**Andreas D. Lyras**

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**PERSONAL INFORMATION:**

**Place/ Date of birth**: Athens, Greece; 2/4/1958

**Nationality**: Greek

**Marital Status**: Married; 2 children

**EDUCATION / SCIENTIFIC CAREER:**

**7/1982:** Diploma in Electrical Engineering, Dept. of Electrical Engineering, NTUA, Athens, Greece

**6/1987:** Master’s Degree in Physics, Dept. of Physics, Univ. of Crete, Heraklion, Crete, Greece

**7/1988:** Ph. D. in Theoretical Atomic Physics, Dept. of Physics, Univ. of Crete, Heraklion, Crete, Greece

*Dissertation title* : ‘Rydberg Series of Autoionizing States in Strong Laser Fields’

*Supervisor:* Prof. P. Lambropoulos

**9/1988 – 9/1989:** Postdoctoral Fellow, Dept. of Physics, Univ. of Southern California, California, USA.

**9/1991 – 8/1992:** Research Associate, Max-Planck Institute for Quantum Optics, Garching, Germany

**1/1993 – 12/1993:** Research Scientist, Institute of Theoretical and Physical Chemistry, Hellenic Research Foundation, Athens, Greece

**1/1994 – 5/1998:** Tenure-track Assistant Professor, Physics Dept., Univ. of Ioannina, Ioannina, Greece

**5/1998 – 9/2006:** Tenured Assistant Professor, Physics Dept., Univ. of Ioannina, Ioannina, Greece

**9/2006 - today:** Associate Professor, Physics Dept., Univ. of Ioannina, Ioannina, Greece

**9/2012 – today:** Associate Professor, Dept. of Physics & Astronomy, College of Science, King Saud University, Riyadh, KSA

**RESEARCH INTERESTS:**

* spectroscopy of autoionizing states of alkaline earth atoms
* multiphoton excitation/ionisation processes (perturbative & non-perturbative) in one- and two-active-electron atoms
* non-linear optical processes in one- and two-active-electron atoms (e.g. four-wave mixing, harmonic generation)
* coherent quantum control of ionization and autoionization.
* Multiphoton processes in spatially confined atomic systems (endohedrals)
* Intense, short pulse interaction with polyatomic molecules
* Negative-refractive-index properties of few level systems induced by laser fields.
* Interaction of ultrashort XUV pulses with atoms – XUV non-linear optics
* Interaction of few-level atoms with surface Plasmon fields.

