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Personal Data

Born: May 21, 1952; Seattle, Washington
Marital Status: Married, wife - Carol
Children: 2 daughters, Kelly, age 30; Margo, age 27

Education

University of Colorado; Boulder, Colorado - 1977-82
Ph.D. in Physics, 1982
University of Illinois; Champaign-Urbana, Illinois - 1975-76
M.S. in Physics, 1976
University of California; Berkeley, California - 1970-74
B.A. in Physics, 1974; B.A. in Psychology, 1973
University of California; San Diego, California - 1969-70.

Experience

1997-1998, 2006-2007, 2009-present Visiting Professor, Department of Physics,
Temple University.
1997 Visitor (one month) Dept. of Physics, Università di Pisa, Italy.
1994- Professor, Department of Physics, Lehigh University.
1990 Visitor (two months) Dept. of Physics, Universität Kaiserslautern,
Germany.
1989-1994 Associate Professor, Department of Physics, Lehigh University.
1984-1989 Assistant Professor, Department of Physics, Lehigh University.
1982-1984 Research Associate, Dept. of Physics, Princeton University,
Advisor – Dr. Will Happer.
1982 Research Associate, Joint Institute for Laboratory Astrophysics,
University of Colorado. Advisor – Dr. Alan Gallagher.
1978-1982 Research Assistant, Joint Institute for Laboratory Astrophysics,
University of Colorado. Advisor – Dr. Alan Gallagher.
1981 Teaching Assistant, Dept. of Physics, University of Colorado.
1977-1978 Research Assistant, Dept. of Physics, University of Colorado –
Cyclotron.
1975-1977 Teaching Assistant, Dept. of Physics, University of Illinois.

Awards and Honors

Presidential Young Investigator Award 1985.
Alexander von Humboldt Research Fellowship 1990.

Publications

1. J. Huennekens, "Collisional and radiative processes in sodium vapor", Ph.D. thesis, University of Colorado (1982).
2. J. Huennekens and A. Gallagher, "Cross sections for energy transfer in collisions between two excited sodium atoms", *Phys. Rev. A* **27**, 771-784 (1983).
3. J. Huennekens and A. Gallagher, "Self-broadening of the sodium resonance lines and excitation transfer between the $3P_{3/2}$ and $3P_{1/2}$ levels", *Phys. Rev. A* **27**, 1851-1864 (1983).
4. J. Huennekens and A. Gallagher, "Resonance broadening of the sodium D lines" in *Spectral Line Shapes Vol. 2*, K. Burnett ed., (Walter de Gruyter and Co., Berlin, 1983) pages 665-678.
5. J. Huennekens and A. Gallagher, "Radiation diffusion and saturation in optically thick Na vapor", *Phys. Rev. A* **28**, 238-247 (1983).
6. J. Huennekens and A. Gallagher, "Associative ionization in collisions between two Na($3P$) atoms", *Phys. Rev. A* **28**, 1276-1287 (1983).
7. M. Ligare, S. Schaefer, J. Huennekens and W. Happer, "Infrared spectroscopy of a dense potassium vapor jet", *Opt. Commun.* **48**, 39-43 (1983).
8. J. Huennekens, S. Schaefer, M. Ligare and W. Happer, "Observation of the lowest triplet transitions $^3\Sigma_g^+ - ^3\Sigma_u^+$ in Na₂ and K₂", *J. Chem. Phys.* **80**, 4794-4799 (1984), *erratum* **83**, 915 (1985).
9. Z. Wu and J. Huennekens, "Predissociation and collisional depopulation of the Cs₂ (E) state", *J. Chem. Phys.* **81**, 4433-4446 (1984).
10. J. Huennekens, Z. Wu and T. G. Walker, "Ionization, excitation of high-lying atomic states, and molecular fluorescence in Cs vapor excited at $\lambda = 455.7$ and 459.4 nm", *Phys. Rev. A* **31**, 196-209 (1985).
11. J. Huennekens, T. G. Walker and S. C. McClain, "Near infrared spectra of the NaK molecule", *J. Chem. Phys.* **83**, 4949-4957 (1985).
12. J. Huennekens, H. J. Park, T. Colbert and S. C. McClain, "Radiation trapping in sodium-noble gas mixtures", *Phys. Rev. A* **35**, 2892-2901 (1987).
13. J. Huennekens, A. Loza, M. Masters, and K. M. Sando, "Near-infrared bound-free emission from the NaK molecule", *J. Chem. Phys.* **88**, 6013-6021 (1988).
14. B. K. Clark, M. Masters and J. Huennekens, "Wave-mixing processes in sodium-potassium vapor", in *Advances in Laser Science Vol. III*, ed. A. C. Tam, J. L. Gole and W. C. Stwalley, (American Institute of Physics, New York, 1988) p. 167-169.
15. B. Keramati, M. Masters and J. Huennekens, "Excitation-transfer collisions in cesium vapor: $\text{Cs}(5D_{5/2}) + \text{Cs}(6S_{1/2}) \rightarrow \text{Cs}(5D_{3/2}) + \text{Cs}(6S_{1/2})$ ", *Phys. Rev. A* **38**, 4518-4526 (1988).
16. B. K. Clark, M. Masters and J. Huennekens, "Wave mixing and amplified spontaneous emission in pure potassium and mixed sodium-potassium vapors", *Appl. Phys. B* **47**, 159-167 (1988).
17. J. Huennekens and T. Colbert, "On radiative transport of the resonance lines of sodium", *J. Quant. Spectrosc. Radiat. Transfer* **41**, 439-446 (1989).
18. B. K. Clark, W. T. Luh and J. Huennekens, "NaK $2^1\Sigma^+ \rightarrow 1^1\Sigma^+$ band optically pumped laser emission near $1.02 \mu\text{m}$ ", *Appl. Phys. B* **49**, 155-161 (1989).

