

Resume of Eite Tiesinga

General Information

Name : Dr. Eite Tiesinga
Address : Joint Quantum Institute
Atomic Physics Division
100 Bureau Drive, MS 8423
National Institute of Standards and Technology
Gaithersburg, MD 20899-8423
email : eite.tiesinga@nist.gov
tiesinga@umd.edu

Education

September 1984 - December 1988

Undergraduate student at the University of Groningen, Groningen, The Netherlands.

January 1989 - January 1993

PhD Graduate student at the Eindhoven University of Technology, Eindhoven, The Netherlands.

Professional Experience

May 1994 - April 1997

Guest researcher at the National Institute of Standards and Technology, Atomic Physics Division, Gaithersburg, Maryland.

June 1997 - February 2000

Research associate at the University of Maryland, Department of Chemistry and Biochemistry College Park, Maryland

February 2000 - July 2001

Contractual Researcher at the National Institute of Standards and Technology, Atomic Physics Division, Gaithersburg, Maryland.

July 2001 - present

Physicist at the National Institute of Standards and Technology, Atomic Physics Division, Gaithersburg, Maryland.

September 2006 - present

Adjunct Associate Professor at the Joint Quantum Institute, Department of Physics, University of Maryland, College Park, Maryland.

List of publications

1. E. Tiesinga, H.T.C. Stoof, and B.J. Verhaar, *Reflection of hydrogen atoms from the surface of superfluid helium*, Physical Review B **41**, 8886 (1990).
2. E. Tiesinga, H.T.C. Stoof, B.J. Verhaar and S.B. Crampton, *Spin-exchange frequency shift of the cryogenic deuterium maser*, Physica D **165&166**, 19 (1990).
3. E. Tiesinga, S.J.M. Kuppens, B.J. Verhaar, and H.T.C. Stoof, *Collisions between cold ground-state Na atoms*, Physical Review A **43**, 5188 (1991).
4. E. Tiesinga, B.J. Verhaar, H.T.C. Stoof and D. van Bragt, *Spin-exchange frequency shift in a cesium fountain*, Physical Review A **45**, 2671 (1992).
5. E. Tiesinga, A.J. Moerdijk, B.J. Verhaar, and H.T.C. Stoof, *Conditions for Bose-Einstein condensation in magnetically trapped cesium*, Physical Review A **46**, R1167 (1992).
6. E. Tiesinga, B.J. Verhaar and H.T.C. Stoof, *Threshold and resonance phenomena in ultracold ground-state collisions*, Physical Review A **47**, 4114 (1993).
7. E. Tiesinga, S.B. Crampton, B.J. Verhaar, and H.T.C. Stoof, *Collisional frequency shifts and line broadening in the cryogenic deuterium maser*, Physical Review A **47**, 4342 (1993).
8. H.M.J.M. Boesten, B.J. Verhaar, and E. Tiesinga, *Quantum suppression of collisional loss rates in optical traps*, Physical Review A **48**, 1428 (1993).
9. E. Tiesinga, *Comment on: "Elastic scattering of hydrogen atoms at low temperatures"*, Physical Review A **48**, 4801 (1993).
10. E. Tiesinga, A.J. Moerdijk, B.J. Verhaar, and H.T.C. Stoof, *BEC in ultra-cold cesium: Collisional constraints*, *Bose-Einstein Condensation*, edited by A. Griffin, D.W. Snoke, and S. Stringari (Cambridge University Press 1995) p. 465.
11. C.J. Williams, E. Tiesinga, and P.S. Julienne, *Hyperfine structure of the $\text{Na}_2 0_g^-$ long-range molecular state*, Physical Review A **53**, R1939 (1996).
12. K.M. Jones, P.S. Julienne, P.D. Lett, W.D. Phillips, E. Tiesinga, and C.J. Williams, *Measurement of the atomic $\text{Na}(3P)$ lifetime and of retardation in the interaction between two atoms bound in a molecule*, Europhysics Letters **35**, 85 (1996).
13. E. Tiesinga, C.J. Williams, P.S. Julienne, K.M. Jones, P.D. Lett, and W.D. Phillips, *A spectroscopic determination of scattering lengths for sodium atom collisions*, Journal of Research of the National Institute of Standards and Technology, **101**, 505 (1996).

