

## Curriculum Vitae

Vatche Sahakian  
Date of Birth: July 2, 1970

Department of Physics  
Harvey Mudd College  
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### EDUCATION

1995-99	<b>PhD</b> in Physics University of Chicago	Thesis: <i>"Black holes and thermodynamics of non-gravitational theories"</i>
1994-95	<b>MSc</b> in Physics McGill University	Thesis: <i>"String-based organization of sums of Feynman diagrams"</i>
1990-94	<b>BSc</b> in Physics McGill University	

### EMPLOYMENT

2003-	<b>Assistant Professor,</b> Department of Physics	Harvey Mudd College
2002-03	<b>Lecturer,</b> Department of Physics	Cornell University
1999-02	<b>Postdoctoral Associate,</b> Particle Theory group	Cornell University
1998-99	<b>Graduate Research Assistant</b>	University of Chicago
1995-98	<b>Graduate Teaching Assistant</b>	University of Chicago

## FELLOWSHIPS, AWARDS & GRANTS

2004-06	Research Corporation <b>grant</b>	Harvey Mudd College
2004-06	KITP <b>scholar</b>	UC Santa Barbara
1999	Strings 99 graduate student <b>award</b>	UC Santa Barbara
1999	Sugarman <b>award</b>	University of Chicago
1995	Natural Sciences & Engineering Research Council Graduate <b>fellow</b>	McGill University
1994	McConnell <b>award</b> , P.R. Wallace <b>prize</b>	McGill University
1992-93	Natural Sciences & Engineering Research Council Undergraduate <b>fellow</b>	McGill University

## PROFESSIONAL ACTIVITIES

- 2004-06      Attended four **conferences** of the Southern California String Seminar series at UCLA and USC.
- 2005-      **Advisor** for the Society of Physics Students at Harvey Mudd College
- 2005      Particle Theory Group **Seminar**, Caltech
- 2005      **Public lecture** on the Anthropic Principle, Pasadena, CA
- 2004-05      Attended two **workshops** on String theory at the Kavli Institute of Theoretical Physics, and one workshop on Theorists at Undergraduate Institutions.
- 2004      Physics Department **colloquium**, Cal State LA
- 2003-04      Attended two IPAM **conferences** on Conformal Field Theories at UCLA
- 2003-      Participated in Friday **seminars** of the theory group at Caltech
- 2002-      **Elected member** of the Research Board of the Armenian National Science and Education Fund
- 2002      The Society of Physics Students **colloquium** 2002, Cornell U.
- 2002      Physics Department **colloquium**, Cornell U.
- 2002      Particle Theory Group **seminar**, U of Cincinnati
- 2001-      **Referee** for the Journal of Mathematical Physics, the Journal of High Energy Physics, and Physical Review Letters
- 2001      Particle Theory Group **seminar**, McGill U.
- 2001      **Visiting Scholar** at IPAM, UCLA
- 2001      Particle Theory Group **seminar**, Brown U.
- 2000      Particle Theory Group **seminar**, Yerevan State U., Armenia
- 2000      Presented three **seminars** in New York Geometry and Physics series, broadcast from Cornell to Columbia, SUNY Stony Brook
- 1999      Participant in TASI 99 **school** on string theory, participant in Strings 99 **conference**

## TEACHING

**Analytical Mechanics (Harvey Mudd)**, covering Lagrangian and Hamiltonian formulations, Noether's theorem, Liouville theory, Feynman path integrals.

**Classical Field Theory (Harvey Mudd)**, developed new undergraduate course on topics in theoretical physics, covering subjects such as gauge theories, solitons and monopoles, cosmological inflation, integrable systems, and superconductivity.

**Introduction to General Relativity (Harvey Mudd)**, covering Schwarzschild spacetimes, FRW cosmology, and string theoretical perspective on black hole thermodynamics.

**Electromagnetism & Optics (Harvey Mudd)** for Sophomores.

**Physics in the news (Cornell)** for students majoring in the Arts; this new course involved an overview of modern topics in physics with computer animations and interactive applets replacing the use of equations. Topics covered included conservation laws and symmetries, perception of scales, gravitational dynamics including relativistic effects, and the Standard model. At the conclusion of the course, the material was collected into a textbook draft to be published in the future.