**PUBLICATIONS (in refereed journals)**

1. **A. D. Lyras,** J. Roumeliotis, J. Kanellopoulos, and J. Fikioris, “ Analysis of the hybrid modes for an eccentrically cladded fiber”, IEEE Tran. On Microwave Theory and Techniques, MTT-31, 945 (1983).
2. A. Dohdy, J. A. D. Stockdale, R. N. Compton, X. Tang, P. Lambropoulos, and **A. Lyras**, “Two-photon resonant three-photon ionization of the nd 2DJ states of cesium, rubidium and sodium: Photoelectron angular distributions”, Phys. Rev. A 35, 2878 (1987).
3. **A. Lyras**, B. Dai, X. Tang, and P. Lambropoulos, A. Dohdy, J. A. D. Stockdale, D. Zei, and R. N. Compton, “ Multiphoton ionization of cesium via quadrupole transitions: Photoelectron angular distributions and polarization effects on total ionization rates”, Phys. Rev. A 37, 403 (1988).
4. P. Lambropoulos and **A. Lyras**, “Theory of resonant ionization by broadband radiation in the determination of isotopic abundances”, Phys. Rev. A 40, 2199 (1989).
5. X. Tang, **A. Lyras**, and P. Lambropoulos, “Dynamics of resonances rapidly shifting under strong laser pulses”, Phys. Rev. Lett. 63, 972 (1989).
6. **A. Lyras**, X. Tang, P. Lambropoulos, and J. Zhang, “ Radiation amplification through autoionizing resonances without population inversion”, Phys. Rev. A 40, 4131 (1989) ; *ibid.* 44, 796 (1991) (Erratum).
7. **A. Lyras**, “ Rydberg series of autoionizing resonances in strong laser fields”, Zeit. f Physik D 15, 3 (1990).
8. D. Charalambidis, **A. Lyras**, P. Lambropoulos, X. Tang, S. J. Bajic, and R. N. Compton, “Collisional relaxation of the 6s[3/2]01 and 6s’[3/2]01 mj levels of xenon using resonantly enhanced multiphoton ionization”, Phys. Rev. A 41, 1457 (1990).
9. X. Tang, **A. Lyras**, and P. Lambropoulos, “The many faces of resonances in multiphoton ionization”, J. Opt. Soc. Am. B 7, 456 (1990).
10. **A. Lyras**, B. Zorman, And P. Lambropoulos, “ Theory of doubly resonant ionization by broad-band radiation applied to the determination of isotopic abundances” Phys. Rev. A 42, 543 (1990).
11. H. Bachau, **A. Lyras**, and P. Lambropoulos, “On the possibility of radiation amplification through multiphoton pumping of autoionizing states”, Opt. Comm. 83, 331 (1991).
12. **A. Lyras**, X. Tang, and P. Lambropoulos, “Radiation amplification in free-bound transitions through incoherent multiphoton pumping and stimulated recombination”, Opt. Comm. 92, 355 (1992).
13. S. Dionissopoulou, Th. Mercouris, **A. Lyras**, Y. Komninos, and C. A. Nikolaides, “ High-order harmonic generation and ATI in H : Calculations using expansions over field-free state-specific wavefunctions”, *Phys. Rev.* *A* ***51****, 3104 (1995)*.
14. S. Dionissopoulou, **A. Lyras**, Th. Mercouris, and C. A. Nikolaides,” High-order Above threshold Ionization Spectrum of Hydrogen and Photoelectron Angular Distributions”, *J. Phys. B* ***28****, L109 (1995)* ; *corrigendum* *J. Phys. B* ***28****, 4005 (1995)*.
15. A. Bolovinos, E. Luc-Koenig, S. Assimopoulos, **A. Lyras**, N. E. Karapanagioti, D. Charalambidis, and M. Aymar, “ 4pnp J=0e-2e autoionizing series in calcium: experimental and theoretical analysis”, *Z. Phys.D* ***38****, 265-277 (1996).*
16. A. Bolovinos, S. Cohen, **A. Lyras**, C. Skordoulis, T. Mikropoulos and S. Assimopoulos, “Non-linear Optical Phase Conjugation by Degenerate Four-Wave Mixing in Ca vapour”, *Appl. Phys. B* ***64****, 451-458 (1997)*.
17. S. Dionissopoulou, Th. Mercouris, **A. Lyras**, and C. A. Nikolaides, “Strong laser field effects in Hydrogen : High-order above-threshold ionization and photoelectron angular distributions”, *Phys. Rev. A* ***55****, 4397-4406 (1997)*.
18. E. Luc-Koenig, **A. Lyras**, J. -M. Lecomte, and M. Aymar, “Eigenchannel R-matrix study of two-photon processes including above threshold ionization in magnesium” *J. Phys. B: At. Mol. Opt. Phys.* ***30****, 5213-5232 (1997).*
19. S. Cohen and **A. Lyras**, “Phase Conjugation by Degenerate Four Wave Mixing via Autoionizing States” *J. Opt. Soc. Am. B* ***15****, 1069 (1998)*.
20. E. Luc-Koenig, M. Aymar, J. -M. Lecomte, and **A. Lyras**, “Eigenchannel R-matrix study of two-photon excitation of low-lying autoionizing states in strontium: dielectronic core-polarization effects”, *J. Phys. B: At. Mol. Opt. Phys.* ***31****, 727 (1998)*.
21. S. Assimopoulos, A. Bolovinos, E. Luc-Koenig, S. Cohen, **A. Lyras**, P. Tsekeris and M. Aymar, “3dnd J=4,5 autoionizing levels in Ca: laser optogalvanic spectroscopy and theoretical analysis”, *Eur. Phys. J. D* ***1****, 243 (1998)*
22. E. Luc-Koenig, M. Aymar, J.-M. Lecomte, and **A. Lyras**,” R-matrix calculations of Raman couplings and dynamical Stark shifts in heavy alkaline earth atoms”, *Eur. Phys. J. D* ***7***, *487 (1999)*.
23. **A. Lyras** and H. Bachau, “Multiple phase control in Mg through the continuum”, *Phys. Rev. A* ***60****, 4781(1999).*
24. E. Luc-Koenig, M. Aymar, M. Millet, J.-M. Lecomte, and **A. Lyras**, “Ionization of barium through a coherent excitation of two bound intermediate states”, *Eur. Phys. J. D* ***10***, *205 (2000).*
25. S. Cohen and **A. Lyras**, “Phase conjugation through autoionizing states: a density matrix approach”, *J. Phys. B: At. Mol. Opt. Phys.****37****, 1025 (2004).*
26. I. Liontos, A. Bolovinos, S. Cohen and **A. Lyras,** “Single and double ionization of magnesium via four-photon excitation of the 3p2 1S0 autoionizing state: Experimental and theoretical analysis”, *Phys. Rev. A* ***70***, *033403 (2004).*
27. **A. Lyras** and H. Bachau, “Electronic Correlation Effects in a model of endohedral Mg ([Mg@C60](mailto:Mg@C60))” *J. Phys. B: At. Mol. Opt. Phys.****38****, 1119 (2005).*
28. P. Siozos, S. Kaziannis, C. Kosmidis, **A. Lyras,** “Ionization/dissociation processes in some alkyl iodides induced by strong picosecond laser beam” *Int. J. Mass Spectrometry* ***243****, 189 (2005).*
29. C. Kosmidis, S. Kaziannis, P. Siozos, **A. Lyras**, L. Robson, K. W .D. Ledingham, D. A. Jaroszynski, “Molecular hydrogen ion elimination from alkyl iodides under strong laser beam irradiation” *Int. J. Mass. Spectrometry* ***248,*** *1 (2006).*
30. N. Merlemis, **A. Lyras**, M. Katharakis, and T. Efthimiopoulos, “*Amplified spontaneous emission without population inversion in potassium vapour by internally generated fields*”, *J. Phys. B: At. Mol. Opt. Phys.* **39** No 8 *(28 April 2006) 1913-1927*
31. I. Liontos, A. Bolovinos, S. Cohen, **A. Lyras,** S. Benec’h and H. Bachau, “*Two-photon ionization of Calcium above the 4S1/2 threshold* ”, *J. Phys. B: At. Mol. Opt. Phys.* **39** *No 12 (28 June 2006) 2693-2708*.
32. C. Kosmidis, S. Kaziannis and **A. Lyras,** “*Alignment of ethyl Halide Molecules (C2H5X,X=I,Br,Cl) induced by strong picosecond laser irradiation”, J. Phys. Chem. A* **112,** 4754 – 4764 (2008).
33. I. Liontos, S. Cohen, **A. Lyras,** “*Multiphoton Ca2+ production occurring before the onset of Ca+ saturation: is it a fingerprint of direct double ionization?*”, *J. Phys. B: At. Mol. Opt. Phys.* **43** (2010) 095602.
34. A. Dimitriou, S. Cohen and **A. Lyras**, “*Energy dependence of photoelectron angular distributions from two- and four-photon ionization of Mg in the vicinity of the 3p2 1S0 doubly excited state”, J. Phys. B: At. Mol. Opt. Phys.* **44**(2011)135001.*.*

