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Ilias Cholis

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Oakland University
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Rochester, MI, 48309, USA

Education :

Graduate student at Graduate School of Arts and Science,
Department of Physics , New York University (NYU) September 2005 - September 2010.
Graduate student at School of Applied Mathematical and Physical Sciences, Physics Department, National Technical University of Athens (NTUA) October 2004 - May 2005.
School of Applied Mathematical and Physical Sciences,
National Technical University of Athens (NTUA) September 1999 - October 2004.

Professional Experience :

Associate Professor, Oakland University, Department of Physics.
August 2024 - present ;

Assistant Professor, Oakland University, Department of Physics.
August 2018 - August 2024 ;

Postdoctoral Fellow, The Johns Hopkins University, Department of Physics & Astronomy, Astronomy & Astrophysics.
September 2015 - August 2018 ;

Associate Researcher, Fermi National Accelerator Laboratory, Astrophysics Department, Particle Physics Division.
September 2012 - September 2015 ;

Post-Doctoral Researcher, Scuola Internazionale Superiore di Studi Avanzati / International School of Advanced Studies, Astrophysics Sector and High Energy Physics Sector.
September 2010 - September 2012 ;

Graduate Student Researcher, New York University, Physics Dept.
September 2006 - August 2010 ;

Graduate Student Instructor, New York University, Physics Dept.,
January 2006 - May 2006, September 2007 - May 2008, September 2008 - May 2009.

Fellowships and Awards :

Oakland University, Faculty Research Award, 2020
Mark Leslie Graduate Assistantship, NYU, September 2009 - August 2010;
James Arthur Graduate Fellowship, NYU Graduate School of Arts and Science
September 2006 - August 2007;
McCracken Fellowship, NYU Graduate School of Arts and Science
September 2005 - August 2006;
September 2007 - August 2009;
Pecuniary Award from the "Technical Chamber of Greece" for academic year 2001-2002;
Pecuniary Award "In Memory of Professor Evangelos-Manthos Anastasakis" for academic years 1999-2000 and 2000-2001.

Area of Research Interest :

Theoretical High Energy Astrophysics including Cosmic-Ray, Gamma-Ray, Gravitational Waves and High Energy Neutrinos. Dark Matter Phenomenology and Indirect Dark Matter Searches; h_{HEP} index, 39

Grants

6. Department of Energy, "Hunting for Dark Matter Signals in Cosmic-Ray and Gamma-Ray Observations from the MeV to the TeV scale", $ 131,000, Jumne 2023

5. National Science Foundation, "Dark Matter Primordial Black Holes under the scrutiny of LIGO's observations", $ 150,000, July 2022

4. Department of Energy, "Searching for Dark Matter Signals in Cosmic-Ray and Gamma-Ray Observations", $ 60,000, November 2021

3. Michigan Space Grant Consortium, "Correlations of Cosmic Ray Data in Search of Spectral Features", $ 10,000, May 2021

2. University Research Committee, Faculty Research Award, "Modeling the Gamma-Ray Emission from the Milky Way's Center", $ 10,000, May 2020

1. Michigan Space Grant Consortium, "Modeling Solar Modulation of Cosmic Rays Analytically with Data from 2006 to 2016", $ 10,000, May 2019

Graduate Student Mentoring

Mehdi El Bouhaddouti, current PhD student at Oakland University

Muhsin Aljaf, current PhD student at Oakland University

Pradip Rimal, former MSc student at Oakland University (moved to Optimize EV at Detroit MI)

Tanvi Karwal, former graduate student at Johns Hopkins University (moved to postdoc at University of Pennsylvania)

Bhaskaran Balaji, former graduate student at Johns Hopkins University (moved at SpaceX)

Julian Muñoz, former graduate student at Johns Hopkins University (moved to postdoc at Harvard)

Sam McDermott, former graduate student at University of Michigan and Fermilab Predoctoral Fellow (moved to postdoc at Fermilab)

Andrzej Hryczuk, former SISSA graduate student (moved to postdoc at University of Oslo)

Hani Nurbiantoro Santosa, former SISSA graduate student

Maryam Tavakoli, former SISSA graduate student (moved to postdoc at Institute for Research in Fundamental Sciences)

Undergraduate Student Mentoring

John Carlini, current undergraduate student at Oakland University

Joseph P. Surdutovich, undergraduate student at Carleton College (continued to PhD in Ohio State University)

Jenna Bacon, undergraduate student at Oakland University (moved to Momentus Space at San Jose CA)

Iason Krommydas, undergraduate student at National Technical University of Athens (continued to PhD in Physics at Rice University)

Thressay Hoover, undergraduate student at Oakland University (continued to PhD in Physics at Perdue University)

Konstantinos Kritos, undergraduate student at National Technical University of Athens (continued to PhD in Physics at the Johns Hopkins University)

Ian McKinnon, undergraduate student at Oakland University (continued to PhD in Physics at the University of Oklahoma)

Sawyer Hall, undergraduate student at Oakland University (moved to Masters in Engineering at Oakland University)

