Tanmay Vachaspati

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EDUCATION

Ph.D., Tufts University, 1985
M.S., Tufts University, 1982
B.Sc., Allahabad University, 1980

ACADEMIC POSITIONS

Visiting Research Professor, University of Maryland, 2016-2017
Clark Way Harrison Visiting Professor, Washington University, Spring 2015
Director, Cosmology Initiative, Arizona State University, 2010-
Professor of Physics, Arizona State University, 2010-
Member, Institute for Advanced Study, Princeton, 2007-2008
Professor of Physics, Case Western Reserve University, 1999-2010
Warren E. Rupp Associate Professor, Case Western Reserve University, 1996-1999
Rosenbaum Fellow, Isaac Newton Institute, Cambridge (UK), 1994
Assistant Professor, Tufts University, 1991-1994
Visiting Assistant Professor, Tufts University, 1989-1991
Post-doctoral Fellow, DAMTP, University of Cambridge, 1987-1989
Post-doctoral Fellow, Bartol Research Institute, University of Delaware, 1985-1987

HONORS AND DISTINCTIONS

Clark Way Harrison Visiting Professor, Washington University, 1 January - 31 May 2015
Outstanding Referee, Physical Review, 2008
Member, Institute for Advanced Study, Princeton 2007-2008
Member, Foundational Questions Institute, 2007-
Fellow, American Physical Society, 2002-
Rosenbaum Fellow, Isaac Newton Institute, 1994
First Prize, Gravity Research Foundation Essay Competition, 1987
Gold Medal, Allahabad University, 1980
National Science Talent Scholar, India, 1976

OTHER POSITIONS

Scientific Associate, CERN, August-November 2023
Visiting Professor, University of Geneva, June-July 2023
Member at Large, American Physical Society, 4 Corners Section, 2022-
Advisory Committee, BCVSPIN (promotes research in Southeast Asian countries), 2021-
Visitor, Institute for Advanced Study, 2008-2010
Visiting Scientist, Netherlands Organization for Scientific Research, 2006-2007
Visiting Professor, University of Paris VII & XI, 2005, 2019

Visiting Professor, Tata Institute of Fundamental Research, 2001

GRANTS

APS Moore Award, $2992 Visitor Travel Grant 2019, PI.
DOE, ~$120K/year/investigator from 1995-present as PI/co-I.
NSF, $5K, PI, 2000; ~$19K, US-Swiss coop. grant, co-I, 1994-96; ~$16K/year, PI, 1992-95.
NASA, ~$80K/year/investigator, co-I, 2004-07.
FQXi, $14.4K, PI, 2008-2009; $6K, PI, 2007.
NATO, US-Spain cooperative grant, co-I, 1995-97.

CLOSELY ASSOCIATED STUDENTS

Teerthal Patel, current ASU.
Omer Albayrak, current ASU.
Ayush Saurabh, postdoc, ASU.
Mainak Mukhopadhyay, current ASU.
Francis Duplessis, in private sector.
Yiyang Zhang, in private sector.
Jeffrey Hyde, Visiting Asst. Professor, Swarthmore College.
Matthew Kolopanis, ASU.
Henry Lamm, postdoc, Fermilab.
Subir Sabharwal, in financial sector.
Yi-Zen Chu, Associate Professor, National Central University, Taiwan.
Yifung Ng, in private sector.
Hong Liu, Professor, MIT.
Dejan Stojkovic, Professor, SUNY at Buffalo.
Levon Pogosian, Professor, Simon Fraser University.
Sourish Dutta, Instructor, Vanderbilt University.
Audrey Todhunter, graduate student at Tufts University.
Mark Meckes, Associate Professor, Case Western Reserve University.
Michael Salem, Facebook.
Manuel Barriola, Publishers Clearing House, Boston.

CLOSELY ASSOCIATED POSTDOCTORAL FELLOWS

Heling Deng, ASU.
Carlos Cardona, ASU.
George Zahariade, postdoc, UAB Barcelona.
Kohei Kamada, postdoc, University of Tokyo.
Jessica Cook, faculty, SUNY Owsego.
Ema Dimastrogiovanni, faculty, University of Groningen.
Borun Chowdhury, postdoc, CERN.
Andrew Long, faculty, Rice University.
Soma De, in private sector.
Eray Sabancilar, in private sector.
Hiroyuki Tashiro, Lecturer, Nagoya University.
Yifu Cai, faculty, USTC, Anhui, China.

James Dent, Assistant Professor, University of Lafayette, Louisiana.
Dmitry Podolsky, Harvard Medical School.
Irit Maor, Assistant Professor, University of Lafayette, Louisiana.
Francesc Ferrer, Professor, Washington University.
Dragan Huterer, Professor, University of Michigan.
Arthur Lue, Technical Staff, MIT Lincoln Laboratory.
Serge Winitzki, Senior Developer, Versal Group Inc..
Mark Trodden, Professor, University of Pennsylvania.
Scott Koranda, LIGO group, University of Milwaukee.
Andrew de Laix, Development Manager, Wolfram Technologies.

PUBLICATIONS

227. Annihilation of electroweak dumbbells, T. Patel and T. Vachaspati, arXiv:2311.00026 (2023).

226. Creating kinks with quantum mediation, O. Albayrak and T. Vachaspati, arXiv:2308.01962 (2023).

225. Inverse cascading for initial MHD turbulence spectra between Saffman and Batchelor, A. Brandenburg, R. Sharma and T. Vachaspati, arXiv:2307.04602 (2023).

