LEVON POGOSIAN

Simon Fraser University
Department of Physics
8888 University Drive
Burnaby, BC, V5A 1S6, Canada

Tel: +1 778 782-7598 (work)
Tel: +1 604 562-2150 (mobile)
Fax: +1 778 782-3592
E-mail: levon@sfu.ca

RESEARCH INTERESTS

Theoretical cosmology, cosmic microwave background (CMB), dark energy and modified gravity, inflation, cosmic (super-)strings, CMB B-mode polarization, baryogenesis, neutrinos, topological defect solutions in quantum field theories and their implications for particle physics and cosmology, cosmological magnetic fields, tests of cosmological Gaussianity.

EDUCATION

Ph.D., 2001, **Case Western Reserve University**, USA
Thesis title: *"Formation and interaction of topological defects and their role in cosmology"*

M.S. in Physics, 1996, West Virginia University, USA
Thesis on non-linear dynamics and onset of chaos in simple chemical reactions

B.S. in Physics, 1993, Yerevan State University, Armenia

CAREER

Simon Fraser University, Department of Physics
Assistant Professor, 09/2006-present

Syracuse University, Department of Physics
Postdoctoral Research Associate, 09/2005-08/2006

Tufts University, Institute of Cosmology
Postdoctoral Research Associate, 09/2003-08/2005

Imperial College London, Theoretical Physics Group
Postdoctoral Research Associate, 04/2001-09/2003

INVITED AFFILIATIONS and MEMBERSHIPS

Visiting Fellow, Clare Hall, Cambridge, from Aug 2012
Visiting Reader, Institute of Cosmology and Gravitation, Portsmouth, 2011-present
Affiliate Member, Perimeter Institute for Theoretical Physics, 2008-present
Member, Canadian Institute of Theoretical Astrophysics, 2007-present

RESEARCH FUNDING

CAD 205,000, NSERC Discovery Grant, 2010-2015
CAD 94,000, NSERC Discovery Grant, 2007-2010
EUR 4,000 CNRS Travel Grant (Joint with Dr. Daniele Steer, APC, Paris), 2011-2012
EUR 3,000 CNRS Travel Grant (Joint with Dr. Daniele Steer, APC, Paris), 2009-2010
CAD 10,000, SFU President's Research Grant, 2007
CAD 5,000, SFU Endowed Research Fellowship Award, 2007
CAD 40,000 SFU Start up Grant, 2006

TEACHING

Advanced Mechanics, PHYS 413, SFU, Fall 2011
Equilibrium Statistical Physics, PHYS 841, SFU, Spring 2007, 2008, 2009, 2010 and 2011
Intermediate Mechanics, PHYS 211, SFU, Fall 2008, 2009 and 2010
Electricity Magnetism and Light, PHYS 126, SFU, Spring 2008, 2009 and 2010
Graduate Student Seminar, PHYS 801, SFU, Fall 2007, Fall 2010, Spring and Fall 2011
Introductory Solid State Physics, PHYS 173, Tufts University, Spring 2005
Short course on CMB, Theoretical Physics Chair, Yerevan State University, Spring 2004
Special topics lectures on Magnetic Monopoles, Imperial College London, Summer 2002
Academic tutor, Imperial College London, 2001-2002

SUPERVISION OF POSTDOCTORAL FELLOWS

Dr. Gong-Bo Zhao (PhD 2007, Beijing) - 2007-2009
Dr. Aaron Berndsen (PhD 2008, McGill) – NSERC PDF 2008-2010

GRADUATE STUDENT SUPERVISION

Supervisor**,** Ph.D. thesis of Yang Liu (SFU), 2010-present
Supervisor, MSc thesis of Hasmik Hayrapetyan, (SFU), 2008-2011
Supervisor**,** Ph.D. thesis of Alireza Hojjati (SFU), 2007-present
Alireza received the 2011 Billy Jones Graduate Award in Physics
Co-supervisor, Ph.D. thesis of Christian Stephan-Otto (Tufts), with Alex Vilenkin, 2003-2006
Supervisor**,** M.Sc. thesis of Rachel Dawe (Imperial College) 2002