19. W. T. Luh, Y. Li, and J. Huennekens, "830 nm emission in sodium vapor", *Appl. Phys. B* **49**, 349-359 (1989).
20. M. Masters, J. Huennekens, W. T. Luh, L. Li, A. M. Lyyra, K. Sando, V. Zafirooulos, and W. C. Stwalley, "Bound-free $1^3\Pi \rightarrow 1^3\Sigma^+$ emission from the NaK molecule: determination of the $1^3\Sigma^+$ repulsive wall above the dissociation limit", *J. Chem. Phys.* **92**, 5801-5813 (1990).
21. T. Colbert and J. Huennekens, "Radiation trapping under conditions of low to moderate line-center optical depth", *Phys. Rev. A* **41**, 6145-6154 (1990).
22. Z. J. Jabbour, M. S. Malcuit, and J. Huennekens, "Broadly tunable near-infrared six-wave mixing processes in potassium vapor", *Appl. Phys. B* **52**, 281-289 (1991).
23. T. Colbert and J. Huennekens, "Radiation trapping in the far wings of the foreign-gas broadened potassium resonance lines", *Phys. Rev. A* **44**, 4753-4756 (1991).
24. A. Sasso, W. Demtröder, T. Colbert, C. Wang, E. Ehrlacher, and J. Huennekens, "Radiative lifetimes, collisional mixing, and quenching of the cesium $5D_J$ levels", *Phys. Rev. A* **45**, 1670-1683 (1992).
25. E. Ehrlacher and J. Huennekens, "Noble-gas broadening rates for barium transitions involving the metastable $6s5d\ ^3D_J$ levels", *Phys. Rev. A* **46**, 2642-2648 (1992).
26. H. Sun and J. Huennekens, "Spin-orbit perturbations between the $A(2)^1\Sigma^+$ and $b(1)^3\Pi_0$ states of NaK", *J. Chem. Phys.* **97**, 4714-4722 (1992).
27. E. Ehrlacher and J. Huennekens, "Noble-gas broadening rates for the $6s^2\ ^1S_0 \rightarrow 6s6p\ ^1,3P_1$ resonance and intercombination lines of barium", *Phys. Rev. A* **47**, 3097-3104 (1993).
28. E. Ehrlacher and J. Huennekens, "Excitation transfer among, and quenching of, the barium $6s5d\ ^3D_J$ metastable levels due to collisions with argon, nitrogen, and barium perturbers", *Phys. Rev. A* **50**, 4786-4793 (1994).
29. J. Huennekens, R. K. Namiotka, J. Sagle, Z. J. Jabbour, and M. Allegrini, "Thermalization of velocity-selected excited-state populations by resonance exchange collisions and radiation trapping", *Phys. Rev. A* **51**, 4472-4482 (1995).
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31. J. Sagle, R. K. Namiotka, and J. Huennekens, "Measurement and modelling of intensity dependent absorption and transit relaxation on the cesium D_1 line", *J. Phys. B* **29**, 2629-2643 (1996).
