

# Alan Salcedo Gomez

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## EDUCATION

### The Ohio State University (OSU)

Beginning in Sep. 2020

Ph.D. in Physics, *Distinguished University Fellowship*

### The University of Texas at El Paso (UTEP)

December 2019

B.Sc. in Physics and Mathematics, *honors degree*

Overall GPA: 4.0/4.0

University Honors Thesis: Assessment of Fermi-Löwdin Orbitals on Self-Interaction Corrected Density Functional Theory with the Regularized SCAN Functional Approximation.

- Member, University Honors Program.

March 2016 - December 2019

### Escuela Preparatoria Central de Ciudad Juarez

June 2015

High School, valedictorian.

GPA: 9.7/10.0

## RESEARCH

## EXPERIENCE

### UTEP Physics Department

El Paso, TX

Undergraduate Research Assistant

January 2019 - December 2019

Supervisor: **Prof. Rajendra Zope**

- Worked at the FLOSIC collaboration studying the Fermi-Löwdin Orbital Self-Interaction Correction Method on DFT with the regularized SCAN (rSCAN) functional.
- Compared the performance of rSCAN and SCAN with FLOSIC on electronic properties such as energies of atoms, ionization potentials, electron affinities, reaction barrier heights, and dissociation energies.

### Oak Ridge National Laboratory, Physics Division

Oak Ridge, TN

*U. of Tennessee, Knoxville, Research Fellow*

June 2018 - August 2018

Supervisor: **Dr. Alfredo Galindo-Uribarri**

- Performed cuts on data and analysis of background for the PROSPECT experiment aiding to obtain the antineutrino energy spectrum from fission of  $^{235}\text{U}$  at the High Flux Isotope Reactor.

### MIT Center for Theoretical Physics

Cambridge, MA

*MIT Summer Research Program Fellow*

June 2017 - August 2017

Supervisors: **Prof. John W. Negele**, Prof. Phiala Shanahan, Dr. Andrew Pochinsky

- Investigated the efficiency of Deep Neural Networks (DNN's) on classifying oscillators and predicting the evolution of their coordinates and momenta (read abstract [here](#)).
- Wrote the codes generating training data sets with Python, constructed and trained the DNNs using TensorFlow.

### UTEP Physics Department

El Paso, TX

*Undergraduate Research Assistant*

June 2016 - May 2017

Supervisor: **Prof. Jorge A. Lopez**

- Performed simulations of neutron-rich nuclear matter to study symmetry energy and to obtain an isospin-extended phase diagram of liquid-gas coexistence state using Classical Molecular Dynamics.

