Curriculum Vitae
Kevork N. Abazajian

CONTACT INFORMATION

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EDUCATION

University of California, San Diego, San Diego, California USA

Ph.D., Physics, 2001

- Thesis: *Neutrino Cosmology and Astrophysics*
- Advisor: Professor George M. Fuller

M.S., Physics, 1997

University of Houston, University Park, Houston, Texas USA

B.S., Physics, 1996

- *Magna cum Laude*, With Honors in Physics
- Minors in Mathematics and Philosophy

ACADEMIC POSITIONS

University of California, Irvine, Department of Physics & Astronomy, Irvine, California USA

Professor **2017 to present**

- Director of the UC Irvine Center for Cosmology

Associate Professor **2013 to 2017**

Assistant Professor **2011 to 2013**

University of Maryland, Department of Physics, College Park, Maryland USA

Assistant Professor **2006 to 2011**

- Member of the Maryland Center for Fundamental Physics
- Member of the U Maryland/Goddard Space Flight Center Joint Space-Science Institute

Los Alamos National Laboratory, Theoretical Division, Los Alamos, NM USA

Director's Postdoctoral Fellow **2003 to 2006**

- T-6 & T-8 Groups, Theoretical Astrophysics and Elementary Particle and Field Theory

NASA/Fermilab Theoretical Astrophysics Group, Batavia, IL USA

Research Associate **2001 to 2003**

- Associate Fellow, Center for Cosmological Physics, University of Chicago
- Visiting Scholar, Astronomy & Astrophysics Department, University of Chicago

University of California, San Diego, La Jolla, CA USA

NASA Graduate Student Research Program Fellow **1999 to 2001**

- NASA Science Mission Directorate, NASA Headquarters

Graduate Research Assistant **1997 to 1999**

- Prof. George M. Fuller, PI

Publications

Citations: 26,514; Published h-index: 52, as of April 13, 2026.

89. **"JWST Lensed Quasar Dark Matter Survey V: Measuring the minimum halo mass with strong gravitational lensing,"**
A. M. Nierenberg, D. Gilman, T. Treu, X. Du, C. Gannon, H. Paugnat, S. Birrer, A. J. Benson, K. N. Abazajian and T. Anguita, *et al.*
submitted, Phys. Rev. Lett.
[arXiv:2604.05237 [astro-ph.CO]].

88. **"Statistics meet systematics: Resolution of the massive early JWST galaxy tension,"**
J. R. Krishnan and K. N. Abazajian,
Phys. Rev. D **113**, no.8, 083007 (2026)
[arXiv:2511.13708 [astro-ph.GA]].

87. **"JWST lensed quasar dark matter survey IV: Stringent warm dark matter constraints from the joint reconstruction of extended lensed arcs and quasar flux ratios,"**
D. Gilman, A. M. Nierenberg, T. Treu, C. Gannon, X. Du, H. Paugnat, S. Birrer, A. J. Benson, P. Mozumdar and K. C. Wong, *et al.*
submitted, Phys. Rev. D
[arXiv:2511.07513 [astro-ph.CO]].

86. **"JWST Lensed Quasar Dark Matter Survey III: Dark Matter Sensitive Flux Ratios and Warm Dark Matter Constraint from the Full Sample,"**
R. E. Keeley, A. M. Nierenberg, D. Gilman, T. Treu, X. Du, C. Gannon, P. Mozumdar, K. C. Wong, H. Paugnat and S. Birrer, *et al.*
submitted, Phys. Rev. D
[arXiv:2511.07765 [astro-ph.CO]].

85. **"Extra Radiation Cosmologies: Implications of the Hubble Tension for eV-scale Neutrinos,"**
H. García Escudero and K. N. Abazajian,
Phys. Rev. D **113**, no.2, 023508 (2026)
[arXiv:2509.25478 [hep-ph]].

84. **"Cosmic Structure Strikes Back: The Elimination of Vector-Mediated Nonstandard Interaction Models as a Mechanism for Sterile Neutrino Dark Matter Production,"**
C. M. Vogel, H. García Escudero and K. N. Abazajian,
Phys. Rev. D **112**, no.12, 12 (2025)
[arXiv:2509.05631 [hep-ph]].

83. **"Return of the Lepton Number: Sterile Neutrino Dark Matter Production and the Revival of the Shi-Fuller Mechanism,"**
C. M. Vogel, H. García Escudero, J. Froustey and K. N. Abazajian,
Phys. Rev. D **112**, no.12, 123508 (2025)
[arXiv:2507.18752 [hep-ph]].

82. **"Preference for evolving dark energy from cosmological distance measurements and possible signatures in the growth rate of perturbations,"**
R. E. Keeley, K. N. Abazajian, M. Kaplinghat and A. Shafieloo,
Phys. Rev. D **112**, no.4, 043501 (2025)
[arXiv:2502.12667 [astro-ph.CO]].

81. **"Status of neutrino cosmology: Standard ΛCDM, extensions, and tensions,"**
H. García Escudero and K. N. Abazajian,
Phys. Rev. D **111**, no.4, 043520 (2025)
[arXiv:2412.05451 [astro-ph.CO]].

80. **"JWST lensed quasar dark matter survey – II. Strongest gravitational lensing limit on the dark matter free streaming length to date,"**
R. E. Keeley, A. M. Nierenberg, D. Gilman, C. Gannon, S. Birrer, T. Treu, A. J. Benson, X. Du, K. N. Abazajian and T. Anguita, *et al.*
Mon. Not. Roy. Astron. Soc. **535**, no.2, 1652-1671 (2024)
[arXiv:2405.01620 [astro-ph.CO]].

79. **"Robust inference of the Galactic centre gamma-ray excess spatial properties,"**
D. Song, C. Eckner, C. Gordon, F. Calore, O. Macias, K. N. Abazajian, S. Horiuchi, M. Kaplinghat and M. Pohl,
Mon. Not. Roy. Astron. Soc. **530**, no.4, 4395-4411 (2024)
[arXiv:2402.05449 [astro-ph.GA]].

78. **"Visible in the laboratory and invisible in cosmology: Decaying sterile neutrinos,"**
K. N. Abazajian and H. G. Escudero,
Phys. Rev. D **108**, no.12, 123036 (2023)
[arXiv:2309.11492 [hep-ph]].

77. **"JWST lensed quasar dark matter survey I: Description and First Results,"**
A. M. Nierenberg, R. E. Keeley, D. Sluse, D. Gilman, S. Birrer, T. Treu, K. N. Abazajian, T. Anguita, A. J. Benson and V. N. Bennert, *et al.*
Mon. Not. Roy. Astron. Soc. **530**, no.3, 2960-2971 (2024)
[arXiv:2309.10101 [astro-ph.CO]].

76. **"Entering the era of measuring sub-Galactic dark matter structure: Accurate transfer functions for axino, gravitino, and sterile neutrino thermal warm dark matter,"**
C. M. Vogel and K. N. Abazajian,
Phys. Rev. D **108**, no.4, 043520 (2023)
[arXiv:2210.10753 [hep-ph]].

75. **"Early versus Phantom Dark Energy, Self-Interacting, Extra, or Massive Neutrinos, Primordial Magnetic Fields, or a Curved Universe: An Exploration of Possible Solutions to the H_0 and σ_8 Problems,"**
H. G. Escudero, J. L. Kuo, R. E. Keeley and K. N. Abazajian,
Phys. Rev. D **106**, no.10, 103517 (2022)
[arXiv:2208.14435 [astro-ph.CO]].

74. **"Constraints on sterile neutrino models from strong gravitational lensing, Milky Way satellites, and Lyman-α forest,"**
I. A. Zelko, T. Treu, K. N. Abazajian, D. Gilman, A. J. Benson, S. Birrer, A. M. Nierenberg and A. Kusenko,

Phys. Rev. Lett. **129**, no.19, 191301 (2022)
[arXiv:2205.09777 [hep-ph]].

73. **"Synergy between cosmological and laboratory searches in neutrino physics,"**
M. Gerbino, E. Grohs, M. Lattanzi, K. N. Abazajian, N. Blinov, T. Brinckmann, M. C. Chen, Z. Djurcic, P. Du and M. Escudero, *et al.*
Phys. Dark Univ. **42**, 101333 (2023)
[arXiv:2203.07377 [hep-ph]].

72. **"CMB-S4: Forecasting Constraints on Primordial Gravitational Waves,"**
K. Abazajian *et al.* [CMB-S4],
Astrophys. J. **926**, no.1, 54 (2022)
[arXiv:2008.12619 [astro-ph.CO]].