224. Repeated gravitational wave bursts from cosmic strings, P. Auclair, D. Steer and T. Vachaspati, arXiv:2306.08331 (2023).

223. Construction of non-Abelian electric strings, T. Vachaspati, Physical Review D 107, 096015 (2023).

222. Resonance structures in kink-antikink scattering in a quantum vacuum, M. Mukhopadhyay and T. Vachaspati, Physical Review D 107, 116017 (2023).

221. Structure of electroweak dumbbells, T. Patel and T. Vachaspati, Physical Review D 107, 093010 (2023).

220. Electric strings in non-Abelian theories, T. Vachaspati, Physical Review D 107, L031903 (2023).

219. Time- and space-varying neutrino masses from soft topological defects, G. Dvali, L. Funcke and T. Vachaspati, accepted for publication in Physical Review Letters 130, 091601 (2023).

218. Stability analysis of non-Abelian electric fields, J. Pereira and T. Vachaspati, Physical Review D 106, 096019 (2022).

217. Unexciting non-Abelian Electric Fields, T. Vachaspati, Physical Review D 105, 105011 (2022).

216. Unexciting Classical Backgrounds, T. Vachaspati, Physical Review D 105, 056008 (2022).

215. Kibble mechanism for electroweak magnetic monopoles and magnetic fields, T. Patel and T. Vachaspati, Journal of High Energy Physics 01, 059 (2022).

214. Kink-antikink scattering in a quantum vacuum, M. Mukhopadhyay, E. Sfakianakis, T. Vachaspati and G. Zahariade, JHEP04, 118 (2022).

213. Dirac plus Nambu Monopoles in the Standard Model, G. Lazarides, Q. Shafi and T. Vachaspati, Physical Review D 104, 035020 (2021).

212. On the instability of a uniform electric field in pure non-Abelian Yang-Mills theory, C. Cardona and T. Vachaspati, Physical Review D 104, 045009 (2021).

211. Cosmological chirality and magnetic fields from parity violating particle decays, T. Vachaspati and A. Vilenkin, Physical Review D 103, 103528 (2021).

210. Progress on Cosmological Magnetic Fields, T. Vachaspati, Reports on Progress in Physics 84, 074901 (2021).

209. Quantum Formation of Topological Defects, M. Mukhopadhyay, T. Vachaspati and G. Zahariade, Physical Review D, 102, 116002 (2020).

208. Emergence of Classical Structures from the Quantum Vacuum, M. Mukhopadhyay, T. Vachaspati and G. Zahariade, Physical Review D 102, 056021 (2020).

207. Particle Emission and Gravitational Radiation from Cosmic Strings: Observational Constraints, P. Auclair, D. Steer and T. Vachaspati, Physical Review D101, 083511 (2020).

206. Decay of Cosmic Global String Loops, A. Saurabh, T. Vachaspati and L. Pogosian, Physical Review D 101, 083522 (2020).

205. Dynamical Quantum Collapse and an Experimental Test, T. Vachaspati, quant-ph:1912.08704 (2019).

204. Rolling classical scalar field in a linear potential coupled to a quantum field, M. Mukhopadhyay and T. Vachaspati, Phys. Rev. D100, 096018 (2019).

203. Quantum Evaporation of Classical Breathers, J. Olle, O. Pujolas, T. Vachaspati and G. Zahariade, Phys. Rev. D100, 045011 (2019).

202. Monopole-antimonopole: interaction, scattering and creation, A. Saurabh and T. Vachaspati, Phil. Trans. A, 20190143 (2019).

201. Decay of Cosmic String Loops Due to Particle Radiation, D. Matsunami, L. Pogosian, A. Saurabh, and T. Vachaspati, Phys. Rev. Lett. 122, 201301 (2019).

200. Magnetic Field Production at a First-Order Electroweak Phase Transition, Y. Zhang, T. Vachaspati and F. Ferrer, Phys. Rev. D100, 083006 (2019).

199. String Production in the Abelian-Higgs Vacuum, A. Saurabh and T. Vachaspati, Phys. Rev. D99, 103509 (2019).

198. Classical-Quantum Correspondence for Fields, T. Vachaspati and G. Zahariade, JCAP 1909, 015 (2019).

197. Dynamo Effect in Decaying Helical Turbulence, A. Brandenburg, T. Kahniashvili, S. Mandal, A.R. Pol, A.G. Tevzadze and T. Vachaspati, Phys. Rev. Fluids 4, 024608 (2019).

196. Classical-Quantum Correspondence and Hawking Radiation, T. Vachaspati and G. Zahariade, JCAP 04, 013 (2019).

195. A Classical-Quantum Correspondence and Backreaction, T. Vachaspati and G. Zahariade, Phys. Rev. D98, 065002 (2018).

194. Magnetic Field Transfer From A Hidden Sector, K. Kamada, Y. Tsai, and T. Vachaspati, Phys. Rev. D98, 043501 (2018).

193. Evolution of hydromagnetic turbulence from the electroweak phase transition, A. Brandenburg, T. Kahniashvili, S. Mandal, A.R. Pol, A.G. Tevzadze and T. Vachaspati, Phys. Rev. D96, 123528 (2017).