1. A. Armyras, D. Pentaris, T. Efthimiopoulos, N. Merlemis and **A. Lyras**, “***Saturation and population transfer of a two-photon excited four-level potassium atom***”, *J. Phys. B: At. Mol. Opt. Phys.* **44**(2011) 165401*.*
2. D. Pentaris, T. Efthimiopoulos, N. Merlemis and **A. Lyras** *"****Temporal dynamics of the internally generated radiations in a two-photon excited four-level potassium atom***" *J. Mod. Opt*. **56** (2012) 179.
3. D. Pentaris, T. Efthimiopoulos, N. Merlemis, V. Vaičaitis and **A. Lyras**, *“****Emissions from high density potassium atoms excited by either nanosecond or femtosecond laser pulses****”, App. Phys. B* **107** (2012) 71.
4. D Pentaris, T Efthimiopoulos, N Merlemis and **A Lyras,** “***Control of the emission channels energy flow in a nonlinear laser–potassium atom interaction*”** *J. Phys. B: At. Mol. Opt. Phys.* **45**(2012) 205505*.*
5. A Dimitriou, S Cohen, **A Lyras** and I Liontos, “***Strong laser-induced coupling between autoionizing states: the case of the four-photon-excited 3p2 1S0 state of magnesium***” *J. Phys. B: At. Mol. Opt. Phys.* **45**(2012) 205003
6. D. Pentaris, G. Papademetriou, T. Efthimiopoulos, N. Merlemis and **A. Lyras**, “***Emissions enhancement in a pump-coupling V-type coherently controlled four-level atomic system***” *J. Mod. Optics* **60** (2013) pp. 1855 -1868
7. V. E. Lembessis, A. Lyras, A A Rsheed, O. M. Aldossary, and Z. Ficek, “***Radiation pattern of two identical emitters driven by a Laguerre-Gaussian beam: An atom nanoantenna”*** *Phys. Rev. A* **92** (2015) 023850
8. Mateusz Łącki, Hannes Pichler, Antoine Sterdyniak, **Andreas Lyras**, Vassilis E. Lembessis, Omar Al-Dossary, Jan Carl Budich, and Peter Zoller, “ Quantum Hall physics with cold atoms in cylindrical optical lattices” *Phys. Rev. A* **93** (2016) 013604
9. D. Pentaris, D. Damianos, G. Papademetriou, A. Lyras, K. Steponkevičious, V. Vaičaitis, and T. Efthimiopoulos, “***Coherently controlled emissions* |4P3/2,1/2> ↔ |4S1/2> *from a femtosecond Λ-type excitation scheme in potassium atom***” *J. Mod. Optics* **63** (2016) pp. 1301 – 1312
10. Anwar Al Rsheed, Andreas Lyras, Vassilis E Lembessis and Omar M Aldossary, “***Guiding of atoms in helical optical potential structures***” *J. Phys. B: At. Mol. Opt. Phys.* **49**(2016) 125002

