

DAVID LAWRENCE SHUSTER
Curriculum Vitae

Berkeley Geochronology Center
2455 Ridge Road
Berkeley, CA 94709, USA

dshuster@bgc.org
(Phone) 510-644-9891
(Fax) 510-644-9201
www.bgc.org/shuster/

Born August 7, 1974

Education

California Institute of Technology , Pasadena, CA	
Ph.D., Geochemistry	2005
<i>Thesis: Application of spallogenic noble gases induced by energetic proton irradiation to problems in geochemistry and thermochronology;</i>	
M.S., Geochemistry	2003
University of California at Berkeley , Berkeley, CA	1992-1996
A.B., Geology	1996

Professional Appointments

Geochronologist, Berkeley Geochronology Center	2005-present
Lecturer, Dept. Earth and Planetary Sciences, UC Berkeley	Spring, 2008
Research Assistant, California Institute of Technology	2000-2005
Teaching Assistant, California Institute of Technology	2000-2005
Research Associate, Berkeley Center for Isotope Geochemistry Lawrence Berkeley National Laboratory	1996-2000

Teaching Experience

EPS 224 Isotope Geochemistry, UC Berkeley	Spring, 2008
Graduate level course in Dept. Earth and Planetary Sciences	

Honors and Awards

Invited Speaker, Goldschmidt Conference, 2007
Invited Speaker, Goldschmidt Conference, 2006
Invited Instructor, Mineralogical Society of American Short Course, 2005
Harry Hess Postdoctoral Fellowship in Geosciences (Princeton), 2005 (*declined*)
Reginald A. Daly Postdoctoral Fellowship (Harvard), 2005 (*declined*)
Invited Speaker, International Geological Congress, 2004
Invited Speaker, Goldschmidt Conference, 2003
National Science Foundation Graduate Research Fellowship, 2001-2004
Caltech Special Institute Fellowship, 2000-2001
California Federation of Mineralogical Societies Award, 1995
UC Berkeley Alumni Scholar, 1992

Professional Activities

Session Convener, “Quantifying Surface Processes using Noble Gases,” Fall Meeting, American Geophysical Union, 2008 (*solicited*)

Session Convener, “The Physics and Chemistry of Thermochronology,” 18th Annual V.M. Goldschmidt Conference, 2008 (*solicited*)

Session Convener: “New developments in geochronology,” Fall Meeting, American Geophysical Union, 2007

Session Convener: “Chemical weathering and mineralogy of the Martian surface and Earth analogs,” 16th Annual V.M. Goldschmidt Conference, 2006

Journal Referee: *American Journal of Science, Chemical Geology, Earth and Planetary Science Letters, Geochimica et Cosmochimica Acta, Geosphere, G-cubed, Geology, Journal of Geophysical Research, Geosphere, Nature, Terra Nova*

NSF Referee: *Geomorphology and Land-Use Dynamics, Geophysics, Sedimentary Geology and Paleobiology, Petrology and Geochemistry, Tectonics Programs*

Numbers of publications and proposals reviewed by year:
2004:3, 2005:2, 2006:8, 2007:7, 2008:6, 2009:9

Affiliations: American Geophysical Union, Geochemical Society

Refereed Publications

* denotes student contribution

** denotes post-doctoral associate

Total citations: 358

H-index: 13

In Progress:

- [32] **Shuster, D.L.**, *Sanders, J.W., Cuffey, K.M., (2010) High-relief glacial landscape evolution in Fiordland New Zealand constrained by apatite $^4\text{He}/^3\text{He}$ thermochronometry.
- [31] *Cassata, W.S., **Shuster, D.L.**, Renne, P.R., Weiss, B.P., (2010) $^{40}\text{Ar}/^{39}\text{Ar}$ thermochronometry of Martian meteorites ALH 84001, Nakhla, MIL 03446, *to be submitted to GCA.*
- [30] *Valla, P.G., **Shuster, D.L.**, van der Beek, P.A., et al., (2010) Apatite $^4\text{He}/^3\text{He}$ evidence of Alpine relief increase at the onset of Quaternary glaciations.

