M. Sten Delos

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RESEARCH INTERESTS

Dark matter and the dynamics of self-gravitating systems

Origins of matter and structure in the Universe

EDUCATION

May 2020 **University of North Carolina at Chapel Hill** [Chapel Hill, NC, USA]
Ph.D. in Physics
Thesis: "Probing the early universe using dark matter minihalos"
Advisor: Adrienne Erickcek

May 2015 **State University of New York at Stony Brook** [Stony Brook, NY, USA]
M.A. in Physics

May 2010 **University of Virginia** [Charlottesville, VA, USA]
B.S. in Physics and Mathematics *with Highest Distinction*

HONORS

2019 Dissertation Completion Fellowship (UNC-Chapel Hill)

2019 North Carolina Space Grant Graduate Research Fellowship

2019 Kenan Trust Graduate Student Research Grant (UNC-Chapel Hill)

2010 Sigma Pi Sigma Physics Honor Society

PROFESSIONAL ACTIVITIES AND SERVICE

2018 Visiting Scholar at The Ohio State University

2017 University of North Carolina at Chapel Hill
Senior graduate student pre-candidacy mentoring team

PUBLICATION LIST

Submitted Journal Articles

Rouzbeh Allahverdi, Mustafa A. Amin, Asher Berlin, Nicolás Bernal, Christian T. Byrnes, **M. Sten Delos**, Adrienne L. Erickcek, Miguel Escudero, Daniel G. Figueroa, Katherine Freese, *et al*. "The First Three Seconds: a Review of Possible Expansion Histories of the Early Universe." Submitted to *The Open Journal of Astrophysics* August 2020 [arXiv:2006.16182].

Refereed Journal Articles

M. Sten Delos, Tim Linden, and Adrienne L. Erickcek. "Breaking a dark degeneracy: The gamma-ray signature of early matter domination." *Phys. Rev. D* **100**, 123546 (2019) [arXiv:1910.08553].

Carlos Blanco, **M. Sten Delos**, Adrienne L. Erickcek, and Dan Hooper. "Annihilation signatures of hidden sector dark matter within early-forming microhalos." *Phys. Rev. D* **100**, 103010 (2019) [arXiv:1906.00010].

M. Sten Delos. "Evolution of dark matter microhalos through stellar encounters." *Phys. Rev. D* **100**, 083529 (2019) [arXiv:1907.13133].

M. Sten Delos. "Tidal evolution of dark matter annihilation rates in subhalos." *Phys. Rev. D* **100**, 063505 (2019) [arXiv:1906.10690].

M. Sten Delos, Margie Bruff, and Adrienne L. Erickcek. "Predicting the density profiles of the first halos." *Phys. Rev. D* **100**, 023523 (2019) [arXiv:1905.05766].

M. Sten Delos, Adrienne L. Erickcek, Avery P. Bailey, and Marcelo A. Alvarez. "Density profiles of ultracompact minihalos: Implications for constraining the primordial power spectrum." *Phys. Rev. D* **98**, 063527 (2018) [arXiv:1806.07389].

M. Sten Delos, Adrienne L. Erickcek, Avery P. Bailey, and Marcelo A. Alvarez. "Are ultracompact minihalos really ultracompact?" *Phys. Rev. D Rapid Communications* **97**, 041303(R) (2018) [arXiv:1712.05421].

Conference Presentations

M. Sten Delos, Adrienne L. Erickcek, and Tim Linden. "The gamma-ray signature of an early matter-dominated era." *APS April Meeting* (2019).

M. Sten Delos, Adrienne L. Erickcek, and Tim Linden. "The gamma-ray signature of an early matter-dominated era." *Eighth International Fermi Symposium* (2018).

M. Sten Delos, Adrienne L. Erickcek, Avery P. Bailey, and Marcelo A. Alvarez. "Accurately constraining the primordial power spectrum using minihalos." *APS April Meeting* (2018).

TEACHING EXPERIENCE

University of North Carolina at Chapel Hill [Chapel Hill, NC, USA]

Spring 2019	Cosmology (TA)
Fall 2017	Graduate Quantum Mechanics I (TA)
Summer 2017	Introductory Calculus-based Electromagnetism and Quanta (TA)
Spring 2017	Introductory Calculus-based Electromagnetism and Quanta (TA)
Fall 2016	Introductory Calculus-based Mechanics and Relativity (TA)

Guilford Technical Community College [Jamestown, NC, USA]

Spring 2016	Conceptual Physics

State University of New York at Stony Brook [Stony Brook, NY, USA]

Spring 2012	Physics for Life Sciences I (TA)
Fall 2011	Physics for Life Sciences II (TA)
Spring 2011	Physics for Life Sciences II (TA)
Fall 2010	Physics for Life Sciences I (TA)