**PUBLICATIONS (in books)**

**1.** P. Lambropoulos and **A. Lyras,** “Resonant multiphoton ionization under broadband excitation: application to the determination of isotopic composition”,

Resonance Ionization Spectroscopy 1988, Eds. T.B. Lucatorto & J. E. Parks, Institute of Physics Conference Series Number 94, Institute of Physics (1988, Bristol).

**2.** P. Lambropoulos, **A. Lyras**, and X. Tang, “Resonance Multiphoton Ionization under strong fields” Fundamentals of Laser Interactions II, Ed. F. Ehlotzky, Springer Verlag (1990)

**PUBLICATION in CONFERENCE PROCEEDINGS (after refereeing):**

**1**. D. Pentaris, N. Merlemis, **A. Lyras**, and T. Efthimiopoulos, “*Parametric Four-Wave* *Mixing in Low Atomic Densities of Pottasium Vapor*” AIP Conf. Proc. **963**, 788 – 791 (Dec. 26, 2007).

**2**. M. Eleftheriou, M. Bakarezos, A. Lyras, C. Kosmidis, M. Tatarakis, N. Papadogiannis, “ *High Frequency Ultrasonic Waves in Metals and Dielectrics*” The Journal of the Acoustical Society of America **123(5)**, 3551 (2008).

**3**. E. Tzianaki, M. Tatarakis, M. Bakarezos, M. Eleftheriou, N. Papadogiannis, S. Kazianis, C. Kosmidis and A. Lyras, “*Experimental Studies of Generation and Propagation of High Frequency Acoustic Waves in various Solid Materials using Ultraviolet Picosecond Laser Pulses*”, The Journal of the Acoustical Society of America **123(5)**, 3155 (2008).

**CITATIONS : ~ 570**

**RESEARCH FUNDING / COLLABORATIONS:**

**1/1995 – 12/1996**: Joint research program with the Lab. Aimè Cotton, Orsay, France, funded through the Greek-French Research and Technology Cooperation Agreement (PLATON program). TITLE : ‘Spectroscopy and multiphoton processes in doubly excited autoionizing states of alkaline earths’

**6/1997:** Visiting Assistant Professor (1 month) at the Univ. de Paris Süd & Lab. Aimè Cotton, Orsay, France (funded by Univ. de Paris Süd)

**6/1998:** Visiting Assistant Professor (1 month) at the Univ. de Bordeaux I, Talence, France (funded by Univ. de Bordeaux I)

**9/2002 - 2/2003:** Marie Curie Fellowship (Category: Experienced Researcher). Host Institution: CELIA, Univ. de Bordeaux I, Talence, France (funded by the EC)

**6/2006:** Visiting Assistant Professor (1 month) at CELIA, Univ. de Bordeaux I, Talence, France (funded by Univ. de Bordeaux I)

**10/2010:** Visiting Associate Professor (1 month) at CELIA, Univ. de Bordeaux I-CNRS-CEA, Talence, France (funded by Univ. de Bordeaux I)

**1/2011 – 5/2011:** Visiting Associate Professor (1 semester) at the Dept. of Physics, University of Cyprus, Nicosia, Cyprus.

**REFEREE for scientific journals:** I have refereed submitted manuscripts for the following journals: The Journal of Physical Chemistry A, The Journal of Chemical Physics, Chemical Physics Letters, European Physical Journal D, Journal of Physics B: Atomic, Molecular and Optical Physics, New Journal of Physics.