- [29] Farley, K.A., **Shuster, D.L.**, Wanser, Watson, B. (2010) Numerical investigations of the assumptions underlying apatite $^4\text{He}/^3\text{He}$ thermochronometry
- [28] **Shuster, D.L.**, Vasconcelos, P.M., Farley, K.A., Stone, J.O., (2010) Cosmogenic ^3He in Fe-oxides, *to be submitted to EPSL*.
- [27] Stone, J. O., Vasconcelos, P. M., **Shuster D. L.**, (2010) Very low erosion rates in Pantanaal, Brazil: Armoring effect of deeply weathered rocks, *to be submitted to Geology*.

In Press/Review:

- [26] Carporzen, L., Weiss, B.P., Ebel, D.S., J. Gattacceca, J., **Shuster, D.L.**, (2010) Evidence for a Metallic Core in the CV Chondrite Parent Planetesimal, *Science*, in review.
- [25] Schildgen, T.F., Balco, G, **Shuster, D.L.**, (2010) Canyon incision and knickpoint propagation recorded by apatite $^4\text{He}/^3\text{He}$ thermochronometry, *Earth and Planetary Science Letters*, in review.
- [24] **Shuster, D. L.**, ****Balco, G.**, ***Cassata, W.S.**, ****Fernandes, V.A.**, Garrick-Bethell, I., Weiss, B.P. (2010) A record of impacts preserved in the lunar regolith, *Earth and Planetary Science Letters*, in press.

In Print:

- [23] ***Cassata, W.S.**, Renne, P.R., **Shuster, D.L.**, (2009) Argon diffusion in plagioclase and implications for thermochronometry: A case study from the Bushveld Complex, South Africa, *Geochimica Et Cosmochimica Acta*, **73**(21), 6600-6612.
- [22] ****Balco, G.**, **Shuster, D. L.**, (2009b) ^{26}Al - ^{10}Be - ^{21}Ne burial dating, *Earth and Planetary Science Letters*, **286**(3-4), 570-575.
- [21] Reiners, P.W., **Shuster, D. L.**, (2009) Thermochronology and Landscape Evolution, *Physics Today*, **62**(9), 31-36.
- [20] ****Balco, G.**, **Shuster, D. L.**, (2009a) Production rate of cosmogenic ^{21}Ne in quartz estimated by comparison of ^{21}Ne , ^{10}Be , and ^{26}Al concentrations in slowly eroding Antarctica sandstone surfaces, *Earth and Planetary Science Letters*, **281**(1-2), 48-58.
- [19] Flowers, R.M., Ketcham, R.A., **Shuster, D.L.**, Farley, K.A., (2009) Apatite (U-Th)/He thermochronometry using a radiation damage accumulation and annealing model, *Geochimica Et Cosmochimica Acta*, **73**(8), 2347-2365.
- [18] Garrick-Bethell, I., Weiss, B.P., **Shuster, D.L.**, Buz, J., (2009) Early lunar magnetism, *Science* **323**(5912), 356-359.
- [17] **Shuster D. L.** and Farley, K. A., (2009) The influence of artificial radiation damage and thermal annealing on helium diffusion kinetics in apatite, *Geochimica Et Cosmochimica Acta* **73**(1), 6183-196
- [16] Colgan J.P., **Shuster D. L.**, Reiners, P. W. (2008) Two-phase Neogene extension in the northwest Basin and Range recorded in a single thermochronology sample. *Geology* **36**(8), 631-634.
- [15] Flowers R. M., **Shuster D. L.**, Wernicke B. P., and Farley K. A. (2007) Radiation damage control on apatite (U-Th)/He dates from the Grand Canyon region, Colorado Plateau. *Geology* **35**(5), 447-450.
- [14] **Shuster D. L.**, Flowers R. M., and Farley K. A. (2006) The influence of natural radiation damage on helium diffusion kinetics in apatite. *Earth and Planetary Science Letters* **249**(3-4), 148-161.
- [13] Heim J. A., Vasconcelos P. M., **Shuster D. L.**, Farley K. A., and Broadbent G. (2006) Dating palaeochannel iron ore by (U-Th)/He analysis of supergene goethite, Hamersley Province, Australia. *Geology* **34**(3), 173-176.
- [12] **Shuster D. L.**, Ehlers T. A., Rusmore M. E., and Farley K. A. (2005) Rapid glacial erosion at 1.8 Ma revealed by $^4\text{He}/^3\text{He}$ thermochronometry. *Science* **310**(5754), 1668-1670.