192. Lunar Mass Black Holes from QCD Axion Cosmology, T. Vachaspati, arXiv:1706.03868 (2017).

191. Vacuum Topology and the Electroweak Phase Transition, Y. Zhang, F. Ferrer and T. Vachaspati, Phys. Rev. D96, 043014 (2017).

190. Monopole-antimonopole Interaction Potential, A. Saurabh and T. Vachaspati, Phys. Rev. D96, 103536 (2017).

189. Quantum Backreaction on Classical Dynamics, T. Vachaspati, Phys. Rev. D95, 125002 (2017).

188. Probing stochastic inter-galactic magnetic fields using blazar-induced gamma ray halo morphology, F. Duplessis and T. Vachaspati, JCAP 05, 005 (2017).

187. Vortex structure in superfluid color-flavor locked quark matter, M.G. Alford, S.K. Mallavarapu, T. Vachaspati and A. Windisch, conference proceedings of QCD@Work 2016, http://arxiv.org/abs/1609.04863 (2016).

186. Creation of Magnetic Monopoles in Classical Scattering, T. Vachaspati, Phys. Rev. Lett. 117, 181601 (2016). *A PRL Highlight: http://physics.aps.org/synopsisfor/10.1103/PhysRevLett.117.181601*

185. Probing Intergalactic Magnetic Fields with Simulations of Electromagnetic Cascades, R.A. Batista, A. Saveliev, G. Sigl and T. Vachaspati, Phys. Rev. D94, 083005 (2016).

184. Fundamental Implications of Intergalactic Magnetic Field Observations, T. Vachaspati, Phys. Rev. D95, 063505 (2016).

183. Gravitational Waves, Gamma Ray Bursts, and Black Stars, T. Vachaspati, Int. J. Modern Phys. D Vol. 25, No. 12, 1644025 (2016).

182. Stability of superfluid vortices in dense quark matter, M.G. Alford, S.K. Mallavarapu, T. Vachaspati and A. Windisch, Phys. Rev. C93, no. 4, 045801 (2016).

181. Monopole-Antimonopole Scattering, T. Vachaspati, Phys. Rev. D93, 045008 (2016).

180. Morphology of blazar-induced gamma ray haloes due to a helical intergalactic magnetic field, A.J. Long and T. Vachaspati, JCAP 09, 065 (2015).

179. Monopoles on strings, T.W.B. Kibble and T. Vachaspati, J. Phys. G: Nucl. Part. Phys. 42, 094002 (2015).

178. Magnetic monopole-domain wall collisions, M. Brush, L. Pogosian and T. Vachaspati, Phys. Rev. D92, 045008 (2015).

177. Implications of a Primordial Magnetic Field for Magnetic Monopoles, Axions, and Dirac Neutrinos, A.J. Long and T. Vachaspati, Phys. Rev. D91, 103522 (2015).

176. Intergalactic magnetic field spectra from diffuse gamma rays, W. Chen, B. D. Chowdhury, F. Ferrer, H. Tashiro and T. Vachaspati, Monthly Notices of the Royal Astronomical Society, 450 (4): 3371-3380 (2015). *Featured in the media, including https://www.ras.org.uk/news-and-press/2635-left-handed-cosmic-magnetic-field-could-explain-missing-antimatter.*

175. Parity-odd correlators of diffuse gamma rays and intergalactic magnetic fields, H. Tashiro and T. Vachaspati, Monthly Notices of the Royal Astronomical Society 448 (4), 299-306 (2015).

174. Cosmic Strings in Hidden Sectors: 2. Cosmological and Astrophysical Signatures, A.J. Long and T. Vachaspati, JCAP 12, 040 (2014).

173. Cosmic Strings in Hidden Sectors: 1. Radiation of Standard Model Particles, A.J. Long, J.M. Hyde and T. Vachaspati, JCAP 09, 030 (2014).

172. Dark Strings and their Couplings to the Standard Model, J.M. Hyde, A.J. Long and T. Vachaspati, Phys. Rev. D89, 065031 (2014).

171. Search for CP Violation in the Gamma Ray Sky, H. Tashiro, W. Chen, F. Ferrer and T. Vachaspati, MNRAS: Letters 445 (1): L41-L45 (2014).

170. Leptogenesis and Primordial Magnetic Fields, A.J. Long, E. Sabancilar and T. Vachaspati, JCAP 02, 036 (2014).

169. Damping of Primordial Gravitational Waves from Generalized Sources, J. Dent, L.M. Krauss, S. Sabharwal and T. Vachaspati, Phys. Rev. D88, 084008 (2013).

168. CMB Faraday rotation as seen through the Milky Way, S. De, L. Pogosian and T. Vachaspati, Phys. Rev. D88, 063527 (2013).

167. Cosmological Magnetic Field Correlators from Blazar Induced Cascade, H. Tashiro and T. Vachaspati, Phys. Rev. D87, 123527 (2013).

166. Gravitational Scattering of Photons Off Cosmic Strings, Y-Z. Chu and T. Vachaspati, Phys. Rev. D87, 083512 (2013).

165. Quantum Excitations in Time-Dependent Backgrounds, M. Kolopanis and T. Vachaspati, Phys. Rev. D87, 085041 (2013).

164. Numerical Exploration of Soliton Creation, H. Lamm and T. Vachaspati, Phys. Rev. D87, 065018 (2013).

163. CMB Distortions from Damping of Acoustic Waves Produced by Cosmic Strings, H. Tashiro, E. Sabancilar and T. Vachaspati, JCAP 08, 035 (2013).