Talks

- Council of the Committee on Space Research, Scientific Assembly 2024, Busan, South Korea, *"Antimatter Cosmic Ray Nuclei as a Probe for Dark Matter"*, July 2024, (*invited talk*)
- New Horizons in Primordial Black Holes, Edinburg, Scotland, *"The mass-distribution of LIGO's events as a probe for primordial black holes"*, June 2024
- Athens Symposium on Exploring the Universe, National Research Institute, Athens, Greece, *"Searching for Dark Matter in Gamma Rays"*, June 2024, (*invited talk*)
- American Physical Society Meeting 2024, Sacramento, California, *"Scrutinizing the Gamma-Ray background in search of Dark Matter"*, April 2024
- Kashiwa Dark Matter Symposium, Tokyo, Japan, *"The gamma-ray galactic center excess in 2023"*, December 2023
- University of California Santa Cruz, Santa Cruz, California, *"The gamma-ray galactic center excess in 2023"*, October 2023, (*invited talk*)
- CETUP 2023, The Institute for Underground Science at Sanford Underground Research Facility, South Dakota, *"The gamma-ray galactic center excess with multi-messenger observations"*, June 2023, (*invited talk*)
- Status of the Galactic Center Gamma-Ray Excess, Rutgers University, New Jersey, *"On the morphology of the gamma-ray galactic center excess"*, June 2023, (*invited talk*)
- Next-generation gamma-ray searches for dark matter, University of Chicago, Illinois, *"The gamma-ray galactic center excess with multi-messenger observations"*, May 2023, (*invited talk*)
- Leinweber Center for Theoretical Physics spring symposium, University of Michigan, Michigan, *"The properties of the gamma-ray galactic center excess"*, May 2023, (*invited talk*)
- Texas A&M University, College Station, Texas, *"The Gamma-ray Galactic Center Excess with Multi-Messenger Observations"*, April 2023, (*invited talk*)
- American Physical Society Meeting 2023, Minneapolis, Minnesota, *"Have we found the counterpart signal of the Fermi bubbles at the cosmic-ray positrons"*, April 2023, (*featured presentation*)
- Oakland University *"What can we learn from cosmic-ray positrons?"*, March 2023, (*colloquium talk*)
- National and Kapodistrian Univeristy of Athens, Athens, Greece, *"WIMP dark matter searches in the Milky Way with gamma-rays and cosmic rays"*, November 2022, (*invited talk*)
- American Physical Society Eastern Great Lakes Section Fall meeting, Lawrence Technological University, Southfield, Michigan, *"The current status of WIMP dark matter searches"*, October 2022, (*invited talk*)
- 10th Fermi Symposium, University of Johannesburg, Johannesburg, South Africa, *"The Galactic Center Excess in 2022"*, October 2022

- Roma International Conference on AstroParticle Physics, La Sapienza, Rome, Italy, *"Revisiting the Gamma-Ray Galactic Center Excess with Multi-Messenger Observations"*, September 2022
- TeV Particle Astrophysics, Queen's University, Kingston, Canada, *"Revisiting the Gamma-Ray Galactic Center Excess with Multi-Messenger Observations"*, August 2022
- 27th International Symposium on Particles, Strings and Cosmology, Max Planck Institute, Heidelberg, Germany, *"Revisiting the Galactic Center Excess in Gamma Rays with Multi-Messenger Observations"*, July 2022
- 14th International Conference on Identification of Dark Matter 2022, Vienna, Austria, *"Revisiting the Galactic Center Excess with Multi-Messenger Observations"*, July 2022
- Council of the Committee on Space Research, Scientific Assembly 2022, Athens, Greece, *"Cosmic rays as a new probe to study the properties and evolution of Milky Way pulsars"*, July 2022, (*invited talk*)
- HEP2022-39th Conference on Recent Developments in High Energy Physics and Cosmology, Thessaloniki, Greece *"Searching for Dark Matter Signals from the Center of the Milky Way"*, June 2022
- CERN-CKC workshop on physics beyond the Standard Model, Jeju Island, South Korea *"Revisiting the Galactic Center Excess with New High-Resolution Templates"*, June 2022, (*invited talk*)
- Global Summit on Gravitation, Astrophysics and Cosmology *"Searching for Signals of Dark Matter Annihilation in the Milky Way"*, April 2022, (*invited talk*)
- American Physical Society Meeting 2022, *"Using cosmic-ray positron and electron observations to probe the averaged properties of Milky Way pulsars and their time evolution"*, April 2022
- Oakland University *"Hunting for WIMPs in the Milky Way"*, November 2021, (*colloquium talk*)
- Michigan Space Grant Consortium Conference, Calvin University *"The cosmic-ray lepton spectra and their implication on the properties of Milky Way pulsars"*, October 2021
- 17th International Conference on Topics in Astroparticle and Underground Physics 2021 *"Antimatter Cosmic-Ray Nuclei and Dark Matter"*, September 2021
- New Frontiers in Physics, ICNFP 2021 *"Antimatter Cosmic Rays and Dark Matter"*, August 2021
- Council of the Committee on Space Research, Scientific Assembly 2021 *"Antimatter Cosmic Ray Nuclei from Dark Matter Annihilations"*, May 2021 (*invited talk*)
- American Physical Society Meeting 2021 *"Coalescence of Black Holes with Low Mass Gap Objects in Globular Clusters through Binary-Single Exchanges"*, April 2021
- University of Johannesburg, 9th International Fermi Symposium *"Current Constraints on WIMP Dark Matter"*, April 2021 (*invited plenary talk*)
- National Technical University of Athens, *"Antimatter Cosmic-Ray Nuclei as a Probe of Dark Matter"*, February 2021 (*invited talk*)
- Warren Astronomical Society, Michigan *"Antimatter Cosmic Rays and Dark Matter"*, February 2021 (*invited public talk*)
- Committee on Space Research Scientific Assembly, Sydney Australia, *"Antimatter Cosmic Ray Nuclei from Dark Matter Annihilations"*, January 2021 (*invited talk*)
- Aachen University, Germany, *"Scrutinizing Gamma-Ray Observations from Milky Way's Center in Search of Dark Matter Signals"*, November 2020 (*invited talk*)
- Johns Hopkins University *"Evaluating the Merger Rate of Binary Black Holes from Direct Captures and Third-Body Soft Interactions Using the Milky Way Globular Clusters"*, November 2020 (*invited talk*)