- [11] **Shuster D. L.** and Farley K. A. (2005b) $^4\text{He}/^3\text{He}$ thermochronometry: Theory, practice and potential complications. In *Low-Temperature Thermochronology: Techniques, Interpretations, and Applications*, Vol. 58 (ed. P. W. Reiners and T. A. Ehlers), pp. 181-202. Mineralogical Society of America.
- [10] **Shuster D. L.** and Weiss B. P. (2005) Martian surface paleotemperatures from thermochronology of meteorites. *Science* **309**(5734), 594-597.
- [9] **Shuster D. L.**, Vasconcelos P. M., Heim J. A., and Farley K. A. (2005) Weathering geochronology by (U-Th)/He dating of goethite. *Geochimica Et Cosmochimica Acta* **69**(3), 659-673.
- [8] **Shuster D. L.** and Farley K. A. (2005a) Diffusion kinetics of proton-induced ^{21}Ne , ^3He , and ^4He in quartz. *Geochimica Et Cosmochimica Acta* **69**(9), 2349-2359.
- [7] **Shuster D. L.**, Farley K. A., Sisterson J. M., and Burnett D. S. (2004) Quantifying the diffusion kinetics and spatial distributions of radiogenic ^4He in minerals containing proton-induced ^3He . *Earth and Planetary Science Letters* **217**(1-2), 19-32.
- [6] **Shuster D. L.** and Farley K. A. (2004) $^4\text{He}/^3\text{He}$ thermochronometry. *Earth and Planetary Science Letters* **217**(1-2), 1-17.
- [5] Weiss B. P., **Shuster D. L.**, and Stewart S. T. (2002) Temperatures on Mars from $^{40}\text{Ar}/^{39}\text{Ar}$ thermochronology of ALH84001. *Earth and Planetary Science Letters* **201**(3-4), 465-472.
- [4] Weiss B. P., Vali H., Baudenbacher F. J., Kirschvink J. L., Stewart S. T., and **Shuster D. L.** (2002) Records of an ancient Martian magnetic field in ALH84001. *Earth and Planetary Science Letters* **201**(3-4), 449-463.
- [3] Evans W. C., Sorey M. L., Cook A. C., Kennedy B. M., **Shuster D. L.**, Colvard E. M., White L. D., and Huebner M. A. (2002) Tracing and quantifying magmatic carbon discharge in cold groundwaters: lessons learned from Mammoth Mountain, USA. *Journal of Volcanology and Geothermal Research* **114**(3-4), 291-312.
- [2] DePaolo D. J., Bryce J. G., Dodson A., **Shuster D. L.**, and Kennedy B. M. (2001) Isotopic evolution of Mauna Loa and the chemical structure of the Hawaiian plume. *Geochemistry Geophysics Geosystems* **2**.
- [1] Evans W. C., Sorey M. L., Kennedy B. M., Stonestrom D. A., Rogie J. D., and **Shuster D. L.** (2001) High CO_2 emissions through porous media: transport mechanisms and implications for flux measurement and fractionation. *Chemical Geology* **177**(1-2), 15-29.

Other publications

- [R1] Vasconcelos P. M., Heim J. A., Farley K. A., **Shuster D. L.**, and Broadbent G. (2006) Dating palaeochannel iron ore by (U-Th)/He analysis of supergene goethite, Hamersley province, Australia: Reply to Comment by Morris R. C., Kneeshaw M., and Ramanaidou E.R., *Geology: Online Forum*, Published Online: April 2007, DOI: 10.1130/G22755Y.1, page e119.

Selected Meeting Abstracts

- [A33] *Valla P.G., **Shuster D.L.**, Van der Beek P., Balco G., Herman F., Braun J. (2009) Tectonically-Controlled Exhumation versus Climatically Driven Relief Development in the Valais Area (Western European Alps) Revealed by Apatite (U-Th-Sm)/He and $^4\text{He}/^3\text{He}$ Thermochronometry. *Fall AGU*, ID# V52C-08.

