

Suprit SINGH

PERSONAL AND CONTACT DETAILS

PLACE AND DATE OF BIRTH: New Delhi, India | 24 January 1987

Department of Mathematics & Statistics
University of New Brunswick
Fredericton E3B 5A3
Canada.

PHONE: +1 506 292 3543
URL: supritsingh.weebly.com
EMAIL: suprit.singh@unb.ca
supritsingh@gmail.com

RESEARCH INTERESTS

Classical and Quantum gravity, Black hole physics, Quantum fields in curved spacetimes, Theoretical cosmology, Modified gravity, Quantum Information.

CURRENT POSITION

UNB Postdoctoral Researcher at the Department of Mathematics & Statistics, University of New Brunswick, Fredericton, Canada since Jan. 2018.

POSITIONS HELD

- FEB. 2017 - JAN. 2018 SERB Overseas Postdoctoral Fellow (Department of Science & Technology, Govt. of India) at the Department of Mathematics & Statistics, University of New Brunswick, Fredericton, Canada.
- FEB. 2015 - JAN. 2017 Dr. D. S. Kothari Postdoctoral Fellow (University Grants Commission, Govt. of India) at the Department of Physics & Astrophysics, University of Delhi, New Delhi, India.

EDUCATION

- Nov. 2014 Ph.D. PHYSICS, [IUCAA](#), Pune.
Thesis: "Aspects of quantum field theory in black holes and cosmological spacetimes" | Advisor: Prof. T PADMANABHAN
- JUL. 2009 M.Sc. PHYSICS, [University of Delhi](#) (St. Stephen's College), New Delhi.
First Class | Dissertation: "Classical mechanics and quantum mechanics using geometric algebra"
- JUL. 2007 B.Sc. (H) PHYSICS, University of Delhi (Hans Raj College), New Delhi.
First Class | Dissertation: "Quantum mechanics visualised: A set of mathematica codes to solve Schrödinger equation for various cases."

AWARDS AND SCHOLARSHIPS

Selected for Kaleidoscope in Physical Review D July 2017: Multifaceted Schwinger effect in de Sitter space. Sharma, R. and Singh, S. *Physical Review D*, 96(2):025012.

- JUL. 2016 [SERB Overseas Postdoctoral Fellowship](#), DST (Govt. of India).
- MAR. 2015 [V. V. Narlikar Best Thesis Award](#), IAGRG.
- JAN. 2015 [Dr. D. S. Kothari Postdoctoral Fellowship](#), UGC (Govt. of India).
- JUL. 2009 [Dr. Shyama Prasad Mukherjee Fellowship](#), CSIR (Govt. of India).
- MAR. 2007 Jiwa Ram Shakuntala Kaushal Prize in B.Sc. (H) Physics (II).
- MAR. 2007 Smt. Lajwanti and Rajrani Memorial Prize in B.Sc. (H) Physics (II).
- MAR. 2007 First position in Hans Raj College and second position in University of Delhi in B.Sc. (H) Physics (II).

PUBLICATIONS AND PREPRINTS

The list is also available on [INSPIRE](#), [ADS](#) and [arXiv](#).

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| 2018 | Husain, V. and Singh, S. (2018). Does quantum gravity relate the constants of Nature? <i>Submitted</i> . |
| | Samantray, P. and Singh, S. (2018). Schwinger Pair Production in Hot Anti-de Sitter Space. <i>arXiv:hep-th/1804.04140</i> |
| 2017 | Husain, V. and Singh, S. (2017). Penrose inequality in anti-desitter space. <i>Phys. Rev. D</i> , 96:104055 |
| | Sharma, R. and Singh, S. (2017). Multifaceted Schwinger effect in de Sitter space. <i>Physical Review D</i> , 96(2):025012 |
| | Singh, S. (2017). <i>From Quantum to Classical in the Sky</i> , pages 397–409. Springer International Publishing, Cham |
| 2016 | Singh, S. and Singh, P. (2016). It's a dark, dark world: background evolution of interacting ϕ CDM models beyond simple exponential potentials. <i>Journal of Cosmology and Astrophysics</i> , 5:017 |
| 2015 | Chakraborty, S., Singh, S., and Padmanabhan, T. (2015). A quantum peek inside the black hole event horizon. <i>Journal of High Energy Physics</i> , 6:192 |
| | Singh, S. (2015). Excavations at the gravitationally collapsed site: Recent findings. In <i>Journal of Physics Conference Series</i> , volume 600 of <i>Journal of Physics Conference Series</i> , page 012035 |
| 2014 | Singh, S. and Chakraborty, S. (2014). Black hole kinematics: The “in”-vacuum energy density and flux for different observers. <i>Physical Review D</i> , 90(2):024011 |
| 2013 | Singh, S., Modak, S. K., and Padmanabhan, T. (2013b). Evolution of quantum field, particle content, and classicality in the three stage universe. <i>Physical Review D</i> , 88(12):125020 |
| | Smerlak, M. and Singh, S. (2013). New perspectives on Hawking radiation. <i>Physical Review D</i> , 88(10):104023 |

