

Paul Joseph Robinson

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EDUCATION	<i>Bachelor of Science, Physics</i> University of California, Los Angeles, June 2018 (expected)	
RESEARCH EXPERIENCE	<i>John Stauffer VURP Fellow at Caltech</i> Advisor: Professor Garnet Chan Ph.D.	Summer 2017
	Implementing and exploring the potential uses of the “Intrinsic Atomic Orbital” projection scheme and the “Intrinsic Bonding Orbital” orbital localization algorithm in PySCF for periodic systems.	
	<i>Junior Specialist at UC Berkeley</i> Advisor: Professor Eric Neuscamman Ph.D.	Summer 2016
	Using Quantum Monte Carlo methods to explore wave function variance matching as a method for maximizing error cancellation when comparing the energies of ground state and excited-state wave functions with differing CI expansion lengths.	
	<i>Undergraduate Research Scholar at UCLA</i> Advisor: Professor Anastassia Alexandrova Ph.D.	Fall 2014-Present
	Analyzing ultra hard metal borides and determining the bonding motifs responsible for their extraordinary and anomalous strength. Applying these bonding insights to create new design paradigms which guide the creation of new, harder, materials. In collaboration with the experimental groups of Professors Sarah Tolbert and Richard Kaner at UCLA.	
	Performing global minimum searches and excited state calculations on small gas-phase anion clusters to elucidate the nature of the chemical bonds. Focused on clusters with non-negligible multireference and relativistic character. In collaboration with the experimental groups of Professors Kit Bowen and Tyrel McQueen at Johns Hopkins University.	
LEADERSHIP EXPERIENCE	<i>Tutor</i> Glendale Learning Program One-on-one tutoring with middle schoolers to help strengthen their math and science skills.	Spring 2017-Present
	<i>Member & Mentor</i> Student Members of the American Chemical Society Worked with children in the greater Los Angeles area to teach them about chemistry during Saturday STEM fairs.	Fall 2014-Spring 2016
	<i>Auxiliary Staff</i> <i>This Land is Your Land</i> , summer science camp for children Held an administrative position supporting and instructing the counselors. Additionally, I taught children ages 4-10 fundamentals of science in conjunction with demonstrative science-toy projects.	Summer 2013-Summer 2015

COMPUTER SKILLS Languages: Python: NumPy, SciPy, Regex; Bash; Java; HTML; CSS; JavaScript
Quantum Chemistry Software: PySCF (**Developer**); Molpro; NWChem; V.A.S.P.; Gaussian; QMCPack; GAMESS; GaussView; VMD
Other Software: L^AT_EX, LabVIEW, Mathematica, Microsoft Office
Operating Systems: LINUX, Mac, Windows

GRANTS *Sigma Xi Grant-in-Aid of Research*
A national award for undergraduate and graduate student researchers to allow them to pursue their own projects. One of 200 students selected from a nationwide pool (17% funding rate).

SCHOLARSHIPS & FELLOWSHIPS *Senior Undergraduate Research Scholar* 2017-2018
Support for Senior undergraduate researchers competitively awarded by the UCLA Undergraduate Research Center

John Stauffer VURP Fellowship Summer 2017
Award supporting top summer research students in Caltech's Division of Chemistry and Chemical Engineering

Junior Undergraduate Research Scholar 2016-2017
Selective award for Junior undergraduate researchers from the UCLA Undergraduate Research Center

2016 Elmer Carvey Scholarship 2016-2017
Awarded by the Southern California Chapter of the American Vacuum Society

Raymond & Dorothy Wilson Research Fellowship Summer 2015
Awarded by the UCLA Department of Chemistry and Biochemistry. One of four students selected.

Honors Program Maggie Gilbert Research Award Summer 2015
College Honors Program Summer Stipend. One of two students selected from a pool of UCLA honors students of all majors.

Stuart C. Waugh and Scott L. Waugh Scholarship Fall 2015-Spring 2016
College Honors Program scholarship for the academic year. Selected on the basis of academic merit.

Honorary Undergraduate Research Fellow Winter 2015-Spring 2015
Support for UCLA students early on in their research awarded by the UCLA Undergraduate Research Center

HONORS & AWARDS *Seaborg Poster Session Winner* November 2016
College Honors Program Winter 2015-Present
Dean's Honors List Fall: 2014, 2016; Winter: 2016, 2017; Spring: 2017
Eagle Scout January 2014

PUBLICATIONS 7. Robinson, P.J.; Zhang, X.; McQueen, T. M.; Bowen, K.H.; Alexandrova, A.N. *SmB₆—A Non-Born-Oppenheimer Solid with a New Type of Mixed Valency; In Preparation*
6. Robinson, P. J.; Liu, G; Ciborowski, S.M. ; Martinez-Martinez, C. J.; Chamorro,

- J. R.; McQueen, T. M.; Bowen, K.H.; Alexandrova, A.N. *Mystery of Three Borides: Promiscuous Metal-Boron Bonding Governing Superhard Structures*; Submitted
5. Lei, J. ; Yeung, M.T. ; Robinson, P.J. ; Mohammadi, R.; Turner, C. L. ; Alexandrova, A. N. ; Kavner, A. ; Kaner, R. B. ; Tolbert, S. ; *Volumetric deformation and strength anisotropy of orthorhombic tungsten monoboride under non-hydrostatic compression* ; Submitted
 4. Robinson, P.J.; Neuscamman, E.; *Excitation Variance Matching with Limited Configuration Interaction Expansions in Variational Monte Carlo*, 2017, arXiv 1705.04856, <http://arxiv.org/abs/1705.04856>
 3. Robinson, P.J.; Zhang, X.; McQueen, T. M.; Bowen, K.H.; Alexandrova, A.N. *SmB₆⁻ Cluster Anion: Covalency Involving f-Orbitals*, 2017, J. Phys. Chem. A. <http://dx.doi.org/10.1021/acs.jpca.7b00247>
 2. Robinson, P. J.; Alexandrova, A. N.; *Assessing the bonding properties of individual molecular orbitals*. 2015, J. Phys. Chem A; <http://pubs.acs.org/doi/abs/10.1021/acs.jpca.5b09687>
 1. Zhang, X.; Robinson, P. J.; Gantefoer, G.; Alexandrova, A. N.; Bowen, K. H.; *Photoelectron Spectroscopic and Theoretical Study of the [HPd(η^2 -H₂)]⁻ Cluster Anion*. 2015, J. Chem. Phys., 143, 094307; <http://dx.doi.org/10.1063/1.4929998>

TALKS & POSTERS

5. Robinson, P. J.; Alexandrova, A. N.; UCLA Research Poster Day 2017; Poster
4. Robinson, P. J.; Alexandrova, A. N.; 2017 American Chemical Society Southern California Undergraduate Research Conference, UCLA; Talk
3. Robinson, P. J.; Alexandrova, A. N.; Seaborg Symposium, 2016, UCLA; Poster — **Poster Session Winner**
2. Robinson, P. J.; Alexandrova, A. N.; 4th International Conference on Chemical Bonding, 2016, Lihue, HI; **Invited Talk — Highlighted in C&EN Magazine and ACS Central Science**
1. Robinson, P. J.; Alexandrova, A. N.; 2015 American Chemical Society Southern California Undergraduate Research Conference, U.C. San Diego; Talk

REFERENCES

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| <p>Dr. Anastassia N. Alexandrova
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| <p>Dr. Garnet Chan
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