

# Esam Ali, Ph.D.



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## Work Experience

- I am currently a Postdoctoral research associate at Northwest Missouri State University (May-2019- until now).
- I was a postdoc at Missouri University of S&T (June-2017- May-2019).
- I am referee to American Physical Society (APS) journal.
- Working experience in teaching tutorial in general physics lab at Missouri University of S&T (Spring 2017).
- Good understanding of theoretical and computational Atomic & molecular physics.
- I have been involved as a teacher in the program of International computer Driving License intended for the employees of the public post office company in my city (Al Marj, Libya).(2007-2008).
- Working experience in teaching tutorial in general physics lab (2005-2009).
- I have been appointed as a Health Institute teacher in the period between (2007-2008).

## Education

- Ph.D. in Physics, Missouri University of Science and technology, Rolla, Mo. [2017]
- M.Sc. in physics, Garyounis University, Benghazi, Libya. [2009]

## Technique Skills

Molecular Dynamic Reaction	Quantum Chemistry	Quantum Mechanics
Atomic-Molecular Physics	Photoionization and thermalization of fullerene nanomolecules	Project management skill
MPI Clusters	Fortran Language	C/C+ Language
Computer Repair Technician	XSEDE (HPC)	C-plot
Quantum Espresso Package	Computational nanophysics	Pyaxid package

## **Affiliation, Awards & Hobbies**

The article “A dynamical ( $e,2e$ ) investigation into the ionization of the outermost orbitals of R-Carvone” has been chosen as an Editor’s Pick in J. Chem. Phys. (2019).

The article “Experimental and theoretical study of electron-impact ionization plus excitation of aligned  $H_2$ ” has been selected by the Editors of Journal of Physics B:Atomic, Molecular and Optical Physics for inclusion in their 'Highlights of 2015'.

One my hobbies are playing soccer ball and reading novels. Also, I was the second place winner of the Graduate Student Seminar competition in May 2015. I was also the second winner of the 23<sup>rd</sup> Annual Scheerer Research prize competition in December 2016 at MST University.

## **Description of research experience**

### **Papers**

1. Dakota Shields, Ruma De, **Esam Ali**, Mohamed E Madjet, Steven T Manson, Himadri S. Chakraborty, A density functional theory based comparative study of hybrid photoemissions from Cl@C<sub>60</sub>, Br@C<sub>60</sub> and I@C<sub>60</sub>, *Eur. Phys. J. D.* **74**: 191 (2020).
2. M. Dhital, S. Bastola, A. Silvus, J. Davis, B. R. Lamichhane, **E. Ali**, M. F. Ciappina, R. Lomsadze, A. Hasan, D. H. Madison, and M. Schulz, *Phys. Rev. A* **102**, 032818 (2020).
3. Enliang Wang, **Esam Ali**, et al. Molecular-frame ( $e, 2e$ ) ionization dynamics of  $H_2$  at high impact-energy, *Eur. Phys. J. D.* **74**: 105 (2020).
4. **Esam Ali**, et al. Improved Theoretical Calculations for Electron-Impact Ionization of DNA Analogue Molecules, *J. Chem. Phys.* **152**, 124303 (2020).
5. Darryl Jones, **Esam Ali**, et al. A dynamical ( $e,2e$ ) investigation into the ionization of the outermost orbitals of R-carvone, *J. Chem. Phys.* **150**, 124306 (2019).
6. **Esam Ali** and Don Madison, Multicenter distorted-wave approach for electron-impact ionization of molecules, *Phys. Rev. A* **100**, 012712 (2019).
7. M. Dhital, S. Bastola, A. Silvus, B.R. Lamichhane, **E. Ali**, M.F. Ciappina, R. Lomsadze, A. Hasan, D.H. Madison, and M. Schulz, Target Dependence of PCI Effects on Fully Differential Ionization Cross Sections, *Phys. Rev. A* **100**, 032707 (2019).

