

Sarah B. Nagel

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Educator. Physicist. Problem Solver.

Teaching Experience

Charter College -- Remote-- Oxnard, CA campus

June 2024- Present Adjunct Instructor: General Physics

Mississippi State University -- Athletic Academics -- Starkville, MS

2022- Present In-person tutor. courses, physics, chemistry, and others.

Wake Tech Community College -- Northern Scott Campus -- Raleigh, NC

2022-June 2024 Virtual Tutor (Math and Science) at Individual learning Center

2016-2022 Adjunct Instructor (Math and Science) at Individual Learning Center

Henderson Collegiate High School -- Henderson NC

2019-2020 AP Calculus BC Instructor

2018- 2020 Statistics Instructor

2018-2019 AP Statistics Instructor

2018-2019 AP Physics C Mechanics Instructor

Durham School of the Arts -- Durham Public Schools -- Durham, NC

2011- 2016 Physics and AP Physics C: Mechanics Instructor

2015-2016 Physical Science Instructor

YES Prep Public Schools --Southeast Campus -- Houston, TX

2008- 2011 Physics and AP Physics C: Mechanics Instructor

2009-2010 Pre-Calculus Instructor

Rice University -- Houston, TX

2007-2008 Introductory Physics (PHYS 125/ PHYS 126) Instructor

Rice University -- Houston, TX

2005-2006: Guest Lecturer in graduate level experimental methods: 2 semesters.

2002-2004: Laboratory Instructor for undergraduate introductory physics: 3 semesters.

2002, 2004: Recitation Leader for undergraduate introductory physics: 2 semesters.

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Mississippi State University – Starkville, MS

1999-2001: Laboratory Instructor for undergraduate introductory physics: 4 semesters

Education

Doctoral Degree in Physics, January 2008 Rice University - Houston, TX

Thesis Title: Ultracold Collisions in Atomic Strontium

Advisor: Thomas C. Killian

Master of Science in Physics, May 2004 Rice University - Houston, TX

Thesis Title: A Narrow Linewidth Diode Laser System for Strontium Laser Cooling Applications

Advisor: Thomas C. Killian

Bachelor of Science in Physics, May 2001 Mississippi State University- Starkville, MS

With minors in mathematics and chemistry

Professional Development

Summer 2019 -- College Board AP Calculus BC Summer Institute, Rice University

Summer 2018 -- KIPP/College Board AP Statistics Summer Institute

Fall 2016 -- Appreciative Tutoring Cycle, Adult Learners, Up and Running with Python

Summer 2014 -- Modeling Instruction Workshop: Using Scribbler Robots in Mechanics

Summer 2013 -- Modeling Instruction Workshop: Physics: E&M

Summer 2012 -- Modeling Instruction Workshop:: Physics Mechanics

Summer 2011 -- AP Physics C: Mechanics workshop, UCLA

Licensure and Certification

North Carolina SP2 Teaching License, #1143911

North Carolina Department of Public Instruction

Physics 8-12

Mathematics 6-12

Research Experience

Summer 2009 Rice University—Houston, TX

NSF Research Experience for Teachers: Participated in ongoing laser-cooling research, created laser camp curriculum, lead four YES Prep students in laser camp,

culminating in a poster at Rice Quantum Institute, an end-of-summer research showcase

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for chemistry, physics and applied physics undergraduates and graduate students at Rice University

2001- 2007 Rice University – Houston, TX

Graduate work on laser cooling and trapping atomic strontium, including magnetic trapping of metastable states, creation and absorption imaging of an ultracold neutral plasma, narrow-line cooling, photoassociation, ultracold collisions, and pursuit of quantum degeneracy

1999-2001 Mississippi State University – Starkville, MS

Undergraduate research on time distribution of subsequent peaks in gamma ray bursts; ab initio calculations on aromaticity of highly strained ring molecules

Summer 2000 University of Colorado, Boulder – Boulder, CO

NSF REU: undergraduate research on synthetic opals and photonic crystals

Publications

“Bose-Einstein Condensation of ^{84}Sr ” [Y. N. Martinez de Escobar](#), [P. G. Mickelson](#), [M. Yan](#), [B. J. DeSalvo](#), [S. B. Nagel](#), and [T. C. Killian](#) Phys. Rev. Lett. 103, 200402 (2009)

“Inelastic and elastic collision rates for triplet states of ultracold strontium” [A. Traverso](#), [R. Chakraborty](#), [Y. N. Martinez de Escobar](#), [P. G. Mickelson](#), [S. B. Nagel](#), [M. Yan](#), [T. C. Killian](#) Phys. Rev. A 79, 060702 (2009)

Two-photon photoassociative spectroscopy of ultracold ^{88}Sr

Y. N. Martinez de Escobar, P. G. Mickelson, P. Pellegrini, S. B. Nagel, A. Traverso, M. Yan, R. Côté, and T. C. Killian Phys. Rev. A 78, 062708 (2008) – Published December 10, 2008

“Spectroscopic Determination of the s-Wave Scattering Lengths of ^{86}Sr and ^{88}Sr ” P. G. Mickelson, Y. N. Martinez, A. D. Saenz, S. B. Nagel, Y. C. Chen, T. C. Killian, P. Pellegrini, and R. Côté. Phys. Rev. Lett. 95, 223002 (2005).

