

Publications of Stephen R. Leone

1. S. R. Leone, B. Swanson and D. F. Shriver, "Polarized Raman scattering by tetraethylammonium pentachlorindate(III) single crystals. Vibrational assignments for the square pyramidal InCl_5^{2-} Ion," *Inorg. Chem.* **9**, 2189 (1970).
2. S. R. Leone and C. B. Moore, "V→V energy transfer with tunable optical parametric oscillator excitation," *Chem. Phys. Lett.* **19**, 340 (1973).
3. S. R. Leone and C. B. Moore, "Laser sources," in Chemical and Biological Applications of Lasers, edited by C. B. Moore (Academic Press, 1974).
4. S. R. Leone and F. J. Wodarczyk, "Laser excited electronic-to-vibrational energy transfer from $\text{Br}(4^2\text{P}_{1/2})$ to HCl and HBr," *J. Chem. Phys.* **60**, 314 (1974).
5. S. R. Leone and C. B. Moore, "Isotopically selective photochemistry of bromine," *Phys. Rev. Lett.* **33**, 269 (1974).
6. A. B. Petersen, C. Wittig and S. R. Leone, "Infrared molecular lasers pumped by E-V energy transfer from $\text{Br}(4^2\text{P}_{1/2})$: CO_2 , N_2O , HCN, and $\text{C}_2\text{H}_2^\ddagger$," *Appl. Phys. Lett.* **27**, 305 (1975).
7. K. Bergmann, S. R. Leone and C. B. Moore, "Effect of reagent electronic excitation on the chemical reaction $\text{Br}(2^2\text{P}_{1/2}, 2^2\text{P}_{3/2}) + \text{HI}$," *J. Chem. Phys.* **63**, 4161 (1975).
8. S. R. Leone, R. G. McDonald and C. B. Moore, "Vibrational relaxation and photochemistry of $\text{HCl}(\nu=1,2)$ and Br atoms," *J. Chem. Phys.* **63**, 4735 (1975).
9. S. R. Leone, "Application of lasers to chemical research," *J. Chem. Educ.* **53**, 9 (1976).
10. S. R. Leone, "Selective photochemical reactions and excited state energy transfer," in Physics of Quantum Electronics, Vol. 4, edited by S. F. Jacobs, et al. (Addison Wesley, 1976).
11. A. B. Petersen, C. Wittig and S. R. Leone, "E-V pumped CO_2 laser operating at 4.3, 10.6 and 14.1 μm ," *J. Appl. Phys.* **47**, 1051 (1976).
12. K. Bergmann, S. R. Leone, R. G. McDonald and C. B. Moore, "Vibrational photochemistry," *Isr. J. Chem.* **14**, 105 (1975).
13. F. Zaraga, S. R. Leone and C. B. Moore, "Br + Br_2 atom exchange: An isotopically selective, laser-initiated, chemical study," *Chem. Phys. Lett.* **42**, 275 (1976).
14. S. R. Leone, "Infrared fluorescence studies of state-selected energy transfer and isotopic chemistry," *SPIE Proc.* **83** (1976).
15. S. R. Leone, "Applications and trends in laser-induced chemistry," *SPIE Proc.* **92** (1977), 130.
16. S. R. Leone and K. G. Kosnik, "An optically pumped S_2 laser," in Electronic Transition Lasers II, Proceedings of the Third Summer Colloquium on Electronic Transition Lasers, edited by L. E. Wilson, S. N. Suchard and J. I. Steinfeld (MIT Press, 1977), p 298.
17. S. R. Leone and K. G. Kosnik, "A tunable visible and ultraviolet laser on $\text{S}_2(\text{B}^3\Sigma_u^- - \text{X}^3\Sigma_g^-)$," *Appl. Phys. Lett.* **30**, 346 (1977).
18. V. M. Bierbaum, G. B. Ellison, J. H. Futrell and S. R. Leone, "Vibrational chemiluminescence from ion-molecule reactions: $\text{O}^- + \text{CO} \rightarrow \text{CO}_2^\ddagger + \text{e}^-$," *J. Chem. Phys.* **67**, 2375 (1977).
19. V. M. Bierbaum, G. B. Ellison, J. H. Futrell and S. R. Leone, "Infrared chemiluminescence studies of ion-molecule reactions," Proceedings of the 25th Annual Meeting of the American Society for Mass Spectrometry (1977), p 435.
20. J. B. Koffend, R. W. Field, D. R. Guyer and S. R. Leone, "Pulsed and cw optically pumped lasers for novel applications in spectroscopy and kinetics," Laser Spectroscopy, Proceedings of the Third International Conference on Laser Spectroscopy, Jackson Hole, Wyoming, edited by J. L. Hall and J. L. Carlsten (Springer-Verlag, Springer Series in Optical Sciences, 1977), Vol. 7, p 382.
21. A. B. Horwitz and S. R. Leone, "Isotopic vibration-to-vibration energy transfer," *SPIE Proc.* **113** (1977), 114.
22. M. Braithwaite and S. R. Leone, "Pulsed kinetic studies of laser excited molecular states," Proceedings of the 1977 Electro-Optics Laser Conference (1977), p 582.
23. H. Hofmann and S. R. Leone, "Collisional deactivation of laser-excited $\text{Br}^*(2^2\text{P}_{1/2})$ atoms with halogen and interhalogen molecules," *Chem. Phys. Lett.* **54**, 314 (1978).
24. H. Hofmann and S. R. Leone, "Quenching and reactions of laser-excited $\text{I}(5^2\text{P}_{1/2})$ atoms with halogen and interhalogen molecules," *J. Chem. Phys.* **69**, 641 (1978).
25. M. Braithwaite and S. R. Leone, "Laser-initiated chemical reactions: $\text{Cl} + \text{H}_2\text{S} \rightarrow \text{HCl} + \text{HS}$: Rate constant, product energy distribution, and direct detection of a chain mechanism," *J. Chem. Phys.* **69**, 839 (1978).
26. H. Hofmann and S. R. Leone, "Tunable laser photodissociation of HgI_2 : Quantum yield for formation of excited $\text{I}(5^2\text{P}_{1/2})$ atoms," *J. Chem. Phys.* **69**, 3819 (1978).
27. A. B. Horwitz and S. R. Leone, "Laser-excited resonant, isotopic V→V energy transfer: $\text{H}^{35}\text{Cl}-\text{H}^{37}\text{Cl}$, $\text{H}^{79}\text{Br}-\text{H}^{81}\text{Br}$, $\text{D}^{35}\text{Cl}-\text{D}^{37}\text{Cl}$, $\text{D}^{79}\text{Br}-\text{D}^{81}\text{Br}$," *J. Chem. Phys.* **69**, 5319 (1978).
28. S. L. Baughcum and S. R. Leone, "Free radical studies by excimer laser ultraviolet photolysis," *SPIE Proc.* **158**, 29 (1978).
29. S. L. Baughcum, H. Hofmann, S. R. Leone and D. J. Nesbitt, "Photofragmentation dynamics and reactive collisions of laser-excited electronic states," *Faraday Discuss.* **67**, 306 (1979).
30. A. B. Horwitz and S. R. Leone, "Temperature dependence of resonant isotopic vibrational energy transfer," *J. Chem. Phys.* **70**, 4916 (1979).
31. A. B. Horwitz and S. R. Leone, "Versatile, isotopically selective hydrogen halide TEA pin laser," *Rev. Sci. Instrum.* **50**, 811 (1979).
32. W. H. Pence and S. R. Leone, "New atomic and molecular lasers and their application to the study of collision physics," in International Conference on the Physics of Electronic and Atomic Collisions, ICPEAC 1979, edited by N. Oda and K. Takayanagi (North Holland, 1980), p 773.
33. D. J. Nesbitt and S. R. Leone, "Laser-initiated chemical chain reactions," *J. Chem. Phys.* **72**, 1722 (1980).
34. T. S. Zwier, V. M. Bierbaum, G. B. Ellison and S. R. Leone, "Vibrational product state distributions of ion-molecule reactions by infrared chemiluminescence: $\text{Cl}^- + \text{HBr}$, $\text{HI} \rightarrow \text{HCl}(\nu) + \text{Br}^-$, I^- ," *J. Chem. Phys.* **72**, 5426 (1980).
35. S. L. Baughcum and S. R. Leone, "Photofragmentation infrared emission spectroscopy of vibrationally excited free radicals CH_3 and CH_2I ," *J. Chem. Phys.* **72**, 6531 (1980).
36. T. S. Zwier, M. M. Maricq, C. J. S. M. Simpson, V. M. Bierbaum, G. B. Ellison and S. R. Leone, "Direct detection of

- the product vibrational-state distribution in the associative detachment reaction $\text{Cl}^- + \text{H} \rightarrow \text{HCl}(v) + e^-$, *Phys. Rev. Lett.* **44**, 1050 (1980).
37. D. J. Nesbitt and S. R. Leone, "Laser-induced gas phase chain chemistry," in Proceedings of the Technical Program, Electro-Optics/Laser 79 Conference and Exposition (1979), p 281.
 38. D. J. Nesbitt and S. R. Leone, " $\text{Br}^*(\text{P}_{1/2}) + \text{H}_2(v=0,1)$: Laser studies of the competition between reactive pathways and inelastic energy transfer channels," *J. Chem. Phys.* **73**, 6182 (1980).
 39. S. R. Leone, "Photofragment dynamics," in "Dynamics of the Excited State," Advances in Chemical Physics, Vol. 50, edited by K. Lawley (Wiley, New York, 1982), p 255.
 40. W. H. Pence and S. R. Leone, "Laser studies of electronic excitation transfer in atomic calcium: $\text{Ca}(4s5p \ ^1\text{P}_1) + \text{Ar} \rightleftharpoons \text{Ca}(4s5p \ ^3\text{P}_{2,1,0}) + \text{Ar}$," *J. Chem. Phys.* **74**, 5707 (1981).
 41. J. B. Koffend and S. R. Leone, "Tunable laser photodissociation: Quantum yield of $\text{I}^*(\text{P}_{1/2})$ from CH_2J_2 ," *Chem. Phys. Lett.* **81**, 136 (1981).
 42. S. L. Bernasek and S. R. Leone, "Direct detection of vibrational excitation in the CO_2 product of the oxidation of CO on a platinum surface," *Chem. Phys. Lett.* **84**, 401 (1981).
 43. J. C. Weisshaar, T. S. Zwier and S. R. Leone, "Nascent product vibrational state distributions of ion-molecule reactions: The proton transfer reactions $\text{F}^- + \text{HX} \rightarrow \text{HF}(v) + \text{X}^-$, $\text{X} = \text{Cl}, \text{Br}, \text{I}$," *J. Chem. Phys.* **75**, 4873 (1981).
 44. T. S. Zwier, J. C. Weisshaar and S. R. Leone, "Nascent product vibrational state distributions of ion-molecule reactions: The associative detachment reaction $\text{F}^- + \text{H} \rightarrow \text{HF}(v) + e^-$," *J. Chem. Phys.* **75**, 4885 (1981).
 45. W. H. Pence, S. L. Baughcum and S. R. Leone, "Laser UV photofragmentation of halogenated molecules: Selective bond dissociation and wavelength specific quantum yields for excited $\text{I}(\text{P}_{1/2})$ and $\text{Br}(\text{P}_{1/2})$ atoms," *J. Phys. Chem.* **85**, 3844 (1981).
 46. F. Magnotta, D. J. Nesbitt and S. R. Leone, "Excimer laser photolysis studies of translational-to-vibrational energy transfer," *Chem. Phys. Lett.* **83**, 21 (1981).
 47. D. J. Nesbitt and S. R. Leone, "Laser initiated chain reactions: A generalized extension to complex chemical chain systems," *J. Chem. Phys.* **75**, 4949 (1981).
 48. S. L. Baughcum and S. R. Leone, "Laser photodissociation of $\text{Hg}(\text{CH}_3)_2$: Infrared emission studies of vibrational and rotational excitation in the CH_3 fragments," *Chem. Phys. Lett.* **89**, 183 (1982).
 49. H. W. Hermann and S. R. Leone, "Photofragment infrared emission spectroscopy: Vibrational progression and potential parameters of the CH_3 (ν_2) 'umbrella' mode," *J. Chem. Phys.* **76**, 4759 (1982).
 50. H. W. Hermann and S. R. Leone, "Photofragmentation dynamics of CH_3I at 248 and 266 nm: Vibrational distributions in the CH_3 (ν_2) 'umbrella' mode," *J. Chem. Phys.* **76**, 4766 (1982).
 51. D. J. Nesbitt and S. R. Leone, "Infrared fluorescence studies of intramolecular vibrational relaxation in C_1-C_4 hydrocarbons following pulsed laser excitation of the first CH overtone," *Chem. Phys. Lett.* **87**, 123 (1982).
 52. S. R. Leone, "A compilation of rate coefficients for vibrational energy transfer involving hydrogen halides," *J. Phys. Chem. Ref. Data* **11**, 953 (1982).
 53. S. R. Leone, "Infrared fluorescence: A versatile probe of state-selected chemical dynamics," *Acc. Chem. Res.* **16**, 88 (1983).
 54. D. A. Dolson and S. R. Leone, "Slow chain reactions of Br_2 and Cl_2 with HI: Multiple state analysis and vibrational relaxation of $\text{HBr}(v=2)$ and $\text{HCl}(v=1-4)$," *J. Chem. Phys.* **77**, 4009 (1982).
 55. D. J. Nesbitt and S. R. Leone, "Laser initiated $\text{Cl}_2/\text{Hydrocarbon}$ chain reactions: Time-resolved infrared emission spectra of product vibrational excitation," *J. Phys. Chem.* **86**, 4962 (1982).
 56. C. E. Hamilton, M. A. Duncan, T. S. Zwier, J. C. Weisshaar, G. B. Ellison, V. M. Bierbaum and S. R. Leone, "Product vibrational analysis of ion-molecule reactions by laser-induced fluorescence in a flowing afterglow: $\text{O}^- + \text{HF} \rightarrow \text{OH}(v=0,1) + \text{F}^-$," *Chem. Phys. Lett.* **94**, 4 (1983).
 57. M. A. Smith and S. R. Leone, "Product vibrational state distributions in thermal energy associative detachment reactions: $\text{F}^- + \text{H,D} \rightarrow \text{HF}(v), \text{DF}(v) + e^-$," *J. Chem. Phys.* **78**, 1325 (1983).
 58. V. M. Bierbaum, G. B. Ellison and S. R. Leone, "Flowing afterglow studies of ion reaction dynamics using infrared chemiluminescence and laser-induced fluorescence," in Gas phase Ion Chemistry, Vol. 3, "Ions and Light," edited by M. T. Bowers (Academic Press, New York, 1984), p 1.
 59. M. A. Smith, V. M. Bierbaum and S. R. Leone, "Infrared chemiluminescence from vibrationally excited NO^+ : Product branching in the $\text{N}^+ + \text{O}_2$ ion-molecule reaction," *Chem. Phys. Lett.* **94**, 398 (1983).
 60. C. A. Wight and S. R. Leone, "Excimer laser photolysis studies of translational-to vibrational energy transfer in collisions of H and D atoms with CO," *J. Chem. Phys.* **78**, 4875 (1983).
 61. D. R. Guyer, L. Hüwel and S. R. Leone, "Single collision ion-molecule reactions at thermal energy: Rotational and vibrational distributions from $\text{N}^+ + \text{CO} \rightarrow \text{N} + \text{CO}^+$," *J. Chem. Phys.* **79**, 1259 (1983).
 62. J. E. Smedley and S. R. Leone, "Relative quantum yield of $\text{I}^*(\text{P}_{1/2})$ in the tunable laser UV photodissociation of $\text{i-C}_3\text{F}_7\text{I}$ and $\text{n-C}_3\text{F}_7\text{I}$: Effect of temperature and exciplex emission," *J. Chem. Phys.* **79**, 2687 (1983).
 63. M. O. Hale and S. R. Leone, "Laser excited, state detected calcium-rare gas collisional energy transfer: $\text{Ca}(4s5p \ ^1\text{P}_1)$ spin changing and $\text{Ca}(4s5p \ ^3\text{P}_1)$ fine structure changing cross sections," *J. Chem. Phys.* **79**, 3352 (1983).
 64. C. A. Wight and S. R. Leone, "Vibrational state distributions and absolute excitation efficiencies for T-V transfer collisions of NO and CO with H atoms produced by excimer laser photolysis," *J. Chem. Phys.* **79**, 4823 (1983).
 65. R. Klein, R. P. McGinnis and S. R. Leone, "Photodetachment threshold of CN^- by laser optogalvanic spectroscopy," *Chem. Phys. Lett.* **100**, 475 (1983).
 66. M. A. Duncan, V. M. Bierbaum, G. B. Ellison and S. R. Leone, "Laser-induced fluorescence studies of ion collisional excitation in a drift field: Rotational excitation of N_2^+ in helium," *J. Chem. Phys.* **79**, 5448 (1983).
 67. C. A. Wight and S. R. Leone, "Reinvestigation of the I^* yield in the 193 nm photodissociation of $1,2\text{-C}_2\text{F}_4\text{IBr}$," *J. Phys. Chem.* **87**, 5299 (1983).
 68. H. K. Haugen, W. H. Pence and S. R. Leone, "Infrared double resonance spectroscopy of V-T,R relaxation of $\text{HF}(v=1)$: Direct measurement of the high-J populations," *J. Chem. Phys.* **80**, 1839 (1984).
 69. C. E. Hamilton, V. M. Bierbaum and S. R. Leone, "Vibrational energy disposal in polyatomic ion-molecule reactions: $\text{SF}_6^- + \text{H,D} \rightarrow \text{SF}_5^- + \text{HF}(v), \text{DF}(v)$," *J. Chem. Phys.* **80**, 1831 (1984).