71. **"Strong constraints on thermal relic dark matter from Fermi-LAT observations of the Galactic Center,"**
K. N. Abazajian, S. Horiuchi, M. Kaplinghat, R. E. Keeley and O. Macias,
Phys. Rev. D **102**, no.4, 043012 (2020)
[arXiv:2003.10416 [hep-ph]].

70. **"Near to long-term forecasts in x-ray and gamma-ray bands: Are we entering the era of dark matter astronomy?,"**
D. Zhong, M. Valli and K. N. Abazajian,
Phys. Rev. D **102**, no.8, 083008 (2020)
[arXiv:2003.00148 [astro-ph.HE]].

69. **"Observing Dirac neutrinos in the cosmic microwave background,"**
K. N. Abazajian and J. Heeck,
Phys. Rev. D **100**, 075027 (2019)
[arXiv:1908.03286 [hep-ph]].

68. **"Hidden treasures: Sterile neutrinos as dark matter with miraculous abundance, structure formation for different production mechanisms, and a solution to the σ_8 problem,"**
K. N. Abazajian and A. Kusenko,
arXiv:1907.11696 [hep-ph]
Phys. Rev. D **100**, no.10, 103513 (2019)

67. **"Observational Signatures of Gamma Rays from Bright Blazars and Wakefield Theory,"**
N. E. Canac, K. N. Abazajian, T. Tajima, T. Ebisuzaki and S. Horiuchi,
arXiv:1709.06535 [astro-ph.HE]
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66. **"Warm FIRE: Simulating Galaxy Formation with Resonant Sterile Neutrino Dark Matter"**
B. Bozek *et al.*.
arXiv:1803.05424 [astro-ph.GA]
Mon. Not. Roy. Astron. Soc. **483**, no. 3, 4086 (2019)

65. **"What the Milky Way's dwarfs tell us about the Galactic Center extended gamma-ray excess"**
R. Keeley, K. Abazajian, A. Kwa, N. Rodd and B. Safdi.
arXiv:1710.03215 [astro-ph.HE]
Phys. Rev. D **97**, no. 10, 103007 (2018)

64. **"Sterile neutrinos in cosmology"**
K. N. Abazajian.
arXiv:1705.01837 [hep-ph]
Phys. Rept. **711-712**, 1 (2017)
UCI-TR-2017-03

63. **"High energy photon emission from wakefields"**
D. M. Farinella, C. K. Lau, X. M. Zhang, J. K. Koga, S. Taimourzadeh, Y. Hwang, K. Abazajian, N. Canac, T. Ebisuzaki, P. Taborek and T. Tajima
Phys. Plasmas **23**, 073107 (2016)

62. **"Neutrino Physics from the Cosmic Microwave Background and Large-Scale Structure,"**
K. N. Abazajian, and M. Kaplinghat
Ann.Rev.Nucl.Part.Sci. 66 (2016) no.1, 401-420

61. **"Testing for New Physics: Neutrinos and the Primordial Power Spectrum,"**
N. Canac, G. Aslanyan, K. N. Abazajian, R. Easther and L. C. Price,
JCAP 1609 (2016) no.09, 022
arXiv:1606.03057 [astro-ph.CO].

60. **"Sterile neutrino dark matter: Weak interactions in the strong coupling epoch"**
T. Venumadhav, F. Y. Cyr-Racine, K. N. Abazajian and C. M. Hirata.
Phys. Rev. D **94**, no. 4, 043515 (2016)
arXiv:1507.06655 [astro-ph.CO]
UCI-TR-2015-12, INT-PUB-15-032

59. **"Properties of resonantly produced sterile neutrino dark matter subhaloes"**
S. Horiuchi, B. Bozek, K. N. Abazajian, M. Boylan-Kolchin, J. S. Bullock, S. Garrison-Kimmel and J. Oñorbe.
Mon. Not. Roy. Astron. Soc. **456**, no. 4, 4346 (2016)
arXiv:1512.04548 [astro-ph.CO]
INT-PUB-15-072, UCI-HEP-TR-2015-23

58. **"Resonant Sterile Neutrino Dark Matter in the Local and High-z Universe"**
B. Bozek, M. Boylan-Kolchin, S. Horiuchi, S. Garrison-Kimmel, K. Abazajian and J. S. Bullock.
Mon. Not. Roy. Astron. Soc. **459**, 1489 (2016)
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UCI-HEP-TR-2015-24

57. **"Bright gamma-ray Galactic Center excess and dark dwarfs: Strong tension for dark matter annihilation despite Milky Way halo profile and diffuse emission uncertainties"**
K. N. Abazajian and R. E. Keeley.
Phys. Rev. D **93**, no. 8, 083514 (2016)
UCI-TR-2015-19
arXiv:1510.06424 [hep-ph]

56. **"Discovery of a New Galactic Center Excess Consistent with Upscattered Starlight"**
K. N. Abazajian, N. Canac, S. Horiuchi, M. Kaplinghat and A. Kwa.
JCAP **1507**, no. 07, 013 (2015)
arXiv:1410.6168 [astro-ph.HE]

55. **"Sensitivity of HAWC to high-mass dark matter annihilations"**
A. U. Abeysekara *et al.* [HAWC Collaboration].
Phys. Rev. D **90**, no. 12, 122002 (2014)
arXiv:1405.1730 [astro-ph.HE]
LANL-LA-UR-14-23188

54. **"The Knotted Sky II: Does BICEP2 require a nontrivial primordial power spectrum?"**
K. N. Abazajian, G. Aslanyan, R. Easther and L. C. Price.
JCAP **1408**, 053 (2014)
arXiv:1403.5922 [astro-ph.CO]

53. **"The Knotted Sky I: Planck constraints on the primordial power spectrum"**
G. Aslanyan, L. C. Price, K. N. Abazajian and R. Easther.
JCAP **1408**, 052 (2014)
arXiv:1403.5849 [astro-ph.CO]

52. **"Running with BICEP2: Implications for Small-Scale Problems in CDM"**
S. Garrison-Kimmel, S. Horiuchi, K. N. Abazajian, J. S. Bullock and M. Kaplinghat.
Mon. Not. Roy. Astron. Soc. **444**, 961 (2014)
arXiv:1405.3985 [astro-ph.CO]

51. **"Neutrino Physics from the Cosmic Microwave Background and Large Scale Structure"**
K. N. Abazajian, K. Arnold, J. Austermann, B. A. Benson, C. Bischoff, J. Bock, J. R. Bond and J. Borrill *et al.*.
American Physical Society Division of Particles and Fields Community Summer Study Report (Snowmass)
Astropart. Phys. **63**, 66 (2015)
arXiv:1309.5383 [astro-ph.CO]

50. **"Inflation Physics from the Cosmic Microwave Background and Large Scale Structure"**
K. N. Abazajian, K. Arnold, J. Austermann, B. A. Benson, C. Bischoff, J. Bock, J. R. Bond and J. Borrill *et al.*.
American Physical Society Division of Particles and Fields Community Summer Study Report (Snowmass)
Astropart. Phys. **63**, 55 (2015)
arXiv:1309.5381 [astro-ph.CO]

49. **"Resonantly-Produced 7 keV Sterile Neutrino Dark Matter Models and the Properties of Milky Way Satellites"**
K. N. Abazajian.
Phys. Rev. Lett. **112**, 161303 (2014)
arXiv:1403.0954 [astro-ph.CO]

48. **"Astrophysical and Dark Matter Interpretations of Extended Gamma-Ray Emission from the Galactic Center"**
K. N. Abazajian, N. Canac, S. Horiuchi and M. Kaplinghat.
Phys. Rev. D **90**, 023526 (2014)
arXiv:1402.4090 [astro-ph.HE]

47. **"The High-z Universe Confronts Warm Dark Matter: Galaxy Counts, Reionization and the Nature of Dark Matter"**
C. Schultz, J. Oñorbe, K. N. Abazajian and J. S. Bullock.

