Alexander Dmitri Lusk

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PROFESSIONAL APPOINTMENTS

Postdoctoral Researcher (2020 - present)
University of Wisconsin, Madison, WI
Advisor: Dr. Basil Tikoff. Focus in mantle deformation and rheology.

EDUCATION

Ph.D. Geological Sciences (2019)
College Doctoral Fellow.
University of Southern California, Los Angeles, CA
Advisor: Dr. John P. Platt. Focus in structural geology, metamorphic petrology, rock deformation, and rock rheology.

B.Sc. Geological Sciences (2011)
Summa Cum Laude with Departmental Honors in Earth and Space Sciences.
University of Washington, Seattle, WA

PEER-REVIEWED PUBLICATIONS

Lusk, A. D. and Platt, J. P., 2020. The deep structure and rheology of a plate boundary-scale shear zone: constraints from an exhumed Caledonian shear zone, NW Scotland. *Lithosphere.* doi:10.2113/2020/8824736
Lusk, A. D., *et al.*, Upper-Crustal Architecture and Record of Famatinian Arc Activity in the Sierra de Narváez and Sierra de Las Planchadas, NW Argentina. *South American Journal of Earth Sciences. In press.*
Lusk, A. D. and Platt, J. P., Reconciling experimental and natural deformation: a naturally-calibrated flow law for wet quartz-rich rocks. *Submitted.*

In preparation:
Lusk, A. D. and Platt, J. P, Quartz crystallographic preferred orientation transitions across an actively-exhuming shear zone. *In preparation.*
Lusk, A. D. and Platt, J. P, The role of weak layer interconnectivity in strain localization within the crustal lithosphere. *In preparation.*
Lusk, A. D., Okaya, D., Platt, J.P., Thermal evolution of a foreland propagating orogenic wedge constrained by $^{40}Ar/^{39}Ar$ thermochronology and thermal modeling. *In preparation.*
Ratschbacher B., Cawood, T., Larrovere, M., Paterson S., **Lusk, A. D**., Alasino P., Strain softening in the ≥ 6 km-wide Randolfo mylonite zone in Famatinian peraluminous granites, Argentina.
Mitchell, R. N., Ward, P. D., Brandon, M.T., Haggart, J. W., **Lusk, A. D.**, Raub, T. D., Tobin, T., Spencer, C., Kirschvink, J. L., Upper Cretaceous chronostratigraphy of the Nanaimo Group, Vancouver Island, British Columbia: Tests of biogeographic and paleogeographic correlations. *In preparation*.

ABSTRACTS AND PRESENTATIONS (***first author***)

2020 **Lusk, A.D.,** Duncan, C.J., Chan, M.A., Tikoff, B., StraboSpot for teaching virtual field experiences: a summer 2020 response to COVID-19. Oral presentation. GSA online 2020.
Lusk, A. D., Platt, J. P., Polyphase ultramylonite development during shear zone evolution. Poster and lightning talk. CIG Shear Zone Conference.
Lusk, A. D., Platt, J. P., Development of interconnected fine-grained polyphase networks during progressive exhumation of a shear zone. Accepted as oral presentation. EGU online 2020.

2019 **Lusk, A. D.**, Cawood, T. K., Platt, J. P., Evaluating Flow Laws for Dislocation Creep in Quartz: A Critical Comparison to Natural Shear Zones. Oral presentation. GSA, Phoenix, AZ.
Lusk, A. D., Cawood, T. K., Platt, J. P., Investigating Controls on Fault Zone Width Below the Brittle-to-Ductile Transition. Oral presentation. GSA, Phoenix, AZ.

Lusk, A. D., Platt, J. P., The deep structure and rheology of a plate boundary-scale shear zone: constraints from an exhumed Caledonian shear zone, NW Scotland. Oral presentation. Deformation, Rheology, and Tectonics Conference, Tübingen, Germany.

2018 **Lusk, A. D.,** Schmidt, W. L., Cawood, T.K., Hervig, R.L., Attia, S., Paterson, S. R., Trace element distribution and mobility in naturally-deformed quartz. Poster. AGU, Washington, D.C.