14. P.S. Julienne, F.H. Mies, E. Tiesinga and C.J. Williams, *Collisional Stability of double Bose condensates*, Physical Review Letters **78**, 1880 (1997).
15. X. Wang, H. Wang, P.L. Gould, W.C. Stwalley, E. Tiesinga, and P.S. Julienne, *Observation of the Pure Long-Range 1_u state of an alkali-metal dimer by photoassociative spectroscopy*, Physical Review A, **57**, 4600 (1998).
16. E. Tiesinga, C.J. Williams, and P.S. Julienne, *Photoassociative spectroscopy of highly excited vibrational levels of alkali dimers: Green function approach for eigenvalue solvers*, Physical Review A, **57**, 4257 (1998).
17. P.S. Julienne, K.M. Jones, P.D. Lett, W.D. Phillips, E. Tiesinga, U. Volz, and C.J. Williams, Atomic collisions in Ultra-cold atomic gases, *Photonic, electronic and atomic collisions*, edited by F. Aumayr and H. Winter (World Scientific, Singapore, 1998).
18. P.J. Leo, E. Tiesinga, P.S. Julienne, D.K. Walter, S. Kadlecik, T.G. Walker, *Elastic and Inelastic Collisions of Cold Spin-Polarized ^{133}Cs Atoms*, Physical Review Letters **81**, 1389 (1998).
19. K.-A. Suominen, E. Tiesinga, and P.S. Julienne, *Nonadiabatic dynamics in evaporative cooling of trapped atoms by a radio frequency field*, Physical Review A **38**, 3983 (1998).
20. G.H. Rawitscher, B.D. Esry, E.Tiesinga, J.P. Burke, I. Koltracht, *Comparison of numerical methods for the calculation of cold atom collisions*, Journal of Chemical Physics, **111**, 10418 (1999).
21. C.J. Williams, E. Tiesinga, P.S. Julienne, H. Wang, W.C. Stwalley, and P.L. Gould, *Determination of the scattering lengths of ^{39}K from 1_u photoassociation lineshapes*, Physical Review A **60**, 4427 (1999).
22. K.M. Jones, P.D. Lett, E. Tiesinga. and P.S. Julienne, *Fitting line shapes in photoassociation spectroscopy of ultracold atoms: A useful approximation*, Physical Review A **61**, 012501 (2000).
23. F.H. Mies, E. Tiesinga, and P.S. Julienne, *Manipulation of Feshbach Resonances in Ultracold Atomic Collisions using Time-dependent Magnetic Fields*, Physical Review A **61**, 022721 (2000).
24. S. Kotochigova, E. Tiesinga, and I. Tupitsyn, *Nonrelativistic ab-initio calculation of the interaction potentials between metastable Ne atoms*, Physical Review A **61**, 042712 (2000).
25. S. Kotochigova, E. Tiesinga, and I. Tupitsyn, *Relativistic Valence bond theory and its application to metastable Xe_2* , in *New Trends in Quantum Systems in Chemistry and Physics*, edited by J. Maruani, C. Minot, R. McWeeny, Y.G. meyers, and S. Wilson (Kluwer Academic, Dordrecht, The Netherlands, 2001), Vol 1, p. 219.
26. E. Tiesinga, C.J. Williams, F.H. Mies, and P.S. Julienne, *Interacting atoms under strong quantum confinement*, Physical Review A **61** 063416 (2000).