- Northern Illinois University *"Searching for Dark Matter; a High Energy Astrophysicist's Perspective"*, October 2020 (*invited colloquium talk*)
- Midwest Relativity Meeting 2020 *"Evaluating the Merger Rate of Binary Black Holes Using the Milky Way Globular Clusters"*, October 2020
- American Physical Society Meeting 2020 *"Testing the Galactic Center Excess with the Known Catalogue of Gamma-Ray Point Sources"*, April 2020
- Michigan Space Grant Consortium Conference, University of Michigan *"Charge and Energy-Dependence of Solar Modulation at the AMS, BESS and PAMELA observations of cycle 23"*, October 2019
- Forward Physics and Diffraction at the LHC, University College Dublin *"Forward Production of anti-nuclei and Dark Matter"*, June 2019 (*invited talk*)
- American Physical Society Meeting 2019 *"Astrophysical Systematics on Anti-nuclei Cosmic Rays and Dark Matter"*, April 2019
- Saturday Morning Physics, University of Michigan *"Searching for Dark Matter with Antimatter"*, February 2019 (*invited public talk*)
- Fermi National Accelerator Laboratory, *"Cosmic-Ray Anti-nuclei and Dark Matter"*, February 2019 (*invited talk*)
- University of Michigan *"Anti-nuclei Cosmic-Rays and Dark Matter"*, December 2018 (*invited talk*)
- Brown University, Identification of Dark Matter 2018, *"The Impact of Antiproton and Antimatter Nuclei measurements on Dark Matter Searches"*, July 2018
- University of Maryland, *"Analyzing the Gamma-Ray Sky with Wavelets"*, May 2018 (*invited talk*)
- American Physical Society Meeting 2018, *"Primordial Black Holes as Gravitational Wave Sources"*, April 2018 (*invited talk*)
- Kavli Institute for Cosmological Physics, University of Chicago, *"Dark Matter Searches in Gravitational Waves"*, April 2018 (*invited talk*)
- AMS Days La Palma, *"Tracking down the source of high energy positrons with AMS-02 measurements"*, April 2018 (*invited talk*)
- University of Hawaii, *"New Approaches for Indirect Dark Matter Searches"*, February 2018 (*invited colloquium talk*)
- Institute for Astronomy, University of Hawaii, *"Searching for Dark Matter in High Energy Astrophysics"*, February 2018 (*invited colloquium talk*)
- Virginia Tech, *"Searching for Dark Matter in High Energy Astrophysics"*, February 2018 (*invited colloquium talk*)
- Oakland University, *"Searching for Dark Matter with Gravitational Waves"*, February 2018 (*invited colloquium talk*)
- University of Florida, *"New Approaches for Indirect Dark Matter Searches"*, February 2018 (*invited talk*)
- University of Florida, *"Searching for Dark Matter in High Energy Astrophysics"*, February 2018 (*invited colloquium talk*)
- Rutgers University, *"Wavelet Analysis of the Inner Galaxy"*, January 2018 (*invited talk*)
- Theoretical Physics Workshop, Athens Greece, *"Searching for Dark Matter in Gravitational Waves"*, December 2017 (*invited talk*)
- Topical Workshop on Dark Matter, Singapore, *"Searching for Dark Matter in Gravitational Waves"*, November 2017 (*invited talk*)
- Three Elephants in the Gamma-Ray sky, Germany, *"Wavelet Analysis of the Inner Galaxy"*, October 2017 (*invited talk*)

- National Technical University of Athens, *"Searching for Dark Matter in Gravitational Waves"*, August 2017 (*invited talk*)
- TeVPA 2017, *"Evidence of Stochastic Acceleration on Secondary Antiprotons by Supernova Remnants"*, August 2017
- TeVPA 2017, *"Dark Matter contributions to the CR spectra. What is the origin of the positron excess and the antiproton CRs?"*, August 2017 (*invited talk*)
- University of Pittsburgh, Pheno 2017, *"Searching for Signals of Merging Primordial Black Hole Binaries"*, May 2017
- Johns Hopkins University, *"Cosmic Ray positrons from near-by pulsars"*, February 2017
- Aspen Center for Physics, *"Have we detected Dark Matter in LIGO data?"*, February 2017
- Imperial College, London, *"Indirect Searches for Dark Matter and Gravitational Waves"*, February 2017 (*invited talk*)
- California State University Long Beach, *"Searching for Dark Matter with Gravitational Waves"*, February 2017 (*invited colloquium talk*)
- American Physical Society Meeting 2017, *"The Fermi Galactic Center Excess as a signal of Bursts of Cosmic Rays"*, January 2017
- University of Virginia, *"Searching for Dark Matter in Gravitational Waves"*, January 2017 (*invited colloquium talk*)
- King's College, London, *"Dark Matter and Gravitational Waves"*, November 2016 (*invited talk*)
- Massachusetts Institute of Technology, *"Have we detected of dark matter with LIGO?"*, November 2016 (*invited talk*)
- Pennsylvania State University, *"Have we seen a signal of dark matter in LIGO data?"*, November 2016 (*invited talk*)
- Deutsches Elektronen-Synchrotron, workshop on Gravitational Waves and Cosmology, *"Primordial Black Holes and Dark Matter"*, October 2016 (*invited talk*)
- University of Delaware, *"Looking for signals of Dark Matter with LIGO"*, October 2016 (*invited talk*)
- Pennsylvania State University, Neighborhood Workshop on Astrophysics and Cosmology, *"A predictive analytic model for the solar modulation of cosmic rays"*, March 2016
- University of Maryland, *"Did LIGO detect Dark Matter?"*, March 2016 (*invited talk*)
- LHC Results Forum, *"Observing Gravitational Waves with LIGO"*, March 2016 (*invited talk*)
- University of Cincinnati, colloquium, *"Searching for signals of dark matter annihilation, Scheherazade's astrophysics tales"*, February 2016 (*invited colloquium talk*)
- Johns Hopkins University, *"Towards a predictive analytic model for the solar modulation of cosmic rays"*, February 2016
- University of Cincinnati, *"The Fermi Galactic Center Excess; A signal of Dark Matter Annihilation, Millisecond Pulsars or Bursts of Cosmic Rays"*, November 2015 (*invited talk*)
- Johns Hopkins University, *"The Fermi Galactic Center Excess"*, October 2015
- Particle Physics and Cosmology Workshop 2015, Deadwood South Dakota, *"Searching for Signals of Dark Matter Galactic Annihilation"*, June-July 2015 (*invited talk*)
- Mitchell Workshop, Texas A&M University, *"The Fermi Galactic Center Excess; Background Model Systematics and Interpretations"*, May 2015 (*invited talk*)
- Ohio State University, *"The Fermi Galactic Center Excess"*, May 2015 (*invited talk*)
- Princeton University, *"WIMP ante portas? The Fermi Galactic Center Excess"*, April 2015 (*invited talk*)