**Mechanics (Cornell)** for Sophomores.

**Heat & Electromagnetism (Cornell)** for Sophomores.

**Quantum Field Theory (Cornell)**, guest lecturer.

## RESEARCH STUDENTS

Date	Student	Undergraduate Thesis	Currently at
2006-07	Anand Murugan	Black hole formation in Matrix theory	HMC (graduates in '07)
2006-07	Sam Skillman	Cosmological structure formation in non-commutative theories	HMC (graduates in '07)
2005-06	Audrey Sederberg	C-function for time-space non-commutative theories	Princeton
2004-05	Steven Avery	Mathematical aspects of non-commutative geometry	Ohio State
2004-05	Ryan Larsen	Stability of rotating cylindrical shell of D0 branes	Industry
2004-05	Chris Jazwa	Stability of rotating cylindrical shell of D0 branes	U of Rhode Island (Archeology)
2004-05	Clay Hambrick	D0 brane polarization in the de Sitter universe.	Princeton
2004-05	Andrew Wetzel	D0 brane polarization in the de Sitter universe.	UC Berkeley
2003-04	Duane Loh	Gravitational radiation in cylindrically symmetric D0 configurations	Cornell
2003-04	Kit Rodolfa	A rotating cylindrical shell of D0 branes	Harvard

## PUBLICATIONS

- ♣ **hep-th/07xxxx**, *Dynamics of polarized D2 branes at the fuzzy horizon*, Anand Murugan, Vatche Sahakian; work in progress.
- ♣ **hep-th/0608103**, *Emergence of the fuzzy horizon through gravitational collapse*, Anand Murugan, Vatche Sahakian; Phys. Rev. D**74** (2006) 106010
- ♦ **hep-th/0511196**, *Hairy strings*, Vatche Sahakian; Phys.Rev. D**73** (2006) 026002
- ♣ **hep-th/0408072**, *Non-commutative dynamics of spinning D0 branes*, Duane Loh, Kit Rodolfa, Vatche Sahakian; unpublished preprint
- ♦ **hep-th/0405103**, *On the polarization of closed strings by Ramond-Ramond fluxes*, Vatche Sahakian; JHEP **0410** (2004) 021
- ♦ **hep-th/0402037**, *Closed strings in Ramond-Ramond backgrounds*, Vatche Sahakian; JHEP **0404** (2004) 026
- ♦ **hep-th/0209179**, *Holography with RR fluxes*, Vatche Sahakian; JHEP **0212** (2002) 30
- ♦ **hep-th/0107180**, *The large M limit of Non-Commutative Open Strings at strong coupling*, Vatche Sahakian; Nucl. Phys. B**621** (2002), 62-100
- ♦ **hep-th/0102200**, *On D0 brane polarization by tidal forces*, Vatche Sahakian; JHEP **0104** (2001) 38
- ♦ **hep-th/0010237**, *Transcribing spacetime data into matrices*, Vatche Sahakian; JHEP **0106** (2001) 37
- ♦ **hep-th/0008073**, *The phases of 2D NCOS*, Vatche Sahakian; JHEP **0009** (2000) 25
- ♦ **hep-th/0002126**, *Comments on D branes and the renormalization group*, Vatche Sahakian; JHEP **0005** (2000) 11
- ♦ **hep-th/9910099**, *Holography, a covariant c-function, and the geometry of the renormalization group*, Vatche Sahakian; Phys. Rev. D**62** (2000) 126011
- ♦ **hep-th/9906137**, *A note on the thermodynamics of 'little string' theory*, Emil Martinec, Vatche Sahakian; unpublished preprint
- ♦ **hep-th/9901135**, *Black Holes and Five-brane Thermodynamics*, E. Martinec, V. Sahakian; Phys. Rev. D**60** (1999) 64002
- ♦ **hep-th/9810224**, *Black Holes and the Super Yang-Mills diagram. II*, E. Martinec, V. Sahakian; Phys. Rev. D**59** (1999) 124005
- ♦ **hep-th/9809061**, *Black Holes and the SYM Phase Diagram*, Miao Li, Emil Martinec, Vatche Sahakian; Phys. Rev. D**59** (1999) 44035

Hep-th numbers refer to preprint reference numbers at arxiv.org

♣ Denotes publications with Harvey Mudd students.