8. A. Silvus, M. Dhital, S. Bastola, J. Buxton, Z. Klok, **E. Ali**, M.F. Ciappina, B. Boggs, D. Cikota, D.H. Madison, and M. Schulz, Target Dependence of Post-Collision Effects in Ionization by Proton Impact, *J. Phys. B: At. Mol. Opt. Phys.* **52** 125201 (2019).
9. **Esam Ali**, Carlos Granados, Ahmad Sakaamini, Matthew Harvey, Lorenzo Ugo Ancarani, Andrew James Murray, Mevlut Dogan, Chuangang Ning, James Colgan, Don Madison, Triple differential cross sections for electron-impact ionization of methane at intermediate energy, *J. Chem. Phys.* **150**, 194302 (2019).
10. M. Dhital, S. Bastola, A. Silvus, A. Hasan, B.R. Lamichhane, **E. Ali**, M.F. Ciappina, R.A. Lomsadze, D. Cikota, B. Boggs, D.H. Madison, and M. Schulz, Few-Body Dynamics Underlying Post-Collision Effects in the Ionization of H<sub>2</sub> by 75 keV Proton Impact, *Phys. Rev. A* **99**, 062710 (2019).
11. X. Ren, S. Amami, K. Hossen, **E. Ali**, et al. Electron impact ionization of H<sub>2</sub>O at low projectile energy: internormalized triple-differential cross sections in three-dimensional kinematics. *Phys. Rev. A* **95**, 022701 (2017).
12. D. B. Jones, **E. Ali**, et al. Electron impact ionization dynamics of para-benzoquinone, *J. Chem. Phys.* **145**, 164306 (2016).
13. Zehra N. Ozer, **Esam Ali**, et al. Comparison of experimental and theoretical triple differential cross sections for the single ionization of CO<sub>2</sub> ( $1\pi_g$ ) by electron impact. *Phys. Rev. A* **93**, 062707 (2016).
14. **Esam Ali**, XueGuang Ren et al. , Experimental and theoretical triple-differential for tetrahydrofuran ionized by low-energy 25-eV-electron impact. *Phys. Rev. A* **93**, 062705 (2016).
15. D. B. Jones, **E. Ali**, et al. Electron- and photon-impact ionization of furfural, *J. Chem. Phys.* **143**, 184310 (2015).
16. **Esam Ali**, Kate Nixon, et al. Comparison of experimental and theoretical electron-impact ionization triple-differential cross sections for ethane, *Phys. Rev. A* **92**, 042711 (2015).
17. **Esam Ali**, XueGuang Ren et al. , Experimental and theoretical study of electron-impact ionization plus excitation of aligned H<sub>2</sub>, *J. Phys. B: At. Mol. Opt. Phys.* **48** 115201 (2015).
18. George da Silva, Rafael Neves, Luca Chiari, Darryl Jones, **Esam Ali** et al., Triply differential (e,2e) studies of phenol, *J. Chem. Phys.* **141**, 124307 (2014).
19. **Esam Ali**, Don Madison et al. ,Theoretical and Experimental investigation of (e,2e) for aligned H<sub>2</sub> molecules, 6th Conference on Elementary Processes in Atomic Systems – CEPAS 9-12 July, 2014, Slovakia.

20. **E. Ali**, A. L. Harris et al. , Fully differential cross sections for electron-impact excitation-ionization of aligned D<sub>2</sub>, Phys. Rev. A **89**, 062713(2014).
21. Julian C. A. Lower, **Esam Ali**, et al. , Experimental and theoretical cross sections for molecular-frame electron-impact excitation-ionization of D<sub>2</sub>, Phys. Rev. A **88**, 062705(2013).