Lusk, A. D., Platt, J. P., Reconciling experimental and natural deformation: a naturally-calibrated flow law for quartz. Poster. Gordon Research Conference in Rock Deformation, Andover, NH.

Lusk, A. D., Platt, J. P., Quantifying variability in rheology and structure across an exhumed Caledonian shear zone, NW Scotland. Poster. Structural Geology & Tectonics Forum, Tempe, AZ.

2017 **Lusk, A. D.**, Platt, J. P., A naturally-calibrated flow law for quartz. Poster. AGU, New Orleans, LA.

Lusk, A. D., Paterson, S. R., Ratschbacher, B. C., Larrovere, M, Memeti, V., Alasino, P. H., Cawood, T., Hernandez, R., Deformation of the uppermost Famatinian Orogen: mapping and structural analysis from the Sierra de Narváez and Sierra de Las Planchadas, NW Argentina. Poster. GSA, Seattle, WA.

2016 **Lusk, A. D.**, Platt, J. P., Temperature-stress profile across an exhumed Caledonian shear zone, NW Scotland. Poster. AGU, San Francisco, CA.

Lusk, A. D., Platt, J. P., Variation in magnitude of differential stress and development of quartz crystal fabrics across an exhumed continental-scale thrust zone. Oral presentation. Microanalysis Society EBSD, Tuscaloosa, AL.

2015 **Lusk, A. D.**, Platt, J. P., Variation in magnitude of differential stress across an exhumed continental-scale thrust zone. Poster. AGU, San Francisco, CA.

2010 **Lusk, A. D.**, Gorman-Lewis, D., Toxicity of carbon nanotubes to *Bacillus subtilis*. Poster and oral presentation. Mary Gates Undergraduate Research Symposium, Seattle, WA.

TEACHING

Instructor of Record: Exploring California's National Parks (GEOL116)

University of Southern California, Spring 2016

As a Provost's Mentored Teaching Fellow, I had the opportunity to develop and teach an undergraduate course, with advising from Dr. Scott Paterson, over a fully-funded academic year. *Exploring California's National Parks* is an introductory level undergraduate class that covers basic principles of geology and an elementary geologic history of California taught through examination of California's National Parks. The course emphasizes an integration of interdisciplinary topics including park ecology, history, policy, economics, and geologic hazard assessment and mitigation. An integral part of the course are trips to Joshua Tree and Death Valley National Parks. These trips help to reinforce concepts introduced in the classroom and give students hands-on practice and the chance to demonstrate proficiency in understanding geologic processes in the field, where they are more easily observed and studied.

Teaching Assistant

University of Southern California

I have been a teaching assistant for a total of five courses over six semesters, plus two international field camps:

- GEOL105: Planet Earth (Autumn 2013; Spring 2014)
- GEOL160: Introduction to Earth Systems (Autumn 2017)
- GEOL432: Field Techniques (Autumn 2016)
- GEOL321: Structural Geology & Tectonics (Spring 2017)
- GEOL316: Petrologic Systems (Spring 2018)
- USC *Maymester* field courses (Argentina, 2017; Spain, 2018)

Duties primarily consisted of developing, organizing, and instructing laboratory sections but also included developing and presenting course material in the lecture portions of courses. Laboratory duties included development of original lab exercise material, accompanying lectures, quizzes, and exams. I consistently received high-scoring student evaluations and Departmental Teaching Awards for every course.

MENTORSHIP

Jonathan Mantilla (High school researcher, Summer 2019); Jonathan worked on a project examining the effect of weak phase interconnectivity on rock strength. His work was presented at the 2019 Young Researchers Programs symposium.

Megan White (B.Sc., 2019); Megan worked on a stable isotope study to determine the provenance of geo-fluids in shear zones active during the Famatinian Orogeny, NW Argentina.

Christopher Rick (B.Sc., 2019); Chris completed a senior thesis examining the microstructural characteristics and petrology of shear zones across the Famatinian Orogen, NW Argentina.

Robert Hernandez (B.Sc., 2018); Robert Hernandez completed a senior thesis using gravity modeling to better constrain the orientation and geometry of lithospheric discontinuities in NW Scotland. Robert is now pursuing a Master's Degree at San Diego State University.