27. S.D. Gensemer, P.L. Gould, P.J. Leo, E. Tiesinga, and C.J. Williams, *Ultracold ^{87}Rb Ground-State Hyperfine-Changing Collisions in the Presence and Absence of Laser Light*, Physical Review A, **62**, 030702 (2000).
28. H. Wang, A. N. Nikolov, J. R. Ensher, P.L. Gould, E. E. Eyler, and W. C. Stwalley, J.P. Burke Jr., J. L. Bohn, Chris. H. Greene, E. Tiesinga, C. J. Williams and P. S. Julienne, *Ground State Scattering Length of ^{39}K Determined by Double-Resonance Photoassociative Spectroscopy*, Physical Review A, **62**, 052704 (2000).
29. S. Kotochigova, E. Tiesinga, and P.S. Julienne, *Relativistic ab-initio treatment of the second-order spin-orbit splitting of the $a^3\Sigma_u^+$ potential of rubidium and cesium dimers*, Physical Review A **63**, 012517 (2000).
30. C. Samuelis, E. Tiesinga, T. Laue, M. Elbs, H. Knöckel, and E. Tiemann, *Cold atomic collisions studied by molecular spectroscopy*, Physical Review A, **63**, 012710 (2000).
31. E. Charron, E. Tiesinga, F. Mies, and C. Williams, *Quantum gates using motional states in an optical lattice*, Quantum communication, Computing, and Measurement 3, Editors P. Tombesi and O. Hirota (Kluwer Academic, Plenum Publishers, 2001).
32. T. Laue, E. Tiesinga, C. Samuelis, H. Knöckel, E. Tiemann, *Magnetic field imaging of weakly bound levels of the ground state Na_2 dimer*, Physical Review A, **65**, 023412 (2002).
33. E. Charron, E. Tiesinga, F. Mies, and C. Williams, *Optimizing a phase gate using quantum interference*, Physical Review Letters **88**, 077901 (2002).
34. K. Burnett, P.S. Julienne, P.D. Lett, E. Tiesinga, and C.J. Williams, *Quantum encounters of the ultra cold kind*, Nature **416**, 21 (2002).
35. C. McKenzie, J. Hecker Denschlag, H. Häffner, A. Browaeys, Luis E.E. de Araujo, F.K. Fatemi, K.M. Jones, J.E. Simsarian, D. Cho, A. Simoni, E. Tiesinga, P.S. Julienne, K. Helmerson, P.D. Lett, S.L. Rolston, and W.D. Phillips, *Photoassociation of sodium in a Bose-Einstein condensate*, Physical Review Letters **88**, 120403 (2002).
36. E. Tiesinga, S. Kotochigova, and P.S. Julienne, *Scattering length of the ground state $\text{Mg}+\text{Mg}$ collision.*, Physical Review A, **65**, 042722 (2002).
37. E. L. Bolda, E. Tiesinga, and P. S. Julienne, *Effective-scattering-length model of ultracold atomic collisions and Feshbach resonances in tight harmonic traps*. Physical Review A **66**, 013403 (2002).
38. T. Bergeman, P. S. Julienne, C. J. Williams, E. Tiesinga, M. Riad Manaa, H. Wang, P. L. Gould, and W. C. Stwalley, *Predissociations in the K_2 0_u^+ and 1_g States*, Journal of Chemical Physics **117**, 7491 (2002).
39. F.K. Fatemi, K.M. Jones, P.D. Lett, and E. Tiesinga, *Ultracold ground state molecule production in sodium*, Physical Review A **66**, 053401 (2002).

40. K.M. O'Hara, S.L. Hemmer, S.R. Granade, M.E. Gehm, J.E. Thomas, V.Venturi, E. Tiesinga, C.J. Williams, *Measurement of the Zero Crossing in a Feshbach Resonance of Fermionic ^6Li* , Physical Review A **66**, 041401 (2002).
41. A. Simoni, P. S. Julienne, E. Tiesinga, and C. J. Williams, *Intensity effects in ultracold photoassociation line shapes*, Physical Review A **66**, 63406 (2002).
42. A. Derevianko, S. G. Porsev, S. Kotochigova, E. Tiesinga, and P. S. Julienne *Ultracold Collision Properties of Metastable Alkaline-Earth Atoms*, Physical Review Letters **90**, 063002 (2003).
43. L. E. E. de Araujo, J. D. Weinstein, S. D. Gensemer, F. K. Fatemi, K.M. Jones, P. D. Lett, and E. Tiesinga, *Two-color photoassociation spectroscopy of the lowest triplet potential of Na_2* , Journal of Chemical Physics **119**, 2062 (2003).
44. E. L. Bolda, E. Tiesinga, and P. S. Julienne, *Pseudopotential model of ultracold atomic collisions in quasi-one- and two-dimensional traps* Physical Review A **68**, 032702 (2003).
45. S. Kotochigova, P. S. Julienne, and E. Tiesinga, *Ab initio calculation of the KRb dipole moments*, Physical Review A **68**, 022501 (2003).
46. V. Venturi, P.J. Leo, E. Tiesinga, C.J. Williams, and I.B. Whittingham, *Purely-long range bound states of $\text{He}(2s\ ^3S)+\text{He}(2p\ ^3P)$* , Physical Review A **68**, 022706 (2003).
47. G. Pupillo, E. Tiesinga, and C.J. Williams, *Effects of Inhomogeneity on the spectrum of the Mott-Insulator state*, Physical Review A **68**, 063604 (2003).
48. W. F. Mitchell and E. Tiesinga, *Adaptive Grid Refinement For a Model of Two Confined and Interacting Atoms*, Applied Numerical Mathematics, **52**, 235 (2005).
49. J. Ramirez-Serrane, W. DeGraffenreid, J. Weiner, E. Tiesinga, and P.S. Julienne, *Beam-loss spectroscopy of cold collisions in a bright sodium beam*, Physical Review A **69**, 042708 (2004).
50. K. Góral, T. Köhler, S.A. Gardiner, E. Tiesinga, and P.S. Julienne, *Adiabatic association of ultracold molecules via magnetic field tunable interactions*, Journal of Physics B **37**, 3457 (2004).
51. P.S. Julienne, E. Tiesinga, and T. Köhler, *Making cold molecules by time-dependent feshbach resonances*, Journal of Modern Optics **51**, 1787-1806 (2004).
52. C. Chin, V. Vuletić, A. J. Kerman, S. Chu, E. Tiesinga, P. J. Leo, and C. J. Williams, *Precision Feshbach spectroscopy of ultracold Cs_2* , Physical Review A **70**, 032701 (2004).
53. E.L. Bolda, E. Tiesinga, and P.S. Julienne, *Ultracold dimer association induced by a far-off resonance optical lattice*, Physical Review A **71**, 033404 (2005).
54. S. Kotochigova, E. Tiesinga, and P.S. Julienne, *Photoassociative formation of ultracold polar KRb molecules*, The European Physical Journal D **31**, 189 (2004).