UNDERGRADUATE STUDENT SUPERVISION

Supervisor, work-study research of Thomas Wintschel (SFU), 2010-2011
Supervisor, summer research of Starla Talbot, NSERC USRA, 2010
Supervisor, summer research of Nicholi Shiell, NSERC USRA, 2009
Supervisor, summer research of Jennifer Flood, NSERC USRA, 2008
Supervisor, honours thesis of Joel Zylberberg (SFU) 2007-2008, who received
Joel received the Fulbright Science and Technology PhD Award (2008-2011)
as well as (NSERC) Julie Payette Postgraduate scholarship (2008-2009)
Supervisor, undergraduate thesis of Hamik Hayrapetyan, (Yerevan State), 2006-2007

SERVICE and OTHER PROFESSIONAL ACTIVITIES

Member, Tenure and Promotion Committee, SFU Physics, 2010-present
Member, 2010 CAP Undergraduate Physics Examination Committee
Reviewer, CRDF Early Carrier Support Program Grants, 2009-present
Co-Chair, Dark Energy parallel session, Texas'08 International Symposium, 2008
Member, Local Organizing Committee, Texas'08 International Symposium, 2008
Member, Dean's Entrance Scholarship Selection Committee, Faculty of Science, SFU, 2008-present
CAP Lecturer, *2008 CAP Lecture Tour,* U. of Manitoba, Brandon U., U. of Winnipeg, March, 2008
Member, Outreach Committee**,** SFU Physics, 2007-present
Reviewer, NSERC Discovery Grants**,** 2007-present
Organizer, Physics Department colloquium, SFU, Fall 2007
Organizer, Joint Cornell/Syracuse Theory meetings, 2005-2006
Organizer, CAPAC seminars, Imperial College London, 2001-2003
Referee, Phys Rev Lett, Phys Rev D, JCAP, Ap J, Ap J Lett, Int J of Mod Phys and New J of Phys.

INVITED CONFERENCE TALKS

"Model-independent tests of dark energy", Workshop on Prog in Theor & Obs Cosm. Beijing, Nov 7-11, 2011
"Primordial magnetism and CMB", Primordial Magnetism Workshop, Tempe, Arizona, Mar 30-Apr 2, 2011
"Cosmological tests of GR", Theory 5 Canada, U. of New Brunswick, June 3-6, 2009
"B-modes from cosmic strings", Strings in Observational Cosmology, Paris, Dec 10-13, 2007
"B-mode from strings", Workshop on Cosmology and Strings, ICTP, Trieste, July 9-13, 2007
"Cosmic Acceleration and the ISW effect", CAP congress, Saskatoon, June 17-20, 2007
"Probing dark energy with ISW effect", Cosmology on the Lakes, Perimeter, Nov 10-12, 2006
"ISW effect in the era of precision cosmology", CMB workshop, UC Irvine, March 23-25, 2006
"CMB", invited lecture at New England Particle Physics Summer Retreat, Craigville, MA, Aug, 2005

COLLOQUIA

"Lambda, w and beyond", Simon Fraser University, Nov 25, 2011
"New cosmological tests of fundamental physics", THC@NL, Lorentz Institute, Leiden, March 12, 2010
"*Strings in the background*", University of Victoria, Sept 24, 2008
"Cosmology: facts and speculations", University of Winnipeg, March 7, 2008
"Cosmology: facts and speculations", Brandon University, March 6, 2008
"Cosmology: facts and speculations", University of Manitoba, March 5, 2008
"*Testing fundamental physics with cosmology"*, Simon Faser University, Feb 13, 2006
"*Testing fundamental physics with cosmology",* Florida State Univeristy, Feb 3, 2006
"*Testing fundamental physics with cosmology"*, SUNY at Buffalo, Nov 15, 2005