Mon. Not. Roy. Astron. Soc. **442**, 1597 (2014)
arXiv:1401.3769 [astro-ph.CO]

46. **"Sterile neutrino dark matter bounds from galaxies of the Local Group"**
S. Horiuchi, P. J. Humphrey, J. Oñorbe, K. N. Abazajian, M. Kaplinghat and S. Garrison-Kimmel.
Phys. Rev. D **89**, no. 2, 025017 (2014)
arXiv:1311.0282 [astro-ph.CO]

45. **"Are Light Sterile Neutrinos Preferred or Disfavored by Cosmology?"**
S. Joudaki, K. N. Abazajian and M. Kaplinghat.
Phys. Rev. D **87**, no. 6, 065003 (2013) [arXiv:1208.4354 [astro-ph.CO]]

44. **"Models of the Contribution of Blazars to the Anisotropy of the Extragalactic Diffuse Gamma-ray Background"**
J. P. Harding and K. N. Abazajian.
JCAP **1211**, 026 (2012) [arXiv:1206.4734 [astro-ph.HE]]

43. **"Detection of a Gamma-Ray Source in the Galactic Center Consistent with Extended Emission from Dark Matter Annihilation and Concentrated Astrophysical Emission"**
K. N. Abazajian and M. Kaplinghat.
Phys. Rev. D **86**, 083511 (2012) [arXiv:1207.6047 [astro-ph.HE]]

42. **"Lower Limits on the Strengths of Gamma Ray Lines from WIMP Dark Matter Annihilation"**
K. N. Abazajian, P. Agrawal, Z. Chacko and C. Kilic.
Phys. Rev. D **85**, 123543 (2012) [arXiv:1111.2835 [hep-ph]]

41. **"Constraints on WIMP and Sommerfeld-Enhanced Dark Matter Annihilation from HESS Observations of the Galactic Center"**
K. N. Abazajian and J. P. Harding.
JCAP **1201**, 041 (2012) [arXiv:1110.6151 [hep-ph]]

40. **"Current and Future Constraints on Dark Matter from Prompt and Inverse-Compton Photon Emission in the Isotropic Diffuse Gamma-ray Background"**
K. N. Abazajian, S. Blanchet and J. P. Harding.
Phys. Rev. D **85**, 043509 (2012) [arXiv:1011.5090 [hep-ph]]

39. **"The Contribution of Blazars to the Extragalactic Diffuse Gamma-ray Background and Their Future Spatial Resolution"**
K. N. Abazajian, S. Blanchet and J. P. Harding.
Phys. Rev. D **84**, 103007 (2011) [arXiv:1012.1247 [astro-ph.CO]]

38. **"Cosmological and Astrophysical Neutrino Mass Measurements"**
K. N. Abazajian, E. Calabrese, A. Cooray, F. De Bernardis, S. Dodelson, A. Friedland, G. M. Fuller, S. Hannestad *et al.*.
Astropart. Phys. **35**, 177-184 (2011) [arXiv:1103.5083 [astro-ph.CO]]

37. **"The Consistency of Fermi-LAT Observations of the Galactic Center with a Millisecond Pulsar Population in the Central Stellar Cluster"**
K. N. Abazajian,
JCAP **1103**, 010 (2011) [arXiv:1011.4275 [astro-ph.HE]]

36. **"Conservative Constraints on Dark Matter from the Fermi-LAT Isotropic Diffuse Gamma-Ray Background Spectrum"**
K. N. Abazajian, P. Agrawal, Z. Chacko and C. Kilic
JCAP **1011**, 041 (2010), [arXiv:1002.3820 [astro-ph.HE]]

35. **"Morphological Tests of the Pulsar and Dark Matter Interpretations of the WMAP Haze"**
J. P. Harding and K. N. Abazajian
Phys. Rev. D **81**, 023505 (2010) [arXiv:0910.4590 [astro-ph.CO]]

34. **"The Seventh Data Release of the Sloan Digital Sky Survey"**
K. N. Abazajian *et al.* [SDSS Collaboration]
Astrophys. J. Suppl. **182**, 543 (2009) [arXiv:0812.0649 [astro-ph]]

33. **"Chaos, Determinacy and Fractals in Active-Sterile Neutrino Oscillations in the Early Universe"**
K. N. Abazajian and P. Agrawal
JCAP **0810**, 006 (2008) [arXiv:0807.0456 [hep-ph]]

32. **"Toward a halo mass function for precision cosmology: the limits of universality"**
J. L. Tinker, Andrey V. Kravtsov, Anatoly Klypin, Kevork Abazajian, Michael S. Warren, Gustavo Yepes, Stefan Gottlober, Daniel E. Holz
Astrophys. J. **688**, 709 (2008) [arXiv:0803.2706 [astro-ph]]

31. **"Limits on the radiative decay of sterile neutrino dark matter from the unresolved cosmic and soft X-ray backgrounds"**
K. N. Abazajian, M. Markevitch, S. M. Koushiappas and R. C. Hickox
Phys. Rev. D **75**, 063511 (2007) [arXiv:astro-ph/0611144]

30. **"Cosmological Constraints from the SDSS Luminous Red Galaxies"**
M. Tegmark *et al.* [SDSS Collaboration]
Phys. Rev. D **74**, 123507 (2006) [arXiv:astro-ph/0608632]

29. **"Light Element Signatures of Sterile Neutrinos and Cosmological Lepton Numbers"**
C. J. Smith, G. M. Fuller, C. T. Kishimoto and K. N. Abazajian
Phys. Rev. D **74**, 085008 (2006) [arXiv:astro-ph/0608377]

28. **"Constraints on sterile neutrino dark matter"**
K. Abazajian and S. M. Koushiappas
Phys. Rev. D **74**, 023527 (2006) [arXiv:astro-ph/0605271]

27. **"A Large Dark Matter Core in the Fornax Dwarf Spheroidal Galaxy?"**
L. E. Strigari, J. S. Bullock, M. Kaplinghat, A. V. Kravtsov, O. Y. Gnedin, K. Abazajian and A. A. Klypin
Astrophys. J. **652**, 306 (2006) [arXiv:astro-ph/0603775]

26. **"Percolation Galaxy Groups and Clusters in the SDSS Redshift Survey: Identification, Catalogs, and the Multiplicity Function"**
A. A. Berlind *et al.* [SDSS Collaboration]
Astrophys. J. Suppl. **167**, 1 (2006) [arXiv:astro-ph/0601346]

25. **"Linear cosmological structure limits on warm dark matter"**
K. Abazajian
Phys. Rev. D **73**, 063513 (2006) [arXiv:astro-ph/0512631]

24. **"Production and evolution of perturbations of sterile neutrino dark matter"**
K. Abazajian
Phys. Rev. D **73**, 063506 (2006) [arXiv:astro-ph/0511630]

23. **"Parameterizing the Power Spectrum: Beyond the Truncated Taylor Expansion"**
K. Abazajian, K. Kadota and E. D. Stewart
JCAP **0508**, 008 (2005) [arXiv:astro-ph/0507224]

22. **"Precision Determination of the Mass Function of Dark Matter Halos"**
M. S. Warren, K. Abazajian, D. E. Holz and L. Teodoro
Astrophys. J. **646**, 881 (2006) [arXiv:astro-ph/0506395]

21. **"The nonlinear cosmological matter power spectrum with massive neutrinos: The halo model"**
K. Abazajian, E. R. Switzer, S. Dodelson, K. Heitmann and S. Habib
Phys. Rev. D **71**, 043507 (2005) [arXiv:astro-ph/0411552]

20. **"The Third Data Release of the Sloan Digital Sky Survey"**
K. Abazajian *et al.* [SDSS Collaboration]
Astron. J. **129**, 1755 (2005) [arXiv:astro-ph/0410239]

19. **"Cosmological lepton asymmetry, primordial nucleosynthesis, and sterile neutrinos"**
K. Abazajian, N. F. Bell, G. M. Fuller and Y. Y. Y. Wong
Phys. Rev. D **72**, 063004 (2005) [arXiv:astro-ph/0410175]

18. **"Cosmology and the Halo Occupation Distribution from Small-Scale Galaxy Clustering in the Sloan Digital Sky Survey"**
K. Abazajian *et al.* [SDSS Collaboration]
Astrophys. J. **625**, 613 (2005) [arXiv:astro-ph/0408003]

17. **"The Second Data Release of the Sloan Digital Sky Survey"**
K. Abazajian *et al.* [SDSS Collaboration]
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16. **"Cosmological parameters from SDSS and WMAP"**
M. Tegmark *et al.* [SDSS Collaboration]
Phys. Rev. D **69**, 103501 (2004) [arXiv:astro-ph/0310723]

15. **"The First Data Release of the Sloan Digital Sky Survey"**
K. Abazajian *et al.* [SDSS Collaboration]
Astron. J. **126**, 2081 (2003) [arXiv:astro-ph/0305492]

14. **"Neutrino mass and dark energy from weak lensing"**
K. N. Abazajian and S. Dodelson
Phys. Rev. Lett. **91**, 041301 (2003) [arXiv:astro-ph/0212216]