70. L. J. Kovalenko and S. R. Leone, "Laser studies of methyl radical reactions with Cl₂ and Br₂: Absolute rate constants, product vibrational excitation, and hot radical reactions," *J. Chem. Phys.* **80**, 3656 (1984).
71. S. R. Leone, "State-resolved molecular reaction dynamics," *Annu. Rev. Phys. Chem.* **35**, 109 (1984).
72. H. K. Haugen and S. R. Leone, "Infrared double-resonance spectroscopy of V-T,R relaxation of HF(v=1) using an F-center laser," in *Proceedings of the International Conference on Lasers 83*, edited by R. C. Powell (STS Press, McLean, VA, 1983), p 189.
73. C. A. Wight, F. Magnotta and S. R. Leone, "Vibrational energy disposal in reactive and inelastic collisions of H(D) + HCl(DCl) at 1 to 3 eV," *J. Chem. Phys.* **81**, 3951 (1984).
74. L. Hüwel, D. R. Guyer, G.-H. Lin and S. R. Leone, "Laser-induced fluorescence measurement of nascent vibrational and rotational product state distributions in the charge transfer of Ar⁺ + N₂ → Ar + N₂⁺(v=0,1) at 0.2 eV," *J. Chem. Phys.* **81**, 3520 (1984).
75. M. O. Hale and S. R. Leone, "Laser studies of near resonant state-changing collisions of calcium (4s6s ¹S₀) with the rare gases," *Phys. Rev. A* **31**, 103 (1985).
76. S. R. Leone, "Laser probing of chemical reaction dynamics," *Science* **227**, 889 (1985).
77. M. O. Hale, I. V. Hertel and S. R. Leone, "Effects of orbital alignment on inelastic collisions of Ca(4s5p ¹P₁) with helium," *Phys. Rev. Lett.* **53**, 2296 (1984).
78. K. L. Carleton, K. H. Welge and S. R. Leone, "Detection of nitrogen rotational distributions by resonant 2 + 2 multiphoton ionization through the a ¹P_g state," *Chem. Phys. Lett.* **115**, 492 (1985).
79. C. A. Wight, D. J. Donaldson and S. R. Leone, "A two-laser pulse-and-probe study of T-R,V collisions in H + NO at 1 and 2.2 eV," *J. Chem. Phys.* **83**, 660 (1985).
80. G. H. Lin, J. Maier and S. R. Leone, "Nascent vibrational and rotational distributions from the charge transfer reaction Ar⁺ + CO → CO⁺ + Ar at near thermal energy," *J. Chem. Phys.* **82**, 5527 (1985).
81. H. K. Haugen, E. Weitz and S. R. Leone, "Effect of spin-orbit excitation on reactivity: Laser transient absorption spectroscopy of Br(²P_{1/2}, ²P_{3/2}) + IBr reactive dynamics," *Chem. Phys. Lett.* **119**, 75 (1985).
82. C. E. Hamilton, V. M. Bierbaum and S. R. Leone, "Product vibrational state distributions of thermal energy charge transfer reactions determined by laser induced fluorescence: N⁺ + CO → N + CO⁺(v=0–2)," *J. Chem. Phys.* **83**, 601 (1985).
83. C. E. Hamilton, V. M. Bierbaum and S. R. Leone, "Product vibrational state distributions of thermal energy charge transfer reactions determined by laser induced fluorescence in a flowing afterglow: Ar⁺ + CO → CO⁺(v=0–6) + Ar," *J. Chem. Phys.* **83**, 2284 (1985).
84. C. E. Hamilton and S. R. Leone, "Nascent product vibrational state distributions of thermal ion-molecule reactions determined by infrared chemiluminescence," in *Gas-Phase Chemiluminescence and Chemi-Ionization*, edited by A. Fontijn (North-Holland, 1985), p 139.
85. H. K. Haugen, E. Weitz and S. R. Leone, "Accurate quantum yields by laser gain vs absorption spectroscopy: Investigation of Br/Br^{*} channels in photofragmentation of Br₂ and IBr," *J. Chem. Phys.* **83**, 3402 (1985).
86. A. O. Langford, V. M. Bierbaum and S. R. Leone, "Flowing afterglow infrared chemiluminescence studies of vibrational energy disposal in the ion-molecule reactions F⁻ + HBr, DBr → HF, DF + Br⁻," *J. Chem. Phys.* **83**, 3913 (1985).
87. A. O. Langford, V. M. Bierbaum and S. R. Leone, "Auroral implications of recent measurements on O(¹S) and O(¹D) formation in the reaction of N⁺ with O₂," *Planet. Space Sci.* **33**, 1225 (1985).
88. D. Neuschäfer, M. O. Hale, I. V. Hertel and S. R. Leone, "Energy transfer processes of aligned excited states of Ca atoms," in *Electronic and Atomic Collisions*, edited by D. C. Lorentz, W. E. Meyerhof and J. R. Petersen (Elsevier, Amsterdam, 1986), p 585.
89. D. J. Donaldson and S. R. Leone, "Absolute rate coefficients for methyl radical reactions by laser photolysis, time-resolved infrared fluorescence: CD₃ + HX → CD₃H + X (X=Br, I)," *J. Phys. Chem.* **90**, 936 (1986).
90. A. O. Langford, V. M. Bierbaum and S. R. Leone, "Branching ratios for electronically excited oxygen atoms formed in the reaction of N⁺ with O₂ at 300 K," *J. Chem. Phys.* **84**, 2158 (1986).
91. G. H. Lin, J. Maier and S. R. Leone, "Nascent rotational and vibrational product state distribution in the charge transfer reaction of N⁺ + CO → CO⁺ + N at near thermal energy," *J. Chem. Phys.* **84**, 2180 (1986).
92. W. P. Hess, S. J. Kohler, H. K. Haugen and S. R. Leone, "Application of an InGaAsP diode laser to probe photodissociation dynamics: I^{*} quantum yields from n- and i-C₃F₇I and CH₃I by laser gain vs. absorption spectroscopy," *J. Chem. Phys.* **84**, 2143 (1986).
93. G. H. Lin, J. Maier and S. R. Leone, "Nascent rotational distribution of the minor v=0 channel in the N₂⁺ product of the Ar⁺ + N₂ charge transfer reaction at near thermal energy," *Chem. Phys. Lett.* **125**, 557 (1986).
94. D. J. Donaldson and S. R. Leone, "Photofragmentation dynamics of acetone at 193 nm: State distributions of the CH₃ and CO fragments by time- and wavelength-resolved infrared emission," *J. Chem. Phys.* **85**, 817 (1986).
95. J. E. Smedley, W. P. Hess, H. K. Haugen and S. R. Leone, "Transient gain-versus absorption laser probing of spin-orbit states, kinetics and dynamics," *J. Chem. Phys.* **84**, 385 (1987).
96. D. J. Donaldson and S. R. Leone, "Time-resolved FTIR photofragment emission spectroscopy: HCl vibrational distributions from the 193 nm photolysis of chloroethylenes," *Chem. Phys. Lett.* **132**, 240 (1986).
97. R. W. Schwenz and S. R. Leone, "Near resonant collisional energy transfer in Sr(5s6p ¹P₁)-rare gas systems," *Chem. Phys. Lett.* **133**, 433 (1987).
98. V. M. Bierbaum and S. R. Leone, "Optical studies of product state distributions in thermal energy ion-molecule reactions," in *Proceedings of the NATO ASI, Structure/Reactivity and Thermochemistry of Ions*, edited by P. Ausloos (D. Reidel, Boston, 1987), p 23.
99. W. P. Hess and S. R. Leone, "Absolute I^{*} quantum yields for the ICN $\tilde{\Lambda}$ state by diode laser gain versus absorption spectroscopy," *J. Chem. Phys.* **86**, 3773 (1987).
100. K. L. Carleton and S. R. Leone, "Laser probing of gallium spin orbit state desorption and scattering from silicon (100) surfaces," Proc. of the Industry University Advanced Materials Conference, Denver 1987, edited by J. G. Morse (The Metallurgical Society, Inc., Warrendale, PA, 1987), p 9.
101. H. K. Haugen, W. P. Hess and S. R. Leone, "Application of semiconductor lasers to probe photodissociation dynamics," *AIP Conf. Proc.* **160** (Adv. Laser Sci.-2), 566 (1987).
102. J. E. Smedley, H. K. Haugen and S. R. Leone, "Collision-induced dissociation of laser-excited Br₂[B³Π(O_u⁺);v'J]: Formation of Br(²P_{1/2}) + Br(²P_{3/2}) at energies 1–5 kT below dissociation," *J. Chem. Phys.* **86**, 6801 (1987).