- [A32] *Cassata W.S., **Shuster D.L.**, Renne P.R., Weiss B.P. (2009) An alternative hypothesis for high-T $^{40}\text{Ar}/^{39}\text{Ar}$ age spectrum discordance in polyphase extraterrestrial materials. *Fall AGU, ID# V41D-2206*.
- [A31] Schildgen T.F., Balco G., **Shuster D.L.**, Ehlers T.A., Hodges K., Whipple K.X. (2009) Thermochronometer and Numerical Modeling Constraints on Canyon Incision and Topographic Evolution, SW Peru (*Invited*). *Fall AGU, ID# T32B-07*.
- [A30] Weiss B.P., Carporzen L., Ebel D.S., Gattacceca J., **Shuster D.L.** (2009) Evidence for a Metallic Core in the CV Chondrite Parent Planetesimal. *Fall AGU, ID# GP34A-07*.
- [A29] **Shuster D.L.**, *Sanders J.W., Cuffey K.M. (2009) High-relief glacial landscape evolution constrained by apatite $^4\text{He}/^3\text{He}$ thermochronometry. *Fall AGU, ID# EP44A-01*.
- [A28] Simon-Labric T., Brocard G.Y., Reiners P.W., **Shuster D.L.**, Teyssier C. (2009) Low-temperature thermochronology of a rapid incision event induced by lake overflow, Skagit River Gorge, Northern Cascades Range, Washington. *Fall AGU, ID# EP41B-0610*.
- [A27] *Cassata W.S., Renne P.R., **Shuster D.L.** (2009) $^{40}\text{Ar}/^{39}\text{Ar}$ thermochronology using plagioclase. Goldschmidt Conference. *Geochimica Et Cosmochimica Acta* **73**(13), A198.
- [A26] **Shuster D.L.**, Weiss B.P., **Fernandes V.A. (2009) Identifying a lunar impact at ~3.3 Ga using $^{40}\text{Ar}/^{39}\text{Ar}$ thermochronometry. Goldschmidt Conference. *Geochimica Et Cosmochimica Acta* **73**(13), A1218.
- [A25] Stone J., Fifield L.K., Finkel R., Rood D., **Balco G., **Shuster D.L.** (2009) Cosmogenic nuclide production rates from ancient Antarctic surfaces. Goldschmidt Conference. *Geochimica Et Cosmochimica Acta* **73**(13), A1280.
- [A24] **Fernandes V.A., Garrick-Bethell I., **Shuster D.L.** and Weiss B. (2008) Apollo 16 and 17 2-4 mm samples: common 4.2 Ga impact age in samples from the two sites. Early Solar System Impact Bombardment Workshop, abst.#3028.
- [A23] Garrick-Bethell I., **Fernandes V.A., **Shuster D.L.**, Weiss B. and Becker T. (2008) 4.2 Billion year old ages from Apollo 16, 17 and the lunar farside: Age of the South Pole Aitken? Early Solar System Impact Bombardment Workshop, abst.#3029
- [A22] *Cassata, W. S., Renne, P.R., **Shuster, D.L.**, (2008) ^{39}Ar and ^{37}Ar diffusion in plagioclase. Goldschmidt Conference. 2008, Vancouver, Canada.
- [A21] Garrick-Bethell I., Weiss B., **Fernandes V., **Shuster D.L.** and Becker T. (2008) New argon ages from the Cayley Plains: and absolute age for the South Pole Aitken Basin. NLSI Lunar Science Conference, abst.#2131.
- [A20] **Shuster, D.L.**, Farley, K.A., (2008) What is $^4\text{He}/^3\text{He}$ thermochronometry telling us about the (U-Th)/He system in apatite? Goldschmidt Conference. 2008, Vancouver, Canada, abstract #. A865
- [A19] Garrick-Bethell I., Weiss B.P., **Shuster D.L.**, **Fernandes V.A. and Becker T.A (2008) Early Lunar Magnetic Fields Recorded Before the Late Heavy Bombardment. Goldschmidt Conf. 2008, Vancouver, Canada, abst#. A297.
- [A18] Garrick-Bethell, I., Weiss, B. P., Becker, T. A., **Fernandes, V. A., and **Shuster, D. L.** (2008) Evidence for Magnetic Fields on the Early Moon. 2008 Joint Meeting of The Geological Society of America, abst.# 151309.
- [A17] **Shuster D.L.**, Farley, K.A., Vasconcelos, P.M., Stone, J.O., (2007) Cosmogenic ^3He in Fe oxides weathering products, *AGU Fall Meet. Suppl.*, Abstract V13F-06
- [A16] Wolfe, M.R., Stockli, D.F., **Shuster, D. L.**, Walker, J.D., Macpherson, G.L., (2007), Assessment of the rutile (U-Th)/He thermochronometry on the KTB drill hole, Germany, *AGU Fall Meet. Suppl.*, Abstract V23C-1549.
- [A15] Colgan, J. P., **Shuster D.L.**, Reiners, P.W., (2007), Two-phases Neogene extension of the northwestern Basin and Range decodes from thermochronology of a single sample, *AGU Fall Meet. Suppl.*, Abstract V33E-06
- [A14] **Shuster D. L.**, Farley K. A., (2007) The influence of neutron irradiation and thermal annealing on helium diffusivity in apatite. Goldschmidt Meeting Aug 2007 (*invited*).