162. Primordial Magnetism in CMB B-modes, L. Pogosian, T. Vachaspati and A. Yadav, Can. J. Phys. 91, 451-454 (2013).

161. Probing Primordial Magnetism with Off-Diagonal Correlators of CMB Polarization, A. Yadav, L. Pogosian and T. Vachaspati, Phys. Rev. D86, 123009 (2012).

160. Chiral Effects and Cosmic Magnetic Fields, H. Tashiro, T. Vachaspati and A. Vilenkin, Phys. Rev. D86, 105033 (2012).

159. Radio Broadcasts from Superconducting Strings, Y. F. Cai, E. Sabancilar, D. Steer and T. Vachaspati, Phys. Rev. D86, 043521 (2012).

158. Constraints on Superconducting Cosmic Strings from Early Reionization, H. Tashiro, E. Sabancilar and T. Vachaspati, Phys. Rev. D85, 103522 (2012).

157. CMB Distortions from Superconducting Cosmic Strings, H. Tashiro, E. Sabancilar and T. Vachaspati, Phys. Rev. D85, 103522 (2012).

156. Radio Bursts from Superconducting Strings, Y.-F. Cai, E. Sabancilar and T. Vachaspati, Phys. Rev. D85, 023530 (2012).

155. Soliton Creation with a Twist, T. Vachaspati, Phys. Rev. D84, 125003 (2011).

154. Primordial Magnetism in the CMB: Exact Treatment of Faraday Rotation and WMAP7 Bounds, L. Pogosian, A.S. Yadav, Y. Ng and T. Vachaspati, Phys. Rev. D84, 043530 (2011); Erratum-ibid D84, 089903 (2011).

153. Magnetic Helicity in Sphaleron Debris, Y. Chu, J.B. Dent and T. Vachaspati, Phys. Rev. D83, 123530 (2011).

152. Seeking String Theory in the Cosmos, E.J. Copeland, L. Pogosian and T. Vachaspati, Classical and Quantum Gravity 28, 204009 (2011).

151. Light from Cosmic Strings, D. Steer and T. Vachaspati, Phys.Rev. D83, 043528 (2011).

150. Shape of Cosmic String Loops, C.J. Copi and T. Vachaspati, Phys.Rev. D83, 023529 (2011).
149. Spectra of Magnetic Fields Injected during Baryogenesis, Y. Ng and T. Vachaspati, Phys. Rev. D82, 063515 (2010).

148. Capacitor Discharge and Vacuum Resistance in Massless QED2, Y. Chu and T. Vachaspati, Phys. Rev. D81, 085020 (2010).

147. Cosmic Rays from Cosmic Strings with Condensate, T. Vachaspati, Phys. Rev D81, 043531 (2010).

146. Aharonov-Bohm Radiation, K. Jones-Smith, H. Mathur and T. Vachaspati, Phys. Rev. D81, 043503 (2010). *Featured in Nature Physics, Research Highlights, March 2010.*

145. Dark Strings, T. Vachaspati, Phys. Rev. D80, 063502 (2009).

144. Cosmology of Bifundamental Fields, T. Vachaspati, Phys. Rev. D79, 023506 (2008).

143. Formation of Non-Abelian Monopoles Connected by Strings, Y. Ng, T.W.B. Kibble and T. Vachaspati, Phys. Rev. D78, 046001 (2008).

142. Creating Kinks from Particles, S. Dutta, D.A. Steer and T. Vachaspati, Phys. Rev. Lett. 101, 121601 (2008).

141. Magnetic Fields in the Aftermath of Phase Transitions, T. Vachaspati, Phil. Trans. R. Soc. A 366, 2915 (2008).

140. Cosmic Sparks from Superconducting Strings, T. Vachaspati, Phys. Rev. Lett. 101, 141301 (2008).

139. Helical Magnetic Fields from Sphaleron Decay and Baryogenesis, C. Copi, F. Ferrer, T. Vachaspati and A. Achucarro, Phys. Rev. Lett 101, 171302 (2008).

138. Schrodinger Picture of Quantum Gravitational Collapse, T. Vachaspati, Class. Quantum Gravity 26, 215007 (2009).

137. Island Cosmology, S. Dutta and T. Vachaspati, in "Beyond the Big Bang", ed. R. Vaas (Springer Verlag, 2008); in press.

136. Fermions on One or Fewer Kinks, Y. Chu and T. Vachaspati, Phys. Rev. D77, 025006 (2007).

135. Non-Abelian Magnetic Monopoles on S^3, I. Maor, H. Mathur and T. Vachaspati, Phys. Rev. D76, 105013 (2007).

134. Microlensing from Cosmic Strings, K. Kuijken, X. Siemens and T. Vachaspati, MNRAS 384, 161 (2008).

133. Black Stars and Gamma Ray Bursts, T. Vachaspati, arXiv:0706.1203 (2007).

132. On Constructing Baby Universes and Black Holes, T. Vachaspati, arXiv:0705.2048 (2007).

131. Quantum Radiation from Quantum Gravitational Collapse, T. Vachaspati and D. Stojkovic, Phys. Lett. B663, 107 (2008).