### Talks

1. Ejected Electron-Energy and Angular Dependence of Fully Differential Ionization Cross Sections in Proton Collisions with He and H<sub>2</sub>, Madhav Dhital, Sujan Bastola, Aaron Silvus, Jacob Davis, Basu Lamichhane, **Esam Ali**, Marcelo Ciappina, Ramaz Lomsadze, Ahmad Hasan, Don Madison, Michael Schulz, 73th annual Gaseous Electronics Conference, 5-9 October 2020. (*It was online meeting*)
2. Electron-impact ionization of Biomolecules, **Esam Ali**, Don Madison, and Himadri Chakraborty, 51st annual DAMOP (Division of atomic, molecular, and optical physics) meeting, Portland, Oregon, NC, 1-5 June 2020. (*It was online meeting*)
3. New Structures in Fully Differential Cross Sections for Ionization of He by Proton Impact, M Dhital, S Bastola, A Silvus, A Hasan, B R Lamichhane, **E Ali**, M F Ciappina, R A Lomsadze, D H Madison, and M Schulz, ICPEAC 2019 (International Conference on Photonic, Electronic and Atomic Collisions) meeting, Deauville, France, 23-30 July 2019.
4. Triple Differential Cross section for electron impact ionization of methane at intermediate energy, C. Granados, **E. Ali**, A. Sakaamini, M. Harvey, L. U. Ancarani, A. J. Murray, M. Dogan, C. Ning, J. Colgan, and D. Madison, ICPEAC 2019 (International Conference on Photonic, Electronic and Atomic Collisions) meeting, Deauville, France, 23-30 July 2019.
5. Target Dependence of Post-Collision Effects in Ionization by Proton Impact, A Silvus, M Dhital, S Bastola, J Buxton, Z Klok, **E Ali**, M F Ciappina, D H Madison, and M. Schulz, ICPEAC 2019 (International Conference on Photonic, Electronic and Atomic Collisions) meeting, Deauville, France, 23-30 July 2019.
6. Fully Differential Study of Ionization of H<sub>2</sub> by p Impact Near Velocity Matching,,M Dhital , S Bastola, A Silvus, A Hasan, B R Lamichhane, **E Ali**, M F Ciappina, R A Lomsadze, D Cikota, B Boggs, D H Madison, and M Schulz, ICPEAC 2019 (International Conference on Photonic, Electronic and Atomic Collisions) meeting, Deauville, France, 23-30 July 2019.

7. Experimental and theoretical study of the energy and angular dependence of the triple differential cross sections for electron-impact ionization of aligned H<sub>2</sub>. **Esam Ali**, Enliang Wang, Xingyu Li, Xueguang Ren, Chuangang Ning, Xiangjun Chen, Alexander Dorn, and Don Madison, 71th annual Gaseous Electronics Conference, Portland, Oregon, 5-9 November 2018.
8. Multicenter distorted wave approach for electron-impact ionization of molecules, Don Madison, **Esam Ali**, and Chuangang Ning, 71th annual Gaseous Electronics Conference, Portland, Oregon, 5-9 November 2018.
9. Experimental and theoretical investigation of triple differential cross sections for the CO<sub>2</sub> molecule at intermediate electron energy, Zehra N. Ozer, **Esam Ali**, Murat Yavuz, Osman Alwan, Adnan Naja, Ochbadrakh Chuluunbaatar, Boghos B. Joulakian, Chuangang Ning, James Colgan, and Don Madison, International Conference on Many Particle Spectroscopy of Atoms, Molecules, Clusters and Surfaces, Budapest, Hungary, 21-24 August 2018
10. Theoretical and experimental study of electron impact ionization (e,2e) of para-benzoquinone for an intermediate incident electron energy, **Esam Ali**, Darryl Jones, Odder Ingolfsson, Chuangang Ning, James Colgan, Michael Brunger, and Don Madison, 70th annual Gaseous Electronics Conference, Pittsburgh, Pennsylvania, 6-10 November 2017.
11. Dynamical (e,2e) results on biomass fragments and biomolecules, B. Lohmann, **E. Ali**, C. G. Ning, J. Colgan, D. H. Madison, O. Ingólfsson, M. J. Brunger and D. B. Jones. ICPEAC 2017 (International Conference on Photonic, Electronic and Atomic Collisions) meeting, Queensland, Australia, 26 July 2017.
12. Electron impact ionization of large molecules, D. B. Jones, **E. Ali**, C. G. Ning, J. Colgan, O. Ingólfsson, D. H. Madison and M. J. Brunger, MPS 2016 (International Conference on Many Particle Spectroscopy of Atoms, Molecules, Clusters and Surfaces) meeting, Lomonosov Moscow State University, Russia, 23-26 August 2016.
13. Experimental and Theoretical Fully differential cross sections for electron impact ionization of furfuryl molecules, **Esam Ali**, Darryl Jones, Kate Nixon, Chuangang Ning, Michael Brunger, Andrew Murray, and Don Madison, 68th annual Gaseous Electronics Conference, Honolulu, Hawaii, 12-16 October 2015, [Bul. Am. Phys. Soc. **60**, 122 (2015)].
14. Theoretical and experimental study of (e,2e) ionization of the CO<sub>2</sub> (1 $\pi$ g) molecule at 250 eV, Mevlut Dogan, Zehra N. Ozer, Murat Yavuz, O. Alwan, A. Naja, BB. Joulakian, **Esam Ali**, C. Ning, Don Madison, ICPEAC 2015 (International Conference