FELLOWSHIPS, SCHOLARSHIPS, AND AWARDS

USC Graduate Student Government Travel Award: University of Southern California, 2018
Funding awarded for costs related to conference registration and travel. Total funding of $700.

University Outstanding Teaching Assistant Award: University of Southern California, 2018
Winner of the University-level award recognizing excellence in teaching among USC teaching assistants from all departments.

SCGS Best Poster Award: South Coast Geological Society Poster Session, 2017
Awarded for *Deformation of the uppermost Famatinian Orogen: mapping and structural analysis from the Sierra de Narváez and Sierra de Las Planchadas, NW Argentina*.

Summer Field Fellowship: University of Southern California, 2017
Funding awarded from the University of Southern California to cover field expenses. Total funding of $3750.

Departmental Teaching Assistant Award: University of Southern California 2013-2017
Recognition for outstanding teaching assistants as reflected on course evaluations and student feedback. I received this award for all semesters as a teaching assistant.

Graduate Student Research Fund (GSRF) grant: University of Southern California, 2015
Total funding of $2000.

Provost's Mentored Teaching Fellowship: University of Southern California, 2015-2016
The Provost's Mentored Teaching Fellowship gives USC's best teaching assistants a full year of funding and the opportunity to develop and teach their own course. *Exploring California's National Parks* is designed as an introductory course to attract new students to the natural sciences through examination of areas they can relate to. Course development and planning during the autumn, including constructing a syllabus, lectures, and labs, as well as organizing two fieldtrips, resulted in a fully built course, which was taught in the spring.

College Doctoral Fellowship: University of Southern California, 2013-2019
College Doctoral Fellowships are awarded to top incoming students. Fellows receive an enhanced fellowship support package that includes research funding for five years.

Graduated *Summa Cum Laude*: University of Washington, 2011
University award bestowed to graduating students with highest honors.

Douglas E. Merrill Prize: University of Washington, 2010
Top undergraduate prize awarded for excellence in the Department of Earth and Space Sciences. Award of $500.

Howard A. & Leila Coombs Scholarship: University of Washington, 2010
Monetary award for undergraduate achievement and scholarship. Award of $1000.

Mary Gates Undergraduate Research Scholarship: University of Washington, 2009
Monetary award for outstanding undergraduate research project. Award of $2000.

Dean's List: 2006-2010
I was on the Dean's List every quarter of attendance, at both California Polytechnic State University and the University of Washington.

SHORT COURSES AND WORKSHOPS

Organizer:

StraboSpot Structural Geology and Metamorphic Petrology Community Workshops: 2020. Workshops were designed to introduce members of the Structural Geology or Metamorphic Petrology communities to using the StraboSpot field app as a research tool. I was a co-organizer and presenter at both workshops.

Participant:

Workshop on Data Standards and Vocabulary in Structural Geology, Microstructures, and Experimental Deformation (invited participant). AGU: December, 2018.

Image Analysis in the Geosciences. Massachusetts Institute of Technology: January, 2018. Instructors: R. Heilbronner, M. Peč.

Structural Geology & Tectonics Forum. Arizona State University: January 2018. Workshops included: *Effective teaching in structural geology and tectonics* and *Best practices for teaching structural geology and tectonics labs*.

Digital Mapping in the Field. University of Southern California: April, 2015. Instructor: T. Pavlis.

OUTREACH AND SERVICE

StraboSpot field app development: I am active in the development of a digital database and iOS app for structural geology, tectonics, and petrology (www.strabospot.org), including running community workshops.

Utilizing StraboSpot as a teaching tool: an example from the Baraboo Hills, WI: Co-author on a 'virtual field experience' teaching module in StraboSpot, in response to COVID-19 field camp cancellations. Available on the SERC website.

Young Researchers Program Mentor: Summer, 2019. I was a mentor for the Young Researchers Program which gives underrepresented and disadvantaged high school students the opportunity to complete scientific research projects under the guidance of a graduate student mentor.