130. Observation of Incipient Black Holes and the Information Loss Problem, T. Vachaspati, D. Stojkovic and L.M. Krauss, Phys. Rev. D76, 024005 (2007). *Featured in the media, including The Economist, 21 June 2007.*

129. Light Superconducting Strings in the Galaxy, F. Ferrer and T. Vachaspati, proceedings of the NASA workshop on "From Quantum to Cosmos: Fundamental Physics Research in Space", Washington, D.C. May 22-24 (2006); Int. J. Mod. Phys. D16, 2392-2405 (2008).

128. Domain walls and fermion scattering in Grand Unified models, D.A. Steer and T. Vachaspati, Phys. Rev. D73, 105021 (2006)

127. Intercommutation of semilocal strings, P. Laguna, R. Matzner, V. Natchu and T. Vachaspati, Phys. Rev. Lett. 98, 041602 (2007).

126. Zero modes on domain walls in an external magnetic field, F. Ferrer, H. Mathur, T. Vachaspati and G. Starkman, Phys. Rev. D74, 025012 (2006).

125. On the detection of magnetic helicity, T. Kahniashvili and T. Vachaspati, Phys. Rev. D73, 063507 (2005).

124. 511 KeV photons from superconducting cosmic strings, F. Ferrer and T. Vachaspati, Phys. Rev. Lett. 95, 261302 (2005).

123. Islands in the Lambda-sea: An alternative cosmological model, S. Dutta and T. Vachaspati, Phys. Rev. D71, 083507 (2005).

122. Distribution of singularities in the cosmic microwave background polarization, D. Huterer and T. Vachaspati, Phys. Rev. D72, 043004 (2005).

121. Spontaneous formation of domain wall lattices in two spatial dimensions, N.D. Antunes and T. Vachaspati, Phys. Rev. D70, 063516 (2004).

120. Cosmic problems for condensed matter experiment, T. Vachaspati, Journal of Low Temperature Physics 136, Nos. 5/6 (2004).

119. Topology in the little Higgs models, M. Trodden and T. Vachaspati, Phys. Rev. D70, 065008 (2004).

118. Forecasting cosmic doomsday from cmb/lss cross-correlations, J. Garriga, L. Pogosian and T. Vachaspati, Phys. Rev. D69, 063511 (2003).

117. Reconstruction of field theory from excitation spectra of defects, T. Vachaspati, Phys. Rev. D69, 043510 (2004).

116. Formation of domain wall lattices, N.D. Antunes, L. Pogosian and T. Vachaspati, Phys. Rev. D69, 043513 (2004).

115. Eternal inflation and energy conditions in de Sitter spacetime, T. Vachaspati, in the proceedings of the U.C. Davis meeting on Cosmic Inflation (2003); astro-ph/0305439.

114. The bubbling universe, T. Vachaspati, (essay awarded Honorable mention by the Gravity Research Foundation), Int. J. Mod. Phys. D12, 1783 (2003).

113. Gravitational lensing by cosmic strings in the era of wide-field surveys, D. Huterer and T. Vachaspati, Phys. Rev. D68, 041301 (2003).

112. Topological properties of the Cosmic Microwave Background polarization map, T. Vachaspati and A. Lue, Phys. Rev. {\bf D67}, 121302(R) (2003).

111. Symmetries within domain walls, T. Vachaspati, Phys. Rev. D67, 125002 (2003).

110. A post-WMAP perspective on inflation, A. Lue, G. Starkman and T. Vachaspati, astro-ph/0303268 (2003).

109. Domain wall solutions, T. Vachaspati, lectures at "Patterns of symmetry breaking", NATO Advanced Study Institute, Cracow, 2002; hep-th/0211109.

108. Domain wall lattices, L. Pogosian and T. Vachaspati, Phys. Rev. D67, 065012 (2003).

107. Signatures of primordial helicity in the CMBR, L. Pogosian, T. Vachaspati and S. Winitzki, proceedings of ICHEP02, Amsterdam, July 24-31, 2002, Elsevier Science BV; astro-ph/0210039.

106. Triplication of SU(5) monopoles, L. Pogosian, D.A. Steer and T. Vachaspati, Phys. Rev. Lett. 90, 061801 (2003).

105. Bound states in bottomless potentials, T. Vachaspati, Phys. Rev. A66, 014104 (2002).

104. Band structure in classical field theory, M. Salem and T. Vachaspati, Phys. Rev. D66, 025003 (2002).

103. Signatures of kinetic and magnetic helicity in the CMBR, L. Pogosian, T. Vachaspati and S. Winitzki, Phys. Rev. D65, 083502 (2002).

102. Primordial magnetic fields and CP violation in the sky, T. Vachaspati, in proceedings of the COSMO-01 workshop, Rovaniemi, Finland (2001); astro-ph/0111124.

101. Space of kink solutions in SU(5) x Z_2, L. Pogosian and T. Vachaspati, Phys. Rev. D64, 105023 (2001).

100. Zero modes of fermions with a general mass matrix, G. Starkman, D. Stojkovic and T. Vachaspati, Phys. Rev. D65, 065003 (2002).

99. Class of Kinks in SU(N) x Z_2, T. Vachaspati, Phys. Rev. D63, 105010 (2001).

98. Lectures on Cosmic Topological Defects, T. Vachaspati, in the proceedings of the 2000 summer school on cosmology, ICTP, Trieste; hep-ph/0101270 (2001).