- on Photonic, Electronic and Atomic Collisions) meeting, Toledo, Spain, 22-28 July 2015.
15. Importance of projectile-target interactions in the triple differential cross sections for Low energy (e,2e) ionization of aligned H<sub>2</sub>, **Esam Ali**, Don Madison, X. Ren, A. Dorn, and Chuangang Ning, 67th annual DAMOP (Division of atomic, molecular, and optical physics) meeting, Raleigh, NC, 2-7 November 2014.
  16. Theoretical and experimental investigation for (e,2e) with aligned H<sub>2</sub> molecule, **Esam Ali**, Don Madison, X. Ren, A. Dorn, and Chuangang Ning, 6th Conference on Elementary Processes in Atomic Systems Bratislava (Slovakia), 9-12 July 2014.
  17. Fully Differential Cross Sections for Electron-Impact ionization of aligned molecules , **Esam Ali**, Don Madison, Erich Weigold ,Allison Harris, Julian Lower , and Chuangang Ning, 66th annual DAMOP (Division of atomic, molecular, and optical physics) meeting, Princeton, NJ, 30 September to 04 October 2013.
  18. Importance of Molecular alignment in (e,2e) collisions, **Esam Ali**, Don Madison, Allison Harris, Julian Lower, Erich Weigold, and Chuangang Ning, 65th annual DAMOP (Division of atomic, molecular, and optical physics) meeting, Austin, Texas, 22-25 October 2012.
  19. Fully differential molecular-frame measurements and calculations for the electron impact dissociative ionization, Erich Weigold, **Esam Ali**, Susan Bellm, Allison Harris, Julian Lower, Don Madison, and Chuangang Ning, Invited talk, International Conference on Many Particle Spectroscopy of Atoms, Clusters & Surfaces, Berlin, Germany, 27 August – 1 September 2012.
  20. Experimental and theoretical triple differential cross sections for electron impact ionization of aligned H<sub>2</sub>, **Esam Ali**, Allison Harris, Julian Lower, Erich Weigold, Chuangang Ning, Don Madison, Bulletin of the American Physical Society  
64th Annual Gaseous Electronics Conference Volume 56, Number 15, November 14– 18, 2011; Salt Lake City, Utah
  21. Conference : (Calculation of mass absorption coefficients for some rocks in Libya : Baslt Rock – Limestone Rock – Gypsum Rock) 2007: Physics Department – Garyounis University(Benghazi city- Libya).
  22. (A study of some physical properties of some rocks in the city of Gheryan) . The 3rd National Conference on basic Sciences in Gharian City (Libya) – April 25-27, 2009.