13. **"Telling Three from Four Neutrinos with Cosmology"**
K. N. Abazajian
Astropart. Phys. **19**, 303 (2003) [arXiv:astro-ph/0205238]

12. **"Bulk QCD thermodynamics and sterile neutrino dark matter"**
K. N. Abazajian and G. M. Fuller
Phys. Rev. D **66**, 023526 (2002) [arXiv:astro-ph/0204293]

11. **"Stringent constraints on cosmological neutrino antineutrino asymmetries from synchronized flavor transformation"**
K. N. Abazajian, J. F. Beacom and N. F. Bell
Phys. Rev. D **66**, 013008 (2002) [arXiv:astro-ph/0203442]

10. **"SDSS J124602.54+011318.8: A Highly Luminous Optical Transient at z=0.385"**
D. E. Vanden Berk *et al.* [SDSS Collaboration]
Astrophys. J. **576**, 673 (2002) [arXiv:astro-ph/0111054]

9. **"Direct detection of warm dark matter in the X-ray"**
K. Abazajian, G. M. Fuller and W. H. Tucker
Astrophys. J. **562**, 593 (2001) [arXiv:astro-ph/0106002]

8. **"Testing the Cosmic Coincidence Problem and the Nature of Dark Energy"**
N. Dalal, K. Abazajian, E. E. Jenkins and A. V. Manohar
Phys. Rev. Lett. **87**, 141302 (2001) [arXiv:astro-ph/0105317]

7. **"Sterile neutrino hot, warm, and cold dark matter"**
K. Abazajian, G. M. Fuller and M. Patel
Phys. Rev. D **64**, 023501 (2001) [arXiv:astro-ph/0101524]

6. **"The cosmological bulk neutrino catastrophe"**
K. Abazajian, G. M. Fuller and M. Patel
Phys. Rev. Lett. **90**, 061301 (2003) [arXiv:hep-ph/0011048]

5. **"New connection between central engine weak physics and the dynamics of gamma-ray burst fireballs"**
J. Pruet, K. Abazajian and G. M. Fuller
Phys. Rev. D **64**, 063002 (2001) [arXiv:astro-ph/0009144]

4. **"Can a large neutron excess help solve the baryon loading problem in gamma ray burst fireballs?"**
G. M. Fuller, J. Pruet and K. Abazajian
Phys. Rev. Lett. **85**, 2673 (2000) [arXiv:astro-ph/0004313]

3. **"The increase to the primordial He-4 yield in the two-doublet four-neutrino mixing scheme"**
K. Abazajian, G. M. Fuller and X. Shi
Phys. Rev. D **62**, 093003 (2000) [arXiv:astro-ph/9908081]

2. **"Neutrino-mixing-generated lepton asymmetry and the primordial He-4 abundance"**
X. D. Shi, G. M. Fuller and K. Abazajian
Phys. Rev. D **60**, 063002 (1999) [arXiv:astro-ph/9905259]

1. **"Optimization of J_c of YBCO thin films prepared by photo-assisted MOCVD through statistical robust design"**
P. C. Chou, Q. Zhong, K. Abazajian, A. Ignatiev, Q. L. Li, C. Y. Wang, E. E. Deal and J. G. Chen
Physica C: Superconductivity, **254**, 93 (1995)

Proceedings (unrefereed)

1. **"Sterile Neutrino/Dark Fermion Dark Matter: Searches in the X-Ray Sky, the Nuclear Physics Laboratory and in Galaxy Formation,"**
   K. N. Abazajian,
   Astrophys. Space Sci. Proc. **56**, 1-8 (2019)
   doi:10.1007/978-3-030-31593-1_1

2. **"Massive Neutrinos and the Halo Model of Large Scale Structure"**
   E. Switzer, K. Abazajian, S. Dodelson, S. Habib and K. Heitmann.
   Nucl. Phys. Proc. Suppl. **143**, 571 (2005).
   Proceedings of the XXIst International Conference on Neutrino Physics and Astrophysics.

3. **"The cosmological energy density of neutrinos from oscillation measurements"**
   K. Abazajian
   AIP Conf. Proc. **721**, 256 (2004) [arXiv:hep-ph/0312163]
   Proceedings of 5th International Workshop on Neutrino Factories and Superbeams (NuFact 03), New York, New York, 5-11 Jun 2003

4. **"Gamma-ray burst afterglows"**
   K. N. Abazajian
   *In *La Thuile 2002, Results and perspectives in particle physics* 3-8*
   Proceedings. Edited by Mario Greco. Frascaty, Italy, Istituto Naz. Fis. Nucl. (2002).

5. **"Are gamma-ray bursts signals of supermassive black hole formation?"**
   K. Abazajian, G. M. Fuller and X. Shi
   arXiv:astro-ph/9812287
   Proceedings of International Conference on the Activity of Galaxies and Related Phenomena, Byurakan, Armenia, 17-21 Aug 1998

6. **"Active-sterile neutrino mixing in the early universe and primordial nucleosynthesis"**
   K. Abazajian, X. D. Shi and G. M. Fuller
   arXiv:astro-ph/9904052
   Proceedings of American Physical Society (APS) Meeting of the Division of Particles and Fields (DPF 99), Los Angeles, CA, 5-9 Jan 1999

7. **"Baryon/anti-baryon inhomogeneity and big bang nucleosynthesis"**
   K. Abazajian and G. M. Fuller
   arXiv:astro-ph/9812288
   Proceedings of 3rd International Symposium on Sources and Detection of Dark Matter in the Universe (DM 98), Santa Monica, CA, 18-20 Feb 1998

Reports, Lectures, White Papers, and Comments

1. **"Snowmass2021 Cosmic Frontier: Cosmic Microwave Background Measurements White Paper,"**
   C. L. Chang, K. M. Huffenberger, B. A. Benson, F. Bianchini, J. Chluba, J. Delabrouille, R. Flauger, S. Hanany, W. C. Jones and A. J. Kogut, *et al.*
   [arXiv:2203.07638 [astro-ph.CO]].

2. **"Snowmass 2021 CMB-S4 White Paper,"**
   K. Abazajian *et al.* [CMB-S4],
   [arXiv:2203.08024 [astro-ph.CO]].

3. **"Neutrinos in Astrophysics and Cosmology: Theoretical Advanced Study Institute (TASI) 2020 Lectures,"**
K. N. Abazajian,
PoS **TASI2020**, 001 (2021)
doi:10.22323/1.388.0001
[arXiv:2102.10183 [hep-ph]].

4. **"CMB-S4 Decadal Survey APC White Paper,"**
K. Abazajian, G. Addison, P. Adshead, Z. Ahmed, S. W. Allen, D. Alonso, M. Alvarez, M. A. Amin, A. Anderson and K. S. Arnold, *et al.*
Bull. Am. Astron. Soc. **51**, no.7, 209 (2019)
doi:10.2172/1556957
[arXiv:1908.01062 [astro-ph.IM]].

5. **"Scratches from the Past: Inflationary Archaeology through Features in the Power Spectrum of Primordial Fluctuations,"**
A. Slosar, K. N. Abazajian, M. Abidi, P. Adshead, Z. Ahmed, D. Alonso, M. A. Amin, B. Ansarinejad, R. Armstrong and C. Baccigalupi, *et al.*
Bull. Am. Astron. Soc. **51**, no.3, 98 (2019)
[arXiv:1903.09883 [astro-ph.CO]].

6. **"Messengers from the Early Universe: Cosmic Neutrinos and Other Light Relics,"**
D. Green, M. A. Amin, J. Meyers, B. Wallisch, K. N. Abazajian, M. Abidi, P. Adshead, Z. Ahmed, B. Ansarinejad and R. Armstrong, *et al.*
Bull. Am. Astron. Soc. **51**, no.7, 159 (2019)
[arXiv:1903.04763 [astro-ph.CO]].

7. **"Snowmass2021 Cosmic Frontier: Cosmic Microwave Background Measurements White Paper,"**
C. L. Chang, K. M. Huffenberger, B. A. Benson, F. Bianchini, J. Chluba, J. Delabrouille, R. Flauger, S. Hanany, W. C. Jones and A. J. Kogut, *et al.*
[arXiv:2203.07638 [astro-ph.CO]].

8. **"Snowmass 2021 CMB-S4 White Paper,"**
K. Abazajian *et al.* [CMB-S4],
[arXiv:2203.08024 [astro-ph.CO]].