- [A13] Flowers, R. M., **Shuster D. L.**, Farley, K. A., Wernicke, B. P. (2006) Evidence for radiation damage control on apatite He ages from the Grand Canyon region, Colorado Plateau. *Geochimica Et Cosmochimica Acta* **70**(18), A178.
- [A12] **Shuster D. L.**, Flowers, R. M., Farley, K. A. (2006) Radiation damage and helium diffusion kinetics in apatite. *Geochimica Et Cosmochimica Acta* **70**(18), A590. (invited)
- [A11] Heim J. A., Vasconcelos P. V., Farley K. A., **Shuster D. L.**, and Broadbent G. (2006) (U-Th)/He and Ar-40/Ar-39 geochronology of weathering, Hamersley Province, Australia: Implications for weathering history and landscape evolution. *Geochimica Et Cosmochimica Acta* **70**(18), A240-A240.
- [A10] Flowers, R. M., **Shuster D. L.**, Farley, K. A., Wernicke, B. P. (2006) Evidence for radiation damage control on apatite He ages from the Grand Canyon region, Colorado Plateau. *Geochimica Et Cosmochimica Acta* **70**(18), A178.
- [A9] **Shuster D. L.**, Flowers, R. M., Farley, K. A. (2006) Radiation damage and helium diffusion kinetics in apatite. *Geochimica Et Cosmochimica Acta* **70**(18), A590.
- [A8] **Shuster D. L.**, Farley K. A., and Ehlers T. A. (2005) Timing of accelerated glacial denudation constrained by $^4\text{He}/^3\text{He}$ thermochronometry. *Geochimica Et Cosmochimica Acta* **69**(10), A299.
- [A7] Farley K. A., **Shuster D. L.**, Clark M., and Maheo G. (2005) Dating erosion events using $^4\text{He}/^3\text{He}$ thermochronometry. *Geochimica Et Cosmochimica Acta* **69**(10), A317.
- [A6] **Shuster D. L.**, Farley K. A., Sisterson J., and Burnett D. S. (2003) $^4\text{He}/^3\text{He}$ thermochronometry. *Geochimica Et Cosmochimica Acta* **67**(18), A436.
- [A5] **Shuster D. L.**, Farley K. A., and Vasconcelos P. M. (2002) Cosmogenic ^3He in goethite. *Geochimica Et Cosmochimica Acta* **66**(15A), A713.
- [A4] Farley K. A., **Shuster D. L.**, Burnett D. S., and Sisterson J. (2002) Using proton-induced ^3He to study He diffusion kinetics and rock thermal histories. *Geochimica Et Cosmochimica Acta* **66**(15A), A224.
- [A3] Weiss B. P., Vali H., Baudenbacher F. J., **Shuster D. L.**, Stewart S. T., and Kirschvink J. L. (2002) Records of the ancient Martian magnetic field and climate in ALH84001. *Geochimica Et Cosmochimica Acta* **66**(15A), A827.
- [A2] **Shuster D. L.**, Farley K. A., and Vasconcelos P. M. (2000) Geochronology of weathering processes by (U-Th)/He analysis of supergene goethite and cryptomelane. *Eos Trans. AGU* **81**(48), 1263.
- [A1] Fischer T. P., Roggensack K., **Shuster D. L.**, and Kennedy B. M. (1999) Noble gas isotopic compositions of Central American magmas. *Eos Trans. AGU*.