- Exploring the Dark Sector, Korea Institute of Advanced Study, *"The Status of the GeV Galactic Center Excess"*, March 2015 (*invited talk*)
- Fermi National Accelerator Laboratory, *"On the Solar Modulation of Cosmic Rays"*, March 2015
- Rice University, colloquium, *"Searching for Dark Matter using the Gamma-Ray sky"*, February 2015 (*invited colloquium talk*)
- Arizona State University, *"Wimp ante portas? Background model systematics for the Fermi GeV excess"*, December 2014 (*invited talk*)
- COSMO 2014, *"Searching for signals of dark matter in the extragalactic gamma-ray background"*, August 2014
- New Frontiers in Physics, ICNFP 2014, *"Understanding the origin of the rising cosmic-ray positron fraction after AMS"*, July 2014
- Amsterdam, Astroparticle Physics 2014, *"Searching for dark matter in the extragalactic gamma-ray background"*, June 2014
- 47th Annual Fermilab Users Meeting, *"Status of Dark Matter Searches"*, June 2014
- Fermi National Accelerator Laboratory, *"Cross-correlating gamma-rays with known galaxies"*, May 2014
- Marshall Space Flight Center, *"The cosmic ray positron fraction measurement with AMS; discussing its implications on dark matter, local pulsars and near-by supernova remnant sources"*, May 2014 (*invited talk*)
- California Institute of Technology, *"Update after AMS: implications on Dark Matter, local pulsar and supernova remnant sources"*, April 2014 (*invited talk*)
- Washington University in St. Louis, *"The AMS-02 CR results: implications on near-by supernova remnant sources, pulsars and on dark matter"*, April 2014 (*invited talk*)
- Institute for Advanced Study, Princeton, *"Indirect Detection of Wino Dark Matter: Multichannel Detection Study"*, March 2014 (*invited talk*)
- University of California Los Angeles, Dark Matter 2014, *"The AMS-02 cosmic-ray spectra, implications on dark matter, local pulsar and supernova remnant sources"*, February 2014
- Abdus Salam International Center for Theoretical Physics, *"Residuals in the Inner Galaxy and the case of an unresolved population of Millisecond Pulsars"*, October 2013 (*invited talk*)
- Fermi National Accelerator Laboratory, *"Constraining the origin of Cosmic Ray lepton anomalies by measuring the Boron to Carbon ratio"*, September 2013
- Aspen Center for Physics, *"The cosmic ray positron fraction spectrum measured by AMS-02; dark matter and local pulsar interpretations"*, September 2013
- Aspen Center for Physics, *"The smoothly rising positron fraction spectrum as measured by AMS, its implications on $\sim$100 GeV and TeV annihilating dark matter"*, August 2013
- Kavli Institute for Cosmological Physics, The University of Chicago, *"The AMS positron fraction: Interpretations"*, June 2013 (*invited talk*)
- Kavli Institute for Theoretical Physics, University of California Santa Barbara, *"The 130 GeV line as a signal of dark matter annihilation"*, May 2013
- University of Aegean, HEP 2013 Recent Developments in High Energy Physics and Cosmology, *"TeV and PeV neutrinos in km3 telescopes, a new probe of studying high energy astrophysical phenomena"*, April 2013
- University of Crete, *"Spectral Lines at the GeV scale; a signal of Dark Matter annihilation?"*, April 2013 (*invited talk*)

- Kavli Institute for Cosmological Physics, The University of Chicago, *"Interpretations of the AMS positron fraction results"*, April 2013 (*invited talk*)
- Argonne National Laboratory, *"TeV and PeV astrophysics with km3 neutrino telescopes, a few examples"*, December 2012 (*invited talk*)
- Northwestern University, *"The 130 GeV gamma-ray line(s) from Dark Matter annihilations in the Galaxy and constraints on the associated spectrum"*, October 2012 (*invited talk*)
- Kavli Institute for Cosmological Physics, The University of Chicago, *"Gamma-rays Dark Matter"*, October 2012 (*invited talk*)
- Fermi National Accelerator Laboratory, *"The 130 GeV line(s) claims spectral feature, implications for annihilating Dark Matter"*, October 2012
- Chicago, Identification of Dark Matter 2012, *"Extracting limits on Dark Matter annihilation from dwarf Spheroidal galaxies"*, July 2012
- University of Ioannina, HEP 2012 Recent Developments in High Energy Physics and Cosmology, *"New results on Dark Matter Annihilation using dwarf Spheroidal galaxies"*, April 2012
- International School of Advanced Studies, Astrophysics seminar, *"Searching for Dark Matter Annihilation Signals in dwarf spheroidal galaxies"*, March 2012
- Max Planck Institüte für Physik, Astroparticle Physics Seminar, *"Annihilating Dark Matter, from gamma-rays in dwarf spheroidal galaxies and the galactic halo"*, January 2012 (*invited talk*)
- Deutsches Elektronen-Synchrotron, Astroparticle Physics Seminar, *"Diffuse Gamma-rays and annihilating Dark Matter, possible Signals; Constraints"*, January 2012 (*invited talk*)
- Oscar Klein Centre, TeV Particle Astrophysics 2011, *"The Fermi haze from Dark Matter Annihilation and Anisotropic Diffusion"*, August 2011
- AREA di ricerca Scientifica e Tecnologica di Trieste, *"Galactic Cosmic Rays and Gamma Rays at intermediate and high latitudes. Placing constraints on Dark Matter and the Interstellar Medium"*, July 2011 (*invited talk*)
- Polytech Université Montpellier II, Cosmic rays and their interstellar medium environment, *"Diffuse Galactic Gamma Rays at intermediate and high latitudes, Constraints on ISM properties and DM"*, June 2011
- Deutsches Elektronen-Synchrotron, workshop on Indirect Dark Matter Searches, *"The Fermi Gamma-ray haze from Dark Matter annihilation and anisotropic diffusion"*, June 2011
- University of Patras, XXIX Workshop on Recent Advances in Particle Physics and Cosmology, *"The Fermi Gamma-ray haze from Dark Matter annihilation and anisotropic diffusion"*, April 2011
- National Technical University of Athens, *"Recent advances in Dark Matter Indirect Detection"*, April 2011 (*invited talk*)
- International School of Advanced Studies, Trieste, *"The Fermi haze as a signal from Dark Matter"*, December 2010
- Institute of Astronomy and Astrophysics, National Observatory of Athens, *"The Fermi haze, a signal from Dark Matter?"*, November 2010 (*invited talk*)
- Institut d'Astrophysique de Paris, TeV Particle Astrophysics 2010, *"Cosmic Ray Signals from Multiple States of Dark Matter"*, July 2010
- Center for Cosmology and Particle Physics, New York University, *"Fermi and WMAP haze from Dark Matter and anisotropic diffusion"*, May 2010
- Center for Cosmology and Particle Physics, New York University, *"Pulsars vs Dark Matter"*, November 2009
- Fermi National Accelerator Laboratory, Dark Matter Annihilation and the ISM, *"Multiple XDM Species: Implications for the Local Electron/Positron Spectra and the Haze"*, September 2009