9. **"Technical Comment on "The dark matter interpretation of the 3.5-keV line is inconsistent with blank-sky observations","**
K. N. Abazajian,
[arXiv:2004.06170 [astro-ph.HE]].

10. **"CMB-S4 Science Case, Reference Design, and Project Plan"**
K. Abazajian *et al.*.
arXiv:1907.04473 [astro-ph.IM]
FERMILAB-PUB-19-431-AE-SCD (Jul 9, 2019)

11. **"Dark Matter Science in the Era of LSST"**
K. Bechtol *et al.*.
science White Paper submitted to the National Academy of Science Astro2020 decadal survey
arXiv:1903.04425 [astro-ph.CO]
FERMILAB-PUB-19-141-A-AE-CD (Mar 11, 2019)

12. **"CMB-S4 Science Book, First Edition"**
K. N. Abazajian *et al.* [CMB-S4 Collaboration].

arXiv:1610.02743 [astro-ph.CO]
FERMILAB-FN-1024-A-AE (Oct 9, 2016)

13. **"Neutrinos"**
A. de Gouvea *et al.* [Intensity Frontier Neutrino Working Group Collaboration].
American Physical Society Division of Particles and Fields Community Summer Study Report (Snowmass)
arXiv:1310.4340 [hep-ex]

14. **"Dark Energy and CMB"**
S. Dodelson, K. Honscheid, K. Abazajian, J. Carlstrom, D. Huterer, B. Jain, A. Kim and D. Kirkby *et al.*.
American Physical Society Division of Particles and Fields Community Summer Study Report (Snowmass)
arXiv:1309.5386 [astro-ph.CO]

15. **"Light Sterile Neutrinos: A White Paper"**
K. N. Abazajian, M. A. Acero, S. K. Agarwalla, A. A. Aguilar-Arevalo, C. H. Albright, S. Antusch, C. A. Arguelles and A. B. Balantekin *et al.*.
arXiv:1204.5379 [hep-ph]

16. **"Comment on 'Joint Anisotropy and Source Count Constraints on the Contribution of Blazars to the Diffuse Gamma-Ray Background' "**
J. P. Harding and K. N. Abazajian.
arXiv:1204.3870 [astro-ph.CO]

17. **"The Halo Model of Large Scale Structure for Warm Dark Matter"**
R. M. Dunstan, K. N. Abazajian, E. Polisensky, M. Ricotti.
arXiv:1109.6291 [astro-ph.CO]

18. **"The search for decaying Dark Matter"**
J. W. d. Herder, A. Boyarsky, O. Ruchayskiy, K. Abazajian, *et al.*
Science white paper submitted to the European Space Agency Fundamental Physics Roadmap Advisory Team (FPR-AT)
arXiv:0906.1788 [astro-ph.CO]

19. **"Detection of Dark Matter Decay in the X-ray"**
K. N. Abazajian
Science white paper submitted to the Astro2010 Decadal Cosmology & Fundamental Physics Science Frontier Panel
arXiv:0903.2040 [astro-ph.CO]

20. **"Strong gravitational lensing probes of the particle nature of dark matter"**
L. A. Moustakas, K. N. Abazajian, *et al.*
Science white paper submitted to the Astro2010 Decadal Cosmology & Fundamental Physics Science Frontier Panel
arXiv:0902.3219 [astro-ph.CO]

21. **"Transformation induced nonthermal neutrino spectra and primordial nucleosynthesis"**
K. Abazajian, X. Shi and G. M. Fuller
arXiv:astro-ph/9909320

22. **"Comments regarding 'On neutrino-mixing-generated lepton asymmetry and the primordial helium-4 abundance' "**
X. D. Shi, G. M. Fuller and K. Abazajian
arXiv:astro-ph/9909221

Fellowships and Awards

- Fellow of the American Association for the Advancement of Science, 2024
- Fellow of the American Physical Society, 2022
- Founding Fellow of the *Armenian Society of Fellows*, 2021
- *2012 & 2022 Faculty with Greatest Impact on an Outstanding Graduating Senior*, University of California, Irvine
- *Outstanding Reviewer for the Journal The Dark Universe*, 2015
- *Distinguished Assistant Professor Award for Research*, University of California, Irvine Academic Senate, 2013
- *Outstanding Reviewer for the Journal of Astroparticle Physics*, 2013
- *NSF CAREER Award: Cosmological Structure at Small Scales. from the Nature of Dark Matter and its Small-Scale Behavior to Galaxy Formation*, 2010-2015
- *Los Alamos National Laboratory Director's Postdoctoral Fellow*, 2003
- *NASA Graduate Student Research Program Fellowship*, 1999-2001
- *University Honors in Physics*, University of Houston Honors College, 1996
- *Distinguished Honors Thesis in Physics*, University of Houston Honors College, 1996
- *National Merit Scholar*, University of Houston Honors College, 1992
- *Moody Foundation Scholar*, University of Houston Honors College, 1992

Invited Presentations

1. **Neutrinos as standard & nonstandard dark radiation & dark matter**
   TRIUMF Workshop: Neutrinos in Cosmology and Astrophysics, Vancouver, Canada, March 8, 2024
2. **Dark Matter in the Neutrino Sector**
   Alikhanyan National Science Laboratory, Yerevan, Armenia, June 30, 2023
3. **Dark Matter Signals at keV & GeV**
   Center for Theoretical Underground Physics and Related Areas Workshop, The Institute for Underground Science at SURF, Lead, South Dakota, June 21, 2023
4. **Astrophysical Constraints on Warm Dark Matter**
   UCLA Dark Matter Conference, March 30, 2023
5. **Cosmology & Neutrinos**
   Particle Physics Project Prioritization Panel Town Hall, Fermi National Accelerator Laboratory, March 22, 2023
6. **Light-mass Dark Matter**
   Mini-Symposium with Sam Ting, UC Irvine, Feb. 22, 2023
7. **Cosmological Matchmaking: Seven Proposals for Two Candidate Tensions, H_0 and σ_8**
   Workshop on Cosmological Probes of New Physics, Maryland Center for Fundamental Physics, University of Maryland, College Park, September 16, 2022
8. **The Most Stringent Tests of CDM vs WDM & Hidden Treasures in the Neutrino Sector**
   UCLA SoCal Hub Meeting: HUNTER, May 10, 2022

9. **Dark Matter and other Hidden Treasures in the Neutrino Sector**
   Kavli Institute for Theoretical Physics Conference: Interdisciplinary Developments in Neutrino Physics, March 30, 2022

10. **Shi-Fuller mechanism on the ropes? The status of MSW-based sterile neutrino dark matter production**
    Institute for Nuclear Theory Workshop INT-21-79W, New Directions in Neutrino Flavor Evolution in Astrophysical Systems, September 21, 2021

11. **Arising and Demising Dark Matter Signals on the Sky & the Potential of Future Searches**
    Lawrence Berkeley National Laboratory Institute for Nuclear and Particle Astrophysics Seminar, October 16, 2020

12. **Arising and Demising Dark Matter Signals on the Sky & the Potential of Future Searches**
    University of Miami Department of Physics Seminar, July 8, 2020

13. **Warm Dark Matter & Sterile Neutrinos**
    The XXIX International Conference on Neutrino Physics and Astrophysics, June 24, 2020 ($\sim$1100 in attendance)

14. **Sterile Neutrinos & Dark Matter**
    Invited Plenary Talk at International Workshop on New Physics at the Low Energy Scales (NEPLES-2019), Seoul, Korea, Korea Institute for advanced Study(KIAS) September 24, 2019

15. **X-ray Astronomy: A Very Strong Probe of New Physics at Super-Weak Scales of Sterile Neutrinos**
    Invited Plenary Talk at XCALIBUR 2019 Conference, Winchester, U.K., Southhampton University, July 15, 2019

16. **The Saga of Two Candidate Signals for Dark Matter on the Sky**
    Invited Particle Physics Wine & Cheese Seminar, University of California, Los Angeles, May 1, 2019

17. **Cosmological Neutrinos**
    Invited Colloquium at the Department of Physics, California State University, Long Beach, March 18, 2019

18. **Cosmological Neutrinos**
    Invited Colloquium at the Department of Physics, University of New Mexico, February 1, 2019

19. **Cosmological Neutrinos**
    Invited Colloquium at the Department of Physics, University of North Carolina, Chapel Hill, December 3, 2018

20. **Sterile Neutrinos**
    Invited Presentation, Neutrino Cosmology Workshop, University of California, San Diego, November 8, 2018