Invited Lectures

Rice University, Department of Earth Science, Houston, TX, September 2007
 Johannes Gutenberg Universitat, Dep. of Geology, Mainz, Germany, June 2007
 University of Washington, Dept. Earth and Space Sciences, Seattle, WA, April 2007
 Yale University, Dept. of Geology and Geophysics, New Haven, CT, April 2007
 C.U. Boulder, Dept. of Geological Science, Boulder, CO, January 2007
 Petrobras, Cenpes, Rio de Janeiro, Brazil, December 2006
 ExxonMobil Upstream Research Company, Houston, TX, September 2006
 MIT, Dept. Earth, Atmospheric and Planetary Sci., Cambridge, MA, September 2006
 U.C. Santa Cruz Earth Sciences Department, Santa Cruz, CA, May 2006
 Southern Methodist University Dept. of Geological Sciences, Dallas, TX, April 2006
 Stanford University Dept. of Geo. and Environmental Sciences, Stanford, CA, April 2006
 U.C. Berkeley Dept. of Earth and Planetary Science, Berkeley, CA, March 2006
 Universidade Federal do Rio Grande do Norte, Natal, Brazil, January 2006

Berkeley Geochronology Center, Berkeley, CA, December, 2005
Mineralogical Soc. of America. Short Course, Salt Lake City, UT, October, 2005
Caltech Division of Geological and Planetary Sciences, Pasadena, CA, May 2005
Washington University Dept. of Earth and Planetary Sci., St. Louis, MO, March 2005
Princeton University Dept. of Geosciences, Princeton, NJ, February 2005
U.C. Berkeley Center for Isotope Geochemistry, Berkeley, CA, February 2005
Harvard University, Dept. of Earth and Planetary Sci., Cambridge, MA, February 2005

External Funding

Source: National Aeronautics and Space Administration, Mars Fundamental Research
Title: Thermal and magnetic history of Mars from meteorites; PI: Ben Weiss (74%), Co-I David Shuster (26%)

Total Award Amount: \$470,380

Total Award Period Covered: 5/1/06-4/30/10

Source: National Science Foundation, Major Research Instrumentation

Title: Acquisition of a noble gas thermochronometry laboratory at Berkeley Geochronology Center; PI: David Shuster, Co-PI: Paul Renne

Total Award Amount: \$149,757

Total Award Period Covered: 7/1/06-6/30/08

Source: National Science Foundation, Geomorphology and Land Use Dynamics

Title: Collaborative Research: The Pleistocene erosion history of glaciated alpine valleys interrogated by apatite $^4\text{He}/^3\text{He}$ thermochronometry; PI: David Shuster (77%), PI: Kurt Cuffey (23%)

Total Award Amount: \$198,000

Total Award Period Covered: 12/1/07-11/30/10

Source: National Science Foundation, Geomorphology and Land Use Dynamics

Title: Collaborative Research: Probing the Role of Rock Type in the Evolution of Glacial Landscapes; PI: Bob Anderson (79%), David Shuster (21%)

Total Award Amount: \$263,000

Total Award Period Covered: 6/1/07-5/31/10

Source: National Science Foundation, Petrology and Geochemistry

Title: Collaborative Research: Controls on He Diffusion from Minerals; PI: David Shuster (22%), PI: Ken Farley (78%).