97. Estimate of the Primordial Magnetic Field Helicity, T. Vachaspati, Phys. Rev. Lett. 87, 251302 (2001).

96. Neutrino Zero Modes on Electroweak Strings, G. Starkman, D. Stojkovic and T. Vachaspati, Phys. Rev. D63, 085011 (2001).

95. Spin and Dualization of SU(5) Dyons, T. Vachaspati and D.A. Steer, Phys. Rev. D63, 085008 (2001).

94. Domain Walls in SU(5), L. Pogosian and T. Vachaspati, Phys. Rev. D62, 123506 (2000).

93. Interaction of Magnetic Monopoles and Domain Walls, L. Pogosian and T. Vachaspati, Phys. Rev. D62, 105005 (2000).

92. What is the homogeneity of our Universe telling us?, M. Trodden and T. Vachaspati, (essay awarded Honorable Mention by the Gravity Research Foundation), Mod. Phys. Lett. A14, 1661-1665 (1999).

91. Cosmic Microwave Background Anisotropy from Wiggly Strings, L. Pogosian and T. Vachaspati, Phys. Rev. D60, 083504 (1999).

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89. Remarks on Inflation, T. Vachaspati, published in the proceedings of COSMO-98, ed. D. O. Caldwell (American Institute of Physics, New York, 1999).

88. Observation of Cosmic Acceleration and Determining the Fate of the Universe, G. Starkman, M. Trodden and T. Vachaspati, Phys. Rev. Lett. 83, 1510 (1999).

87. Causality and Cosmic Inflation, T. Vachaspati and M. Trodden, Phys. Rev. D61, 023502 (1999).

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83. Semilocal and Electroweak Strings, A. Achucarro and T. Vachaspati, Phys. Rep. 327, 347 (1999).

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79. Topological Defects: Fossils from the Early Universe, T. Vachaspati, proceedings of the 1997 RESCEU Symposium, University of Tokyo, eds. K. Sato, T. Yanagida and T. Shiromizu (1998).

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63. An Attempt to Construct the Standard Model with Monopoles, T. Vachaspati, Phys. Rev. Lett. 76, 188 (1996).

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47. Electroweak Strings: An Overview, T. Vachaspati, in "Proceedings of the XXVI International Conference on High Energy Physics, Dallas, Texas, 1992" (AIP, New York).

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44. Generalized Semilocal Theories and Higher Hopf Maps', M. Hindmarsh, R. Holman, T. Kephart and T. Vachaspati, Nucl. Phys. B404, 794 (1993).

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35. Cosmic Strings and the Large-Scale Structure of the Universe, T. Vachaspati, in the "Proceedings of the Second International Symposium on Particles, Strings and Cosmology" (World Scientific, 1992).

34. Semilocal Cosmic Strings, T. Vachaspati and A. Achucarro, Phys. Rev. D44, 3067 (1991).

33. Magnetic Fields from Cosmological Phase Transitions, T. Vachaspati, Phys. Lett. B265, 258 (1991).

32. Large-Scale Structure from Wiggly Cosmic Strings, T. Vachaspati and A. Vilenkin, Phys. Rev. Lett. 67, 1057 (1991).

31. The Formation of Topological Defects, T. Vachaspati, Phys. Rev. D44, 3723 (1991).

30. Quantum State of a Nucleating Bubble, T. Vachaspati and A. Vilenkin, Phys. Rev. D43, 3846 (1991).

29. Analytical Approximations to the Self-similar Global Texture Metric, M. Barriola and T. Vachaspati, Phys. Rev. D43, 2726 (1991).

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26. Effects of the Image Universe on Cosmic Strings, T. Vachaspati, C. J. Hogan and M. Rees, Phys. Lett. B242, 29 (1990).

25. Travelling Waves on Domain Walls and Cosmic Strings, Vachaspati and T. Vachaspati, Phys. Lett. B238, 41 (1990).

24. The Formation of Pregalactic Objects from White-Noise Density Perturbations, R. J. Scherrer and T. Vachaspati, Astrophys. J. 361, 338 (1990).

23. The Non-Relativistic Coulomb Problem on a Cone, G.W. Gibbons, F. Ruiz-Ruiz and T. Vachaspati, Comm. Math. Phys. 127, 295 (1990).

22. On the Vilenkin Boundary Condition Proposal in Anisotropic Universes, J. Louko and T. Vachaspati, Phys. Lett. B223, 21 (1989).

21. de Sitter Invariant States from Quantum Cosmology, T. Vachaspati, Phys. Lett. B217, 228 (1989).

20. Cosmic String Loop Self-Intersections and Intercommuting, T. Vachaspati, Phys. Rev. D39, 1768 (1989).

19. Global String Dynamics, T. Vachaspati, Rapport D'activite Scientifique du C.E.C.A.M. 1988, Institut d' Astrophysique, Paris.

18. Topological Approach to Self-Intersections and Intercommuting, T. Vachaspati in "Cosmic Strings: The Current Status", proceedings of the 1988 Yale Workshop (World Scientific Press).

17. Self-Intersections of Closed Curves and Cosmic Strings, T. Vachaspati in "Developments in Theoretical Physics", Volume 1: TPSC Lectures 1988, eds. S. M. Roy, V. C. Sahni and M. Barma (Oxford and IBH Publishing Co.).

16. On the Uniqueness of the Tunnelling Wave-function of the Universe, T. Vachaspati and A. Vilenkin, Phys. Rev. D37, 898 (1988).