103. L. M. Cousins and S. R. Leone, "T-V energy transfer and chemical reactions of laser-produced hot H and D atoms," *Radiochim. Acta* **43**, 107 (1988).
104. D. A. Dolson and S. R. Leone, "A reinvestigation of the laser initiated Cl₂/HBr chain reaction: Absolute rate constants and the v=2/v=1 ratio from Cl + HBr → HCl(v) + Br," *J. Phys. Chem.* **91**, 3543 (1987).
105. L. M. Cousins and S. R. Leone, "T-V energy transfer and the exchange reaction of H(D) + HF at 2.2(2.1) eV: Vibrational state distributions by time and wavelength resolved infrared fluorescence," *J. Chem. Phys.* **86**, 6731 (1987).
106. K. L. Carleton and S. R. Leone, "Laser probing of gallium atom interactions with silicon (100) surfaces," *J. Vac. Sci. Technol. B* **5**, 1141 (1987).
107. W. Bussert, D. Neuschäfer and S. R. Leone, "The effect of orbital alignment on the forward and reverse electronic energy transfer Ca(4s5p ¹P₁) + M ⇌ Ca(4s5p ³P_J) + M with rare gases," *J. Chem. Phys.* **87**, 3833 (1987).
108. W. Bussert and S. R. Leone, "Orbital alignment effects on the Ca(4s5p ¹P₁) to Ca(4s5p ³P_J) electronic energy transfer with molecular collision partners," *Chem. Phys. Lett.* **138**, 269 (1987).
109. W. Bussert and S. R. Leone, "State-specific orbital alignment effects in electronic energy transfer: Sr(5s6p ¹P₁) + M → Sr(5s6p ³P_J, 4d5p ³F₄, ³F₃) + M," *Chem. Phys. Lett.* **138**, 276 (1987).
110. R. A. Dressler, H. Meyer and S. R. Leone, "Laser probing of the rotational alignment of N₂⁺ drifted in helium," *J. Chem. Phys.* **87**, 6029 (1987).
111. J. E. Smedley, H. K. Haugen and S. R. Leone, "Laser determinations of "hot band" quantum yields: Br*(²P_{1/2}) formation in the continuum absorption of Br₂ at 510–550 nm," *J. Chem. Phys.* **87**, 2700 (1987).
112. D. J. Donaldson and S. R. Leone, "Laser photolysis, infrared fluorescence determination of CH₃(v₃) vibrational deactivation by the He, Ar, N₂, CO, SF₆ and (CH₃)₂CO," *J. Phys. Chem.* **91**, 3128 (1987).
113. L. J. Kovalenko and S. R. Leone, "Innovative laser techniques in chemical kinetics: A pedagogical survey," *J. Chem. Ed.* **65**, 681 (1988).
114. S. R. Leone and V. M. Bierbaum, "Laser probing of product state distributions in thermal energy ion-molecule reactions," *Discuss. Faraday Soc.* **84**, 253 (1987).
115. D. M. Sonnenfroh and S. R. Leone, "A rotationally resolved LIF study of the N₂⁺ products of the thermal energy Penning ionization reaction: Ne*(³P₂) + N₂," *J. Chem. Phys.* **87**, 5041 (1987).
116. H. Meyer and S. R. Leone, "Steady state model for the collision induced rotational alignment of molecular ions in electric drift fields," *Mol. Phys.* **63**, 705 (1988).
117. R. A. Dressler, H. Meyer, A. O. Langford, V. M. Bierbaum and S. R. Leone, "Direct observation of Ba⁺ velocity distributions in a drift tube using single frequency laser-induced fluorescence," *J. Chem. Phys.* **87**, 5578 (1987).
118. D. M. Sonnenfroh and S. R. Leone, "Bimodal rotational distributions of N₂⁺ produced in the thermal energy Penning ionization of N₂ by Ne*(³P₂)," *Int. J. Mass. Spectrosc. Ion Processes.* **80**, 63 (1987).
119. S. R. Leone, "Alignment effects in electronic energy transfer and reactive events," in *Selectivity in Chemical Reactions*, Proceedings of the NATO ASI Series C: Mathematical and Physical Sciences "Selectivity in Chemical Reactions," edited by J. C. Whitehead (Kluwer Academic Publishers, Dordrecht, 1988), p 245.
120. K. L. Carleton, B. Bourguignon and S. R. Leone, "Desorption of a two-state system: Laser probing of gallium atom spin-orbit states from silicon (100)," *Surf. Sci.* **199**, 447 (1988).
121. W. P. Hess, R. Naaman and S. R. Leone, "Nonunity I* quantum yield in the 193-nm photodissociation of methyl iodide," *J. Phys. Chem.* **91**, 6085 (1987).
122. T. R. Fletcher and S. R. Leone, "Rotationally resolved product states of polyatomic photofragmentation by time-resolved FTIR emission: HF elimination from 1,1-CH₂CClF at 193 nm," *J. Chem. Phys.* **88**, 4720 (1988).
123. B. Bourguignon and S. R. Leone, "Surface structure and growth mechanism of Ga on Si(100)," in *Symposium on Atomic and Surface Physics '88: Contributions* (Inst. de Recherche Fondamentale, 1988), p 228.
124. E. L. Woodbridge, T. R. Fletcher and S. R. Leone, "Photofragmentation of acetone at 193 nm: Rotational and vibrational-state distributions of the CO fragment by time-resolved FTIR emission spectroscopy," *J. Phys. Chem.* **92**, 5387 (1988).
125. T. R. Fletcher and S. R. Leone, "Time-resolved FTIR emission studies of molecular photofragmentation initiated by a high repetition rate excimer laser," in *Advances in Laser Science - III*, Proceedings of the Third International Laser Science Conference, AIP Conf. Proc. No. 172 (A. C. Tam, J. L. Gole and W. C. Stwalley, Eds., Am. Inst. of Phys. New York, 1988), p 596.
126. C. A. Taatjes and S. R. Leone, "Laser double-resonance measurements of rotational relaxation rates of HF(J=13) with rare gases, H₂, and D₂," *J. Chem. Phys.* **89**, 302 (1988).
127. K. Knutsen, V. M. Bierbaum and S. R. Leone, "Remeasurement of the rate constant and branching ratio for the N₂⁺ + O reaction," *Planet. Space Sci.* **36**, 307 (1988).
128. K. L. Carleton, B. Bourguignon, R. V. Smilgys, D. J. Oostra and S. R. Leone, "Laser probing of the dynamics of Ga interactions on Si(100)," *Mater. Res. Soc. Symp. Proc.* **116** (1988), 45–50.
129. S. R. Leone, "Laser probing of ion collisions in drift fields: State excitation, velocity distributions, and alignment effects," in *Bimolecular Collisions*, edited by M. N. R. Ashfold and J. E. Baggott, Royal Society of Chemistry Series, Advances in Gas-Phase Photochemistry and Kinetics, 377 (1989).
130. B. Bourguignon, K. L. Carleton and S. R. Leone, "Surface structures and growth mechanism of Ga on Si(100) determined by LEED and Auger electron spectroscopy," *Surf. Sci.* **204**, 455 (1988).
131. B. Bourguignon, R. V. Smilgys and S. R. Leone, "AES and LEED studies correlating desorption energies with surface structures and coverages for Ga on Si(100)," *Surf. Sci.* **204**, 473 (1988).
132. L. M. Cousins and S. R. Leone, "Production of 0.1–3 eV reactive molecules by laser vaporization of condensed molecular films: A potential source for beam surface interactions," *J. Mater. Res.* **3**, 1158 (1988).
133. R. A. Dressler, J. P. M. Beijers, H. Meyer, S. M. Penn, V. M. Bierbaum and S. R. Leone, "Laser probing of ion velocity distributions in drift fields: Parallel and perpendicular temperatures and mobility for Ba⁺ in He," *J. Chem. Phys.* **89**, 4707 (1988).
134. T. R. Fletcher and S. R. Leone, "Photodissociation dynamics of C₂H₂ at 193 nm: Vibrational distributions of the CCH radical and the rotational state distribution of the Ā(010) state by time-resolved Fourier transform infrared emission," *J. Chem. Phys.* **90**, 871 (1989).

135. K. C. Lin, P. D. Kleiber, J. X. Wang, W. C. Stwalley and S. R. Leone, "Alignment effects in Ca–He ($5^1\text{P}_1 - 5^3\text{P}_J$) spin-changing collisions by far wing laser scattering," *J. Chem. Phys.* **89**, 4771 (1988).
136. K. Yamasaki and S. R. Leone, "Quenching and energy transfer processes of single rotational levels of $\text{Br}_2 \text{B}^3\Pi(\text{O}_u^+)$ $v'=24$ with Ar under single collision conditions," *J. Chem. Phys.* **90**, 964 (1989).
137. D. M. Sonnenfroh and S. R. Leone, "A laser-induced fluorescence study of product rotational state distributions in the charge transfer reaction: $\text{Ar}^+(^2\text{P}_{3/2}) + \text{N}_2 \rightarrow \text{Ar} + \text{N}_2^+(\text{X})$ at 0.28 and 0.40 eV," *J. Chem. Phys.* **90**, 1677 (1989).
138. L. M. Cousins and S. R. Leone, "Time-of-flight measurements of hyper-thermal Cl_2 molecules produced by UV laser vaporization of cryogenic chlorine films," *Chem. Phys. Lett.* **155**, 162 (1989).
139. L.M. Cousins, R. J. Levis, and S. R. Leone, "Observation of translationally hot, rotationally cold NO molecules produced by 193-nm laser vaporization of multilayer NO films," *J. Phys. Chem.* **93**, 5325 (1989).
140. L. J. Kovalenko, R. L. Robinson and S. R. Leone, "Alignment effects involving multiple pathways: Electronic energy transfer of Sr 5s6p $^1\text{P}_1$ with rare gases," *J. Chem. Soc., Faraday Trans. 2*, **85**(8), 939 (1989).
141. S. R. Leone, "Molecular collisions, 1990 McGraw-Hill Yearbook of Science and Technology 210, McGraw Hill (1989).
142. S. R. Leone, T. R. Fletcher and E. L. Woodbridge, "Pulsed time-resolved Fourier transform infrared emission spectroscopy," in 1989 Technical Digest on High Resolution Fourier Transform Spectroscopy (Optical Society of America, 1989).
143. D. J. Oostra, R. V. Smilgys and S. R. Leone, "Interaction of In atom spin-orbit states with Si(100) surfaces," in Chemical Perspectives of Microelectronic Materials, (Materials Research Society Proceedings, 1989), Vol. 131, p 239.
144. S. R. Leone, "Time-resolved FTIR emission studies of molecular photofragmentation," *Acc. Chem. Res.* **22**, 139 (1989).
145. K. C. Lin, S. Ananthamurphy, P. D. Kleiber, J. X. Wang, W. C. Stwalley and S. R. Leone, "Alignment effects in Ca–He ($5^1\text{P}_1 - 5^3\text{P}_J$) energy transfer half collisions," in Advances in Laser Science - IV, Proceedings of the Fourth International Laser Science Conference, AIP Conf. Proc. 191 (J. L. Gole et al., Eds., Am. Inst. of Phys., New York, 1989), pp 630–633.
146. L. J. Kovalenko, S. R. Leone and J. B. Delos, "Mechanism of collisionally-induced transitions among fine-structure levels: Semiclassical calculations of alignment effects in the Na–He system," *J. Chem. Phys.* **91**, 6948 (1989).
147. G. C. Schatz, L. J. Kovalenko and S. R. Leone, "A coupled channel quantum scattering study of alignment effects in $\text{Na}(^2\text{P}_{3/2}) + \text{He} \rightarrow \text{Na}(^2\text{P}_{1/2}) + \text{He}$ collisions," *J. Chem. Phys.* **91**, 6961 (1989).
148. L. M. Cousins, R. J. Levis, and S. R. Leone, "Translational and internal state distributions of NO produced in the 193 nm explosive vaporization of cryogenic NO films: Rotationally cold, translationally fast NO molecules," *J. Chem. Phys.* **91**, 5731 (1989).
149. D. J. Oostra, R. V. Smilgys, and S. R. Leone, "Initial stages of heteroepitaxial growth of InAs on Si(100)," *Appl. Phys. Lett.* **55**, 1333 (1989).
150. R. L. Robinson, L. J. Kovalenko, and S. R. Leone, "Distinct alignment effects for $\text{Y}_{2,0}$ vs. $\text{Y}_{2,\pm 1}$ angular wave functions observed in collisions of an atomic Ca D state," *Phys. Rev. Lett.* **64**, 388 (1990).
151. D. J. Oostra, R. V. Smilgys, and S. R. Leone, "Spin-orbit state specific laser probing of the desorption kinetics and islanding behavior of In on Si(100)," *Surf. Sci.* **226**, 226 (1990).
152. R. J. Levis, C. J. Waltman, L. M. Cousins, R. G. Copeland and S. R. Leone, "A hyperthermal (0.1–4 eV) F atom beam source suitable for surface etching investigations," *J. Vac. Sci. Technol. A* **8**, 3118 (1990).
153. R. L. Robinson, L. J. Kovalenko, C. J. Smith and S. R. Leone, "Individual cross sections for $^1\text{D}_2$ sublevels ($M_L = 0, \pm 1, \pm 2$) in the alignment-dependent process: $\text{Ca}(4\text{p}^2 \ ^1\text{D}_2) + \text{Rg} \rightarrow \text{Ca}(3\text{d}4\text{p} \ ^1\text{F}_3) + \text{Rg}$ as a function of rare gas," *J. Chem. Phys.* **92**, 5260 (1990).
154. R. V. Smilgys and S. R. Leone, "State-resolved laser probing of As_2 in a molecular-beam epitaxy reactor," *J. Vac. Sci. Technol. B* **8**, 416 (1990).
155. S. R. Leone, "Novel laser gain and time-resolved FTIR studies of photochemistry," in Proceedings, First International Conference on Laboratory Research for Planetary Atmospheres, Bowie State University, Maryland, edited by K. Fox, J. E. Allen, Jr., L. J. Stief and D. T. Quillen (NASA, 1990), p 129.
156. S. R. Leone, "Laser probing of III–V semiconductor growth on Si(100)," in Proceedings of the Society of Photo-Optical Instrumentation Engineers, SPIE Vol. 1208 Laser Photoionization and Desorption Surface Analysis Techniques (1990), p 11.
157. R. V. Smilgys, D. J. Oostra and S. R. Leone, "A study of the GaAs-Si(100) interface using laser probing of thermal desorption kinetics," *J. Vac. Sci. Technol. B* **8**, 1102 (1990).
158. P. J. Miller, S. A. Rogers, J. Senekowitsch, S. V. O'Neil, S. R. Leone, H. J. Werner and P. J. Knowles, "Multireference-configuration interaction (MR-CI) calculations on HS^{2+} and experimental observation via electron impact ionization of H_2S ," *Int. J. Mass Spectrom. Ion Processes* **100**, 505 (1990).
159. S. A. Rogers, P. J. Miller, S. R. Leone and B. Brehm, "Observation of the NF^{2+} dication in the electron impact ionization mass spectrum of NF_3 ," *Chem. Phys. Lett.* **166**, 137 (1990).
160. S. M. Penn, J. P. M. Beijers, R. A. Dressler, V. M. Bierbaum, and S. R. Leone, "Laser-induced fluorescence measurements of drift-velocity distributions for Ba^+ in Ar: Moment analysis and a direct measure of skewness," *J. Chem. Phys.* **93**, 5118 (1990).
161. J. I. Cline, C. A. Taatjes, and S. R. Leone, "Diode laser probing of $\text{I}^*(^2\text{P}_{1/2})$ Doppler profiles: Time Evolution of a fast, anisotropic velocity distribution in a thermal bath," *J. Chem. Phys.* **93**, 6543 (1990).
162. C. A. Taatjes, J. I. Cline, and S. R. Leone, "A generalized method for Doppler determination of cylindrically symmetric velocity distributions: An application of Fourier transform Doppler spectroscopy," *J. Chem. Phys.* **93**, 6554 (1990).
163. E. L. Woodbridge, M. N. R. Ashfold, and S. R. Leone, "Photodissociation of ammonia at 193.3 nm: Rovibrational state distribution of the NH_2 ($\tilde{\Lambda} \ ^2\text{A}_1$) fragment," *J. Chem. Phys.* **94**, 4195 (1991).
164. H. C. Miller, K. Yamasaki, J. E. Smedley, and S. R. Leone, "An optically pumped ultraviolet laser on $\text{SO}(\text{B}^3\Sigma^- - \text{X}^3\Sigma^-)$," *Chem. Phys. Lett.* **181**, 250 (1991).
165. J. I. Cline, C. A. Taatjes, and S. R. Leone, "Diode laser probe of $\text{I}^* \ ^2\text{P}_{1/2}$: Doppler measurements of velocity distributions," Proceedings, AIAA 22nd Fluid Dynamics, Plasma Dynamics and Lasers Conference, Honolulu, HI, 1991.
166. J. I. Cline and S. R. Leone, "Temperature dependence of the quenching of $\text{I}^*(^2\text{P}_{3/2})$ by I_2 from 300 to 800 K," *J. Phys. Chem.* **95**, 2917 (1991).