Outreach lecture series: *A climber's guide to the geologic history of southwestern North America*. An interactive lecture series developed to give climbers and outdoor enthusiasts an understanding of the geological processes and events that shape their playgrounds. Invited talks include The Stronghold Climbing Gym, Los Angeles, CA (3/17, 7/18) and Patagonia, Pasadena, CA (8/17).

Science communication on social media: I actively maintain an Instagram account (@adventures_in_geology) devoted to visually portraying how geologists interpret landforms and geologic phenomena in the field.

USC Department of Earth Sciences Lithospheric Dynamics (*LD*) Seminar Series organizer: 2015/16 and 2017/18 academic years. Organized departmental seminar series featuring speakers from within the department and visiting scholars from domestic and international universities, industry, and surveys.

FIELD GUIDES

Nourse, J. A., Swanson, B., **Lusk, A. D.**, Barth, N., Schwartz, J., Vermillion, K. Recent Advancements in Geochronology, Geologic Mapping, and Landslide Characterization in Basement Rocks of the San Gabriel Mountains Block, GSA Cordilleran Section 2020.

FIELDWORK AND GEOLOGIC MAPPING

White-Inyo Mountains, CA: 1:10000 mapping and structural analysis to investigate pluton emplacement. 2019 – present.
Frazier Mountain and Lebec Quadrangles, CA: mapping basement and surficial geology, including landslide hazard, with the California Geological Survey STATEMAP project. 2018 – 2020.
N. American Cordillera, CA, NV: mapping, teaching assistant, and instructor for mapping exercises. 2014 – present.
Betic-Rif Orogen, S. Spain: Student mentor and instructor. 2018.
Joshua Tree National Park, CA: 1:10000 mapping, structural analysis, and sample collection. 2017, 2018.
Caledonian Orogen, NW Scotland: Detailed mapping, structural analysis, and sample collection. 2015,2016,2017.
Alpine Orogen, Italian and Swiss Alps: Field assistant to structural analysis and sample collection. 2017.
Famatinian Orogen, NW Argentina: Reconnaissance, mentor to student mapping, and sample collection. 2017.
Monashee Range, British Columbia: Reconnaissance, detailed structural analysis and sample collection. 2014.
Ruby Mountains-East Humboldt Range, NV: Detailed structural analysis and sample collection. 2013.
Snake Range, NV: Detailed structural analysis and sample collection. 2013.
Manistee River, MI; **E. Seaboard**, MA: Detailed geomorphic mapping, depth-to-bedrock by passive seismicity. 2010.
N. American Cordillera, MT: Summer field camp. 2009.

WORK EXPERIENCE

California Geological Survey
Los Angeles, CA. 2018 - 2020.
As a volunteer intern with the California Geological Survey (CGS), I am assisting CGS scientists with mapping of two quadrangles in the San Gabriel Mountains, near the intersection of the San Andreas and Garlock Faults. In addition to assisting with mapping, I am carrying out microstructural and petrologic examination and synthesis of rocks exposed in these areas for publication accompanying CGS maps.

Aera Energy
Bakersfield, CA. Summer 2014
I examined several Aera leases in the San Joaquin Valley in terms of reservoir properties and viability of continuous versus cyclic steam injection. Work was done reconstructing detailed depositional environments and reservoir properties using petrophysical examination of conventional core, sidewall core, and log correlation. During my time at Aera, I became familiar with industry practices, including the interpretation of petrophysical and geophysical datasets, and with commonly-used software packages including Openworks and Decision Space Geosciences.

U. S. Geological Survey & National Association of Geoscience Teachers
Reston, VA and Hartford, CT. Summer 2010.
I worked as a USGS/NAGT intern with Dr. Kevin Kincare and Dr. Byron Stone on projects that included mapping surficial geology and reconstructing glacial histories in parts of northern Michigan and southeastern Massachusetts, revising pre-existing surface deposit geologic maps, and performing depth-to-bedrock measurements by means of passive seismicity.

PROFESSIONAL AFFILIATIONS

Geological Society of America (GSA)
American Geophysical Union (AGU)
National Association of Geoscience Teachers (NAGT)