Paul S. Julienne

Emeritus Fellow, Joint Quantum Institute (JQI), University of Maryland and National Institute of Standards and Technology (NIST), Room 2103 CSS Building (224), 4254 Stadium Drive, College Park MD 20742

(a) Professional preparation

Wofford College, Chemistry, B. S. (1965)
University of North Carolina at Chapel Hill, Chemical Physics, Ph. D. (1969)
National Bureau of Standards (NBS), postdoctoral research associate, 1969-1973

(b) Positions

JQI Emeritus Fellow, NIST Emeritus Scientist, 2013-present (retired)
Joint Quantum Institute Fellow, University of Maryland and NIST, 2007-2013
NIST Fellow, 2003-2013
NIST, Group Leader, Quantum Processes Group, Atomic Physics Division, 1995-2003
NIST/NBS, staff, 1974-1995
Naval Research Laboratory, staff, 1973-1974

(c) Publications

A select set of relevant publications (Over 250 publications in peer-reviewed journals with more than 800 citations per year since 2010 and an h-index of 60 through 2016).

Yujun Wang and P. S. Julienne, "Universal van der Waals Physics for Three Ultracold Atoms," Nature Physics 10, 768-773 (2014). (arXiv:1404.0483v1).

S. Ospelkaus, K.-K. Ni, D. Wang, M. H. G. de Miranda, B. Neyenhuis, G. Quéméner, P. S. Julienne, J. L. Bohn, D. S. Jin and J. Ye, "Quantum-State Controlled Reactions of Ultracold KRb Molecules," Science 327, 853-857(2010). (arXiv:0912.3854v1)

Z. Idziaszek and P. S. Julienne, "Universal rate constants for reactive collisions of ultracold molecules," Phys. Rev. Lett 104, 113202 (2010). (arXiv:0912.0370v2)

C. Chin, R. Grimm, P. S. Julienne, and E. Tiesinga, "Feshbach Resonances in Ultracold Gases," Rev. Mod. Phys. 82, 1225-1286 (2010). (arXiv:0812.1496v2)

P. S. Julienne, "Ultracold molecules from ultracold atoms: a case study with the KRb molecule," Faraday Discuss. 142, 361-388 (2009). (arXiv:0812.1233v23)

K.-K. Ni, S. Ospelkaus, M. H. G. de Miranda, A. Pe'er, B. Neyenhuis, J. J. Zirbel, S. Kotochigova, P. S. Julienne, D. S. Jin, J. Ye, "A High Phase-Space-Density Gas of Polar Molecules," Science 322, 231-235 (2008). (arXiv:0808.2963v2)

H. R. Thorsheim, J. Weiner, and P. S. Julienne, "Laser-induced photoassociation of ultracold sodium atoms," Phys. Rev. Letters **58**, 2420 (1987).

(d) Honors and Awards

* 1992, Department of Commerce Silver Medal
* 1998, Department of Commerce Gold Medal
* 2004, Davisson-Germer Prize of the American Physical Society,

Citation: For his pioneering studies of the theory of ultracold atomic collisions, and its applications to precision metrology and quantum gas dynamics.

* 2004, NIST Samuel Wesley Stratton Award for outstanding scientific or engineering achievements in support of NIST objectives.

Citation: For world leading theoretical physics research in collisions fundamental to the laser cooling of atoms and Bose-Einstein condensation

* 2005, Washington Academy of Sciences Annual Award for Work of Merit and Distinction in the Physical Sciences

Citation: For pioneering studies of the theory of ultracold atomic collisions and its numerous applications that continue to impact forefront research from Bose-Einstein condensation to atomic clocks.

* 2007, Meritorious Presidential Rank Award.

These awards recognize exceptional long-term accomplishments in public service by career senior government executives or scientists. Award winners are nominated by their agency heads, evaluated by boards of private citizens, and approved by the President.

* 2015, William F. Meggers Award, Optical Society of America

Citation: For seminal contributions to precision photoassociation and magnetic-Feshbach spectroscopy of ultracold atoms, and the application of these techniques to the formation of cold polar molecules.

(e) Committees

* 1994-1998, National Research Council Committee on Atomic, Molecular, and Optical Science (CAMOS)
* 2005-2007, Advisory Board for the Harvard-Smithsonian Institute for Atomic and Molecular Physics (ITAMP).
* 2007-2010, American Physical Society Divisional Councilor, representing the Division of Atomic, Molecular, and Optical Physics (DAMOP).

(f) Research interests:

My area of interest has been theoretical atomic, molecular, and optical physics. Work in the 1970's involved atmospheric and astrophysical problems. Work in the 1980s, centered on issues relating to high-energy lasers and collisions in light fields. Since the development of laser cooling at NIST in the mid 1980s, I have concentrated on quantum phenomena associated with cold atoms and molecules. This includes the quantum dynamics of cold collisions, namely, their precise characterization, their control by magnetic, electric, or electro-magnetic fields, their role in quantum gases and in lattice structures with tight confinement, and the production and properties of ultra-cold molecules. This work continues since retirement from NIST in 2013.