55. P.S. Julienne, E.Tiesinga, and T. Köhler, *Making cold molecules by time-dependent Feshbach resonances*, Journal of Modern Optics **51**, 1787 (2004).
56. M. Mudrich, S. Kraft, J. Lange, A. Mosk, M. Weidemüller, and E. Tiesinga, *Hyperfine-changing collisions in an optically trapped gas of ultracold cesium and lithium*, Physical Review A **70**, 062712 (2004).
57. R. Ciuryło, E. Tiesinga, S. Kotochigova, and P. S. Julienne, *Photoassociation spectroscopy of cold alkaline earth atoms near the intercombination line*, Physical Review A **70**, 062710 (2004).
58. C.H. Schunck, M.W. Zwierlein, C.A. Stan, S.M.F. Raupach, W. Ketterle, A. Simoni, E. Tiesinga, C.J. Williams, and P.S. Julienne *Feshbach Resonances in Fermionic ^6Li* , Physical Review A **71**, 045601 (2005).
59. T. Köhler, E. Tiesinga, and P. S. Julienne, *Spontaneous dissociation of long-range Feshbach molecules*, Physical Review Letters, **94**, 020402 (2005).
60. M. Bartenstein, A. Altmeyer, S. Reidl, R. Geursen, S. Jochim, C. Chin, J. Hecker Denschlag, R. Grimm, A. Simoni, E. Tiesinga, C.J. Williams, and P.S. Julienne, *Precise determination of ^6Li cold collision parameters by radio-frequency spectroscopy on weakly bound molecules*, Physical Review Letters **94**, 103201 (2005).
61. R. Ciuryło, E. Tiesinga, and P. S. Julienne, *Optical tuning of the scattering length of cold alkaline earth atoms*, Physical Review A **71**, 030701 (2005).
62. J. Werner, A. Griesmaier, S. Hensler J. Stuhler, T. Pfau, A. Simoni, and E. Tiesinga, *Observation of Feshbach resonances in an ultracold gas of ^{52}Cr* , Physical Review Letters **94**, 183201 (2005).
63. E. Tiesinga, K. M. Jones, P. D. Lett, U. Volz, C. J. Williams, and P. S. Julienne, *Measurement and modeling of hyperfine- and rotation-induced state mixing in large weakly-bound sodium dimers*, Physical Review A **71**, 052703 (2005).
64. B. Gao, E. Tiesinga, C. J. Williams, and P. S. Julienne, *Multichannel quantum-defect theory for slow atomic collisions*, Physical Review A, **72**, 042719 (2005).
65. S. Shresta, E. Tiesinga, and C. J. Williams, *Scattering length determination from trapped pairs of atoms*, Physical Review A **72**, 022701 (2005).
66. S. Kotochigova and E. Tiesinga, *Ab Initio Relativistic Calculation of the RbCs Molecule*, Journal of Chemical Physics **123**, 174304 (2005).
67. K. Xu, Y. Liu, J.R. Abo-Shaeer, T. Mukaiyama, J.K. Chin, D.E. Miller, W. Ketterle, K. M. Jones, and E. Tiesinga, *Sodium Bose-Einstein Condensates in an Optical Lattice*, Physical Review A **72**, 043604 (2005).
68. K. M. Jones, E. Tiesinga, P. D. Lett, and P. S. Julienne, *Ultracold Photoassociation Spectroscopy: Long-range molecules and atomic scattering*, Review of Modern Physics **78**, 483-535 (2006).