167. C. P. Lauenstein, M. J. Bastian, V. M. Bierbaum, S. M. Penn, and S. R. Leone, "Laser-induced fluorescence measurements of rotationally resolved velocity distributions for CO⁺ drifted in He," *J. Chem. Phys.* **94**, 7810 (1991).
168. J. P. J. Driessen, C. J. Smith, and S. R. Leone, "Relative cross sections for Ca(¹F₃) sublevels (|M| = 0,1,2,3) through alignment effects in collisional energy transfer: Ca(4s4f,¹F₃)+Rg → Ca(4p²,¹S₀)+Rg as a function of rare gas," *J. Phys. Chem.* **95**, 8163 (1991).
169. C. A. Taatjes, C. M. Lovejoy, B. J. Opansky, and S. R. Leone, "Laser double resonance measurements of the quenching rates of Br(²P_{1/2}) with H₂O, D₂O, HDO, and O₂," *Chem. Phys. Lett.* **182**, 39 (1991).
170. J. P. J. Driessen, C. J. Smith, and S. R. Leone, "Alignment effects of J|J=3> states prepared by three photon excitation: Six-fold symmetry in collisional energy transfer: Ca(4s4f,¹F₃) + He → Ca(4p²,¹S₀) + He," *Phys. Rev. A* **44**, R1431 (1991).
171. C. A. Taatjes and S. R. Leone, "Laser double-resonance studies of low temperature rotational and vibrational relaxation of HF: Rates for HF(J=13) + HF from 225 to 298 K and detection of HF(v=1) deactivation by HF clusters at 210–240 K," *J. Phys. Chem.* **95**, 5870 (1991).
172. R. L. Pastel, G. D. Hager, H. C. Miller, and S. R. Leone, "Efficient Br* laser pumped by frequency doubled Nd:YAG and electronic-to-vibrational transfer-pumped CO₂ and HCN lasers," *Chem. Phys. Lett.* **183**, 565 (1991).
173. K. Knutsen, V. M. Bierbaum, and S. R. Leone, "Effect of enhanced collision energy on product vibrational excitation for the proton transfer reaction: O⁻ + HF → F⁻ + OH(v=0,1)," *J. Chem. Phys.* **96**, 298 (1992).
174. F. X. Campos, G. C. Weaver, C. J. Waltman, and S. R. Leone, "Enhanced etching of Si(100) by neutral chlorine beams with kinetic energies up to 6 eV," *J. Vac. Sci. Technol. B* **10**, 2217 (1992).
175. S. R. Leone, "Orbital stereochemistry: Discovering the symmetries of collision processes," *Acc. Chem. Res.* **25**, 71 (1992).
176. P. W. Seakins and S. R. Leone, "A laser flash photolysis/time resolved FTIR emission study of a new channel in the reaction of CH₃ + O: The production of CO(v)," *J. Phys. Chem.* **96**, 4478 (1992).
177. P. G. Strupp, A. L. Alstrin, B. J. Korte, and S. R. Leone, "Pulsed laser irradiation at 532 nm of In and Ga adsorbed on Si(100): Desorption, incorporation, and damage," *J. Vac. Sci. Technol. A* **10**, 508 (1992).
178. C. M. Lovejoy, L. Goldfarb, and S. R. Leone, "Preferential in-plane rotational excitation of H₂O (001) by translational-to-vibrational transfer from 2.2 eV H atoms," *J. Chem. Phys.* **96**, 7180 (1992).
179. J. P. J. Driessen and S. R. Leone, "n-Vector correlations in collision dynamics with atomic orbital alignment: The importance of coherence for n ≥ 3," *J. Phys. Chem.* **96**, 6136 (1992).
180. C. J. Smith, J. P. J. Driessen, L. Eno, and S. R. Leone, "Laser preparation and probing of initial and final orbital alignment in collision-induced energy transfer: Ca(4s5p,¹P₁)+He → Ca(4s5p,³P₂)+He," *J. Chem. Phys.* **96**, 8212 (1992).
181. K. Knutsen, V. M. Bierbaum, and S. R. Leone, "Thermal energy reactions of OH⁻ + Cl₂, Br₂: Rate coefficients, product branching fractions, and OH product vibrational populations," *Int. J. Mass Spectrom. Ion Processes* **117**, 537 (1992).
182. A. L. Alstrin, R. V. Smilgys, P. G. Strupp, and S. R. Leone, "Vibrational distributions of As₂ in the cracking of As₄ on Si(100) and Si(111)," *J. Chem. Phys.* **97**, 6864 (1992).
183. R. deVivie-Riedle, J. P. J. Driessen, and S. R. Leone, "Three-vector correlation study of orientation and coherence effects in Na(3p,²P_{1/2}→²P_{3/2})+He: semiclassical and quantum calculations," *J. Chem. Phys.* **98**, 2038 (1993).
184. S. A. Rogers, S. D. Price, and S. R. Leone, "Charge transfer and collision-induced dissociation reactions of CO⁺⁺ with the rare gases at E_{lab}=49 eV," *J. Chem. Phys.* **98**, 280 (1993).
185. P. G. Strupp, A. L. Alstrin, B. J. Korte, and S. R. Leone, "Laser-induced desorption of In and Ga from Si(100) and adsorbate enhanced surface damage," *Materials Research Society Proceedings*, 1992, Vol. 236, p 27.
186. F. X. Campos, G. C. Weaver, C. J. Waltman, and S. R. Leone, "Activation of the Si(100)/Cl₂ etching reaction at high Cl₂ translational energies," *Materials Research Society Proceedings*, 1992, Vol. 236, p 177.
187. P. G. Strupp, A. L. Alstrin, R. V. Smilgys, and S. R. Leone, "Single photon laser ionization time-of-flight mass spectroscopy detection in molecular beam epitaxy: Application to As₄, As₂ and Ga," *Appl. Opt.* **32**, 842 (1993).
188. C. J. Smith, E. M. Spain, M. J. Dalberth, S. R. Leone, and J. P. J. Driessen, "Initial and final orbital alignment probing of the fine structure changing collisions among the Ca 4s4p ³P_J states with He: Determination of coherence and conventional cross sections," *J. Chem. Soc. Faraday Trans.* **89**, 1401 (1993).
189. A. L. Alstrin, P. G. Strupp, and S. R. Leone, "Direct detection of atomic arsenic desorption from Si(100)," *Appl. Phys. Lett.* **63**, 815 (1993).
190. S. D. Price, S. A. Rogers, and S. R. Leone, "Charge transfer and collision-induced dissociation reactions of OCS²⁺ and CO₂²⁺ with the rare gases at a laboratory collision energy of 49 eV," *J. Chem. Phys.* **98**, 9455 (1993).
191. M. J. Frost, S. Kato, V. M. Bierbaum, and S. R. Leone, "Direct observation of the simultaneous transfer of vibrational energy and charge in the ¹⁵N₂⁺(v) + ¹⁴N₂ reaction," *J. Chem. Phys.* **98**, 5993 (1993).
192. F. X. Campos, C. J. Waltman, and S. R. Leone, "Laser vaporization time-of-flight studies of cryogenic Cl₂/Xe films," *Chem. Phys. Lett.* **201**, 399 (1993).
193. J. O. P. Pedersen, B. J. Opansky, and S. R. Leone, "Laboratory studies of low temperature reactions of C₂H with C₂H₂ and implications for atmospheric models of Titan," *J. Phys. Chem.* **97**, 6822 (1993).
194. A. L. Alstrin, P. G. Strupp, L. Cook, and S. R. Leone, "Single-photon ionization and detection of Ga, In, and As_n species in GaAs growth," *SPIE Proc.* **1858**, 367 (1993).
195. M. J. Bastian, C. P. Lauenstein, V. M. Bierbaum, and S. R. Leone, "Single frequency laser probing of velocity component correlations and transport properties of Ba⁺ drifting in Ar," *J. Chem. Phys.* **98**, 9496 (1993).
196. P. W. Seakins, E. L. Woodbridge, and S. R. Leone, "A laser flash photolysis, time resolved fourier transform infrared emission study of the reaction Cl + C₂H₅ → HCl(v) + C₂H₄," *J. Phys. Chem.* **97**, 5633 (1993).
197. G. C. Weaver, F. X. Campos, and S. R. Leone, "Hyperthermal Cl atom beam produced by laser vaporization of cryogenic ICl films," in *Proceedings, Materials Research Society Vol. 285* (1993), p 249.
198. M. Manning, S. D. Price, and S. R. Leone, "Charge transfer and collision-induced dissociation reactions of CF²⁺ and