Professional References

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Publications - Papers

80. **"On the mass distribution of the LIGO-Virgo-KAGRA events"**
Muhsin Aljaf and Ilias Cholis
arXiv:2409.00179 [astro-ph.CO]

79. **"Scrutinizing the Isotropic Gamma-Ray Background in Search of Dark Matter"**
Ilias Cholis and Iason Krommydas
arXiv:2408.11421 [astro-ph.HE]

78. **"Simulating Binary Primordial Black Hole Mergers in Dark Matter Halos"**
Muhsin Aljaf and Ilias Cholis
arXiv:2408.06515 [astro-ph.GA]

77. **"Robustness of the Galactic Center excess morphology against masking"**
Yi-Ming Zhong and Ilias Cholis
Phys. Rev. D. **109**, no. 12, 123017 (2024), arXiv:2401.02481 [astro-ph.HE]

76. **"Observing signals of spectral features in the cosmic-ray positrons and electrons from Milky Way pulsars"**
Ilias Cholis and Thressay Hoover
Phys. Rev. D. **107**, no. 06, 063003 (2023), arXiv:2211.15709 [astro-ph.HE]

75. **"Revisiting GeV-scale annihilating dark matter with the AMS-02 positron fraction"**
Iason Krommydas and Ilias Cholis
Phys. Rev. D. **107**, no. 02, 023003 (2023), arXiv:2210.04903 [astro-ph.HE]

74. **"On the Morphology of the Gamma-Ray Galactic Center Excess"**
Samuel D. McDermott, Yi-Ming Zhong and Ilias Cholis
Mon. Not. of Roy. Astron. Soc. Letters **522**, 1, L21-L25 (2023), arXiv:2209.00006 [astro-ph.HE]

73. **"Possible counterpart signal of the Fermi bubbles at the cosmic-ray positrons"**
Ilias Cholis and Iason Krommydas
Astrophys. J. 950:120-126 (2023), arXiv:2208.07880 [astro-ph.HE]

72. **"Constraining the Charge-, Time- and Rigidity-Dependence of Cosmic-Ray Solar Modulation with AMS-02 Observations during Solar Cycle 24"**
Ilias Cholis and Ian McKinnon
Phys. Rev. D. **106**, no. 06, 063210 (2022), arXiv:2207.12447 [astro-ph.SR]

71. **"Snowmass2021 Cosmic Frontier White Paper: Puzzling Excesses in Dark Matter Searches and How to Resolve Them"**
R. K. Leane *et al.*,
arXiv:2203.0659 [hep-ph]

70. **"Snowmass2021 Cosmic Frontier: Synergies between dark matter searches and multiwavelength/ multimessenger astrophysics'**
A. Ando *et al.*,
arXiv:2203.06781 [hep-ph]

69. **"Snowmass2021 theory frontier white paper: Astrophysical and cosmological probes of dark matter"**
K. K. Boddy *et al.*,
Journal of High Energy Astrophysics **35**, 112 (2022), arXiv:2203.06380 [hep-ph]

68. **"Return of the templates: Revisiting the Galactic Center excess with multimessenger observations"**
Ilias Cholis, Yi-Ming Zhong, Samuel D. McDermott and Joseph P. Surdutovich
Phys. Rev. D. **105**, no. 10,103023 (2022), arXiv:2112.09706 [astro-ph.HE]

67. **"Utilizing cosmic-ray positron and electron observations to probe the averaged properties of Milky Way pulsars"**
Ilias Cholis and Iason Krommydas
Phys. Rev. D. **105**, no. 02, 023015 (2022), arXiv:2111.05867 [astro-ph.HE]

66. **"Can Thorne-Żytkow Objects source GW190814-type events?"**
Ilias Cholis, Konstantinos Kritos and David Garfinkle
Phys. Rev. D. **105**, no. 02, 123022 (2022), arXiv:2106.07662 [astro-ph.HE]

65. **"Black holes merging with low mass gap objects inside globular clusters"**
Konstantinos Kritos and Ilias Cholis
Phys. Rev. D. **104**, no. 04, 043004 (2021), arXiv:2104.02073 [astro-ph.GA]

64. **"Where do AMS-02 anti-helium events come from?"**
Vivian Poulin, Pierre Salati, Ilias Cholis, Marc Kamionkowski and Joseph Silk,
Proceedings of Science EPS-HEP2019

63. **"Evaluating the merger rate of binary black holes from direct captures and third-body soft interactions using the Milky Way globular clusters"**
Konstantinos Kritos and Ilias Cholis
Phys. Rev. D. **102**, no. 08, 083016 (2020), arXiv:2007.02968 [astro-ph.HE]

62. **"Constraining the Charge-Sign and Rigidity-Dependence of Solar Modulation"**
Ilias Cholis, Dan Hooper and Tim Linden,
JCAP 10, 051 (2022), arXiv:2007.00669 [astro-ph.HE]

61. **"Antideuterons and antihelium nuclei from annihilating dark matter"**
Ilias Cholis, Tim Linden and Dan Hooper,
Phys. Rev. D. **102**, no. 10, 103019 (2020), arXiv:2001.08749 [astro-ph.HE]

60. **"A New Mask for An Old Suspect: Testing the Sensitivity of the Galactic Center Excess to the Point Source Mask"**
Yi-Ming Zhong, Samuel D. McDermott, Ilias Cholis and Patrick J. Fox,
Phys. Rev. Lett. **124**, no. 23, 231103 (2020), arXiv:1911.12369 [astro-ph.HE]