69. S. Kotochigova and E. Tiesinga, *Controlling Polar Molecules in Optical Lattices.*, Physical Review A **73**, 041405 (2006).
70. R. Ciuryło, E. Tiesinga, and P. S. Julienne, *Stationary phase approximation for the strength of optical Feshbach resonances*, Physical Review A **74**, 022710 (2006).
71. P. Naidon, E. Tiesinga, W. F. Mitchell, and P. S. Julienne *Effective-range description of a Bose gas under strong one- or two-dimensional confinement*, New Journal of Physics **9**, 19 (2007).
72. E. Tiesinga, M. Anderlini, and E. Arimondo, *Determination of the scattering length of the $a^3\Sigma^+$ potential of $^{87}\text{RbCs}$* , Physical Review A **71**, 022707 (2007).
73. E. Gomez, A.T. Black, L.D. Turner, E. Tiesinga, and P.D. Lett, *Light forces in ultracold photoassociation*, Physical Review A **75**, 013420 (2007).
74. K. Szymaniec, W. Chalupczak, E. Tiesinga, C.J. Williams, S. Weyers, and R. Wynands *Cancellation of the collisional frequency shift in caesium fountain clocks*, Physical Review Letters **98**, 153002 (2007).
75. D. DeMille, S. Sainis, J. Sage, T. Bergeman, S. Kotochigova, and E. Tiesinga, *Enhanced sensitivity to variation of m_e/m_p in molecular spectra*. Physical Review Letters **100**, 043202 (2008).
76. E. Wille, F.M. Spiegelhalder, G. Kerner, D. Naik, A. Trenkwalder, G. Hendl, F. Schreck, R. Grimm, T.G. Tiecke, J.T.M. Walraven, S.J.J.M.F. Kokkelmans, E. Tiesinga, P.S. Julienne, *Exploring an ultracold Fermi-Fermi mixture: Interspecies Feshbach resonances and scattering properties of ^6Li and ^{40}K* , Physical Review Letters **100**, 053201 (2008).
77. P. Naidon, E. Tiesinga, and P. S. Julienne, *Two-body transients in coupled atomic-molecular BECs*, Physical Review Letters **100**, 093001 (2008).
78. F.W. Strauch, M. Edwards, E. Tiesinga, C. J. Williams, C. W. Clark, *Tunneling phase gate for neutral atoms in a double-well lattice*, Physical Review A, **77**, 050304 (2008).
79. K. Mitra, F.W. Strauch, C.J. Lobb, J.R. Anderson, F.C. Wellstood, and E. Tiesinga, *Quantum behavior of the dc SQUID phase qubit*, Physical Review B **77**, 214512 (2008).
80. S. K. Dutta, F. W. Strauch, R. M. Lewis, K. Mitra, H. Paik, T. A. Palomaki, E. Tiesinga, J. R. Anderson, A. J. Dragt, C. J. Lobb, and F. C. Wellstood, *Multi-level effects in the Rabi oscillations of a Josephson phase qubit*, Physical Review B **78**, 104510 (2008)
81. J. M. Hutson, E. Tiesinga, and P. S. Julienne, *Avoided crossings between bound states of ultracold Cesium dimers*, Physical Review A, **78**, 052703 (2008).
82. Y. Liu, S. Jung, S. Maxwell, L. D. Turner, E. Tiesinga, and P. D. Lett, *Quantum Phase Transitions and Continuous Observation of Spinor Dynamics in an Antiferromagnetic Condensate*, Physical Review Letters, **102**, 125301 (2009).

83. S. Kotochigova, E. Tiesinga, and P. S. Julienne, *Multi-channel modelling of the formation of vibrationally cold polar KRb molecules*, New Journal of Physics **11**, 055043 (2009).
84. T. M. Hanna, E. Tiesinga, and P. S. Julienne, *Prediction of Feshbach resonances from three input parameters*, Physical Review A **79**, 040701 (2009).
85. M. Iskin and E. Tiesinga, *Rotation induced superfluid-normal phase separation in trapped Fermi gases*, Physical Review A **79**, 053621 (2009).
86. Y. Liu, E. Gomez, S. Maxwell, L. D. Turner, E. Tiesinga, and P. D. Lett, *Number Fluctuations and Energy Dissipation in Sodium Spinor Condensates*, Physical Review Letters **102**, 225301 (2009).
87. A. Hu, L. Mathey, I. Danshita, E. Tiesinga, C. J. Williams, and C. W. Clark, *Counterflow and paired superfluidity in one-dimensional Bose mixtures in optical lattices*, Physical Review A **80**, 023619 (2009).
88. P. R. Johnson, E. Tiesinga, J. V. Porto, and C. J. Williams, *Effective three-body interactions and decoherence of coherent atom states in optical lattices*, New Journal of Physics **11**, 093022 (2009) .
89. L. Mathey, E. Tiesinga, P. S. Julienne, and C. W. Clark, *Collisional cooling of ultra-cold atom ensembles using Feshbach resonances*, Physical Review A **80**, 030702 (2009).