- CF_2^{2+} with rare gases at a laboratory collision energy of 49 eV," *J. Chem. Phys.* **99**, 8695 (1993).
199. S. Kato, M. J. Frost, V. M. Bierbaum, and S. R. Leone, "A selected ion flow tube laser induced fluorescence instrument for vibrationally state-specific ion molecule reactions," *Rev. Sci. Instrum.* **64**, 2808 (1993).
 200. S. A. Rogers and S. R. Leone, "Pulsed laser photolysis time-resolved FTIR emission studies of molecular dynamics," *J. Appl. Spectrosc.* **47**, 1430 (1993).
 201. B. J. Opansky, P. W. Seakins, J. O. P. Pedersen, and S. R. Leone, "Kinetics of the reaction $\text{C}_2\text{H} + \text{O}_2$ from 193 to 350 K by using laser flash kinetic infrared absorption spectroscopy," *J. Phys. Chem.* **97**, 8583 (1993).
 202. S. R. Leone, A. L. Alstrin, P. G. Strupp, and R. V. Smilgys, "Laser gas ionization technique monitors MBE crystal growth," *Laser Focus World* **29**, 65 (1993).
 203. S. Kato, M. J. Frost, V. M. Bierbaum, and S. R. Leone, "Vibrational specificity for charge transfer versus deactivation in N_2^+ ($v=0, 1, 2$) + Ar and O_2 ion-molecule reactions," *Can. J. Chem.* **72**, 625 (1994).
 204. S. D. Price, M. Manning, and S. R. Leone, "Collision induced neutral loss reactions of molecular dications," *Chem. Phys. Lett.* **214**, 553 (1993).
 205. M. J. Frost, S. Kato, V. M. Bierbaum, and S. R. Leone, "Kinetics and dynamics of vibrationally state resolved ion-molecule reactions: $^{14}\text{N}_2^+$ ($v=1$ and 2) and $^{15}\text{N}_2^+$ ($v=0, 1$ and 2) with $^{14}\text{N}_2$," *J. Chem. Phys.* **100**, 6359 (1994).
 206. S. D. Price, M. Manning, and S. R. Leone, "Bond forming reactions of gas phase molecular dications," *J. Am. Chem. Soc.* **116**, 8673 (1994).
 207. L. Young, W. T. Hill III, S. J. Sibener, S. D. Price, C. E. Tanner, C. E. Wieman, and S. R. Leone, "Precision lifetime measurements of Cs 6p $^2\text{P}_{1/2}$ and 6p $^2\text{P}_{3/2}$ by single photon counting," *Phys. Rev. A* **50**, 2174 (1994).
 208. R. M. Williams and S. R. Leone, "Investigating the 3.3 μm infrared fluorescence from naphthalene following ultraviolet excitation," *Proceedings, Diffuse Interstellar Bands* (NASA Conf. Publ. 10144) (1994).
 209. G. C. Weaver and S. R. Leone, "Scattering of Cl_2 beams from Si(100) for kinetic energies up to 2.6 eV: Implications for sticking coefficients and reaction product formation," *Surf. Sci.* **328**, 197 (1995).
 210. E. M. Spain, C. J. Smith, M. J. Dalberth, and S. R. Leone, "Orbital alignment and vector correlations in inelastic atomic collisions," *The Physics of Electronic and Atomic Collisions, ICPEAC XVIII*, AIP Conf. Proc. 295 (T. Andersen et al., Eds., Am. Inst. of Phys., New York, 1993), p 675.
 211. A. L. Alstrin, A. K. Kunz, P. G. Strupp, and S. R. Leone, "Single photon laser ionization as an in-situ diagnostic for MBE growth," *Proceedings, Materials Research Society Symposium*, Vol. 324, (1994), p 359.
 212. T. Mill and S. R. Leone, "Line-tunable electronic-to-vibrational energy transfer lasers in the mid-infrared," in *Lasers in Remote Sensing*, Proceedings of the 11th International Congress LASER '93 (Ch. Werner, W. Waidelich, Eds., Springer Verlag, 1994), p 61.
 213. A. L. Alstrin, A. K. Kunz, and S. R. Leone, "In-situ monitoring of molecular beam epitaxial growth using single photon ionization," in *SPIE Proc.* **2125**, 42 (1994).
 214. R. M. Williams and S. R. Leone, "Laboratory studies of 3.3 μm emission from naphthalene induced by 193 nm and 248 nm excitation," *Ap. J.* **443**, 675 (1995).
 215. S. M. Casey, A. L. Alstrin, A. K. Kunz, and S. R. Leone, "Laser vacuum ultraviolet single photon ionization probing of III-V semiconductor growth," in *SPIE Proc.* **2282**, 39 (1994).
 216. A. K. Kunz, A. L. Alstrin, S. M. Casey, and S. R. Leone, "Single photon ionization, laser optical probe technique for semiconductor growth," in *SPIE Proc.* **2337**, 20 (1994).
 217. J. Lindner, J. K. Lundberg, R. M. Williams, and S. R. Leone, "Pulse-to-pulse normalization of time-resolved Fourier transform emission experiments in the near infrared," *Rev. Sci. Instrum.* **66**, 2812 (1995).
 218. S. D. Price, Y-Y. Lee, M. Manning, and S. R. Leone, "Laser photodissociation of fluorinated molecular dications," *Chem. Phys.* **190**, 123 (1995).
 219. S. R. Leone, F. X. Campos, and G. C. Weaver, "Silicon etching by kinetic-energy enhanced chlorine," *1994 Proceedings of Symposium on Dry Process*, p 85 (1994).
 220. E. M. Spain, M. J. Dalberth, P. D. Kleiber, S. R. Leone, S. S. Op de Beek, and J. P. J. Driessens, "Alignment probing of Rydberg states by stimulated emission," *J. Chem. Phys.* **102**, 9522 (1995).
 221. E. M. Spain, M. J. Dalberth, P. D. Kleiber, S. R. Leone, S. S. Op de Beek, and J. P. J. Driessens, "Orbital alignment cross sections by stimulated emission probing: The state-to-state Ca Rydberg process $\text{Ca}(4s17d}^1\text{D}_2) + \text{Xe} \rightarrow \text{Ca}(4s18p}^1\text{P}_1) + \text{Xe}$," *J. Chem. Phys.* **102**, 9532 (1995).
 222. Y-Y. Lee and S. R. Leone, "Photodissociation and rare gas reactions of CCl_3^{2+} : Energetic thresholds for the CCl^+ product," *J. Phys. Chem.* **99**, 15438 (1995).
 223. J. P. J. Driessens, S. S. Op de Beek, H. C. W. Beijerinck, E. M. Spain, H. V. Parks, R. De Vivie-Riedle, and S. R. Leone, "An optical analogue of complex-valued coherence terms in atomic scattering," *Comments At. Mol. Phys.* **32**, 327 (1996).
 224. J. A. de Gouw, L. N. Ding, M. J. Frost, S. Kato, V. M. Bierbaum and S. R. Leone, "Vibrational energy dependence of the reaction $\text{N}_2^+(v) + \text{H}_2 \rightarrow \text{N}_2\text{H}^+ + \text{H}$ at thermal energies," *Chem. Phys. Lett.* **240**, 362 (1995).
 225. S. Kato, V. M. Bierbaum and S. R. Leone, "Laser fluorescence and mass spectrometric measurements of vibrational relaxation of $\text{N}_2^+(v)$ with He, Ne, Ar, Kr, and Xe," *Int. J. Mass Spectrom. Ion Processes* **150**, 469 (1995).
 226. J. M. Papanikolas, R. M. Williams, P. D. Kleiber, J. L. Hart, C. Brink, S. D. Price, and S. R. Leone, "Wave packet dynamics in the $\text{Li}_2(^1\Sigma_g^+)$ shelf state: Simultaneous observation of vibrational and rotational recurrences with single ro-vibronic control of an intermediate state," *J. Chem. Phys.* **103**, 7269 (1995).
 227. S. R. Leone, "Kinetic-energy-enhanced neutral etching," *Jpn. J. Appl. Phys.* **34**, 2073 (1995).
 228. A. K. Ott, S. M. Casey, A. L. Alstrin, and S. R. Leone, "Single-photon ionization, *in situ* optical diagnostic of molecular beam epitaxial growth of GaAs," *MRS Proc.* **406**, 101 (1996).
 229. J. J. Klaassen, J. Lindner, and S. R. Leone, "Observation of the ν_1 OH(OD) stretch of HOI and DOI by Fourier transform infrared emission spectroscopy," *J. Chem. Phys.* **104**, 7403 (1996).
 230. A. K. Ott, S. M. Casey, A. L. Alstrin, and S. R. Leone, "Chemistry of arsenic incorporation during GaAs/GaAs(100) molecular beam epitaxy probed by simultaneous laser flux monitoring and reflection high-energy electron diffraction," *J. Vac. Sci. Technol. B* **14**, 2742 (1996).
 231. S. R. Leone, Y-Y. Lee, S. D. Price, M. Manning, and S. A. Rogers, "Reactions and photofragmentation of doubly charged molecular ions: Novel pathways, structure, and energy

thresholds," *Proceedings, Symposium on Atomic, Cluster and Surface Physics* (SASP 96).

232. J. Lindner, J. K. Lundberg, C. M. Lovejoy, and S. R. Leone, "Translational to vibrational and rotational ($T \rightarrow V, R$) energy transfer and reactive exchange collisions of H(D) + HF(DF) at 2 eV by time-resolved Fourier transform spectroscopy," *J. Chem. Phys.* **106**, 2265 (1997).

233. B. J. Opansky and S. R. Leone, "Low temperature rate coefficients of C_2H with CH_4 and CD_4 from 154–359 K," *J. Phys. Chem.* **100**, 4888 (1996).

234. G. C. Weaver and S. R. Leone, "Fragmentation and recombination of molecules during laser vaporization of cryogenic films," *J. Phys. Chem.* **100**, 4188 (1996).

235. H. Q. Lorenzen, H. V. Parks, E. M. Spain, J. E. Smedley, C. H. Greene, and S. R. Leone, "Resonant formation of Ca^+ ($4s25d\ ^1D_2$) level explained by autoionization through the $3d_{3/2}9f_{5/2}, J^\pi = 2^-$ resonance," *Phys. Rev. A* **54**, 1577 (1996).

236. M. Krishnamurthy, J. A. de Gouw, V. M. Bierbaum, and S. R. Leone, "Mobilities of aromatic ions drifting in helium," *J. Phys. Chem.* **100**, 14908 (1996).

237. J. A. de Gouw, L. N. Ding, M. Krishnamurthy, H. S. Lee, E. A. Anthony, V. M. Bierbaum, and S. R. Leone, "The mobilities of NO^+ (CH_3CN)_n cluster ions ($n=0–3$) drifting in helium and in helium-acetonitrile mixtures," *J. Chem. Phys.* **105**, 10398 (1996).

238. S. Kato, J. A. deGouw, C.-D. Lin, V. M. Bierbaum, and S. R. Leone, "Charge transfer rate constants for N_2^+ ($v=0–4$) with Ar at thermal energies," *Chem. Phys. Lett.* **256**, 305 (1996).

239. S. Kato, J. A. de Gouw, C.-D. Lin, V. M. Bierbaum, and S. R. Leone, "Vibrational enhancement of the charge transfer rate constant of $N_2^+(v=0–4)$ with Kr at thermal energies," *J. Chem. Phys.* **105**, 5455 (1996).

240. M. P. Knowles and S. R. Leone, "Hyperthermal (1–10 eV) cobalt deposition on Si(100)," *Chem. Phys. Lett.* **258**, 217 (1996).

241. B. J. Opansky and S. R. Leone, "Rate coefficients of C_2H with CH_4 , C_2H_6 , and H_2 from 150–359 K," *J. Chem. Phys.* **100**, 19904 (1996).

242. R. M. Williams, J. M. Papanikolas, J. Rathje, and S. R. Leone, "Quantum-state resolved 2-level femtosecond rotational coherence spectroscopy: determination of rotational constants at medium and high J in Li_2 , a simple diatomic system," *Chem. Phys. Lett.* **261**, 405 (1996).

243. M. Krishnamurthy, J. A. de Gouw, L. N. Ding, V. M. Bierbaum, and S. R. Leone, "Mobility and formation kinetics of $NH_4^+(NH_3)_n$ cluster ions ($n=0–3$) in helium and helium/ammonia mixtures," *J. Chem. Phys.* **106**, 530 (1997).

244. R. A. Loomis, J. J. Klaassen, Jörg Lindner, P. G. Christopher, and S. R. Leone, "Fourier transform infrared emission study of the mechanism and dynamics of HOI formed in the reaction of alkyl iodides with $O(^3P)$," *J. Chem. Phys.* **106**, 3934 (1997).

245. H. Meyer and S. R. Leone, "Preparation and probing of alignment in molecular ensembles by saturated coherent pulsed laser excitation," *J. Chem. Phys.* **105**, 5858 (1996).

246. R. J. Hoobler, B. J. Opansky, and S. R. Leone, "Low-temperature rate coefficients for reactions of ethynyl radical (C_2H) with propane, isobutane, n-butane and neopentane," *J. Phys. Chem. A* **101**, 1338 (1997).

247. A. K. Ott, S. M. Casey, and S. R. Leone, "Laser ionization measurements of gaseous gallium atom desorption from GaAs(100) during molecular beam epitaxy," *Appl. Surf. Sci.* **119**, 301 (1997).

248. R. M. Williams, J. M. Papanikolas, J. Rathje, and S. R. Leone, "Compositional control of rovibrational wave packets in the $E(^1\Sigma_g^+)$ "shelf" state of Li_2 via quantum-state-resolved intermediate state selection," *J. Chem. Phys.* **106**, 8310 (1997).

249. Y-Y. Lee, S. R. Leone, P. Champkin, N. Kaltosyannis and S. D. Price, "Laser photofragmentation and collision-induced reactions of SiF_2^{2+} and SiF_3^{2+} ," *J. Chem. Phys.* **106**, 7981 (1997).

250. J. A. de Gouw, M. Krishnamurthy, V. M. Bierbaum, and S. R. Leone, "Measured and calculated mobilities of cluster ions drifting in helium and in nitrogen," *Int. J. Mass Spectrom. Ion Processes* **167/168**, 281 (1997).

251. E. B. Anthony, W. Schade, M. J. Bastian, V. M. Bierbaum, and S. R. Leone, "Laser probing of velocity-subgroup dependent rotational alignment of N_2^+ drifted in He," *J. Chem. Phys.* **106**, 5413 (1997).

252. M. P. Knowles and S. R. Leone, "Generation of a velocity selected, pulsed source of hyperthermal (1–10 eV) neutral metal atoms for thin film growth studies," *J. Vac. Sci. Technol. A* **15**, 2709 (1997).

253. N. Materer, R. S. Goodman, and S. R. Leone, "Laser single-photon ionization mass spectrometry measurements of $SiCl$ and $SiCl_2$ during thermal etching of Si(100)," *J. Vac. Sci. Technol. A* **15**, 2134 (1997).

254. J. M. Papanikolas, R. M. Williams, and S. R. Leone, "Manipulation of rovibrational wave packet composition in the Li_2 $E(^1\Sigma_g^+)$ shelf state using intermediate state selection and shaped femtosecond laser pulses," *J. Chem. Phys.* **107**, 4172 (1997).

255. A. K. Ott, S. M. Casey, and S. R. Leone, "Laser ionization mass spectrometry measurements of arsenic sticking and incorporation during GaAs(100) homoepitaxy," *J. Cryst. Growth* **181**, 326 (1997).

256. W. Schade, D. L. Osborn, J. Preusser, and S. R. Leone, "Spectroscopic characterization of semiconductor surface impurities by near-field scanning optical microscopy," *Laser Applications to Chemical and Environmental Analysis, Technical Digest* (OSA '98) Vol. 3, p 131.

257. R. S. Goodman, N. Materer, and S. R. Leone, "Ar, N_2 and Cl_2 electron cyclotron resonance plasmas measured by time-of-flight analysis: Neutral kinetic energies and source gas cracking," *J. Vac. Sci. Technol. B* **15**, 971 (1997).

258. J. A. de Gouw, M. Krishnamurthy, and S. R. Leone, "The mobilities of ions and cluster ions drifting in polar gases," *J. Chem. Phys.* **106**, 5937 (1997).

259. N. Materer, R. S. Goodman, and S. R. Leone, "Comparison of electron cyclotron resonance and radio-frequency inductively coupled plasmas of Ar and N_2 : Neutral kinetic energies and source gas cracking," *J. Appl. Phys.* **83**, 1917 (1998).

260. M. Krishnamurthy, V. M. Bierbaum, and S. R. Leone, "Vibrational state dependence of the N_2^+ ($v=0–3$) + HCl reaction at thermal energies," *Chem. Phys. Lett.* **281**, 49 (1997).

261. A. K. Ott, S. M. Casey, and S. R. Leone, "Arsenic desorption kinetics from Si(100)," *Surf. Sci.* **405**, 228 (1998).

262. R. J. Hoobler and S. R. Leone, "Rate coefficients for reactions of ethynyl radical (C_2H) with hydrogen cyanide and acetonitrile: Implications for the formation of complex nitriles on Titan," *J. Geophys. Res.* **102**, 28,717 (1997).

263. M. J. Frost, S. Kato, V. M. Bierbaum, and S. R. Leone, "Reactions of $N_2^+(v)$ with CO and NO," *Chem. Phys.* **231**, 145 (1998).