INVITED SEMINARS

Particle and Astro Seminar,*"Fables of Reconstruction (of w)",* Arizona State University, Dec 7, 2011
Seminar, *"CMB B-modes: the quest for other smoking guns",* APC Paris, June 20, 2011
Theory seminar, *"Fundamental string coupling and B-modes",* TRIUMF, Vancouver, May 25, 2011
Seminar, *"Primordial magnetism and CMB",* ICG, Portsmouth, May 5, 2011
Particle and Astro Seminar,*"Cosmological tests of GR",* Arizona State University, Sep 29, 2010
Seminar, *"Strings in the background*", ICG, U. of Portsmouth, May 5, 2010
HEP group meeting, *"Cosmological tests of GR",* Caltech, March 31, 2010
Particle/Theory/Cosmology seminar, *"Cosmological tests of GR",* Vanderbilt U., Nov 13, 2009
ISCAP seminar, *"Cosmological tests of GR",* Columbia U., Nov 12, 2009
Astro/Cosmo Theory Seminar, *"Cosmological tests of GR",* U. of Pennsylvania, Nov 9, 2009
Astrophysics seminar, *"Cosmological tests of GR",* Cornell University, June 1, 2009
Tufts/MIT/CfA Tuesday Cosmology*, "Strings in the background*", at Tufts, Oct 28, 2008
TRIUMF seminar, *"Strings in the background*", Vancouver, Sept 11, 2008
Astrophysics group seminar, *"B-modes from cosmic strings"*, Oxford, Dec 7, 2007
IASF/INAF seminar, *"Cosmic acceleration and the ISW effect"*, Bologna, Dec 5, 2007
TRIUMF, *"Probing dark energy with ISW"*, Vancouver, May 29, 2007
Herzberg Institute for Astrophysics, *"Probing dark energy with ISW"*, Victoria, March 20, 2007
Theory seminar, *"Testing the early and late universe"*, U of British Columbia, September 25, 2006
Seminar, Vanderbilt U., *"Testing the early and late universe*", May 5, 2006
KIPAC, Stanford U., *"Dark Energy and CMB/LSS correlation"*, April 20, 2005
Case Western Reserve U., *"Dark Energy and CMB/LSS correlation"*, February 15, 2005
SLAC theory, Stanford U., *"(Cosmic) String Renaissance?"*, January 26, 2005
ISCAP, Columbia U., *"Dark Energy and CMB/LSS correlation"*, October 29, 2004
Harvard phenomenology, *"Looking for strings",* October 26, 2004
Ludvig Maximillian University, Munich,*"String Renaissance"*, July 6, 2004
CAPAC, Imperial College London, *"Cosmic strings revisited",* June 16, 2004
HEP theory, Cornell U., *"Cosmic strings revisited"*, May 7, 2004

Tufts/MIT/CfA Tuesday Cosmology, *"CMB and new physics"*, at Tufts, Sept 23, 2003
"CMB for theorists", Yerevan State University, Armenia, 2 lectures in May, 2003
Astrophysics group, Cornell U., *"Primordial helicity and CMB"*, January 22, 2003
CITA, U. of Toronto, *"Primordial helicity and CMB"*, January 20, 2003
CfCP, U. of Chicago, *"Primordial helicity and CMB",* December 6, 2002
New York U., *"Thermal fluctuations and cosmic structure",* December 4, 2002
HEP group, U. of Florida, *"Domain Walls",* December 3, 2002
DAMTP Relativity, *"Thermal fluctuations and cosmic structure"*, November 22, 2002
Astrophysics group, Oxford U., *"Primordial helicity and CMB"*, October 17, 2002
Universite Paris XI, Orsay, *"Primordial helicity and CMB",* July 8, 2002
HEP group, University of Sussex, "Domain Walls", February 18, 2002
Syracuse University, *"Primordial helicity and CMB",* January 18, 2002
ICG, U. of Portsmouth, *"Primordial helicity and CMB",* December 6, 2001