## Posters

1. Strong s, p and d level hybridization in the photoionization of noble metallofullerene molecules, **Esam Ali**, Andrew Dennis, Taylor Obrien, Steve Manson, and Himadri Chakraborty, 51st annual DAMOP (Division of atomic, molecular, and optical physics) meeting, Portland, Oregon, NC, 1-5 June 2020. (*It was online meeting*)
2. Vibrational relaxation of photoexcited electrons in fullerenes, **Esam Ali**, Mohamed Madjet, and Himadri Chakraborty, 51st annual DAMOP (Division of atomic, molecular, and optical physics) meeting, Portland, Oregon, NC, 1-5 June 2020. (*It was online meeting*)
3. Hot carrier dynamics in endohedral compounds, Mohamed Madjet, Marcelo Carignano, Oriol Vendrell, **Esam Ali**, and Himadri Chakraborty, 51st annual DAMOP (Division of atomic, molecular, and optical physics) meeting, Portland, Oregon, NC, 1-5 June 2020. (*It was online meeting*).
4. Photoionization of atom-fullerene hybrid levels in F@C60 versus F-@C60+, Taylor O'Brien, Andrew Dennis, Esam Ali, Steve Manson, and Himadri Chakraborty, 51st annual DAMOP (Division of atomic, molecular, and optical physics) meeting, Portland, Oregon, NC, 1-5 June 2020. (*It was online meeting*).
5. Low energy electron-impact ionization of CF<sub>4</sub>, **Esam Ali**, Khokon Hossen, Enliang Wang, Xueguang Ren, Chuangang Ning, Alexander Dorn, and Don Madison, 71th annual Gaseous Electronics Conference, Portland, Oregon, 5-9 November 2018.
6. Electron impact ionization of Methane at intermediate energy, **Esam Ali**, Zehra Ozer, Chuangang Ning, James Colgan, Mevlut Dogan, and Don Madison, 70th annual Gaseous Electronics Conference, Pittsburgh, Pennsylvania, 6-10 November 2017.
7. Theoretical and experimental study of electron impact ionization (e,2e) of the R-Carvone molecule for an intermediate incident electron energy, **Esam Ali**, Darryl Jones, James Colgan, Chuangang Ning, Odder Ingolfsson, Michael Brunger, and Don Madison, 70th annual Gaseous Electronics Conference, Pittsburgh, Pennsylvania, 6-10 November 2017.
8. Triple Differential Cross Sections for single ionization of the Ethane molecule, **Esam Ali**, Kate Nixon, Chuangang Ning, Andrew Murray, and Don Madison, 68th annual Gaseous Electronics Conference, Honolulu, Hawaii, 12-16 October 2015, [Bul. Am. Phys. Soc. **60**, 79 (2015)].
9. A (e,2e+ion) study of low-energy electron-impact ionization of THF, **Esam Ali**, XueGuang Ren, Chuangang Ning, Alexander Dorn, and Don Madison, 68th annual