264. J. Lindner, R. A. Loomis, J. J. Klaassen, and S. R. Leone, "A laser photolysis/time resolved Fourier transform infrared

- emission study of OH(X²Π, v) produced in the reaction of alkyl radicals with O(³P),” *J. Chem. Phys.* **108**, 1944 (1998).
265. R. Uberna, M. Khalil, R. M. Williams, J. M. Papanikolas, and S. R. Leone, “Phase and amplitude control in the formation and detection of rotational wave packets in the E^{1Σ_g⁺ state of Li₂,” *J. Chem. Phys.* **108**, 9259 (1998).}
266. W. Schade, D. L. Osborn, J. Preusser, and S. R. Leone, “Two-color cross correlation of fs-laser pulses by two-photon induced photoconductivity for near and far field optical measurements,” *Opt. Commun.* **150**, 27 (1998).
267. R. A. Loomis, S. R. Leone, and M. K. Gilles, “Novel five-membered ring intermediates in gas phase reactions,” *Res. Chem. Intermed.* **24**, 707 (1998).
268. H. V. Parks, E. M. Spain, J. E. Smedley, and S. R. Leone, “Experimental investigation of the initial-state alignment dependence in the energy pooling process: Ca(4s4p³P₁) + Ca(4s4p³P₁) → Ca(4s4p¹P₁) + Ca(4s²),” *Phys. Rev. A* **58**, 2136 (1998).
269. S. Kato, V. M. Bierbaum, and S. R. Leone, “Multi-quantum vibrational deactivation of N₂^{+(v)} by collisions with N₂ and O₂ at thermal energies,” *J. Phys. Chem. A* **102**, 6659 (1998).
270. W. Schade, D. L. Osborn, J. Preusser, and S. R. Leone, “Imaging of semiconductor surface impurities by femtosecond near-field photoconductivity,” *Proceedings, International Quantum Electronics Conference (IQEC '98)*, p 229.
271. R. S. Goodman, N. Materer, and S. R. Leone, “Ion-enhanced etching of Si(100) with molecular chlorine: Reaction mechanisms and product yields,” *J. Vac. Sci. Technol. A* **17**, 3340 (1999).
272. R. J. Hoobler and S. R. Leone, “Low-temperature rate coefficients for reactions of the ethynyl radical (C₂H) with C₃H₄ isomers methylacetylene and allene,” *J. Phys. Chem. A* **103**, 1342 (1999).
273. R. A. Loomis, J. P. Reid, and S. R. Leone, “Photofragmentation of ammonia at 93.3 nm: Bimodal rotational distributions and vibrational excitation of NH₂(Å),” *J. Chem. Phys.* **112**, 658 (2000).
274. W. Schade, J. Preusser, D. L. Osborn, Y. Y. Lee, J. deGouw, and S. R. Leone, “Spatially resolved femtosecond time correlation measurements on a GaAsP photodiode,” *Opt. Commun.* **162**, 200 (1999).
275. R. Uberna, Z. Amitay, R. A. Loomis, and S. R. Leone, “Phase control of wave packet dynamics using shaped femtosecond pulses,” *Faraday Discuss.* **113**, 385 (1999).
276. B. Dragnea, J. Preusser, W. Schade, S. R. Leone, and W. D. Hinsberg, “Transmission near-field scanning microscope for infrared chemical imaging,” *J. Appl. Phys.* **86**, 2795 (1999).
277. H. V. Parks and S. R. Leone, “Initial and final state alignment and orientation effects in Ca energy pooling,” *Phys. Rev. A* **60**, 2944 (1999).
278. N. Materer, R. S. Goodman, and S. R. Leone, “Temperature dependence of neutral and positively charged Si and SiCl etch products during argon-ion enhanced etching of Si(100) by Cl₂,” *J. Vac. Sci. Technol. B* **18**, 191 (2000).
279. J. Li, V. M. Bierbaum, and S. R. Leone, “Laser ionization time-of-flight mass spectrometer detection of methyl radical produced by ion reactions in a flowing afterglow apparatus,” *Chem. Phys. Lett.* **313**, 76 (1999).
280. H. V. Parks and S. R. Leone, “Alignment and orientation effects in Sr energy pooling,” *J. Phys. Chem.* **103**, 10042 (1999).
281. C. L. Berrie and S. R. Leone, “Observation of monolayer and bilayer period RHEED oscillations during epitaxial growth of Ge on Ge(100),” *J. Cryst. Growth* **216**, 159 (2000).
282. N. Materer, Rory S. Goodman, and Stephen R. Leone, “Ion-enhanced etching of Si(100) with molecular chlorine: neutral and ionic product yields as a function of ion kinetic energy,” *J. Phys. Chem. B* **104**, 3261 (2000).
283. S. Lee, D. A. Samuels, R. J. Hoobler, and S. R. Leone, “Direct measurements of rate coefficients for the reaction of ethynyl radical (C₂H) with C₂H₂ at 90 and 120 K using a pulsed Laval nozzle apparatus,” *J. Geophys. Res.* **105**, 15085 (2000).
284. J. P. Reid, R. A. Loomis and S. R. Leone, “Characterization of dynamical product state distributions by spectral extended cross-correlation: Vibrational dynamics in the photo-fragmentation of NH₂D and ND₂H,” *J. Chem. Phys.* **112**, 3181 (2000).
285. J. P. Reid, C. X.W. Qian and S. R. Leone, “Probing the cyclic transition state in the reaction O(³P) + alkyl iodides to form HOI: Electronic, steric and thermodynamic factors influencing the reaction pathway,” *Phys. Chem. Chem. Phys.* **2**, 853 (2000).
286. S. Lee, R. J. Hoobler, and S. R. Leone, “A pulsed Laval nozzle apparatus with laser ionization mass spectroscopy for direct measurements of rate coefficients at low temperatures with condensable gases,” *Rev. Sci. Instrum.* **71**, 1816 (2000).
287. D. L. Osborn and S. R. Leone, “Spectral and intensity dependence of spatially resolved two-photon conductivity defects on a GaAsP photodiode,” *J. Appl. Phys.* **89**, 626 (2001).
288. Z. Amitay, R. Uberna, and S. R. Leone, “Time-shifting the dynamics of Li₂ multistate rovibrational wave packets by state selective coherent phase control,” *Advances in Multiphoton Processes and Spectroscopy*, Vol. 14. Quantum Control of Molecular Reactions Dynamics: Proceedings from the US Japan Workshop. R. J. Gordon and Y. Fujimura, eds. **14**, 3 (World Scientific Singapore, 2001).
289. E. B. Anthony, M. J. Bastian, V. M. Bierbaum, and S. R. Leone, “Laser probing of rotational-state-dependent velocity distributions of N₂^{+(v''=0,J)} drifted in He,” *J. Chem. Phys.* **112**, 10269 (2000).
290. L. Nugent-Glandorf, M. Scheer, M. Krishnamurthy, J. W. Odom and S. R. Leone, “Photoelectron spectroscopic determination of the energy bandwidths of high harmonics (7th-55th) produced by an ultrafast laser in neon,” *Phys. Rev. A* **62**, 023812–1 (2000).
291. J. P. Reid, R. A. Loomis and S. R. Leone, “Competition between N–H and N–D bond cleavage in the photodissociation of NH₂D and ND₂H,” *J. Phys. Chem.* **104**, 10139 (2000).
292. J. P. Reid, R. A. Loomis and S. R. Leone, “The effect of parent zero-point motion on the ND₂ (Å) rotational state distribution in the 193.3 nm photolysis of ND₃, *Chem. Phys. Lett.* **324**, 240 (2000).
293. E. Mirowski and S. R. Leone, “Enhancement in the crystalline quality of palladium silicide films: multiple versus single deposition,” *J. Cryst. Growth* **219**, 368 (2000).
294. R. Uberna, Z. Amitay, C. X. W. Qian, and S. R. Leone, “Background-free measurements of wavelength-dependent coherent photoionization cross sections of Li₂ wave packets in the E^{1Σ_g⁺ state: The role of autoionizing Rydberg states,” *J. Chem. Phys.* **114**, 10311 (2001).}
295. J. P. Reid, T. P. Marcy, S. Kuehn and S. R. Leone, “The direct production of CO(v=1–9) in the reaction of O(³P) with the ethyl radical,” *J. Chem. Phys.* **113**, 4572 (2000).
296. L. Pesce, Z. Amitay, R. Uberna, S. R. Leone, M. Ratner, and R. Kosloff, “Quantum dynamics simulation of the ultrafast photoionization of Li₂,” *J. Chem. Phys.* **114**, 1259 (2001).

297. B. Dragnea, J. Preusser, J. M. Szarko, and S. R. Leone, "Pattern characterization of deep-ultraviolet photoresists by near-field infrared microscopy," *J. Vac. Sci. Technol. B* **19**, 142 (2001).
298. B. Dragnea, J. Preusser, J. M. Szarko, L. A. McDonough and S. R. Leone, "Chemical mapping of patterned polymer photoresists by near-field infrared microscopy," *Appl. Surf. Sci.* **175**, 783 (2001).
299. S. Lee and S. R. Leone, "Rate coefficients for the reaction of C₂H with O₂ at 90 K and 120 K using a pulsed Laval nozzle apparatus," *Chem. Phys. Lett.* **329**, 443 (2000).
300. C. L. Berrie, B. Liu, and S. R. Leone, "Defect controlled diffusion in the epitaxial growth of germanium on Si(100)," *Appl. Surf. Sci.* **175**, 69 (2001).
301. J. Li, V. M. Bierbaum, S. R. Leone, "Laser-induced fluorescence study of two weak vibrational bands of the O₂⁺ A²P_u - X²P_g system," *Chem. Phys. Lett.* **330**, 331 (2000).
302. T. P. Marcy, J. P. Reid, C. X. W. Qian and S. R. Leone, "Addition-insertion elimination reactions of O(³P) with halogenated iodoalkanes producing HF(v) and HCl(v)," *J. Chem. Phys.* **114**, 2251 (2001).
303. E. B. Anthony, V. M. Bierbaum and S. R. Leone, "Rotational-state and velocity subgroup dependence of the rotational alignment of N₂⁺ drifted in He," *J. Chem. Phys.* **114**, 6654 (2001).
304. B. Dragnea and S. R. Leone, "Advances in sub-micron infrared vibrational band chemical imaging," *Int. Rev. Phys. Chem.* **20**, 59 (2001).
305. Z. Amitay, J. B. Ballard, H. U. Stauffer, and S. R. Leone, "Phase-tailoring molecular wave packets to time-shift their dynamics," *Chem. Phys.* **267**, 141 (2001).
306. A. B. Vakhtin, S. Lee, D. E. Heard, I. W. M. Smith, and S. R. Leone, "Low temperature kinetics of reactions of the OH radical with propene and 1-butene studied by a pulsed Laval nozzle apparatus combined with laser-induced fluorescence," *J. Phys. Chem. A* **105**, 7889 (2001).
307. T. P. Marcy, R. R. Diaz, D. E. Heard, L. B. Harding, S. J. Klippenstein, and S. R. Leone, "Theoretical and experimental investigation of the dynamics of the production of CO from the CH₃ + O and CD₃ + O reactions," *J. Phys. Chem. A* **105**, 8361 (2001).
308. A. B. Vakhtin, D. E. Heard, I. W. M. Smith, and S. R. Leone, "Kinetics of reactions of C₂H radical with acetylene, O₂, methylacetylene, and allene in a pulsed Laval nozzle apparatus at T = 103K," *Chem. Phys. Lett.* **344**, 317 (2001).
309. J. Vala, Z. Amitay, S. R. Leone and R. Kosloff, "Implementation of the Deutsch Jozsa algorithm with rovibrational molecular wave packets," Proceedings of the International Conference on Quantum Information, Rochester, NY, Optical Society of America (2001).
310. H. U. Stauffer, J. B. Ballard, Z. Amitay, and S. R. Leone, "State-selective phase control of molecular wave packets in two electronic states," *Proceedings, Coherence and Quantum Optics 08*, Rochester, NY, Optical Society of America (2001).
311. L. Nugent-Glandorf, M. Scheer, D. A. Samuels, A. M. Mulhisen, E. R. Grant, X. Yang, V. M. Bierbaum and S. R. Leone, "Ultrafast time-resolved soft x-ray photoelectron spectroscopy of dissociating Br₂," *Phys. Rev. Lett.* **87**, 193002 (2001).
312. J. Vala, Z. Amitay, B. Zhang, S. R. Leone, and R. Kosloff, "Experimental implementation of the Deutsch-Josza algorithm for three-qubit functions using pure coherent molecular superpositions," *Phys. Rev. A* **66**, 062316 (2002).
313. C. L. Berrie and S. R. Leone, "Desorption of arsenic species during the surfactant enhanced growth of Ge on Si(100)," *J. Phys. Chem. B* **106**, 6488 (2002).
314. R. A. Bartels, T. C. Weinacht, S. R. Leone, H. C. Kapteyn and M. M. Murnane, "Nonresonant control of multi-mode molecular wave packets at room temperature," *Phys. Rev. Lett.* **88**, 033001 (2002).
315. Z. Amitay, R. Kosloff, and S. R. Leone, "Experimental coherent computation of a multiple-input AND gate using pure molecular superpositions," *Chem. Phys. Lett.* **359**, 8 (2002).
316. A. B. Vakhtin, D. E. Heard, I. W. M. Smith, and S. R. Leone, "Kinetics of C₂H radical reactions with ethene, propene and 1-butene measured in a pulsed Laval nozzle apparatus at T = 103 and 296 K," *Chem. Phys. Lett.* **348**, 21 (2001).
317. T. Kitajima, B. Liu and S. R. Leone, "Two-dimensional periodic alignment of self-assembled Ge islands on patterned Si(001) surfaces," *Appl. Phys. Lett.* **80**, 497 (2002).
318. J. Ballard, H. U. Stauffer, Z. Amitay, and S. R. Leone, "Optimization of wave packet coefficients in Li₂ using an evolutionary algorithm: The role of resonant and nonresonant wavelengths," *J. Chem. Phys.* **116**, 1350 (2002).
319. H. U. Stauffer, J. B. Ballard, Z. Amitay, and S. R. Leone, "Simultaneous phase control of Li₂ wave packets in two electronic states," *J. Chem. Phys.* **116**, 946 (2002).
320. B. Liu, C. L. Berrie, T. Kitajima, J. Bright, and S. R. Leone, "Atomic force microscopy study of the growth and annealing of Ge islands on Si(100)," *J. Vac. Sci. Technol. B* **20**, 678 (2002).
321. T. P. Marcy, D. E. Heard, and S. R. Leone, "Product studies of inelastic and reactive collisions of NH₂ + NO: Effects of vibrationally and electronically excited NH₂," *J. Phys. Chem. A* **106**, 8249 (2002).
322. L. Nugent-Glandorf, M. Scheer, D. A. Samuels, V. M. Bierbaum, and S. R. Leone, "A laser-based instrument for the study of ultrafast chemical dynamics by soft x-ray-probe photoelectron spectroscopy," *Rev. Sci. Instrum.* **73**, 1875 (2002).
323. B. Liu, C. L. Berrie, T. Kitajima, and S. R. Leone, "Arsenic-induced Ge island morphology changes during molecular beam epitaxy of Ge on Si(001)," *J. Cryst. Growth* **241**, 271 (2002).
324. J. Husband and S. R. Leone, "Mobilites: Small systems," in *Encyclopedia of Mass Spectrometry*, Vol. 5: Theory and Ion Chemistry, edited by P. B. Armentrout, (Elsevier, Amsterdam, 2003), p 498.
325. J. B. Ballard, H. U. Stauffer, E. Mirowski, and S. R. Leone, "Simultaneous control of time-dependent population transfer dynamics and wave-packet quantum interferences in Li₂ by shaped ultrafast pulses," *Phys. Rev. A* **66**, 043402 (2002).
326. L. Nugent-Glandorf, M. Scheer, D. A. Samuels, V. M. Bierbaum, and S. R. Leone, "Ultrafast photodissociation of Br₂: Laser-generated high-harmonic soft x-ray probing of the transient photoelectron spectra and ionization cross sections," *J. Chem. Phys.* **117**, 6108 (2002).
327. E. Mirowski, H. U. Stauffer, J. B. Ballard, B. Zhang, C. L. Hetherington, and S. R. Leone, "Effect of nonresonant frequencies on the enhancement of quantum beat amplitudes in rovibrational states of Li₂: The role of state spacing," *J. Chem. Phys.* **117**, 11228 (2002).
328. B. Dragnea, J. M. Szarko, S. Kowarik, T. Weimann, J. Feldmann, and S. R. Leone, "Near-field surface plasmon excitation on structured gold films," *Nano Lett.* **3**, 3 (2003).
329. D. A. Samuels, T. C. Weinacht, O. L. A. Monti, E. Gershgoren, S. R. Leone, H. C. Kapteyn, M. M. Murnane and R. A. Bartels, "Making and measuring vibrational wave packets