SELECTED CONTRIBUTED CONFERENCE TALK

"Fundamental string coupling and B-modes", COSMO11, Aug 22-26, 2011
"Cosmological Tests of GR", DEUS workshop, Copenhagen, Aug 8-12, 2011
"CMB B-modes from Faraday Rotation", PASCOS 2011, Cambridge, July 7, 2011
"Cosmological Tests of General Relativity", TPI 50th Anniversary, U. of Alberta, Sept 18, 2010
"Strings in the background", Challenges in Theoretical Cosmology, Talloire, France, Sept 2-5, 2009
"Cosmological tests of GR", Test of Gravity Workshop, Cleveland, May 19-21, 2009
"B-mode from strings", Cosmo07, Sussex, Aug 21-25, 2007
"w(z) and ISW measurements", External Correlations workshop, Fermilab May 25-27, 2006
"Dark Energy and CMB/LSS correlation", Cosmo04, Toronto, September 17-21, 2004
"String Renaissance", 20th IAP Colloquium on CMB, Paris, June 28 - July 2, 2004
"Primordial helicity and CMB", ICHEP 2002, Amsterdam, July 24-31, 2002
"Cosmic defects and CMB", DPF2000 APS meeting, Columbus, August 9-12, 2000

PUBLIC TALKS

"The universe outside our galaxy", Galaxy Forum, MacMillan Centre, Vancouver, Apr 10, 2011
"Our universe today and tomorrow", Galaxy Forum, MacMillan Centre, Vancouver, July 26, 2008
"Cosmology for curious minds", RASC meeting, MacMillan Centre, Vancouver, May 10, 2007

PUBLICATIONS

SPIRES citations, as of 3-Jan-2012, published (all): Total 1,441 (1,643)
Average 32.0 (32.2)
h-index 21 (23)

Recently submitted

44) *Fables of Reconstruction: controlling bias in the dark energy equation of state,*
R. Crittenden, G.-B. Zhao, L. Pogosian, L. Samushia, X. Zhang
arXiv:1112.1693, submitted to JCAP

43) *Cosmological tests of General Relativity: a principal component analysis,*
A. Hojjati, G.-B. Zhao, L. Pogosian, A. Silvestri, R. Crittenden, K. Koyama
arXiv:1111.3960, submitted to PRD

Published in refereed journals

42) *Constraints on the fundamental string coupling from B-mode experiments,*
A. Avgoustidis, E. Copeland, A. Moss, L. Pogosian, A. Pourtsidou, and D. Steer
arXiv:1105.6198, Phys. Rev. Lett. 107, 121301 (2011)

41) *Testing gravity with CAMB and CosmoMC*,
A. Hojjati, L. Pogosian, and G.-B. Zhao
arXiv:1106.4543, JCAP 1108:005 (2011)

40) *Primordial Magnetism in the CMB: Exact Treatment of Faraday Rotation and WMAP7 Bounds*,
L. Pogosian, A. Yadav, Bess Ng, and T. Vachaspati
arXiv:1106.1438, Phys. Rev. D84, 043530 (2011)

39) *Seeking String Theory in the Cosmos*
E. J. Copeland, L. Pogosian, T. Vachaspati
arXiv:1105.0207, Class.Quant.Grav. 28, 204009 (2011), invited contribution, String Cosmology focus issue

38) *Scaling configurations of cosmic superstring networks and their cosmological implications*
A. Pourtsidou, A. Avgoustidis, E. J. Copeland, L. Pogosian, D. A. Steer
arXiv:1012.5014, Phys. Rev. D83, 063525 (2011)

37) *Complementarity of Weak Lensing and Peculiar Velocity Measurements in Testing GR*
Y.-S. Song, G.-B. Zhao, D. Bacon, K. Koyama, R. C. Nichol, L. Pogosian
arXiv:1011:2106, Phys. Rev. D84, 083523 (2011)

36) *Correlations between 21 cm Radiation and the CMB from Active Sources*
A. Berndsen, L. Pogosian, M. Wyman
arXiv:1003.2214, MNRAS, 407, 2 (2010)

35) *Probing modifications of General Relativity using current cosmological observations*
G.-B. Zhao, T. Giannantonio, L. Pogosian, A. Silvestri, D. J. Bacon, K. Koyama, R. C. Nichol, Y.-S. Song
arXiv:1003.0001, Phys. Rev. D81, 103510 (2010)