- Gaseous Electronics Conference, Honolulu, Hawaii, 12-16 October 2015, [Bul. Am. Phys. Soc. **60**, 33 (2015)].
10. Theoretical and experimental study of (e,2e) ionization of the CO<sub>2</sub> (1πg) molecule at 250 eV, Mevlut Dogan, Zehra N. Ozer, Murat Yavuz, O. Alwan, A. Naja, B. Joulakian, **Esam Ali**, C. Ning, and Don Madison, XXIX International Conference on Photonic, Electronic, and Atomic Collisions (ICPEAC), Toledo, Spain, 22 - 28 July 2015.
  11. Theoretical and experimental study of (e,2e) ionization of the CO<sub>2</sub> (1πg) molecule at 250 eV, Mevlut Dogan, Zehra N. Ozer, Murat Yavuz, O. Alwan, A. Naja, B. Joulakian, **Esam Ali**, C. Ning, and Don Madison, International Symposium on (e,2e), Double Photoionization and Related Topics, San Sebastián, Spain, July 30 - August 1 2015.
  12. Experimental and Theoretical Fully differential cross sections for electron impact ionization of phenol molecules, **Esam Ali**, D. Jones, G. Silva, L. Chiari, R. Neves, M. Lopes, Ning, and D. MADISON, 67th annual DAMOP (Division of atomic, molecular, and optical physics) meeting, Raleigh, NC, 2-7 November 2014.
  13. A Dynamical (e,2e) Investigation of Phenol, G. B. da Silva, D. B. Jones, L. Chiari, R.F.C. Neves, M.C.A. Lopes<sup>3</sup>, **E. Ali**, D.H. Madison, C. G. Ning, and M.J. Brunger, 12th APCPST & 26th SPSM, Adelaide, South Australia, Aug 31- Sept 5, 2014.
  14. Strong alignment dependence found for simultaneous ionizing-excitation of H<sub>2</sub> by electron impact, **Esam Ali**, Don Madison, X. Ren, A. Dorn, and Chuangang Ning, International Conference on Many Particle Spectroscopy of Atoms, Molecules, Clusters and Surfaces, Université de Lorraine, 1 bd Arago, 57078 Metz, France. July 16-18 2014.
  15. Investigating the Effects of Molecular Orientation on Electron-Impact Ionization, **Esam Ali**, Don Madison, A. Harris, Julian Lower, Erich Weigold, and Chuangang Ning, showcase 2014 at Missouri University of Science and Technology.
  16. Experimental and theoretical investigation of the triple-differential cross sections for electron impact excitation-ionization of aligned H<sub>2</sub> for different orientations of the molecule, **Esam Ali**, Don Madison, Allison Harris, Julian Lower, Erich Weigold, and Chuangang Ning, 43rd annual DAMOP (Division of atomic, molecular, and optical physics) meeting, Anaheim, California, 4-8 June 2012, [Bull. Am. Phys. Soc. 57, No. 5, 164 (2012)].
  17. Molecular Frame (e,2e) cross sections for electron impact ionization with excitation of aligned H<sub>2</sub>, **Esam Ali**, Don Madison, Erich Weigold, Susan Bellm, Allison Harris, Julian Lower, and Chuangang Ning, ICPEAC (International Conference on Photonic, Electronic and Atomic Collisions) meeting, Lanzhou, China, 24-30 July 2013.



18. Molecular Frame (e,2e) cross sections for electron impact ionization with excitation of aligned H<sub>2</sub>, **Esam Ali**, Don Madison, A. Harris, Julian Lower, Erich Weigold, and Chuangang Ning, showcase 2013 at Missouri University of Science and Technology.

### **Invited Talks at National and International Meetings**

1. After fullerene electrons energize by absorbing UV sunlight how much time we got to catch them hot for a solar battery?, invited AMMINS seminar at Northwest Missouri State University, Maryville, MO, USA, 1<sup>st</sup> May 2020, talk given by **Esam Ali**
2. Impact ionization of Biomolecules, invited AMMINS seminar at Northwest Missouri State University, Maryville, MO, USA, 9<sup>th</sup> September 2019, talk given by **Esam Ali**
3. Accuracy of Theoretical Calculations for Electron-Impact Ionization of Molecules, invited plenary talk, International Symposium on (e,2e), Double Photoionization and Related Topics, Hefei, China, 1-3 August 2013, talk given by Don Madison.
4. Accuracy of Theoretical Calculations for Electron-Impact Ionization of Molecules, invited plenary talk, 6th Conference on Elementary Processes in Atomic Systems - CEPAS 2014, Bratislava, Slovakia, 9th - 12th July 2014, talk given by Don Madison.
5. Accuracy of theory for calculating 3-Body and 4-Body fully differential cross sections for electron-impact ionization of atoms and molecules, International Symposium on (e,2e), Double Photo-ionization and Related Topics, San Sebastián, Spain, July 30 - August 1 2015, talk given by Don Madison.
6. Accuracy of Theoretical Calculations for Electron-Impact Ionization of atoms and Molecules, 68th annual Gaseous Electronics Conference, Honolulu, Hawaii, 12-16 October 2015, [Bul. Am. Phys. Soc. 60, 121 (2015)], talk given by Don Madison.