. Finkelstein, William Kallfelz, Zhong Tang, Dennis W. Marks, Andrei Galiautdinov and **Mohsen Shiri,** *Chronon Statistics,* Presented at the American Physical Society Centennial Meeting, Atlanta, Georgia, March 20-26, 1999.
- David R. Finkelstein, William Kallfelz, Zhong Tang, Dennis W. Marks, Andrei Galiautdinov, **Mohsen Shiri** and James Baugh, *Kinematics of Quantum Switching Networks,* Presented at the American Physical Society Centennial Meeting, Atlanta, Georgia, March 20-26, 1999.
- William Kallfelz, Zhong Tang, Dennis W. Marks, Andrei Galiautdinov, **Mohsen Shiri,** James Baugh and David R. Finkelstein, *Correspondence Principles,* Presented at the American Physical Society Centennial Meeting, Atlanta, Georgia, March 20-26, 1999.
- Zhong Tang, Dennis W. Marks, Andrei Galiautdinov, **Mohsen Shiri,** James Baugh and David R. Finkelstein and William Kallfelz, *Quasi-Fermions and Quasi-Bosons in Schur-Wilczek Statistics,* Presented at the American Physical Society Centennial Meeting, Atlanta, Georgia, March 20-26, 1999.
- **M. Shiri**, F. Alavi, A Companion to the *English for the Students of Science,* Tehran: Tarahan-e Nashr, 1990.
- **M. Shiri**, F. Alavi, A Companion to the *English for the Students of Medicine,* Tehran: Tarahan-e Nashr, 1990.

Conferences, Workshops

- APS Annual Meeting, Berkeley, California, Oct. 26-27 (planned).
- 7th International Joint Meeting of American Mathematical Society and Sociedad Matemática Mexicana, (Graphs-Operads-Logic), Universidad Autónoma de Zacatecas, México, May 23-26, 2007. (Invited plenary speaker).
- Sudarshan Symposium, Seven Science Quests, University of Texas, Austin, Nov. 6-7, 2006.
- T.D. Lee Symposium, Columbia University, New York, Sep. 29, 2006.
- XI International Conference on Quantum Optics (ICQO'2006), Minsk, Belarus, May 26-31, 2006 (Invited).
- QFT & QCD: Past, present and Future. Conference in honor of Sidney Coleman, Harvard University, Cambridge, MA, March 18-19, 2005.
- The 3rd International Workshop on Graphs-Operads-Logic, Universidad Nacional Autónoma de México, Oaxtepec, Cuautitlán and Acatlán, Feb. 2-13, 2004. (Invited plenary speaker).
- 3rd International Symposium on Quantum Theory and Symmetries (QTS3), University of Cincinnati, Cincinnati, Ohio, Sep. 11-14, 2003.
- KIRA Institute interdisciplinary summer school on philosophy, science and religion: *Ways of Knowing*, Amherst College, Amherst, Massachusetts, Aug. 2-4, 2002.
- Klauder Fest, Conference in honor of John Klauder, University of Florida, Gainesville, Florida, Feb. 9, 2002.
- American Physical Society Centennial Meeting, Atlanta, Georgia, March 20-26, 1999.

- KIRA Institute interdisciplinary summer school on philosophy, science and religion: *Values and Facts*, Amherst College, Amherst, Massachusetts, Jul. 25-Aug. 7, 1999.
- American Physical Society Centennial Meeting, Atlanta, Georgia, March 20-26, 1999.
- KIRA Institute interdisciplinary summer school on philosophy, science and religion: *Values and Facts*, Amherst College, Amherst, Massachusetts, Aug. 2-15, 1998.

Professional Memberships

- American Physical Society (APS)
- The American Association for the Advancement of Science (AAAS)

Awards, Grants, Fellowships

- Co-investigator, $100K Research Grant, Science and Transcendence Advanced Research Series (STARS), *Quantum Physical Investigation into the Causal and Logical Order and the Physical Basis of Possibility*, (in progress, to be decided on Dec. 15, 2007).
- Co-investigator, $20K Planning Grant, Science and Transcendence Advanced Research Series (STARS), *Quantum Physical Investigation into the Causal and Logical Order and the Physical Basis of Possibility*, (Joined the investigating group after the grant was awarded on May 15, 2007).
- Principal Investigator, Cottrel College Science Award, granted by the Research Corporation, *Physical, Mathematical, and Philosophical Structures of the Physical Evolutions*. (in progress)
- Kenan Fellowship, Pace University (2006)
- Visiting Fellowship, Harvard University (Fund awarded by Pace University, 2006)
- Scholarly Research Awards, Pace University (2005,2006)
- Kira Institute Fellowship (2002,1999,1998)
- Graduate Teaching Assistantship (Georgia Institute of Technology, 1997-2004)
- Graduate Teaching Assistantship (University of Akron, 1995-1997)

Languages

Persian (native), English (fluent), French and Italian (conversational)

Extracurricular Activities, Interests

Play classical guitar. Active participation in a monthly discussion group (with focus on philosophy of science.). Write contemporary Persian poems. Perform Persian traditional music for Setar, Nay and vocals. Write Persian Calligraphy. Interests include reading (history and philosophy of science, Poetry, Sufism and mysticism, linguistics, and arts.), French, Iranian and Italian cinemas, soccer, cooking and hiking.