34) *How to optimally parametrize deviations from GR in the evolution of cosmological perturbations*
L. Pogosian, A. Silvestri, K. Koyama, G.-B. Zhao
arXiv:1002.2382, Phys. Rev. D81, 104023 (2010)

33) *Detecting Features in the Dark Energy Equation of State: A Wavelet Approach*
A. Hojjati, L. Pogosian, G.-B. Zhao
arXiv:0912.4843, JCAP 04 (2010) 007

32) *Investigating dark energy experiments with principal components*
R. Crittenden, L. Pogosian, and G.-B. Zhao,
astro-ph/0510293, JCAP 12 (2009) 025

31) Cosmological tests of General Relativity with Future Tomographic Surveys
G.-B. Zhao, L. Pogosian, A. Silvestri, J. Zylberberg
arXiv:0905.1326, Phys. Rev. Lett., 103, 241301 (2009).

30) *Searching for modified growth patterns with tomographic surveys*
G.-B. Zhao, L. Pogosian, A. Silvestri, J. Zylberberg
arXiv:0809.3791, Phys. Rev. D 79, 083513 (2009).

29) *Cosmic strings as the source of small-scale microwave background anisotropy*
L. Pogosian, S.-H. H. Tye, I. Wasserman, M. Wyman
arXiv:0804.0810, JCAP 02, 13 (2009).

28) *B-mode from cosmic strings*
L. Pogosian and M. Wyman
arXiv:0711.0747, Phys.Rev D77, 083509 (2008).

27) *The pattern of growth in viable f(R) cosmologies*
L. Pogosian and A. Silvestri
arXiv:0709.0296, Phys.Rev. D77, 023503 (2008).

26) *Anthropic predictions for vacuum energy and neutrino masses in the light of WMAP-3*
L. Pogosian and A. Vilenkin
astro-ph/0611573, JCAP 0701 (2007) 025

25) *Dynamics of linear perturbations in f(R) gravity*
R. Bean, D. Bernat, L. Pogosian, A. Silvestri, and M. Trodden
astro-ph/0611321, Phys.Rev. D75 (2007) 064020

24) *Tracking Dark Energy with the ISW effect: short and long-term predictions*
L. Pogosian, P.-S. Corasaniti, C. Stephan-Otto, R. Crittenden, and R. Nichol
astro-ph/0506396, Phys Rev D72 (2005) 103519

23) *Bounds on Cosmic Strings from WMAP and SDSS*
M. Wyman, L. Pogosian, and .I Wasserman
astro-ph/0503364, Phys.Rev. D72 (2005) 023513

22) *Evolving dark energy equation of state and CMB/LSS cross-correlation*
L. Pogosian
astro-ph/0409059 , JCAP 04 (2005) 015

21) *Early reionization by cosmic strings revisited*
L. Pogosian and A. Vilenkin
astro-ph/0405606 , Phys.Rev. D70 (2004) 063523

20) *Anthropic predictions for vacuum energy and neutrino masses*
L. Pogosian, A. Vilenkin, and M. Tegmark,
astro-ph/0404497 , JCAP 0407 (2004) 005

19) *Observational constraints on cosmic strings: Bayesian analysis in a 3- dimensional parameter space,*
L. Pogosian, M. Wyman, and Ira Wasserman
astro-ph/0403268, JCAP 09 (2004) 00

18) *Forecasting Cosmic Doomsday from CMB/LSS Cross-Correlations*
J. Garriga, L. Pogosian and T. Vachaspati
astro-ph/0311412, Phys. Rev. D69 (2004)

17) *Large-scale power in the CMB and new physics: an analysis using Bayesian model comparison,*
A. Niarchou, A. H. Jaffe, L. Pogosian
astro-ph/0308461, Phys. Rev. D69 (2004)

16) *On formation of domain wall lattices*
N. D. Antunes, L. Pogosian, and T. Vachaspati
hep-ph/0307349, Phys. Rev. D69 (2004) 043513

15) *Anthropic predictions for neutrino masses*
M. Tegmark, A. Vilenkin, and L. Pogosian
astro-ph/0304536, Phys. Rev. D71 (2005) 103523

