

M. Sten Delos

Postdoctoral Fellow • Max Planck Institute for Astrophysics

Karl-Schwarzschild-Str. 1 • 85748 Garching • Germany

<https://stendelos.com> | sten@mpa-garching.mpg.de | <https://orcid.org/0000-0003-3808-5321>

RESEARCH INTERESTS

October 9, 2020

Dark matter and the dynamics of self-gravitating systems

Origins of matter and structure in the Universe

PROFESSIONAL EXPERIENCE

Sept. 2020-present	Max Planck Institute for Astrophysics Postdoctoral Fellow	[Garching, Germany]
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EDUCATION

May 2020	University of North Carolina at Chapel Hill Ph.D. in Physics Thesis: “Probing the early universe using dark matter minihalos” Advisor: Adrienne Erickcek	[Chapel Hill, NC, USA]
May 2015	State University of New York at Stony Brook M.A. in Physics	[Stony Brook, NY, USA]
May 2010	University of Virginia B.S. in Physics and Mathematics <i>with Highest Distinction</i>	[Charlottesville, VA, USA]

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

2020	Referee for <i>Monthly Notices of the Royal Astronomical Society</i>
2018	Visiting Scholar at The Ohio State University
2017	University of North Carolina at Chapel Hill Senior graduate student pre-candidacy mentoring team

INVITED PRESENTATIONS

“The first dark matter halos as probes of cosmology.” Institute Seminar at the Max Planck Institute for Astrophysics; Garching, Germany; October 2020.

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, Tomohiro Harada, Dan Hooper, David I. Kaiser, Tanvi Karwal, Kazunori Kohri, Gordan Krnjaic, Marek Lewicki, Kaloian D. Lozanov, Vivian Poulin, Kuver Sinha, Tristan L. Smith, Tomo Takahashi, Tommi Tenkanen, James Unwin, Ville Vaskonen, Scott Watson. “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)