15. Fields due to Kinky, Cuspless, Cosmic Loops, D. Garfinkle and T. Vachaspati, Phys. Rev. D37, 257 (1988).

14. The Gravity of Cosmic Loops, (essay awarded the first prize by the Gravity Research Foundation), T. Vachaspati, Gen. Rel. and Grav. 19, 1053 (1987).

13. Notes on Superconducting Cosmic Strings, M. Aryal, A. Vilenkin and T. Vachaspati, Phys. Lett. B194, 25 (1987).

12. Radiation from Kinky, Cuspless, Cosmic Loops, D. Garfinkle and T. Vachaspati, Phys. Rev. D36, 2229 (1987).

11. Electromagnetic Radiation from Superconducting Cosmic Loops, T. Vachaspati and A. Vilenkin, Phys. Rev. Lett. 58, 1041 (1987).

10. Radiation of Goldstone Bosons from Global Strings, A. Vilenkin and T. Vachaspati, Phys. Rev. D35, 1138 (1987).

9. The Gravity of Cosmic Loops, T. Vachaspati, Phys. Rev. D35, 1767 (1987).

8. Evolution of Cosmic Networks, T. Vachaspati and A. Vilenkin, Phys. Rev. D35, 1131 (1987).

7. Cosmic Strings and the Large-Scale Structure of the Universe, T. Vachaspati, Phys. Rev. Lett. 57, 1655 (1986).

6. Cosmic String Networks, M. Aryal, A. E. Everett, A. Vilenkin and T. Vachaspati, Phys. Rev. D34, 434(1986).

5. Gravitational Effects of Cosmic Strings, T. Vachaspati, Nucl. Phys. B277, 593 (1986).

4. Gravitational Radiation from Strings, T. Vachaspati and A. Vilenkin, Phys. Rev. D31, 3052 (1985).

3. Monopole Annihilation and Causality, T. Vachaspati, A. E. Everett and A. Vilenkin, Phys. Rev. D31, 1925 (1985).

2. Radiation from Vacuum Strings and Walls, T. Vachaspati, A.E. Everett and A. Vilenkin, Phys. Rev. D30, 2046 (1984).

1. Formation and Evolution of Cosmic Strings, T. Vachaspati and A. Vilenkin, Phys. Rev. D30, 2036 (1984).

BOOKS

1. The Formation and Evolution of Cosmic Strings, eds. G.W. Gibbons, S.W. Hawking and T. Vachaspati, Cambridge University Press (1990).

2. Kinks and domain walls: an introduction to classical and quantum solitons, T. Vachaspati, Cambridge University Press (2006).

WEB PUBLICATIONS

Cosmic Strings, T. Vachaspati, L. Pogosian, and D. Steer, Scholarpedia, 10(2):31682 (2015). arXiv:1506.04039; http://www.scholarpedia.org/article/Cosmic_strings.

TEACHING

Undergraduate courses:
Introductory physics for engineers (freshman).
Introductory physics for non-engineering students (freshman).
Modern physics (sophomores).
Mathematical methods (sophomores).
Quantum mechanics I (juniors).
Quantum mechanics II (juniors).
Electromagnetism (juniors).
Online Quantum mechanics I (juniors).
Online Quantum mechanics II (juniors).

Graduate courses:
General Relativity.
Cosmology.
Quantum Mechanics.
Quantum field theory I.
Quantum field theory II.
Advanced classical mechanics.
Statistical mechanics.
Special Topics: Topological Defects.

RECENT CONFERENCES AND SCHOOLS

Invited speaker (remote), CosPA2023, Hong Kong, 13 November 2023.
Invited speaker, The Early Universe: A Window to New Physics, U Florida, Gainesville, 20 October 2023.
Invited speaker, Topological Defects, IBS, Daejeon (South Korea), 25 September 2023.
Invited speaker, Workshop on Cosmological Magnetic Fields, Lorentz Center, Leiden, 30 August 2023.
Invited speaker (remote), "A journey through the theoretical universe, Toulose, 29 June 2023.
Invited speaker (remote), Cosmic Magnetism in Voids and Filaments, Univ of Bologna, 23 January 2023.
Invited speaker, Testing Gravity, Simon Fraser University, 19 January 2023.
Invited speaker, Olentzero workshop at University of Bilbao, Bilbao, 16 December 2022.
Invited speaker, Workshop on Superconducting Strings, IAP, Paris, 5-10 December 2022.
Invited plenary speaker, XV International Conference on Interconnections between Particle Physics and Cosmology, 6-10 June 2022.
Invited speaker, Lorentz Center workshop on "Fundamental Physics at the Crossroads", Leiden, 23-29 February 2020.
Invited lecturer, RESCEU Summer School, Akita, Japan, 23-26 August 2019.
Invited speaker, Royal Society meeting on "Topological Avatars of New Physics", London, UK, 4-5 March 2019.
Invited speaker, "Testing Gravity Workshop", Vancouver, 23 January 2019.
Invited speaker, Workshop on "Cosmological Probes of BSM – from the Big Bang to the LHC", Benasque, Spain, 6-12 May 2018.
Invited speaker, PasCos 2018 at Case Western Reserve University, Cleveland, 6-12 June 2018.
Invited speaker, "Nordita Workshop on Quantum Anomalies and Chiral Magnetic Phenomena", Stockholm, 18 September 2018
Invited speaker, "Lorentz Center Workshop on Cosmic Strings", Leiden, 21 October 2018
Invited speaker, "CosPa 2017", Kyoto University, December 10-15, 2017.
Invited speaker, "Topological Science Symposium", Keio University, Tokyo, November 22-23, 2017.
Invited speaker, "Cosmic Strings", Sao Carlos, Brazil, February 15-18, 2016.
Invited speaker, PACIFIC 2015, Moorea, French Polynesia, September 12-19, 2015.
Invited speaker, "Cosmological Magnetic Fields", NORDITA, Sweden, June 22-26, 2015.
Invited speaker, "Cosmological Frontiers in Fundamental Physics", Perimeter Institute, July 8-11, 2013.
Invited speaker, "Quantized Flux in Tightly Knotted and Linked Systems", Isaac Newton Institute, December 3-7, 2012.
Invited speaker, "Cosmic Strings", McGill University, October 26-28, 2012.
Invited speaker, "Workshop on P and CP Violation", Brookhaven National Lab, June 25, 2012.
Invited Lecturer, "Prospects in Theoretical Physics", Institute for Advanced Study, July, 2011.
Plenary speaker, "Primordial Magnetism", ASU, April 2011.