	Singh, S., Ganguly, C., and Padmanabhan, T. (2013a). Quantum field theory in de Sitter and quasi-de Sitter spacetimes revisited. <i>Physical Review D</i> , 87(10):104004
2012	Singh, S. and Padmanabhan, T. (2012). Complex effective path: A semi-classical probe of quantum effects. <i>Physical Review D</i> , 85(2):025011

TEACHING

OCT. 2016	“Scientific computing with Scilab” to University & College teachers in the Refresher Course in Physics conducted by Centre for Professional Development in Higher Education (CPDHE), UGC-HRDC, University of Delhi.
FALL 2015 and 2016	“Scientific computing with C” to M.Sc. (Physics) Sem. III at Department of Physics and Astrophysics, University of Delhi from July to December. (Involved full-time teaching, setting up of examinations, and evaluation.)
DURING PHD	Tutor for the courses of “Quantum mechanics” and “General Relativity” for Prof. T. Padmanabhan at IUCAA.
	Tutor for Prof. T. Padmanabhan’s course of “General relativity” at IISER, Pune.

SELECTED SEMINARS AND CONFERENCES

MAY 2017	“Multifaceted Schwinger Effect in De Sitter Space” at Atlantic GR 2017 (talk).
JUN. 2016	“From Quantum to Classical in the Sky” at ICTP, Trieste, Italy in the Summer School on Cosmology (poster).
DEC. 2015	“ A quantum peek inside the black hole event horizon ” at ICGC 2015 (talk).
DEC. 2014	X FTAG meeting, IISER, Mohali. (Invited talk).
SEP. 2014	“Zip Zap Zoom” and “Black Holes – up, close and personal” at University of New Brunswick, Fredericton CA. (talks)
SEP. 2014	“A complex path to reality” at Université de Montréal (talk).
SEP. 2014	“ Zip Zap Zoom ” at Perimeter Institute of Theoretical Physics, Waterloo CA (talk).
JUL. 2014	“Quantum musings in de Sitter spacetime” at GR-20/Amaldi-10 (poster).
MAY 2014	“New perspectives on Hawking radiation” at University of Delhi (talk).
MAR. 2013	“De Sitter Musings” at 27 th IAGRG meeting (talk).
DEC. 2011	Participant at ICGC 2011, Goa.
MAR. 2011	“Complex Paths and particle creation” at 3 rd HOPE meeting, Tokyo (poster).

COMPUTING SKILLS

My research deals with both semi-analytical and numerical components. In my current projects, I am also involved in writing codes for dynamical evolution of time-dependent Schrödinger equation in one and two dimensions using standard Crank-Nicolson and ADI techniques in PDE analysis. In my everyday computation, I deal with:

Languages and Packages: PYTHON, C/C++, SCILAB/MATLAB, MATHEMATICA, MAPLE.
Operating systems: Mac OS X, Windows and Linux.

REFERENCES

Prof. V. Husain | email: vhusain@unb.ca; phone: +1 506 443 3909

◇ Department of Mathematics and Statistics
University of New Brunswick
Fredericton E3B 5A3 Canada.

★ *Prof. Husain is my current postdoctoral mentor.*

Prof. T. Padmanabhan | email: nabhan@iucaa.in; phone: +91 20 2560 4106

◇ A106, IUCAA, Ganeshkhind, Pune 411 007 India.

★ *Prof. Padmanabhan was my Ph.D. advisor.*

Prof. T. R. Seshadri | email: trs@physics.du.ac.in; phone: +91 99 7195 4775

◇ Department of Physics and Astrophysics, University of Delhi, New Delhi 110 007 India.

★ *Prof. Seshadri was my postdoctoral mentor at University of Delhi and has also been my teacher in the M.Sc. program.*