

Kenneth M. Nollett Curriculum Vitae

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 Argonne National Laboratory
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**Current
Position** 2003 – present
 Assistant Physicist
 Physics Division
 Argonne National Laboratory

Education THE UNIVERSITY OF CHICAGO
 Ph.D., Department of Physics, 2000

 MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 S.B. in Physics, Concentration in German Language, 1995

**Research
Interests** Nuclear astrophysics, nucleosynthesis, nuclear reactions, few-body nuclear physics, cosmic rays, cosmology.

**Past
Positions** 2002–2003 POSTDOCTORAL RESEARCH ASSOCIATE, Institute for Nuclear Theory,
 University of Washington.
 Research in ultra-high-energy cosmic rays, computational methods, nuclear scattering in
 the variational Monte Carlo technique.

 2000–2002 POSTDOCTORAL SCHOLAR IN PHYSICS, California Institute of Technology.
 Supervised by G. J. Wasserburg, Marc Kamionkowski.
 Research in AGB star nucleosynthesis, presolar grains, ultra-high-energy cosmic rays.

 1996–2000 RESEARCH ASSISTANT, The University of Chicago.
 Supervised by David Schramm, Michael Turner.
 Nuclear data evaluation and uncertainty estimation for big-bang nucleosynthesis.

 1997–2000 GUEST/LAB GRADUATE STUDENT, Argonne National Laboratory, Physics
 Division. Supervised by R. B. Wiringa.
 Calculation of ${}^2\text{H}(\alpha, \gamma){}^6\text{Li}$, ${}^3\text{H}(\alpha, \gamma){}^7\text{Li}$, and ${}^3\text{He}(\alpha, \gamma){}^7\text{Be}$ cross sections from realistic
 nucleon-nucleon interactions, via quantum Monte Carlo methods (Ph.D. thesis).

 1994–1995 UNDERGRADUATE THESIS, M.I.T. Supervised by Alan Guth.
 Thesis title: “Closed Timelike Curves Around Moving Cosmic Strings”

 1992–1993 M.I.T. UNDERGRADUATE RESEARCH OPPORTUNITIES PROGRAM.
 Supervised by Simon Mochrie.
 Design and assembly of apparatus to study x-ray scattering from ordered colloids.
 Computer simulation of order/disorder transitions on silicon surfaces.

**Refereed
Publications**

Kenneth M. Nollett, Martin Lemoine, and David N. Schramm, “Nuclear Reaction Rates and Primordial ${}^6\text{Li}$,” *Phys. Rev. C* **56**, 1144 (1997).

Scott Burles, Kenneth M. Nollett, James W. Truran, and Michael S. Turner, “Sharpening the predictions of big-bang nucleosynthesis”, *Phys. Rev. Lett.*, **82**, 4176 (1999).

Kenneth M. Nollett and Scott Burles, “Estimating reaction rates and uncertainties for primordial nucleosynthesis”, *Phys. Rev. D* **61**, 123505 (2000).

Kenneth M. Nollett, R. B. Wiringa, and R. Schiavilla, “Six-body calculation of the alpha-deuteron radiative capture cross section”, *Phys. Rev. C* **63**, 024003 (2001).

Scott Burles, Kenneth M. Nollett, and Michael S. Turner, “What is the BBN prediction for the baryon density and how reliable is it?”, *Phys. Rev. D* **63**, 063512 (2001).

Kenneth M. Nollett, “Radiative alpha-capture cross sections from realistic nucleon-nucleon interactions and variational Monte Carlo wave functions”, *Phys. Rev. C* **63**, 054002 (2001). Based on thesis work.

Scott Burles, Kenneth M. Nollett, and Michael S. Turner, “Big-bang nucleosynthesis predictions for precision cosmology”, *Astrophys. J. Lett.* **552**, L1 (2001).

S. Peng Oh, Kenneth M. Nollett, Piero Madau, and G. J. Wasserburg, “Did massive stars pre-enrich and reionize the universe?” *Astrophys. J. Lett.* **562**, L1 (2001).

Kenneth M. Nollett and Robert E. Lopez, “Primordial nucleosynthesis with a varying fine structure constant: An improved estimate,” *Phys. Rev. D.* **66**, 063507 (2002).

Kenneth M. Nollett, M. Busso, and G. J. Wasserburg, “Cool bottom Processes on the Thermally-pulsing AGB and the Isotopic Composition of Circumstellar Dust Grains,” *Astrophys. J.* **582**, 1036 (2003).

Wick C. Haxton, Kenneth M. Nollett, and Kathryn M. Zurek, “The Piecewise Moments Method: A Generalized Lanczos Technique for Nuclear Response Surfaces,” *Phys. Rev. C* **72**, 065501 (2005)

L. E. Marcucci, Kenneth M. Nollett, R. B. Wiringa, and R. Schiavilla, “Modern theories of low-energy nuclear reactions,” *Nuclear Physics A* **777**, 111 (2006).