59. **"Electromagnetic probes of primordial black holes as dark matter"**
A. Kashlinsky *et al.*,
arXiv:1903.04424 [astro-ph.CO]

58. **"Tests of General Relativity and Fundamental Physics with Space-based Gravitational Wave Detectors"**
Emanuele Berti, Enrico Barausse, Ilias Cholis, *et al.*,
arXiv:1903.02781 [astro-ph.HE]

57. **"A Robust Excess in the Cosmic-Ray Antiproton Spectrum: Implications for Annihilating Dark Matter"**
Ilias Cholis, Tim Linden and Dan Hooper,
Phys. Rev. D **99**, no.10, 103026 (2019), arXiv:1903.02549 [astro-ph.HE]

56. **"Bounds on Ultra-Light Hidden-Photon Dark Matter from 21cm at Cosmic Dawn"**
Ely D. Kovetz, Ilias Cholis and David E. Kaplan,
Phys. Rev. D **99**, no.12, 123511 (2019), arXiv:1809.01139 [astro-ph.CO]

55. **"Where do the AMS-02 anti-helium events come from?"**
Vivian Poulin, Pierre Salati, Ilias Cholis, Marc Kamionkowski and Joseph Silk,
Phys. Rev. D **99**, no. 2, 023016 (2019), arXiv:1808.08961 [astro-ph.HE]

54. **"Studying the Milky Way Pulsar Population with Cosmic-Ray Leptons"**
Ilias Cholis, Tanvi Karwal and Marc Kamionkowski,
Phys. Rev. D **98**, no. 6, 063008 (2018), arXiv:1807.05230 [astro-ph.HE]

53. **"Analyzing the Gamma-ray Sky with Wavelets"**
Bhaskaran Balaji, Ilias Cholis, Patrick J. Fox and Samuel D. McDermott,
Phys. Rev. D **98**, no. 4, 043009 (2018), arXiv:1803.01952 [astro-ph.HE]

52. **"Limits on Runaway Growth of Intermediate Mass Black Holes from Advanced LIGO"**
Ely D. Kovetz, Ilias Cholis, Marc Kamionkowski and Joseph Silk,
Phys. Rev. D **97**, no. 12, 123003 (2018), arXiv:1803.00568 [astro-ph.HE]
Displayed in Physical Review D Kaleidoscope

51. **"Features in the Spectrum of Cosmic-Ray Positrons from Pulsars"**
Ilias Cholis, Tanvi Karwal and Marc Kamionkowski,
Phys. Rev. D **97**, no.12, 123011 (2018), arXiv:1712.00011 [astro-ph.HE]

50. **"TeV Gamma Rays From Galactic Center Pulsars"**
Dan Hooper, Ilias Cholis and Tim Linden,
Phys. Dark Univ. **21**, 40 (2018), arXiv:1705.09293 [astro-ph.HE]

49. **"Using HAWC to Discover Invisible Pulsars"**
Tim Linden, Katie Auchettl, Joseph Bramante, Ilias Cholis, Ke Fang, Dan Hooper, Tanvi Karwal and Shirley Weishi Li,
Phys. Rev. D **96**, no.10, 103016 (2017), arXiv:1703.09704 [astro-ph.HE]

48. **"HAWC Observations Strongly Favor Pulsar Interpretations of the Cosmic-Ray Positron Excess"**
Dan Hooper, Ilias Cholis,Tim Linden and Ke Fang,
Phys. Rev. D **96**, no.10, 103013 (2017), arXiv:1702.08436 [astro-ph.HE]

47. **"Possible Evidence for the Stochastic Acceleration of Secondary Antiprotons by Supernova Remnants"**
Ilias Cholis, Dan Hooper and Tim Linden,
Phys. Rev. D **95**, no.12, 123007 (2017), arXiv:1701.04406 [astro-ph.HE]

46. **"Black Hole Mass Function from Gravitational Wave Measurements"**
Ely D. Kovetz, Ilias Cholis, Patrick C. Breysse and Marc Kamionkowski
Phys. Rev. D **95**, no.10, 103010 (2017), arXiv:1611.01157 [astro-ph.CO]

45. **"On the Gravitational Wave Background from Black Hole Binaries after the First LIGO Detections"**
Ilias Cholis
JCAP **1706**, no.06, 037 (2017), arXiv:1609.03565 [astro-ph.HE]

44. **"Stochastic Gravitational-Wave Background due to Primordial Binary Black Hole Mergers"**
Vuk Mandic, Simeon Bird and Ilias Cholis
Phys. Rev. Lett. **117**, no. 20, 201102 (2016), arXiv:1608.06699 [astro-ph.CO]

43. **"Orbital eccentricities in primordial black-holes binaries"**
Ilias Cholis, Ely D. Kovetz, Yacine Ali-Haïmoud, Simeon Bird, Marc Kamionkowski, Julian B. Muñoz and Alvise Raccanelli
Phys. Rev. D **94**, no. 8, 084013 (2016), arXiv:1606.07437 [astro-ph.HE]

42. **"Determining the progenitors of merging black-hole binaries"**
Alvise Raccanelli, Ely D. Kovetz, Simeon Bird, Ilias Cholis and Julian B. Muñoz
Phys. Rev. D **94**, no. 2, 023516 (2016), arXiv:1605.01405 [astro-ph.CO]

41. **"Did LIGO detect dark matter?"**
Simeon Bird, Ilias Cholis, Julian B. Muñoz, Yacine Ali-Haïmoud, Marc Kamionkowski, Ely D. Kovetz, Alvise Raccanelli and Adam G. Riess
Phys. Rev. Lett. **116**, no. 20, 201301 (2016), arXiv:1603.00464 [astro-ph.CO],
American Physical Society Highlighted Article

40. **"Wavelet-Based Techniques for the Gamma-Ray Sky"**
Sam D. McDermott, Patrick J. Fox, Ilias Cholis and Samuel K. Lee
JCAP **1607**, no. 07, 045 (2016), arXiv:1512.00012 [astro-ph.HE]