“Photoassociative Spectroscopy at Long Range in Ultracold Strontium” S. B. Nagel, P. G. Mickelson, A. D. Saenz, Y. N. Martinez, Y. C. Chen, T. C. Killian, P. Pellegrini, and R. Côté. Phys. Rev. Lett. 94, 083004 (2005).

“Absorption Imaging of Ultracold Neutral Plasmas” C. E. Simien, Y. C. Chen, P. Gupta, S. Laha, Y. N. Martinez, P. G. Mickelson, S. B. Nagel, and T. C. Killian. IEEE Transactions on Plasma Science, 33 (2005): 540.

“Absorption Imaging and Spectroscopy of Ultracold Neutral Plasmas” T. C. Killian, Y. C. Chen, P. Gupta, S. Laha, Y. N. Martinez, P. G. Mickelson, S. B. Nagel, A. D. Saenz, and C. E. Simien. J. Phys. B, 38 (2005): 351.

“Ultracold Neutral Plasmas.” T. C. Killian, Y. C. Chen, P. Gupta, S. Laha, Y. N. Martinez, P. G. Mickelson, S. B. Nagel, A. D. Saenz, and C. E. Simien. Plasma Phys. Control. Fusion, 47 (2005): A297.

“Electron Screening and Kinetic-Energy Oscillations in a Strongly Coupled Plasma” Y. C. Chen, C. E. Simien, S. Laha, P. Gupta, Y. N. Martinez, P. G. Mickelson, S. B. Nagel, and T. C. Killian. Phys. Rev. Lett. 93, 265003 (2004).

“Using Absorption Imaging to Study Ion Dynamics in an Ultracold Neutral Plasma” C. E. Simien, Y. C. Chen, P. Gupta, S. Laha, Y. N. Martinez, P. G. Mickelson, S. B. Nagel, and T. C. Killian. Phys. Rev. Lett. 92, 143001 (2004).

“Magnetic Trapping of metastable $^3\text{P}_2$ Atomic Strontium” S. B. Nagel, C. E. Simien, S. Laha, P. Gupta, V. S. Ashoka, and T. C. Killian. Phys. Rev. A 67, 011401 (2003).

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Posters and Presentations

“Laser Diode Characterization for use in laser cooling Ultracold Strontium” S.Aguirre, N.Nieto, N. Rodriguez, E. Umanzor, S.B.Nagel, T.C. Killian Poster 2009, August 23rd Annual Summer Research Colloquium of the Rice Quantum Institute

“Laser Cooling and Trapping and Photoassociation” – outreach talk

2007 Jan: YES college preparatory school: In school outreach session to local high school students

2006 Nov: Quarknet talk: Rice University outreach to local high school students

2006 Jul: Rice Quantum Institute: presentation to 20 summer research undergraduates at Rice

Gordon Conference on Atomic Physics

2005 Jun: “Photoassociation in Strontium”

Annual DAMOP (Division of Atomic Molecular and Optical Physics) Meeting

2006 poster in Knoxville, TN: “Recent experiments in ultracold Strontium”

2005 presentation in Lincoln, NE: “Toward Quantum Degeneracy in Strontium”

2004 presentation in Tucson AZ : “Progress Toward Intercombination line cooling in Strontium”

2003 presentation in Boulder CO: “Progress Toward Intercombination line cooling in Strontium”

2002 poster in Williamsburg, VA: “Progress toward intercombination line cooling in Strontium”

Awards

Rice University – Houston, TX

2002 Eric Umland Award for meritorious service to fellow graduate students

2002 National Science Foundation Graduate Fellowship Honorable Mention

2001-2002 Vaughn Fellowship

Mississippi State University – Starkville, MS

2000 Jack Denson Award for outstanding Teaching Assistant

1999-2001. Edward F. Scott Memorial Scholarship for Outstanding physics major.

1999 Frank L. Culley Memorial Scholarship for Outstanding Junior/Senior in Physics

1997 Mississippi Eminent Scholars Grant