G. J. Wasserburg, M. Busso, R. Gallino, and K. M. Nollett, “Short-lived radioactivities in the early solar system: possible AGB sources,” *Nuclear Physics A* **777**, 5 (2006).

Kenneth M. Nollett, Steven C. Pieper, R. B. Wiringa, J. Carlson, and G. M Hale, “Quantum Monte Carlo calculations of neutron-alpha scattering,” *Phys. Rev. Lett.* **99**, 022502 (2007)

M. Busso, G. J. Wasserburg, Kenneth M. Nollett, and A. Calandra, “Can extra mixing in RGB and AGB stars be attributed to magnetic mechanisms?” *Astrophys. J.* **671**, 802 (2007)

**Popular
article**

Kenneth Nollett, “Testing the elements of the Big Bang,” *Physics World* Vol. 20, No. 8, p. 20 (August 2007)

Invited Talks “Mixing in giant stars and its signatures in stellar spectra and presolar grains”
(14 highlights out of 26) Physics Division Seminar, Argonne National Laboratory
February 2002

“Nuclear structure and alpha captures on light nuclei”
Nuclear Science Seminar, Michigan State University
September 2002

“Time-varying constants, the nucleon mass difference, and big-bang nucleosynthesis”
Invited session on charge symmetry breaking
American Physical Society April meeting
Philadelphia, PA
April 2003

“How fast, realistically: *ab initio* calculations of low-energy astrophysical reaction rates”
Invited session on recent developments in computational nuclear physics
American Physical Society April meeting
Denver, CO
May 2004

“Venturing into the continuum with quantum Monte Carlo”
2005 Gordon Research Conference on Nuclear Chemistry
New London, NH
July 2005

“Quantum Monte Carlo: Not Just for Energy Levels Anymore”
Third Argonne/MSU/INT/JINA RIA Theory Workshop
Argonne National Laboratory
April 2006

“Nuclear Physics in the pp Chain, *r*-Process, and *x*-Process”
Physics Division colloquium, Argonne National Laboratory
May 2006

“Quantum Monte Carlo studies of bound and unbound states”
7th International Conference on Radioactive Nuclear Beams
Cortina d’Ampezzo, Italy
July 2006

“Reactions, scattering, *ab initio* nuclear theory, and astrophysics”
Workshop on Nucleons and Nuclei
Washington, DC
October 2006

“Scattering and reactions in *ab initio* nuclear theory”
Pre-meeting workshop: “Exotic Nuclei: From the Laboratory to the Cosmos”
APS Division of Nuclear Physics Annual Meeting
Nashville, TN
October 2006

“Quantum Monte Carlo, continuum states, and the three-nucleon interaction”
Workshop on Three-Nucleon Interactions from Few- to Many-Body Systems
TRIUMF, Vancouver, BC, Canada
March 2007

“What’s the matter with lithium?”
Invited session on nucleosynthesis of the lightest nuclei
American Physical Society April meeting
Jacksonville, FL
April 2007

“Recent insights into light nuclei from quantum Monte Carlo”
2007 Gordon Research Conference on Nuclear Chemistry
New London, NH
June 2007

“Nuclear quantum Monte Carlo: Expanding into the continuum”
20th European Conference on Few-Body Problems in Physics
Pisa, Italy
September 2007

Service

REFEREE FOR:
Journal of High Energy Physics, Atomic Data and Nuclear Data Tables, Nuclear Physics
A, Physical Review Letters, Physics Letters B, Journal of Physics G, European Physical
Journal A

CO-ORGANIZER, Second Argonne/MSU/JINA/INT RIA Workshop: “Reaction Mechanisms
for Rare Isotope Beams,” East Lansing, Michigan, March 9–12, 2005

CO-ORGANIZER AND PROCEEDINGS EDITOR, Third Argonne/MSU/JINA/INT RIA Workshop,
Argonne National Laboratory, April 4–7, 2006

**Teaching
Experience**

THE UNIVERSITY OF CHICAGO, DEPARTMENT OF PHYSICS, Teaching Assistant
Physics 131–133, Introductory physics sequence, 1995–96 academic year
Physics 141–143, Honors introductory physics sequence, 1996–97 academic year

14TH EURO SUMMER SCHOOL ON EXOTIC BEAMS, Lecturer on topic “*Ab initio* calculations
of light nuclei.” Four lectures of three hours total, Houlgate, France, August 26–31, 2007

**Student
Supervision**

CALIFORNIA INSTITUTE OF TECHNOLOGY
SUMMER UNDERGRADUATE RESEARCH FELLOWSHIP PROGRAM
Mentor, Summer 2002

ARGONNE NATIONAL LABORATORY
UNDERGRADUATE SUMMER PROGRAMS
Summer Research Aide supervisor, Summer 2006
Student Research Participation Program supervisor, Summer 2007