<b>PUBLICATIONS</b>	1 Yamamoto, Y., <b>Salcedo, A.</b> , Alam, S., Baruah, T., Zope, R. (2020). Comparison of regularized SCAN functional with SCAN functional with and without self-interaction for wide-array of properties (In prep).	
<b>CONFERENCE - TALKS</b>	1 <b>Salcedo A.</b> , Yamamoto, Y., Baruah, T., Zope, R. (2020). Assessment of SCAN and regularized SCAN functionals with and without Self Interaction Correction. APS March Meeting: <u>DFT and Beyond I*</u> .	
<b>CONFERENCE - POSTERS</b>	5 <b>Salcedo, A.</b> , Yamamoto, Y., Zope, R. (2019). Assessment of rSCAN with FLOSIC. <i>FLOSIC Collaboration Annual Meeting</i> . 4 Venegas, D., <b>Salcedo, A.</b> , Galindo, A. (2018). Background Characterization at the High Flux Isotope Reactor. <i>5th Joint Meeting of the APS Division of Nuclear Physics and the Physical Society of Japan. Bulletin Vol. 63:12, HA 60<sup>†</sup></i> . 3 Hackett, B., <b>Salcedo, A.</b> , Venegas, D. (2018). Background Characterization at the High Flux Isotope Reactor. <i>25th International Conference on the Application of Accelerators in Research and Industry. CAARI Book of Abstracts</i> , 189, #398. 2 <b>Salcedo, A.</b> , Lopez J., Terrazas, S., Gaytan, A. (2017). Liquid-gas Coexistence Phase in Nuclear Matter. <i>Fission Experiments and Theoretical Advances. FIESTA 2017 School &amp; Workshop Book of Abstracts</i> , 70. 1 <b>Salcedo, A.</b> , Lopez, J., Ramirez-Homs, E. (2016). Isospin-Symmetry Dependent Properties of Nuclear Matter. <i>Joint Meeting of the Four Corners and Texas Sections of the American Physical Society. Abstract ID: BAPS.2016.TSF.E1.53</i>	
<b>SYMPOSIUM - POSTERS</b>	3 <b>Salcedo, A.</b> , Yamamoto, Y., Zope, R. (2019). Aspects of Self-Interaction Correction to the Regularized SCAN Functional on Density Functional Theory. <i>UTEP COURI Annual Symposium</i> . 2 <b>Salcedo, A.</b> , Shanahan, P., Pochinsky, A., Negele, J. (2017). Classification of Dynamical Systems and Prediction of their Physical States Using Deep Learning. <i>31<sup>st</sup> Annual MIT Summer Research Poster Session. Link to Abstract</i> . 1 <b>Salcedo, A.</b> , Lopez, J., Ramirez-Homs, E. (2016). Isospin-Symmetry Dependent Properties of Nuclear Matter. <i>UTEP COURI Annual Symposium</i> .	
<b>SCHOOLS AND WORKSHOPS</b>	4 <b>Summer School in Theoretical Physics</b> ; Utrecht University.	Aug. 2018
	3 <b>PROSPECT Data Analysis Workshop</b> ; Yale Wright Laboratory.	July 2018
	2 <b>Fission Experiments and Theoretical Advances</b> ; Los Alamos Nat. Lab.	Sept. 2017
	1 <b>Nuclear Science Summer School (NS<sup>3</sup>)</b> ; NSCL/Michigan State University.	May 2017
<b>HONORS AND AWARDS</b>	• <b>Academic and Research Excellence</b> ; UTEP Physics Dept.	2019
	• <b>Academic and Research Excellence</b> ; UTEP Mathematics Dept.	2019
	• <b>Banner Bearer</b> ; UTEP College of Science Winter Commencement.	2019
	• <b>CEU Travel Award</b> ; APS Division of Nuclear Physics.	2018

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\*Due to COVID-19: A recording is available upon request and will be public after results get published.

<sup>†</sup>Abstract submitted by Venegas, D. Poster presented by me.

- **SURPASS Fellowship**; UTEP Campus Office of Undergraduate Research Initiatives. 2016
- **Jovenes en Accion Finalist**; national leadership program; U.S. Embassy in Mexico. 2014
- **State Youth Award on Social Engagement**; the State of Chihuahua<sup>‡</sup>. 2014

## TEACHING EXPERIENCE

### Instituto Tesla de Ciudad Juarez

#### *High School Lecturer*

- **Selected Topics in Physics II**: A survey of mechanical waves, EM fields, EM waves, special relativity, and quantum mechanics. Sp. 2020

### UTEP Physics Department

#### *Undergraduate Teaching Assistant*

- **Laboratory Instructor**; PHYS 2420, 3 per semester. Sp. 2020
- **Grader**; Analytical Mechanics I and Electromagnetics I. Fall 2019
- **Recitation Instructor**; PHYS 2420 and 2421 for Physics majors. Sp. 2018 - Sp. 2019
- **Recitation Instructor**; PHYS 2420, 2 per semester. Fall 2016 - Fall 2017
- **Grader**; Physical Science courses for education majors, 3 per semester. Sp. 2016

## COMMITTEE/ COMMUNITY

**MIT Summer Research Program**, *Application Review Committee*. 2020

**UTEP Society of Physics Students**, *President*. May 2019 - Present

**UTEP Society of Physics Students**, *Secretary*. August 2018 - May 2019

**U.S. Consulate in Juarez, MX**, *Youth Council, Found. Member*. Sept. 2014 - Sept. 2016

**Transcendental Agents of Change (ACT)**, *Cofounder*. August 2014 - May 2016

## SOFTWARE

- **Data Analysis**: ROOT, Gnuplot.
- **Programming Languages**: C, Java, Python, Fortran90.
- **Other Software**: LaTeX, HDF.

## LANGUAGES

- Spanish (Native Proficiency).
- English (Bilingual Proficiency).

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<sup>‡</sup>Shared with other 3 collaborators.