39. **"A Predictive Analytic Model for the Solar Modulation of Cosmic Rays"**
Ilias Cholis, Dan Hooper and Tim Linden
Phys. Rev. D **93**, no. 4, 043016 (2016), arXiv:1511.01507 [astro-ph.SR],
American Physical Society Highlighted Article

38. **"Unveiling the nature of the "Fermi GeV excess: robust characterization and possible interpretations"**
Francesca Calore, Ilias Cholis, Carmelo Evoli, Dan Hooper, Tim Linden and Christoph Weniger,
PoS ICRC **2015**, 915 (2016)

37. **"The Galactic Center GeV Excess from a Series of Leptonic Cosmic-Ray Outbursts"**
Ilias Cholis, Carmelo Evoli, Francesca Calore, Tim Linden, Christoph Weniger and Dan Hooper
JCAP **1512**, no. 12, 005 (2015), arXiv:1506.05119 [astro-ph.HE]

36. **"The GeV Excess Shining Through: Background Systematics for the Inner Galaxy Analysis"**
Francesca Calore, Ilias Cholis and Christoph Weniger
2014 Fermi Symposium proceedings, arXiv:1502.02805 [astro-ph.HE]

35. **"A Tale of Tails: Dark Matter Interpretations of the Fermi GeV Excess in Light of Background Model Systematics"**
Francesca Calore, Ilias Cholis, Christopher McCabe and Christoph Weniger
Phys. Rev. D **91**, no. 6, 063003 (2015), arXiv:1411.4647 [hep-ph]

34. **"Background model systematics for the Fermi GeV excess"**
Francesca Calore, Ilias Cholis and Christoph Weniger
JCAP **1503**, 038 (2015), arXiv:1409.0042 [astro-ph.CO]

33. **"A Critical Reevaluation of Radio Constraints on Annihilating Dark Matter"**
Ilias Cholis, Dan Hooper and Tim Linden
Phys. Rev. D **91**, no. 8, 083507 (2015), arXiv:1408.6224 [astro-ph.HE]

32. **"Challenges in Explaining the Galactic Center Gamma-Ray Excess with Millisecond Pulsars"**
Ilias Cholis, Dan Hooper and Tim Linden
JCAP **1506**, no. 06, 043 (2015), arXiv:1407.5625 [astro-ph.HE]

31. **"A New Determination of the Spectra and Luminosity Function of Gamma-Ray Millisecond Pulsars"**
Ilias Cholis, Dan Hooper and Tim Linden
arXiv:1407.5583 [astro-ph.HE]

30. **"Indirect Detection Analysis: Wino Dark Matter Case Study"**
Andrzej Hryczuk, Ilias Cholis, Roberto Iengo, Maryam Tavakoli and Piero Ullio
JCAP **1407**, 031 (2014), arXiv:1401.6212 [astro-ph.HE]

29. **"Cosmic Neutrino Pevatrons: A Brand New Pathway to Astronomy, Astrophysics, and Particle Physics"**
Louis A. Anchordoqui, Vernon Barger, Ilias Cholis, Haim Goldberg, Dan Hooper, Alexander Kusenko, John G. Learned, Danny Marfatia, Sandip Pakvasa, Thomas C. Paul and Thomas J. Weiler
JHEAp **01**, 001 (2014), arXiv:1312.6587 [astro-ph.HE]
Invited Review; First Article of the Journal of High Energy Astrophysics

28. **"Constraining the origin of the rising cosmic ray positron fraction with the boron-to-carbon ratio"**
Ilias Cholis and Dan Hooper
Phys. Rev. D **89**, 043013 (2014), arXiv:1312.2952 [astro-ph.HE]

27. **"Dissecting the Gamma-Ray Background in Search of Dark Matter"**
Ilias Cholis, Dan Hooper and Samuel D. McDermott
JCAP **1402**, 014 (2014), arXiv:1312.0608 [astro-ph.CO]

26. **"Constraints on dark matter annihilations from diffuse gamma-ray emission in the Galaxy"**
Maryam Tavakoli, Ilias Cholis, Carmelo Evoli and Piero Ullio
JCAP **1401**, 017 (2014), arXiv:1308.4135 [astro-ph.HE]

25. **"New limits on dark matter annihilation from AMS cosmic ray positron data"**
Lars Bergstrom, Torsten Bringmann, Ilias Cholis, Dan Hooper and Christoph Weniger
Phys. Rev. Lett. **111**, 171101 (2013), arXiv:1306.3983 [astro-ph.HE]
American Physical Society Highlighted Article; Editors' Suggestion

24. **"Pulsars Cannot Account for the Inner Galaxy's GeV Excess"**
Dan Hooper and Ilias Cholis and Tim Linden and Jennifer Siegal-Gaskins and Tracy Slatyer
Phys. Rev. D **88**, 083009 (2013), arXiv:1305.0830 [astro-ph.HE]

23. **"Dark Matter and Pulsar Origins of the Rising Cosmic Ray Positron Fraction in Light of New Data From AMS"**
Ilias Cholis and Dan Hooper
Phys. Rev. D **88**, 023013 (2013), arXiv:1304.1840 [astro-ph.HE]

22. **"The 111 and 129 GeV gamma-ray lines from annihilations in the Milky Way dark matter halo, dark disk and subhalos"**
Ilias Cholis, Hani Nurbiantoro Santosa, Maryam Tavakoli and Piero Ullio
Astronomical Review **V. 08**, issue 3, 4-18 (2013), arXiv:1303.5775 [astro-ph.HE]

21. **"On The Origin of IceCube's PeV Neutrinos"**
Ilias Cholis and Dan Hooper
JCAP **06**, 030 (2013), arXiv:1211.1974 [astro-ph.HE]

20. **"Searching for the continuum spectrum photons correlated to the 130 GeV gamma-ray line"**
Ilias Cholis and Maryam Tavakoli and Piero Ullio
Phys. Rev. D **86**, 083525 (2012), arXiv:1207.1468 [astro-ph.HE]

19. **"Searching for High Energy Neutrino counterpart signals; The case of the Fermi Bubbles signal and of Dark Matter annihilation in the inner Galaxy"**
Ilias Cholis
Phys. Rev. D **88**, 063524 (2013), arXiv:1206.1607 [astro-ph.HE]