Total Award Amount: \$377,000

Total Award Period Covered: 1/1/08-5/31/09

Source: Petrobras

Title: Thermochronology by the (U-Th)/He and $^4\text{He}/^3\text{He}$ methods: Quantifying denudation rates in deeply incised valleys and fault scarps in Southeastern Brazil; PI: Paulo Vasconcelos (57%), PI: David Shuster (43%)

Total Award Amount: \$76,800

Total Award Period Covered: 12/1/06-11/30/07

Source: National Aeronautics and Space Administration, LASER
Title: Measuring Paleomagnetism and Orienting Samples on the Moon; PI: Ben Weiss (87%),
Co-I David Shuster (13%)
Total Award Amount: \$356,579
Total Award Period Covered: 7/1/08-6/30/12

Source: France-Berkeley Fund
Title: Relief development in the Western Alps (France, Switzerland) in response to Quaternary
glaciations assessed through high-resolution $^4\text{He}/^3\text{He}$ thermochronology; PIs: David Shuster and
Kurt Cuffey
Total Award Amount: \$9,500
Total Award Period Covered: 7/1/08-7/30/10

Source: National Science Foundation, Petrology and Geochemistry
Title: Experimental Determination of Argon Diffusion Kinetics and Mechanisms in
Plagioclase; PI: Paul Renne, Co-PI: David Shuster
Total Award Amount: \$ 258,280
Total Award Period Covered: 3/1/09-2/29/12

Source: National Science Foundation, Antarctic Earth Sciences
Title: Extending the record of Antarctic landscape evolution into the Pliocene with ^{21}Ne
measurements; PI: Gregory Balco, Co-PI: David Shuster
Total Award Amount: \$ 47,652
Total Award Period Covered: 6/1/09-5/31/10

Source: National Science Foundation, Major Research Instrumentation
Title: Acquisition of a Single-Collector, Magnetic-Sector ICP-MS for Research in U-
Series and (U/Th)/He Chronometry at the Berkeley Geochronology Center; PI: Warren
Sharp, Co-PI: David Shuster
Total Award Amount: \$ 482,030
Total Award Period Covered: 8/1/09-7/31/10

Source: National Science Foundation, Antarctic Earth Sciences
Title: Collaborative Research: Systematic Analysis of Landscape Evolution and Surface
Ages in Transantarctic Mountains; PI: Gregory Balco, Co-PI: David Shuster
Total Award Amount: \$ 119,028
Total Award Period Covered: 9/1/09-8/31/12

Subawards:

Source: National Science Foundation, Geobiology and Low-Temperature Geochemistry, and Global Change

Title: Ancient environments and the geochemistry of low temperature Fe(III) and Al oxides, PI: Crayton Yapp

Subcontract: \$6,000 (to David Shuster)

Total Award Period Covered: 10/1/2006-9/31/2007

Source: National Science Foundation, Geomorphology and Land Use Dynamics

Title: SGER: Using $^4\text{He}/^3\text{He}$ thermochronometry to quantify the rate and timing of Canadian Shield fjord incision; PI: Jason Briner

Subcontract: \$11,000 (to David Shuster)

Total Award Period Covered: 8/15/2006 – 8/14/2007

Collaborators:

R. S. Anderson (C.U. Boulder), G. Balco (BGC), T. A. Becker (BGC), M. Bender (Princeton), J. P. Briner (SUNY Buffalo), D. S. Burnett (Caltech), J. Colgan (USGS), A. Chutjian (JPL), D. J. DePaolo (U. C. Berkeley), T.A. Ehlers (U. Michigan), K. A. Farley (Caltech), I. Garrick-Bethell (U.C. Santa Cruz), J. A. Heim (U. Queensland), M. A. House (Caltech/Pasadena City College), B. M. Kennedy (LBNL), K. M. Cuffey (U.C. Berkeley), J. Levine (U. Chicago), K. Min (U. Florida), S. Mukhopadhyay (Harvard), P. W. Reiners (ASU), P. R. Renne (BGC), M. E. Rusmore (Occidental College), J.F. Sanders (U.C. Berkeley), T. F. Schildgen (Universität Potsdam), J. M. Sisterson (Northeast Proton Therapy Center), S. T. Stewart (Harvard), D. F. Stockli (U. Kansas), J. O Stone (U. Washington), P. G. Valla (Université Joseph Fourier), P. Van der Beek (Université Joseph Fourier), P. M. Vasconcelos (U. Queensland), B. P. Weiss (MIT), C. J. Yapp (S. Methodist Univ.), P. K. Zeitler (Lehigh Univ.)

Graduate Advisor: Kenneth A. Farley (Caltech)