- in small molecules through nonresonant impulsive stimulated Raman scattering," *Proceedings of the International Conference on Ultrafast Phenomena XIII*, Vancouver, BC, Canada, Optical Society of America (2002), p 91.
330. S. R. Leone, J. Husband and V. M. Bierbaum, "Mobility determinations of molecular ions for hypersonics," American Institute of Aeronautics and Astronautics **2003-705**, 1 (2003).
331. L. A. McDonough, B. Dragnea, J. Preusser, S. R. Leone, and W. D. Hinsberg, "Water vapor uptake in photolithographic polymers observed by infrared near-field scanning optical microscopy in a controlled environment," *J. Phys. Chem. B* **107**, 4951 (2003).
332. J. E. Murphy, A. B. Vakhtin, and S. R. Leone, "Laboratory kinetics of C₂H radical reactions with ethane, propane, and *n*-butane at T=96–296 K: implications for Titan," *Icarus* **163**, 175 (2003).
333. A. B. Vakhtin, J. E. Murphy, and S. R. Leone, "Low-temperature kinetics of reactions of OH radical with ethene, propene, and 1-butene," *J. Phys. Chem. A* **107**, 10055 (2003).
334. A. B. Vakhtin, D. C. McCabe, A. R. Ravishankara, and S. R. Leone, "Low-temperature kinetics of the reaction of the OH radical with hydrogen peroxide," *J. Phys. Chem. A* **107**, 10642 (2003).
335. E. O. Potma, X. S. Xie, L. Muntean, J. Preusser, D. Jones, J. Ye, S. R. Leone, W. D. Hinsberg, and W. Schade, "Chemical imaging of photoresists with coherent anti-Stokes Raman scattering (CARS) microscopy," *J. Phys. Chem. B* **108**, 1296 (2004).
336. J. B. Ballard, A. N. Arrowsmith, L. Hüwel, X. Dai, and S. R. Leone, "Inducing a sign inversion in one state of a two-state superposition using ultrafast pulse shaping," *Phys. Rev. A* **68**, 043409 (2003).
337. B. Nizamov and S. R. Leone, "Kinetics of C₂H reactions with hydrocarbons and nitriles in the 104–296 K temperature range," *J. Phys. Chem. A* **108**, 1746 (2004).
338. L. H. Haber, J. Husband, J. Plenge, and S. R. Leone, "Mobility of t-C₄H₉⁺ in polar and nonpolar atmospheric gases," *Chem. Phys. Lett.* **384**, 219 (2004).
339. S. Kato, S. R. Leone, V. M. Bierbaum, and L. H. Haber, "Mobilities and reactivities of molecular ions in combustion and hypersonics," American Institute of Aeronautics and Astronautics **2004-1015**, 1 (2004).
340. B. Nizamov and S. R. Leone, "Rate coefficients and kinetic isotope effect for the C₂H reactions with NH₃ and ND₃ in the 104 – 294 K temperature range," *J. Phys. Chem. A* **108**, 3766 (2004).
341. J. Shu, D. S. Peterka, S. R. Leone, and M. Ahmed, "Tunable synchrotron vacuum ultraviolet ionization, time-of-flight investigation of the photodissociation of *trans*-crotonaldehyde at 193 nm," *J. Phys. Chem. A* **108**, 7895 (2004).
342. V. Chikan, B. Nizamov and S. R. Leone, "Product state distributions of vibrationally excited CO(v) for the CH(X²Π) and CH(A²Δ) channels of the C₂H+O(³P) reaction," *J. Phys. Chem. A* **108**, 10770 (2004).
343. B. Liu, T. Kitajima, T. H. Zhang, C. Borca, and S. R. Leone, "Imaging of defect-mediated surface morphology of GaN(0001) grown on sapphire by molecular beam epitaxy," *J. Appl. Phys.* **97**, 023509 (2005).
344. Z. H. Kim, B. Liu, and S. R. Leone, "Nanometer-scale optical imaging of epitaxially grown GaN and InN islands using apertureless near-field microscopy," *J. Phys. Chem. B* **109**, 8503 (2005).
345. J. B. Ballard, X. Dai, A. N. Arrowsmith, L. Hüwel, H. U. Stauffer, and S. R. Leone, "Observation of wave packets with simultaneous electronic, vibrational, and rotational degrees of freedom in Li₂," *Chem. Phys. Lett.* **402**, 27 (2005).
346. J. M. Szarko, J. K. Song, C. W. Blackledge, I. Swart, S. R. Leone, S. Li, and Y. Zhao, "Optical injection probing of single ZnO tetrapod lasers," *Chem. Phys. Lett.* **404**, 171 (2005).
347. V. G. Stavros, E. Harel, and S. R. Leone, "The influence of intense control laser pulses on homodyne-detected rotational wave packet dynamics in O₂ by degenerate four-wave mixing," *J. Chem. Phys.* **122**, 064301 (2005).
348. X. Dai, E. A. Torres, E. W. Lerch, D. J. Wilson, and S. R. Leone, "Preparation of a wave packet through a mixed level in Li₂; predissociation of one member of the superposition," *Chem. Phys. Lett.* **402**, 126 (2005).
349. L. A. McDonough, V. Chikan, Z. H. Kim, S. R. Leone and W. D. Hinsberg, "Fourier transform infrared spectroscopy studies of water-polymer interactions in chemically amplified photoresists," *J. Vac. Sci. Technol. B* **23**, 344 (2005).
350. V. Chikan and S. R. Leone, "Vibrational distributions of the CO(v) products of the C₂H₂ + O(³P) and HCCO + O(³P) reactions studied by FTIR emission," *J. Phys. Chem. A* **109**, 2525 (2005).
351. B. Liu, T. Kitajima, D. Chen, and S. R. Leone, "Growth modes of InN (000–1) on GaN buffer layers on sapphire," *J. Vac. Sci. Technol. A* **23**, 304 (2005).
352. S. Gilb, V. Nestorov, S. R. Leone, J. C. Keske, L. Nugent-Glandorf, and E. R. Grant, "Kr (n = 5–10, s, d, g) electronic wave packets: Electron time-of-flight resolution and the ac-Stark shift during wave-packet preparation," *Phys. Rev. A* **71**, 042709 (2005).
353. J. Shu, K. R. Wilson, A. N. Arrowsmith, M. Ahmed, and S. R. Leone, "Light scattering of ultrafine silica particles by VUV synchrotron radiation," *Nano Lett.* **5**, 1009 (2005).
354. L. Muntean, R. Planques, A. L. D. Kilcoyne, S. R. Leone, M. K. Gilles, and W. D. Hinsberg, "Chemical mapping of polymer photoresists by scanning transmission x-ray microscopy (STXM)," *J. Vac. Sci. Technol. B* **23**, 1630 (2005).
355. J. K. Song, J. M. Szarko, S. R. Leone, S. Li, and Y. Zhao, "Ultrafast wavelength-dependent lasing-time dynamics in single ZnO nanotetrapod and nanowire lasers," *J. Phys. Chem. B* **109**, 15749 (2005).
356. S.H. Lim, A. G. Caster, and S. R. Leone, "Single pulse phase-control interferometric coherent anti-Stokes Raman scattering spectroscopy (CARS)," *Phys. Rev. A* **72**, 041803 (2005).
357. V. Chikan, S. R. Leone, "Vibrational and rotational distributions of the CH(A²Δ) product of the C₂H + O(³P) reaction studied by fourier transform visible (FTVIS) emission spectroscopy," *J. Phys. Chem. A* **109**, 10646 (2005).
358. V. Chikan, F. Fournier, B. Nizamov, and S. R. Leone, "State-resolved dynamics of the CH(A²Δ) channels from single and multiple photon dissociation of bromoform in the 10–20 eV energy range," *J. Phys. Chem. A* **110**, 2850 (2006).
359. R. B. Metz, C. Nicolas, M. Ahmed, and S. R. Leone, "Direct determination of the ionization energies of FeO and CuO with VUV radiation," *J. Chem. Phys.* **123**, 114313 (2005).
360. J. Shu, K. R. Wilson, M. Ahmed, S. R. Leone, C. Graf, and E. Rühl, "Elastic light scattering from nanoparticles by monochromatic vacuum-ultraviolet radiation," *J. Chem. Phys.* **124**, 034707 (2006).
361. K. R. Wilson, M. Jimenez-Cruz, C. Nicolas, L. Belau, S. R. Leone, and M. Ahmed, "Thermal vaporization of biological nanoparticles: fragment-free VUV photoionization mass spectra of tryptophan, phenylalanine-glycine-glycine and β-carotene," *J. Phys. Chem. A* **110**, 2106 (2006).