18. **"Extracting limits on Dark Matter annihilation from dwarf Spheroidal galaxies at gamma-rays"**
Ilias Cholis and Paolo Salucci
Phys. Rev. D **86**, 023528 (2012), arXiv:1203.2954 [astro-ph.HE]

17. **"Diffuse Galactic Gamma Rays at Intermediate and High Latitudes, Constraints on ISM properties"**
Maryam Tavakoli, Ilias Cholis, Carmelo Evoli and Piero Ullio
2011 Fermi Symposium proceedings, arXiv:1110.5922 [astro-ph.HE]

16. **"Antiprotons from dark matter annihilation in the Galaxy: astrophysical uncertainties"**
Carmelo Evoli, Ilias Cholis, Dario Grasso, Luca Maccione and Piero Ullio
Phys. Rev. D **85**, 123511 (2012), arXiv:1108.0664 [astro-ph.HE]

15. **"Diffuse Galactic Gamma Rays at intermediate and high latitudes. I. Constraints on the ISM properties"**
Ilias Cholis, Maryam Tavakoli, Carmelo Evoli, Luca Maccione and Piero Ullio
JCAP **05**, 004 (2012), arXiv:1106.5073 [astro-ph.HE]

14. **"The Fermi Gamma-Ray Haze from Dark Matter Annihilations and Anisotropic Diffusion"**
Gregory Dobler, Ilias Cholis and Neal Weiner
Astrophys. J. 741:25-36 (2011), arXiv:1102.5095 [astro-ph.HE]

13. **"Spherical harmonic analysis of Fermi gamma-ray data and the Galactic dark matter halo"**
Dmitry Malyshev, Jo Bovy, and Ilias Cholis
Phys. Rev. D **84**, 023013 (2011), arXiv:1007.4556 [astro-ph.HE]

12. **"New Constraints from PAMELA anti-proton data on Annihilating and Decaying Dark Matter"**
Ilias Cholis
JCAP **09**, 007 (2014), arXiv:1007.1160 [astro-ph.HE]

11. **"Consequences of a Dark Disk for the Fermi and PAMELA Signals in Theories with a Sommerfeld Enhancement"**
Ilias Cholis, Lisa Goodenough
JCAP **09**, 010 (2014), arXiv:1006.2089 [astro-ph.HE]

10. **"Fermi Gamma-ray Haze via Dark Matter and Millisecond Pulsars"**
Dmitry Malyshev, Ilias Cholis, Joseph D. Gelfand
Astrophys. J. 722:1939-1945 (2010), arXiv:1002.0587 [astro-ph.HE]

9. **"MiXDM: Cosmic Ray Signals from Multiple States of Dark Matter"**
Ilias Cholis and Neal Weiner
arXiv:0911.4954 [astro-ph.HE]

8. **"The Fermi Haze: A Gamma-Ray Counterpart to the Microwave Haze"**
Gregory Dobler, Douglas P. Finkbeiner, Ilias Cholis, Tracy R. Slatyer, Neal Weiner
Astrophys. J. 717:825-842 (2010), arXiv:0910.4583 [astro-ph.HE]

7. **"The Fermi gamma-ray spectrum of the inner galaxy:Implications for annihilating dark matter"**
Ilias Cholis, Gregory Dobler, Douglas P. Finkbeiner, Lisa Goodenough, Tracy R. Slatyer, and Neal Weiner
arXiv:0907.3953 [astro-ph.HE]

6. **"Pulsars versus Dark Matter Interpretation of ATIC/PAMELA"**
Dmitry Malyshev, Ilias Cholis, and Joseph D. Gelfand
Phys. Rev. D **80**, 063005 (2009), arXiv:0903.1310 [astro-ph.HE]

5. **"The Case for a 700+ GeV WIMP: Cosmic Ray Spectra from ATIC and PAMELA"**
Ilias Cholis, Gregory Dobler, Douglas P. Finkbeiner, Lisa Goodenough, and Neal Weiner
Phys. Rev. D **80**, 123518 (2009), arXiv:0811.3641 [astro-ph]

4. **"The PAMELA Positron Excess from Annihilations into a Light Boson"**
Ilias Cholis, Douglas P. Finkbeiner, Lisa Goodenough, and Neal Weiner
JCAP 0912:007, (2009), arXiv:0810.5344 [astro-ph]

3. **"High Energy Positrons From Annihilating Dark Matter"**
Ilias Cholis, Lisa Goodenough, Dan Hooper, Melanie Simet and Neal Weiner
Phys. Rev. D **80**, 123511 (2009), arXiv:0809.1683 [hep-ph]

2. **"High Energy Positrons and the WMAP Haze from Exciting Dark Matter"**
Ilias Cholis, Lisa Goodenough and Neal Weiner
Phys. Rev. D **79**, 123505 (2009), arXiv:0802.2922 [astro-ph]

1. **"Volumetric imaging of holographic optical traps"**
Yohai Roichman, Ilias Cholis and David G. Grier
Optics Express Vol 14 No 22, 10907 (2006)

Referee in

The Astrophysical Journal, Physical Review Letters, Physical Review D, Physics Reports, Journal for Cosmology and Astroparticle Physics, Journal of High Energy Physics, Physics Letters B and Nuclear Physics B.

Reviewer for

National Aeronautics and Space Administration

Previous Research

- U.S. Patent: *"System for characterizing a light field"*
Yohai Roichman, David G. Grier and Ilias Cholis U.S. Patent 7,897,910 New York University (2011).
- U.S. Patent: *"Volumetric imaging of holographic optical traps"*
Yohai Roichman, Ilias Cholis and David G. Grier U.S. Patent 7,835,051 New York University (2010).
- U.S. Patent: *"Extended optical traps by shape-phase holography"*
Yohai Roichman, David G. Grier and Ilias Cholis U.S. Patent 7,491,928 New York University (2009).
- Poster: *"Search for Optical Binding with Shape Phase Holographic Optical Trapping"*, 2007 APS March Meeting, Denver, Colorado.
Yohai Roichman, David G. Grier and Ilias Cholis
- Undergraduate Diploma Thesis: *"Supersymmetry and its Spontaneous Breaking"*, under the supervision of Ass. Prof. Alex Kehagias, October 2004.