21. **keV Sterile Neutrinos / Dark Fermions as Dark Matter and the 3.5 keV Line**
    Invited Presentation at the Royal Society Workshop on X-ray astronomy and fundamental physics, The Royal Society, Chicheley Hall, UK, October 24, 2018

22. **keV Sterile Neutrinos as Dark Matter and the 3.5 keV Line**
Invited Plenary talk at XXVIII Conference on Neutrino Physics and Astrophysics, June 9, 2018

23. **Sterile Neutrino Dark Matter**
Invited Presentation, 2018 Conference on the Interface of Nuclear and Particle Physics, May 31, 2018

24. **Sterile Neutrino/Dark Fermion Dark Matter: Searches in the X-ray and Signatures in Galaxy Formation**
Invited Presentation, 2018 Simons Symposium on Illuminating Dark Matter, May 17, 2018

25. **Dark Matter Sterile Neutrinos**
Invited Plenary Talk at Sources and Detection of Dark Matter and Dark Energy in the Universe Conference 2018, UCLA, February 21, 2018

26. **Candidate Signals and Stringent Constraints from Dark Matter in the Sky**
Invited Colloquium, Lawrence Berkeley National Laboratory, Research Progress Meeting, September 21, 2017

27. **The Galactic Center Excess**
Invited Plenary talk, XI International Conference on Interconnections between Particle Physics and Cosmology May 25, 2017, Corpus Christi, Texas

28. **Sterile Neutrinos & Warm Dark Matter**
Invited Presentation at the Beyond WIMPs Workshop, Simons Center for Geometry & Physics Sector Workshop, Stony Brook University, March 16, 2017

29. **Sterile Neutrinos in Cosmology**
Invited Presentation at the Precision Investigations of the Neutrino Sector Workshop, Stanford Linear Accelerator Center, March 16, 2017

30. **The Limits of Scientific Cosmology**
Invited Presentation at the Methodology and Epistemology in Cosmology Conference, Department of Logic & Philosophy of Science, University of California, Irvine, February 10, 2017

31. **Searching for Emission from Dark Matter in X-rays and Gamma-rays**
Invited Colegio de Física Fundamental e Interdiciplinaria de las Américas PIRE Workshop, San Juan, Puerto Rico, February 7, 2017

32. **The Saga of Sterile Neutrino Dark Matter**
Dept. of Physics & Astronomy Colloquium, University of California, Irvine, December 1, 2016

33. **Searching for Emission from Dark Matter in X-rays and Gamma-rays**
Invited Galaxies & Cosmology Seminar, Harvard-Smithsonian Center for Astrophysics, September 27, 2016

34. **The Saga of Sterile Neutrino Dark Matter**
Invited Laboratory for Nuclear Science Colloquium at the Massachusetts Institute for Technology, September 26, 2016

35. **Sterile Neutrino Dark Matter Interpretations of the 3.5 keV Line**
Invited presentation at the Mainz Institute for Theoretical Physics, Workshop on "The Energy Ladder of the Universe," Mainz, Germany, June 8, 2016

36. **Sterile Neutrino Dark Matter: A Tale of Weak Interactions in a Strong-Coupling Epoch**
Invited Karlsruhe Institute for Technology Joint Seminar, Heidelberg, Tuebingen and the KIT, Karlsruhe, Germany, June 7, 2016

37. **Sterile Neutrino Dark Matter Interpretations of the 3.5 keV Line**
Invited Max Planck Institute for Kernphysik Seminar, Heidelberg, Germany, June 6, 2016

38. **Dark Matter and the 3.5 keV Signal**
Invited Presentation at the Americal Physical Society April Meeting, Division of Particles & Fields, Salt Lake City, Utah, April 18, 2016

39. **Toward the End Game for Absolute Neutrino Mass via Cosmology?**
Texas A&M University Mitchell Institute for Fundamental Physics & Astronomy Seminar, April 14, 2016

40. **Sterile Neutrino Candidates for the 3.5 keV Line**
Sources and Detection of Dark Matter and Dark Energy in the Universe Conference, UCLA, February 18, 2016

41. **Neutrino Mass from Cosmology & Astrophysics**
Invited Presentation at the Amherst Center for Fundamental Interactions Workshop on Neutrino Mass: From the Terrestrial Laboratory to the Cosmos, December 14, 2015

42. **Indirect Dark Matter Searches**
Invited Colloquium at Northwestern University Physics & Astronomy Department, November 6, 2015

43. **Dark Matter Detections in Photons Split by a Million in Energy: Implications of X-ray lines and Gamma-ray Bumps**
Invited Seminar at the Amherst Center for Fundamental Interactions, October 16, 2015

44. **Neutrinos as Dark Matter**
Invited Lecture at the Stanford Linear Accellerator Center Summer Institute, August 19, 2015

45. **Neutrino Mass: Cosmological Data Impacts**
Invited review talk for the Department of Energy Nuclear Science Advisory Council Subcommittee on Neutrinoless Double Beta Decay, August 17, 2015

46. **Sterile Dark Matter Cosmological Neutrinos**
Invited Presentation at the Institute for Nuclear Theory Conference in Program 15-2a: Neutrino Astrophysics & Fundamental Properties, June 17, 2015

47. **Dark Matter Detections in Photons Split by a Million in Energy: Implications of X-ray lines and Gamma-ray Bumps**
Invited Seminar at the CalTech Theoretical AstroPhysics Including Relativity and Cosmology Center, April 10, 2015

48. **Implications of the Candidate Dark Matter Decay Line at 3.5 keV**
Invited Texas A&M University Mitchell Institute for Fundamental Physics & Astronomy Seminar, February 12, 2015

49. **Implications of the Candidate Dark Matter Decay Line at 3.5 keV**
Invited Astrophysics Seminar at UC San Diego, January 28, 2015

50. **Signals and degeneracies of the primordial power spectrum: Neutrinos & Inflation**
Invited Plenary Talk at the Cosmology with the CMB and its Polarization Workshop, Fine Theoretical Physics Institute, University of Minnesota, January 14, 2015

51. **Implications of the Candidate Dark Matter Decay Line at 3.5 keV**
Invited Presentation at the University of California Institute for Nuclear, Particle Astrophysics and Cosmology Workshop, Asilomar, California, December 4, 2014

52. **Implications of the Candidate Dark Matter Decay Line at 3.5 keV**
Invited Fermilab Center for Particle Astrophysics Seminar, Batavia, Illinois, October 6, 2014

53. **The First Moments after the Big Bang**
Invited Presentation to the TEC7 CEO Group, August 27, 2014

54. **Cosmology of Massive Neutrinos**
Invited Divisional Seminar, Argonne National Laboratory, June 11, 2014

55. **Intensity and Anisotropy of the Diffuse Gamma-Ray Background**
Invited presentation, High-Energy Messengers Workshop, Kavli Institute for Cosmological Physics, June 2014

56. **Dark matter indirect detection signals and constraints**
First Anti-Deuteron Workshop, UCLA, June 2014

57. **Dark Matter Detections in Photons Split by a Million in Energy: Implications of X-ray Lines and Gamma-ray Bumps**
University of Maryland Department of Physics Seminar, April 2014

58. **Cosmological and Astrophysical Implications of Sterile Neutrinos**
Invited presentation, American Physical Society April 2014 Conference, Savannah, Georgia

59. **Gamma-ray Signals** and **X-ray Signals** Panelist, Dark Matter in Southern California Workshop, California Institute of Technology, April 2014

60. **Cosmological Hot, Warm and Cold Dark Matter**
Colloquium at the Kavli Institute for Particle Astrophysics & Cosmology, Stanford University and SLAC, September 2013

61. **Neutrino Physics from the Cosmic Microwave Background and Large Scale Structure**
invited presentation at the American Physical Society Community Summer Study "Snowmass on the Mississippi," University of Minnesota, August 2013

62. **Neutrino Mass and Number from Cosmology**
invited presentation to the Cosmic Microwave Background and Large Scale Structure session Cosmic Frontiers Meeting, Stanford Linear Accelerator Center, March 2013

63. **Overview of Dark Matter Constraints from Gamma-ray Astrophysics**
invited presentation to the Indirect Detection of Dark Matter session Cosmic Frontiers Meeting, Stanford Linear Accelerator Center, March 2013

64. **Neutrino Mass and Number from Cosmology**
invited presentation to the Neutrino Mass session, Intensity Frontiers Meeting, Stanford Linear Accelerator Center, March 2013

65. **An Unexpected Journey: Detection of Dark Matter in the Galactic Center?**
Aspen Center for Physics Workshop, Closing in on Dark Matter? February 2013