362. D. Strasser, T. Pfeifer, B. J. Hom, A. M. Müller, J. Plenge, and S. R. Leone, "Coherent interaction of femtosecond extreme-UV light with He atoms," *Phys. Rev. A* **73**, 021805 (2006).
363. C. Nicolas, J. Shu, D. S. Peterka, M. Hochlaf, L. Poisson, S. R. Leone, and M. Ahmed, "Vacuum ultraviolet photoionization of C_3 ," *J. Am. Chem. Soc.* **128**, 220 (2006).
364. T. Pfeifer, L. Gallmann, M. Abel, D. M. Neumark, and S. R. Leone, "Single attosecond pulse generation in the multi-cycle driver regime by adding a weak second harmonic field," *Opt. Lett.* **31**, 975 (2006).
365. F. Goulay, and S. R. Leone, "Low temperature rate coefficients for the reaction of ethynyl radical (C_2H) with benzene," *J. Phys. Chem. A* **110**, 1875 (2006).
366. E. W. Lerch, X. Dai, S. Gilb, E. A. Torres, and S. R. Leone, "Control of Li_2 wave packet dynamics by modification of the quantum mechanical amplitude of a single state," *J. Chem. Phys.* **124**, 044306 (2006).
367. K. R. Wilson, L. Belau, C. Nicolas, M. Jimenez-Cruz, S. R. Leone, and M. Ahmed, "Direct determination of the ionization energy of histidine with VUV synchrotron radiation," *Int. J. Mass Spectrosc.* **249**, 155 (2006).
368. X. Dai, E. W. Lerch, and S. R. Leone, "Coherent control through near-resonant Raman transitions," *Phys. Rev. A* **73**, 023404 (2006).
369. K. L. Knappenberger, Jr., S. Gilb, V. G. Stavros, E. W. Lerch, E. A. Torres, D. Strasser, L. Lau, and S. R. Leone, "Ultrafast wave packet, coherent control and dissociation dynamics," in *Femtochemistry VII: Fundamental ultrafast processes in chemistry, physics, and biology*; Castleman, A. W., Jr., Kimble, M. L., Eds.; Elsevier: Amsterdam, p 14 (2006).
370. T. Pfeifer, L. Gallmann, M. J. Abel, D. M. Neumark, and S. R. Leone, "Circular phase-mask for control and stabilization of optical filaments," *Opt. Lett.* **31**, 2326 (2006).
371. V. G. Stavros, L. Lau, D. Strasser, and S. R. Leone, "Coherent ultrafast photoelectron spectroscopy in Br_2 : An alternative method for measuring $\Delta v=0$ transitions in Rydberg-to-Rydberg excitations," *J. Chem. Phys.* **124**, 174307 (2006).
372. J. Shu, K. R. Wilson, M. Ahmed, and S. R. Leone, "Coupling a versatile aerosol apparatus to a synchrotron: Vacuum ultraviolet light scattering, photoelectron imaging, and fragment free mass spectrometry," *Rev. Sci. Instrum.* **77**, 043106 (2006).
373. Z. H. Kim, and S. R. Leone, "High-resolution aperture-less near-field optical imaging using gold nanosphere probes," *J. Phys. Chem. B* **110**, 19804 (2006).
374. K. R. Wilson, D. S. Peterka, M. Jimenez-Cruz, S. R. Leone, and M. Ahmed, "VUV photoelectron imaging of biological nanoparticles: ionization energy determination of nanophase glycine and phenylalanine-glycine-glycine," *Phys. Chem. Chem. Phys.* **8**, 1884 (2006).
375. S. H. Lim, A. G. Caster, O. Nicolet, and S. R. Leone, "Chemical imaging by single pulse interferometric coherent anti-Stokes Raman scattering microscopy," *J. Phys. Chem. B* **110**, 5196 (2006).
376. T. Pfeifer, L. Gallmann, M. J. Abel, P. M. Nagel, D. M. Neumark, and S. R. Leone, "Heterodyne mixing of laser fields for temporal gating of high-harmonic generation," *Phys. Rev. Lett.* **97**, 163901 (2006).
377. J. Plenge, C. Nicolas, A. G. Caster, M. Ahmed, and S. R. Leone, "Two-color visible/vacuum ultraviolet photoelectron imaging dynamics of Br_2 ," *J. Chem. Phys.* **125**, 133315 (2006).
378. C. W. Blackledge, J. M. Szarko, A. Dupont, G. H. Chan, E. L. Read, and S. R. Leone, "Zinc oxide nanorod growth on gold islands prepared by microsphere lithography on silicon and quartz," *J. Nanosci. Nanotechnol.* **7**, 3336 (2007).
379. E. F. Gloaguen, E. R. Mysak, S. R. Leone, M. Ahmed, and K. R. Wilson, "Investigating the chemical composition of mixed organic-inorganic particles by soft vacuum ultraviolet photoionization: The reaction of ozone with anthracene on sodium chloride particles," *Int. J. Mass. Spectrosc.* **258**, 74 (2006).
380. A. G. Caster, S. H. Lim, O. Nicolet, and S. R. Leone, "Chemically selective imaging with broadband CARS Microscopy," *Spectroscopy* **21**, 9 (2006).
381. G. Meloni, P. Zou, S. J. Klippenstein, M. Ahmed, S. R. Leone, C. A. Taatjes, and D. L. Osborn, "Energy-resolved photoionization of alkylperoxy radicals and the stability of their cations," *J. Am. Chem. Soc.* **128**, 13559 (2006).
382. A. N. Arrowsmith, V. Chikan, and S. R. Leone, "Dynamics of the $CH(A^2\Delta)$ product from the reaction of C_2H with O_2 studied by Fourier transform visible spectroscopy," *J. Phys. Chem. A* **110**, 7521 (2006).
383. L. Gallmann, T. Pfeifer, M. J. Abel, P. M. Nagel, D. M. Neumark, and S. R. Leone, "Direct comparison of the hollow-core fiber and filamentation techniques for few-cycle pulse generation," *Ultrafast Phenomena XV*, Springer Series in Chemical Physics **88**, 92 (2007).
384. T. Pfeifer, L. Gallmann, M. J. Abel, P. M. Nagel, D. M. Neumark, and S. R. Leone, "Multi-cycle driven isolated attosecond pulse generation," *Ultrafast Phenomena XV*, Springer Series in Chemical Physics **88**, 54 (2007).
385. T. Pfeifer, L. Gallmann, M. J. Abel, D. M. Neumark, and S. R. Leone, "Phase-mask control and stabilization of optical filamentation," *Ultrafast Phenomena XV*, Springer Series in Chemical Physics **88**, 65 (2007).
386. S. Gilb, E. A. Torres, and S. R. Leone, "Mapping of time-dependent electron orbital alignment," *J. Phys. B: At. Mol. Opt. Phys.* **39**, 4231 (2006).
387. A. M. Müller, J. Plenge, S. R. Leone, S. E. Canton, B. S. Rude, and J. D. Bozek, "Core electron binding energy shifts of $AlBr_3$ and Al_2Br_6 vapor," *J. Electron Spectrosc. Related Phenom.* **154**, 32 (2006).
388. L. Gallmann, T. Pfeifer, P. M. Nagel, M. J. Abel, D. M. Neumark, and S. R. Leone, "Comparison of the filamentation and the hollow-core fiber characteristics for pulse compression into the few-cycle regime," *Appl. Phys. B* **86**, 561 (2007).
389. K. L. Knappenberger, Jr., E. W. Lerch, P. Wen, and S. R. Leone, "Coherent polyatomic dynamics studied by femtosecond time-resolved photoelectron spectroscopy: Dissociation of vibrationally excited CS_2 in the 6s and 4d Rydberg states," *J. Chem. Phys.* **125**, 174314 (2006).
390. D. L. Olynick, A. V. Tivanski, M. K. Gilles, T. Tyliszczak, F. Salmassi, J. A. Liddle, K. Liang, and S. R. Leone, "Scanning x-ray microscopy investigations into the electron beam exposure mechanism of hydrogen silsesquioxane resists," *J. Vac. Sci. Technol. B* **24**, 3048 (2006).
391. F. Goulay, D. L. Osborn, C. A. Taatjes, P. Zou, G. Meloni, and S. R. Leone, "Direct detection of polyynes formation from the reaction of ethynyl radical (C_2H) with propyne (CH_3CCH) and allene ($CH_2=C=CH_2$)," *Phys. Chem. Chem. Phys.* **9**, 4291 (2007).
392. D. Strasser, F. Goulay, M. S. Kelkar, E. J. Maginn, and S. R. Leone, "Photoelectron spectrum of isolated ion-pairs in ionic liquid vapor," *J. Phys. Chem. A* **111**, 3191 (2007).

393. C. Howle, A. N. Arrowsmith, V. Chikan, and S. R. Leone, "State-resolved dynamics of the CN(B²Σ⁺) and CH(A²Δ) excited products resulting from the VUV photodissociation of CH₃CN," *J. Phys. Chem. A* **111**, 6637 (2007).
394. S. H. Lim, A. G. Caster, and S. R. Leone, "Fourier transform spectral interferometric coherent anti-Stokes Raman scattering (FTSI-CARS) spectroscopy," *Opt. Lett.* **32**, 1332 (2007).
395. E. A. Torres, E. W. Lerch, X. Dai, S. Gilb, and S. R. Leone, "N-level Li₂ multiphoton rotational wave packets: Alignment effects in resonant multiphoton coherent excitation," *J. Chem. Phys.* **126**, 044310 (2007).
396. L. Belau, K. R. Wilson, S. R. Leone, and M. Ahmed, "Vacuum-ultraviolet photoionization studies of the microhydration of DNA bases (guanine, cytosine, adenine, and thymine)," *J. Phys. Chem. A* **111**, 7562 (2007).
397. Z. Loh, M. Khalil, R. E. Correa, R. Santra, C. Buth, and S. R. Leone, "Quantum state-resolved probing of strong-field-ionized xenon atoms using femtosecond high-order harmonic transient absorption spectroscopy," *Phys. Rev. Lett.* **98**, 143601 (2007).
398. Y. E. Romanyuk, R. G. Dengel, L. V. Stebounova, and S. R. Leone, "Molecular beam epitaxy of InN dots on nitrided sapphire," *J. Cryst. Growth* **304**, 346 (2007).
399. X. Dai, and S. R. Leone, "Control of wave packets in Li₂ by shaping the pump and probe pulses for a state-selected pump-probe analysis of the ionization continuum," *J. Chem. Phys.* **127**, 014312 (2007).
400. S. H. Lim, A. G. Caster, and S. R. Leone, "Single pulse interferometric coherent anti-Stokes Raman scattering (CARS)," *SPIE Proc.* **6442**, 644205 (2007).
401. R. I. Kaiser, L. Belau, S. R. Leone, M. Ahmed, Y. Wang, B. J. Braams, and J. M. Bowman, "A combined experimental and computational study on the ionization energies of the cyclic and linear C₃H isomers," *Chem. Phys. Chem.* **8**, 1236 (2007).
402. Z. H. Kim, S. H. Ahn, B. Liu, and S. R. Leone, "Nanometer-scale dielectric imaging of semiconductor nanoparticles: Size-dependent dipolar coupling and contrast reversal," *Nano Lett.* **7**, 2258 (2007).
403. L. V. Stebounova, Y. E. Romanyuk, D. X. Chen, and S. R. Leone, "Imaging of InGaN inhomogeneities using visible apertureless near-field scanning optical microscope," *J. Appl. Phys.* **101**, 124306 (2007).
404. K. R. Wilson, S. Zou, J. Shu, E. Rühl, S. R. Leone, G. C. Schatz, and M. Ahmed, "Size-dependent angular distributions of low energy photoelectrons emitted from NaCl nanoparticles," *Nano Lett.* **7**, 2014 (2007).
405. L. V. Stebounova, Y. E. Romanyuk, R. G. Dengel, and S. R. Leone, "Size-dependent near-field coupling observed from InN nanodots grown on nitrided sapphire," *Chem. Phys. Lett.* **443**, 333 (2007).
406. L. Belau, S. E. Wheeler, B. W. Ticknor, M. Ahmed, S. R. Leone, W. D. Allen, H. F. Schaefer III, and M. A. Duncan, "Ionization thresholds of small carbon clusters: tunable VUV experiments and theory," *J. Am. Chem. Soc.* **129**, 10229 (2007).
407. L. Belau, K. R. Wilson, S. R. Leone, and M. Ahmed, "Vacuum ultraviolet (VUV) photoionization of small water clusters," *J. Phys. Chem. A* **111**, 10075 (2007).
408. Z.-H. Loh, C. H. Greene, and S. R. Leone, "Femtosecond induced transparency and absorption in the extreme ultraviolet by coherent coupling of the He 2s2p (¹p⁰) and 2p² (¹S⁰) double excitation states with 800 nm light," *Chem. Phys.* **350**, 7 (2008).
409. K. L. Knappenberger, Jr., D. B. Wong, Y. E. Romanyuk, and S. R. Leone, "Excitation wavelength-dependence of fluorescence intermittency in CdSe/ZnS core shell quantum dots," *Nano Lett.* **7**, 3869 (2007).
410. K. L. Knappenberger, Jr., E. W. Lerch, P. Wen, and S. R. Leone, "Stark-assisted population control of coherent CS₂ 4f and 5p Rydberg wavepacket dynamics studied by femtosecond time-resolved photoelectron spectroscopy," *J. Chem. Phys.* **127**, 124318 (2007).
411. T. Pfeifer, A. Jullien, M. J. Abel, P. M. Nagel, D. M. Neumark, and S. R. Leone, "Generating coherent broadband continuum soft-X-ray radiation by attosecond ionization gating," *Opt. Exp.* **15**, 17120 (2007).
412. J. K. Song, U. Willer, J. M. Szarko, S. R. Leone, S. Li, and Y. Zhao, "Ultrafast upconversion probing of lasing dynamics in single ZnO nanowire lasers," *J. Phys. Chem. C* **112**, 1679 (2008).
413. G. Meloni, T. M. Selby, F. Goulay, S. R. Leone, D. L. Osborn, and C. A. Taatjes, "Photoionization of 1-alkenylperoxy and alkylperoxy radicals and a general rule for the stability of their cations," *J. Am. Chem. Soc.* **129**, 14019 (2007).
414. D. Strasser, F. Goulay, and S. R. Leone, "Transient photoelectron spectroscopy of the dissociative Br₂(¹Π_u) state," *J. Chem. Phys.* **127**, 84305 (2007).
415. H. Merdji, T. Auguste, W. Boutu, J. P. Caumes, B. Carré, T. Pfeifer, A. Jullien, D.M. Neumark, and S. R. Leone, "Isolated attosecond pulses using a detuned second harmonic field," *Opt. Lett.* **32**, 3134 (2007).
416. A. Jullien, T. Pfeifer, M. J. Abel, P. M. Nagel, S. R. Leone, and D. M. Neumark, "Generation of coherent, broadband and tunable soft X-ray continuum at the leading edge of the driver laser pulse," in *Laser Spectroscopy: Proceedings of the XVIII international conference on ICOLS 2007*; L. Hollberg, J. Berquist, and M. Kasevich, eds. World Scientific Publication (2008).
417. E. W. Lerch, X. Dai, E. A. Torres, J. B. Ballard, H. U. Stauffer, and S. R. Leone, "Manipulation of rovibronic wave packet composition using chirped ultrafast laser pulses," *J. Phys. B: At. Mol. Opt. Phys.* **41**, 074015 (2008).
418. Z. H. Kim, and S. R. Leone, "Polarization-selective mapping of near-field intensity and phase around gold nanoparticles using apertureless near-field microscopy," *Opt. Express* **16**, 1733 (2008).
419. D. Strasser, L. H. Haber, B. Doughty, and S. R. Leone, "Ultrafast predissociation of superexcited nitrogen molecules," *Mol. Phys.* **106**, 275 (2008).
420. V. G. Stavros, and S. R. Leone, "The influence of ion gratings in rotational wavepacket dynamics in H₂," *Chem. Phys. Lett.* **452**, 33 (2008).
421. Y. E. Romanyuk, L. D. Kranz, and S. R. Leone, "Effect of band gap on the red luminescence capability of Pr-doped InGaN layers grown by molecular beam epitaxy," *J. Appl. Phys.* **103**, 073104 (2008).
422. Z.-H. Loh, and S. R. Leone, "Ultrafast dynamics of strong-field dissociative ionization of CH₂Br₂ probed by femtosecond soft x-ray transient absorption spectroscopy," *J. Chem. Phys.* **128**, 204302 (2008).