32. R. K. Namiotka, E. Ehrlacher, J. Sagle, M. Brewer, D. J. Namiotka, A. P. Hickman, A. D. Streater, and J. Huennekens, "Diffusion of barium atoms in the $6s5d\ ^3D_J$ metastable levels and the $6s^2\ ^1S_0$ ground state through noble-gas perturbers", *Phys. Rev. A* **54**, 449-461 (1996).
33. Z. J. Jabbour, R. K. Namiotka, J. Huennekens, M. Allegrini, S. Milošević, and F. de Tomasi, "Energy pooling collisions in cesium: $6P_J + 6P_J \rightarrow 6S + (nl = 7P, 6D, 8S, 4F)$ ", *Phys. Rev. A* **54**, 1372-1384 (1996).
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35. R. K. Namiotka, J. Huennekens, and M. Allegrini, "Energy-pooling collisions in potassium: $4P_J + 4P_J \rightarrow 4S + (nl = 5P, 6S, 4D)$ ", *Phys. Rev. A* **56**, 514-520 (1997).
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37. E. Laub, I. Mazsa, S. C. Webb, J. LaCivita, I. Prodan, Z. J. Jabbour, R. K. Namiotka, and J. Huennekens, "Experimental study of the NaK $3^1\Pi$ state", *J. Mol. Spectrosc.* **193**, 376-388 (1999), *erratum* **221**, 142-144 (2003).
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41. J. Huennekens, I. Prodan, A. Marks, L. Sibbach, E. Galle, T. Morgus, and Li Li, "Experimental studies of the NaK $1^3\Delta$ state", *J. Chem. Phys.* **113**, 7384-7397 (2000).
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43. P. Burns, L. Sibbach-Morgus, A. D. Wilkins, F. Halpern, L. Clarke, R. D. Miles, Li Li, A. P. Hickman, and J. Huennekens, "The $4^3\Sigma^+$ state of NaK: Potential energy curve and hyperfine structure", *J. Chem. Phys.* **119**, 4743-4754 (2003).
44. A. Marks, A. P. Hickman, A. D. Streater, and J. Huennekens, "Thermalization of fast cesium $5D_{3/2}$ atoms in collisions with ground state cesium atoms", *Phys. Rev. A* **71**, 012711 (14 pages) (2005).
45. P. Burns, A. D. Wilkins, A. P. Hickman, and J. Huennekens, "The NaK $1(b)^3\Pi_{\Omega=0}$ state hyperfine structure and the $1(b)^3\Pi_{\Omega=0} \sim 2(A)^1\Sigma^+$ spin-orbit interaction", *J. Chem. Phys.* **122**, 074306 (8 pages) (2005).
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48. R. D. Miles, L. Morgus, D. O. Kashinski, J. Huennekens, and A. P. Hickman, "Nonadiabatic coupling in the $3^3\Pi$ and $4^3\Pi$ states of NaK", *J. Chem. Phys.* **125**, 154304 (11 pages) (2006).
49. D. Li, F. Xie, Li Li, V. B. Sovkov, V. S. Ivanov, E. Ahmed, A. M. Lyyra, J. Huennekens, and S. Magnier, "The $^{39}\text{K}_2$ $2^3\Sigma_g^+$ state: Observation and analysis", *J. Chem. Phys.* **126**, 194314 (9 pages) (2007).