66. **Indirect Detection Overview**
Dark Matter in Southern California Workshop, California Institute of Technology, January 2013

67. **Detection of Dark Matter in the Galactic Center?**
Colloquium at the Carnegie Observatory, Pasadena, California, January 2013

68. **Dark Matter Annihilation in the Galactic Center?**
Cosmology Initiative Seminar, Arizona State University, Tempe, Arizona, September 2012

69. **Update on Sterile Neutrino Dark Matter & Gamma-rays from the Galactic Center**
Plenary talk, Identification of Dark Matter, Chicago, July 2012

70. **Dark Matter Signals in the Gamma-ray**
Plenary talk, Snowbird Workshop on Dark Matter Observations through Gamma Rays (SnowDOG), March 2012

71. **Deviant Dark Matter**
University of California, Santa Cruz, Santa Cruz Institute for Particle Physics Seminar, March 2012

72. **Sterile Neutrino Dark Matter in the Near Field**
Plenary Presentation, Conference on Near Field Cosmology as a Probe of the Early Universe, Dark Matter and Gravity, Annapolis, Maryland, November 2011

73. **Uncovering the Nature of Dark Matter**
Colloquium Department of Physics & Astronomy, Cal State Los Angeles, October 2011

74. **Astrophysics Theory Review**
Plenary Presentation, Conference on Sterile Neutrinos at the Crossroads, Virginia Tech University, September 2011

75. **Astrophysical Indicators of the Nature of Dark Matter**
Colloquium, Brown University Department of Physics, March 2011

76. **Constraints and Forecasts for Gamma-ray Signals from Fermi-LAT**
Aspen Center for Physics Workshop on Direct and Indirect Searches for Dark Matter, February 2011

77. **Signals from and Constraints on Dark Matter by the Fermi-LAT Observatory**
Goddard Space Flight Center Workshop on Fermi Gamma Ray Space Telescope Science, November 2010

78. **Fermi-LAT and Gamma-Ray Constraints and Sensitivity to Dark Matter Signals**
Invited presentation at the Santa Fe Cosmology Workshop, July 2010

79. **Constraints on Dark Matter from Gamma-Ray Observations**
Invited presentation at the Workshop on Novel Searches for Dark Matter, The Ohio State University, July 2010

80. **Neutrinos and the Lyman-α forest**
Invited presentation at the Institute for Nuclear Theory Workshop on Neutrino Mass, University of Washington, February 2010

81. **Verification of Indirect Indications of the Nature of Dark Matter**
Department of Physics & Astronomy Seminar, University of Pennsylvania, January 2010

82. **Verification of Indirect Indications of the Nature of Dark Matter**
Department of Physics Seminar, Carnegie-Melon University, October 2009

83. **Cosmology from Small Scale Structure**
Department of Astronomy Colloquium, University of Maryland, May 2009

84. **Detection of Dark Matter in the X-ray**
Quantum 2 Cosmos III Conference, Arlie Center, Virginia, July 2008

85. **Chaos and Fractals in Lepton Number Generation in the Early Universe**
Neutrino Theory Workshop, University of Melbourne, Australia, June 2008

86. **Sterile Neutrino Dark Matter**
Santa Fe Cosmology Workshop, Santa Fe, New Mexico, July 2007

87. **Constraints on Sterile Neutrino Dark Matter**
Astrophysical Methods for Determining the Nature of Dark Matter Workshop, UC Irvine, California, March 2007

88. **Neutrinos and the Cosmos**
NuFact06, Irvine, California, August 2006

89. **Neutrino Mass Measurements from the Cosmic Microwave Background and the Sloan Digital Sky Survey**
American Physical Society April Meeting, 2006

90. **Sterile Neutrino Production and Perturbation Evolution**
Sterile Neutrinos in Astrophysics and Cosmology Conference,
EPFL, Switzerland, March 2006

91. **Sterile Neutrino Dark Matter**
New Views of the Universe Symposium, The University of Chicago,
December 2005

92. **Structure, Statistics and Information at All Cosmological Scales**
Max Planck Instituted for Astrophysics Colloquium, Garching, Germany, April 2005

93. **Massive Neutrinos in the New Cosmology**
Department of Physics Colloquium, University of British Columbia, March 2005

94. **Cosmology and Galaxy Formation from All-Scale Galaxy Clustering in the Sloan Digital Sky Survey**
Institute of Astronomy, ETH Zürich, Switzerland, October 2004

95. **Neutrino Clustering in Cold Dark Matter Halos**
Workshop on Neutrinos and the Early Universe, ECT*, Trento, Italy,
October 2004

96. **Cosmology from the Deeply Nonlinear Regime: the SDSS Two-point Correlation Function**
Santa Fe Cosmology Workshop, July 2004

97. **The Galaxy Dark Matter Halo Occupation, Two-point Correlation, and Cosmology**
Aspen Winter 2003 Conference on Astrophysics, January 2004

98. **Neutrino Cosmology**
Physics Colloquium, New Mexico State University, October 2003

99. **Cosmological Measurements of Neutrino Parameters**
Weak Interactions and Neutrinos, Lake Geneva, Wisconsin, October 2003

100. **Precision Cosmological Measurement of Neutrino Mass**
Eleventh Lomonosov Conference on Elementary Particle Physics, Moscow State University, August 2003

101. **Massive Neutrinos in the New Cosmology**
Joint Experimental and Theoretical Physics Seminar, Fermi National Accelerator Laboratory, April 2003

102. **Sterile Neutrinos in Astrophysics and Cosmology**
Neutrino Conference, Kavli Institute for Theoretical Physics, March 2003

103. **Neutrino Cosmology**
Aspen Winter 2003 Conference on Particle Physics, January 2003

104. **Gamma-Ray Burst Afterglows**
Les Rencontres de Physique de la Vallée d'Aoste Conference, La Thuile, Italy, March 2002

105. **Precision Cosmological Measurements of Neutrino Mass**
Theoretical Particle Physics Seminar, University of California, Los Angeles, October 2003

106. **The Cosmological Energy Density of Neutrinos from Oscillation Measurements**
5th International Workshop on Neutrino Factories & Superbeams, Columbia University, New York, June 2003

107. **Neutrino Mass and Dark Energy from Weak Lensing**
Great Lakes Cosmology Workshop, Ann Arbor, Michigan, May 2003

108. **Massive Neutrinos in the New Cosmology**
Joint Experimental and Theoretical Physics Seminar, Fermilab, April 2003

109. **Sterile Neutrino Dark Matter**
Workshop on Neutrino News from the Lab and the Cosmos, Fermilab, October 2002

110. **New Constraints on Neutrino Degeneracies**
Astrophysics Seminar, University of Notre Dame, September 2002

111. **Direct Detection of the Dark Matter in the X-ray**
Predictions of Cold Dark Matter on Small Scales Workshop, Center for Cosmological Physics, University of Chicago, August 2002

112. **Stringent Constraints on Cosmological Lepton Number from Solar Neutrinos**
Santa Fe Summer Cosmology Workshop, July 2002
Pheno 2002 Symposium, University of Wisconsin, Madison, April 2002

113. **Finding and Resolving Crises in Cold Dark Matter**
Aspen Workshop on Large Scale Structure in the Era of Large Surveys, Aspen Center for Physics, June 2002

114. **Neutrino Cosmology**
Institute for Nuclear Theory Mini-workshop on Neutrino Physics, Program on Nucleosynthesis, April 2002

115. **Making Dark Matter and Deriving Constraints with Neutrino Mixing in the Early Universe**
Center for Cosmological Physics Seminar, University of Chicago, November 2001

116. **A Cosmic "Coincidometer"**
Cosmology Seminar, Department of Physics, University of California Davis, October 2001

117. **Direct Detection of Warm Dark Matter**
Theoretical Physics Seminar, Purdue University, September 2001

118. **Cold Neutrino Dark Matter**
Nuclear Physics Seminar, Lawrence Livermore National Laboratory, February 2001
Theoretical Astrophysics Group Seminar, Fermilab, January 2001
Theoretical Physics Seminar, TRIUMF, Vancouver, January 2001

Contributed Conference Presentations

1. **Astrophysical Constraints on Warm Dark Matter**
American Physical Society April Meeting, April 16, 2023

2. **Telling Three from Four Neutrinos with Cosmology**
COSMO-02, International Workshop on Particle Physics and the Early Universe, Chicago, September 2002

3. **Sterile Neutrinos in the Early Universe**
NATO Advanced Study Institute 2000: Recent Developments in Particle Physics and Cosmology, Cascais, Portugal, July 2000