14) Observational Constraints on Cosmic String Production During Brane Inflation
L. Pogosian, S.-H. Tye, I. Wasserman, and M. Wyman
hep-th/0304188, Phys. Rev. D68 (2003) 023506

13) *Could thermal fluctuations seed cosmic structure?*
J. Magueijo and L. Pogosian
astro-ph/0211337, Phys. Rev. D67 (2003) 043518

12) *Domain Wall Lattices*
L. Pogosian and T. Vachaspati
hep-th/0210232, Phys. Rev. D67 (2003) 065012

11) *Triplication of SU(5) monopoles*
L. Pogosian, D. Steer, and T. Vachaspati
hep-th/0204106 , Phys. Rev. Lett. 60 (2003) 061801

10) *Signatures of kinetic and magnetic helicity in the CMBR*
L. Pogosian, T. Vachaspati, and S. Winitzki
astro-ph/0112536, Phys.Rev. D65 (2002) 083502

9) *Kink interactions in SU(N) x Z_2*
L. Pogosian
hep-th/0111206, Phys. Rev. D 65 (2002) 065023

8) *Cosmic String Signatures in the Cosmic Microwave Background Anisotropies*
A. Gangui, L Pogosian, S. Winitzki,
astro-ph/0112145, New Astron Rev. 46 (2002) 681

7) *Quintessence and variation of the fine structure constant in the CMBR*
G. Huey, S. Alexander, and L. Pogosian,
astro-ph/0110562, Phys. Rev. D 65 (2002) 083001

6) *Space of kink solutions in SU(N) x Z_2*
L. Pogosian and T. Vachaspati
hep-th/0105128, Phys. Rev. D 64 (2001) 105023

5) *CMB bispectrum from active models of structure formation*
A. Gangui, L. Pogosian, and S. Winitzki
astro-ph/0101453 , Phys. Rev. D 64 (2001) 043001

4) *Domain Walls in SU(5)*
L. Pogosian and T. Vachaspati
hep-ph/0007045, Phys. Rev. D62 (2000) 123506

3) *Interaction of Magnetic Monopoles and Domain Walls*
L. Pogosian and T. Vachaspati
hep-ph/9909543, Phys. Rev. D62 (2000) 105005

2) *Cosmic microwave background anisotropy from wiggly strings*
L. Pogosian and T. Vachaspati
astro-ph/9903361, Phys.Rev. D60 (1999) 083504

1) *Relaxing the Geodesic Rule in Defect Formation Algorithms*
L. Pogosian and T. Vachaspati
hep-ph/9709317, Phys.Lett. B423 (1998) 45-48

CONFERENCE PROCEEDINGS, WHITE PAPERS and OTHER

7) *Observing the Evolution of the Universe*
J. Aguirre et al, arXiv:0903.0902, Science White Paper submitted to the US Astro2010 Decadal Survey

6) *The Origin of the Universe as Revealed Through the Polarization of the Cosmic Microwave Background.*
Scott Dodelson et al, arXiv:0902.3796, Science White Paper submitted to the US Astro2010 Decadal Survey

5) CMBPol Mission Concept Study: Probing Inflation with CMB Polarization
Daniel Baumann, Mark G. Jackson, et al
Inflation Working Group contribution to the CMBPol Mission Concept Study;
arXiv:0811.3919; published as AIP Conference Proceedings, 1141 (2009)

4) *Integrated Sachs-Wolfe effect in the era of precision cosmology*
Levon Pogosian, astro-ph/0606626, New Astron. Rev. 50 (2006) 932-937

3) *On vector mode contribution to CMB temperature and polarization form local strings*
L. Pogosian, I. Wasserman, and M. Wyman, astro-ph/0604141, submitted to arxiv only

2) *Signatures of primordial helicity in the CMBR*
L. Pogosian, T. Vachaspati and S. Winitzki, astro-ph/0210039, New Astron. Rev. 47 (2003) 859

1) *Cosmic defects and CMB anisotropy*
L. Pogosian, astro-ph/0009307, Int.J.Mod.Phys. A16S1C (2001) 1043