50. S. Eckel, S. Ashman, and J. Huennekens, "Spin-orbit coupling of the NaK $3^3\Pi$ and $3^1\Pi$ states: Determination of the coupling constant and observation of quantum interference effects", *J. Mol. Spectrosc.* **242**, 182-194 (2007).
51. L. Morgus, T. Morgus, T. Drake, and J. Huennekens, "Hyperfine state changing collisions of Cs($6P_{1/2}$) atoms with argon perturbers", *Phys. Rev. A.* **77**, 032704 (12 pages) (2008).
52. E. H. Ahmed, P. Qi, B. Beser, J. Bai, R. W. Field, J. P. Huennekens, and A. M. Lyyra, "Experimental mapping of the absolute magnitude of the transition dipole moment function $\mu_e(R)$ of the Na₂ $A^1\Sigma_u^+ - X^1\Sigma_g^+$ transition", *Phys. Rev. A* **77**, 053414 (7 pages) (2008).
53. S. J. Sweeney, E. Ahmed, P. Qi, T. Kirova, A. M. Lyyra, and J. Huennekens, "Measurement of absolute transition dipole moment functions of the $3^1\Pi \rightarrow 1(X)^1\Sigma^+$ and $3^1\Pi \rightarrow 2(A)^1\Sigma^+$ transitions in NaK using Autler-Townes spectroscopy and calibrated fluorescence", *J. Chem. Phys.* **129**, 154303 (10 pages) (2008).
54. H. Salami, T. Bergeman, B. Beser, J. Bai, E. Ahmed, S. Kotochigova, A. M. Lyyra, J. Huennekens, C. Lisdat, A. V. Stolyarov, O. Dulieu, P. Crozet, and A. J. Ross, "Spectroscopic observations, spin-orbit functions, and coupled channels deperturbation analysis of data on the $A^1\Sigma_u^+$ and $b^3\Pi_u$ states of Rb₂", *Phys. Rev. A* **80**, 022515 (14 pages) (2009).
55. A. D. Wilkins, L. Morgus, J. Huennekens, and A. P. Hickman, "Effects of spin-orbit coupling on the coupled $3^3\Pi$ and $4^3\Pi$ excited states of NaK", *J. Mol. Spectrosc.* **258**, 13-19 (2009).
56. B. M. McGeehan, S. Ashman, C. M. Wolfe, R. Steinhardt, M. L. Monaco, J. Huennekens, and A. P. Hickman, "NaK bound-free and bound-bound $4^3\Sigma^+ \rightarrow a^3\Sigma^+$ emission", accepted for publication in the *Journal of Molecular Spectroscopy*.
57. A. Lazoudis, T. Kirova, P. Qi, E. H. Ahmed, J. Huennekens, and A. M. Lyyra, "Electromagnetically induced transparency in an open V-type molecular system", manuscript submitted to *Physical Review A*.
58. C. M. Wolfe, S. Ashman, J. Bai, B. Beser, E. H. Ahmed, A. M. Lyyra, and J. Huennekens, "Collisional transfer of population and orientation in NaK", manuscript submitted to the *Journal of Chemical Physics*.
59. J. Bai, E. H. Ahmed, B. Beser, Y. Guan, S. Kotochigova, A. M. Lyyra, S. Ashman, C. M. Wolfe, J. Huennekens, F. Xie, D. Li, L. Li, M. Tamanis, R. Ferber, A. Drozdova, E. Pazyuk, A. V. Stolyarov, J. G. Danzl, H.-C. Nägerl, N. Bouloufa, O. Dulieu, C. Amiot, H. Salami, and T. Bergeman, "Global analysis of data on the spin-orbit coupled $A^1\Sigma_u^+$ and $b^3\Pi_u$ states of Cs₂", accepted for publication in *Physical Review A*.
60. E. Ahmed, S. Ingram, T. Kirova, O. Salihoglu, Y. Guan, J. Huennekens, and M. Lyyra, "Quantum control of the spin-orbit coupling interaction using the AC Stark effect", manuscript in preparation.
61. S. Ashman, B. McGeehan, C. Wolfe, C. Faust, A. P. Hickman, and J. Huennekens, "Experimental studies of the NaCs $5^3\Pi_0$ and $1(a)^3\Sigma^+$ states" manuscript in preparation.