4. **Neutrino Mixing in the Early Universe and the Two-doublet Neutrino Mass Model**
Institute for Nuclear Theory Program on Low-Energy Neutrino Physics, August 1999

5. **Active-Sterile Neutrino Mixing and Primordial Nucleosynthesis**
American Physical Society Meeting of the Division of Particles and Fields, Los Angeles, California, January 1999

6. **Are Gamma-Ray Bursts Signals of Supermassive Black Hole Formation?**
International Conference on the Activity of Galaxies and Related Phenomena, Byurakan, Armenia, August 1998

7. **Baryon/Anti-Baryon Inhomogeneity and Big Bang Nucleosynthesis**
The 3rd International Symposium on Sources and Detection of Dark Matter in the Universe, Marina Del Rey, California, February 1998

Grants

- "Theoretical Particle Physics and Cosmology at UC Irvine" **Co-I**, NSF Theoretical Physics Program, UCI #PHY-2210283, 2022-25, $2,460,000
- "Theoretical Particle Physics and Cosmology at UC Irvine," **Co-PI**, NSF Theoretical Physics Program, UCI #PHY-1915005, 2019-22, $2,130,000
- "Particle Physics and Cosmology in the LHC Era," **Co-PI**, NSF Theoretical Physics Program, UCI #PHY-1620638, 2016-19, $1,920,000
- "Empirical Multiwavelength Analyses of the Milky Way's Galactic Center," **PI**, NASA Fermi Guest Investigator Program, 2016-17, $60,000
- "Particle Physics and Cosmology in the LHC Era," **Co-I**, NSF Theoretical Physics Program, UCI #PHY-1316792, 2013-16, $1,003,292 awarded
- "CAREER: Cosmological Structure at Small Scales. from the Nature of Dark Matter and its Small-Scale Behavior to Galaxy Formation," **PI**, NSF CAREER Program Grant, 2010-2015, U. Maryland Grant #PHY-09-55415, UCI #PHY-1159224, $399,999 awarded
- "Particle Physics and Cosmology Beyond the Standard Model," **Co-PI**, NSF Theoretical Physics Program, 2009-12, U. Maryland Grant #PHY-0968854, $1,145,000 awarded
- "Frontier Challenges in Neutrino Cosmology, Dark Energy and Dark Matter," **PI**, NSF Theoretical Physics Program Grant #PHY-0757966, 2009-2011, $75,000 awarded

Reviewing Activities

Referee for the journals: *Physical Review Letters, Physical Review C, Physical Review D, Astrophysical Journal, Astrophysical Journal Letters, Astroparticle Physics, Physics Letters B, Journal of Cosmology & Astroparticle Physics, Journal of High Energy Physics, Monthly Notices of the Royal Astronomical Society*

Teaching, Mentoring, & Advising

Courses Taught in the last five years

- Fall 2018: Physics 113B, Quantum Physics II, enrollment: 24
- Winter 2019: Physics 137, Introduction to Cosmology, enrollment: 26
- Spring 2019: Physics 113A, Quantum Physics I, enrollment: 86
- Fall 2019: Physics 113B, Quantum Physics II, enrollment: 35
- Spring 2020: Physics 113A, Quantum Physics I, enrollment: 61
- Fall 2020: Physics 113B, Quantum Physics II, enrollment: 38
- Winter 2021: Physics 14, Energy & the Environment, enrollment: 38
- Spring 2021: Physics 113A, Quantum Physics I, enrollment: 101
- Spring 2022: Physics 113A, Quantum Physics I, enrollment: 83; Physics 247, Special Topics in Particle Physics, enrollment: 19
- Fall 2022: Physics 137, Introduction to Cosmology, enrollment: 34
- Spring 2023: Physics 113A, Quantum Physics I, enrollment: 86

Cal-Bridge California State University to University California Undergraduate to Graduate Bridge Program

- UC Director and Steering Committee Member and Mentor, 2014-2023

Chair, Graduate Dissertation Research Committee, University of California, Irvine

- Helena García Escudero, 2021-present
- Cannon Vogel, 2021-present
- Ryan E. Keeley, 2014-2018

- Nicolas E. Canac, 2013-2016

Graduate Dissertation Research Committee, University of Maryland

- Emil Polisensky, 2009-2014 (Member)
- J. Patrick Harding, 2008-2012 (Chair)
- Prateek Agrawal, 2009-2011 (Member)

Postdoctoral Research Advising

- Dr. Michael Ryan 2023-present
- Dr. Jui-Lin Kuo 2018-21
- Dr. Mauro Valli 2018-21
- Dr. Julian Heeck 2019-2020
- Dr. Shunsaku Horiuchi 2012-2014
- Dr. Steve Blanchet, 2008-2010

Cal-Bridge CSU-UC Undergraduate Program

- SDSU Undergraduate: Patrick Bush, 2023-present
- Cal State San Bernadino Undergraduate: John Montano, 2017-2019
- Cal State San Bernadino Undergraduate: Beverley Thackeray, 2013-2016

Service

Professional

- International Advisory Committee, Neutrino 2024, Milan, Italy, June 16-22, 2024
- Organizer, Institute for Nuclear Theory Program on Neutrinos from the Lab to the Cosmos (INT-20-1a), January 13 - February 7, 2020
- Convener, Neutrino Physics, 19 International Workshop on Baryon and Lepton Number Violation (BLV2019), Institute for Theoretical Physics (IFT), Madrid, Spain, October 21-24, 2019
- Advisory Committee, International Workshop on New Physics at Low Energy Scales (NEPLES-2019), September 23-27, 2019, Korea Institue for Advanced Study (KIAS), Seoul
- Organizing Committee Member, Thirteenth Conference on the Intersections of Particle and Nuclear Physics, May 29-June 3, 2018
- Organizer, Institute for Nuclear Theory Program: Neutrino Astrophysics and Fundamental Properties, June 2015
- Steering Committee, CSU-UC Cal-Bridge Undergraduate Program, 2014-2023
- Organizer, Institute for Nuclear Theory Program: Neutrino Astrophysics and Fundamental Properties, June 2015
- Convener for the American Physical Society Community Summer Study, Neutrino Physics from the Cosmic Microwave Background and Large Scale Structure, 2013
- Organizer, *The 4th Neutrino Workshop*, Kavli Institute of Cosmological Physics, University of Chicago, May 2012
- Organizer, *Dark Matter Signatures in the Gamma Ray Sky*, University of Texas, Austin, May 2012
- Organizer, *Near Field Cosmology as a Probe of the Early Universe, Dark Matter and Gravity Conference*, Joint Space-Science Institute, University of Maryland, November 2011
- Organizer, *Sterile Neutrinos at the Crossroads Conference*, Blacksburg, Virginia, September 2011
- Organizer, *Aspen Winter Workshop*, Neutrino Physics and Astrophysics, 2007
- Organizer, *Santa Fe Cosmology Workshop*, Los Alamos National Laboratory, Santa Fe, 2003-2006

- Organizer, *Workshop on Neutrino News from the Lab and the Cosmos*, Fermilab, Oct. 2002

University Wide, UC Irvine

- Faculty Senate Council on Faculty Welfare, 2016-2019
- Faculty Senate Committee on Rules and Jurisdiction, 2015-2019
- Faculty Senate School of Physical Sciences Executive Committee (Divisional Senate Assembly Representative), 2014-2016

Campus, Departmental

- **University of California, Irvine**
  - Chair, Graduate Admissions Committee 2021-22,2022-23
  - Departmental advancement and promotion committees, 2011-2023
  - Elementary Particle Theory Faculty Search Committee, 2021-22
  - Director, UC Irvine Center for Cosmology, 2016-present
  - Departmental Graduate Admissions Committee, 2015-18
  - Departmental search committee for Assistant Professor in plasma physics, 2013-14, 2014-15
  - Executive Committee, UC Irvine Center for Cosmology, 2012-16
- **University of Maryland, College Park**
  - Joint Space-Science Institute, Mini-Workshop Committee, 2010
  - Physics Council Executive Committee, 2009-2010
  - Physics Department Salary Committee, 2009-2010
  - Physics Department Graduate Admissions Committee, 2010
  - Organizer, *Advances in Theoretical and Observational Cosmology*, Maryland Center for Fundamental Physics Workshop, May 26-28 2010
  - Organizer, *Shedding Light on Dark Matter*, Maryland Center for Fundamental Physics Workshop, April 2009
  - Physics Department Elementary Particle Theory Faculty Search Committee, 2006-2007