INVITED SEMINARS AND COLLOQUIA (2022-23):

Washington University; Nordita (Stockholm); CERN (Geneva); Imperial College (London); Arizona State University; UC Davis; Simon Fraser University; NYU; University of Delaware; Tufts University; IFAE, UAB Barcelona.

CONFERENCES CO-ORGANIZED

"Remnants of the Big Bang", January, 2020.
"ASU Precision Physics Workshop", February, 2019.
"Cosmic Strings", Lorentz Center, Leiden, October 2018.
"Origin, Evolution, and Signatures of Cosmological Magnetic Fields", NORDITA, Stockholm, June 15 – July 10, 2015.
"ASU-Tufts Workshop on Cosmic Strings", ASU, February 3-5, 2014.
"Is Our Universe Necessary?", Origins Project workshop, ASU, January 31-February 2, 2014.
"Matters of Gravity", ASU, January 25, 2013.
"Quantized Flux in Tightly Knotted and Linked Systems", Isaac Newton Institute, Cambridge, December 3-7, 2012.
"Coming Opportunities in Physical Cosmology", ASU, January 25-27, 2012.
"Primordial Magnetism", ASU, March 30-April 2, 2011.
"Strings and Cosmology", APC Paris, December 10-14, 2007.
"Confronting Gravity", St. Thomas, March 16-21, 2006.
"Future of Cosmology", Cleveland, October 10-12, 2003.
"Galactic and Cosmological Magnetic Fields", Aspen, 1997.
"Great Lakes Cosmology Workshop", Cleveland, 1995.
"Formation and Evolution of Cosmic Strings", Cambridge, 1989.

RECENT PROFESSIONAL SERVICE

External reviewer for promotion at Carnegie Mellon University (2023).
Member of the Scientific Organizing Committee for the 10th International Conference on Gravitation and Cosmology, Guwahati (India) (2023).
Reviewer for US-Israel Binational Science Foundation (2023).
Reviewer for Israeli Science Foundation (2023).
Member-at-large, APS, Four Corners Section (2022).
Reviewer for PhD thesis at McGill University (2022).
Reviewer for NSF (2022).
Reviewer for Simons Foundation Investigator Award (2022).
External advisor for promotion at Nottingham University (2022).
NSF Panelist (2019).
DOE reviewer (2019).
External Reviewer for Topological Science Project, Keio University, Japan (2018).
Fermi Cycle-10 Review Panel (2017).
Canadian Research Chair Reviewer (2017).
DOE Early Career Review Panel (2015).
Reviewer for Imperial College, London, and University of Nottingham Research Fellowship Scheme (2013).
NSF site-review panelist for Physics Frontier Center (2005).
Referee – Physical Review Letters, Physical Review D, Physics Letters B, Classical and Quantum Gravity, Journal of Cosmology and Astrophysics, JHEP, International Journal of Modern Physics, Astronomy and Astrophysics.

Reviewer – NSF, DOE, PPARC (UK), OTKA (Hungary), Foundation for Fundamental Research on Matter (Netherlands), ETH Zurich Research Commission.

ADMINISTRATION/UNIVERSITY SERVICE

Director, Cosmology Initiative, ASU, 2010-
University Senate, ASU, 2013-2014; 2016.
College Senate, ASU, 2013-2014; 2016.
Member, university (CWRU) curriculum committee (3 years).
Freshman advisor at CWRU (3 years).
Participant, service learning seminars and program at CWRU.

DEPARTMENT SERVICE (ASU)

Director, Cosmology Initiative, *current*.
Graduate Program Committee, Chair, *current*
Budget and Policy Committee.
Personnel Committee
Graduate Exam Committee
Graduate Program Committee
Observational Cosmology Search Committee
Experimental Cosmology Search Committee

COMMUNITY SERVICE

Public talks at the Spirit of the Senses, Phoenix, ~1/year, 2010-2018.
Special Awards Judge, Intel Science Fair, 15 May 2013.
Science Circle lecture, 19 February 2013.
Co-host, Matter of Origins, Dance Exchange, 11 April 2011.
Developed and implemented service learning component for senior project (Case Western Reserve University) in partnership with local inner city high school.