

CHARLES R. STERN

Professor
Department of Geological Sciences
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EDUCATION:

Ph.D. University of Chicago, 1973 (Geophysical Sciences)
B.S. University of Chicago, 1967 (Mathematics)

POSITIONS HELD:

Chair, Dept. Geological Sciences, Univ. Colorado, 1998-2003
Professor, Dept. Geological Sciences, Univ. Colorado, 1992-present
Visiting Professor, University of Santiago, Chile, 1993
Associate Professor, Dept. Geological Sciences, Univ. Colorado, 1983-92
Visiting Professor, University of Chile, 1985-86
Assistant Professor, Dept. Geological Sciences, Univ. Colorado, 1979-83
Assistant Professor, Cornell University, 1978-79
Research Associate, Lamont-Doherty Geological Observatory, Columbia Univ., 1974-78

AWARDS AND HONORS:

Herbert Thomas award, Sociedad Geologica de Chile, 2015
Honorary Doctorate Degree, Universidad de Magallanes, Chile, 2009
Visiting Scientist Fellowship, Andes Foundation, Chile, 1993
Fulbright Fellowship, American Republics Research Program, 1985
University of Colorado Faculty Fellowship, 1985

EDITORSHIPS:

Associate Editor, *Andean Geology* (previously *Revista Geologica de Chile*), 1986-present
Editorial Committee, *Magallania*, 2008-present
Editorial board, *Iranian Journal of Economic Geology*, 2015-present
Guest Editor; *Minerals*; Special volume on "Magmas and Ore Deposits", 2018-2019

RESEARH INTERESTS:

The broad relations between the formation of magmas and tectonics, implications of the chemistry of igneous rocks for their genesis, volcanic hazard evaluation, the formation of economic ore deposits associated with igneous activity, and the analysis of volcanic materials in archaeological sites.

STUDENTS:

Ph.D. degrees:

Derek Weller, Ph.D. 2017. "Genesis of different magmas erupted from volcanoes in the southern Andes"

Saeed Saadat, Ph.D. 2010, "Neogene volcanism in the Lut block of eastern Iran"

Juan Carlos Moya, Ph.D. 1998, "Neotectonics of western Puerto Rico"

David Zimbelman, Ph.D. 1996, "Hydrothermal alteration and its influence on volcanic hazards at Mt Rainier, Washington: a case study"

Carl Thornburg, Ph.D. 1992, "Petrology, geochemistry and origin of ultramafic inclusions and mafic alkaline volcanics from Harrat Hutaymah, Saudi Arabia"

Jorge Muñoz, Ph.D. 1988, "Evolution of Pliocene and Quaternary volcanism in the segment of the Andes between 38-39° south latitude"

Kenneth Hon, Ph.D. 1987, "Geologic and volcanic evolution of the Lake City Caldera, San Juan Mountains, Colorado"

Bruce Loeffler, Ph.D. 1983, "Major and trace element and strontium and oxygen isotope geochemistry of the Poldevara Group, Jemez Volcanic Field, New Mexico: implications for the petrogenesis of the Poldevara Group"

Margo Toth, Ph.D. 1981, "Structure, petrochemistry, and origin of the Bear Creek and Paradise Plutons, Bitterroot Lobe of the Idaho Batholith"

M.S. degrees:

Derek Weller, M.S. 2015 "Tephrochronology of the Andean southern SVZ, Chile"

Jonathan Funk, M.S. 2006, "Anhydrite bearing plutonic rocks, El Teniente Copper Deposit, Chile"

Terry Carter, M.S. 2002, "Iron release from biotite as a function of pH and nitrate concentration"

Daniel Miggins, M.S. 2002, "Ar/Ar chronology and petrochemistry of Mid-Tertiary igneous rocks in southern Colorado generated during the early stages of formation of the Rio Grande Rift"

James Shiroma, M.S., 1996, "Petrology and geochemistry of basalts from within the Liquine-Ofqui Fault Zone, southern Chilean Andes"

Paula Mohseni, M.S. 1992, "Petrochemistry of the Barros Arana Basalts, Ultima Esperanza, Chile: implications for the tectonic evolution of the southernmost Andes during the Cretaceous"

Robert Harrington, M.S. 1987, "Geology and geochemistry of the Mt. Jefferson Caldera Complex, Nye County, Nevada"

Kyoto Futa, M.S. 1986, "Sr and Nd Isotope geochemistry of volcanic rocks from active volcanoes in the southern Andes"

Sandra Saul, M.S. 1986, "Petrology of ultramafic mantle xenoliths from the Pali-Aike Volcanic Field, Chile"

Carol DiJulio, M.S. 1985, "Petrology and geochemistry of volcanic rocks from the Andean Austral Volcanic Zone (49-54°S)"

Dirk Horvoka, M.S. 1984, "Petrology of zircons from the Bear Creek and Paradise Plutons, Bitterroot Lobe of the Idaho Batholith"

Karen Budding, M.S. 1982, "Eruptive history, petrology and chemistry of the Joe Lott Tuff Member of the Mt. Belknap Volcanics, Marysvale volcanic field, West-Central Utah"

Jane Selverstone, M.S. 1981, "Petrologic and fluid inclusion study of granulite xenoliths, Pali-Aike Volcanic Field, Chile"

Lisa McBroome, M.S. 1981, "Stratigraphy and origin of Neogene ash-flow tuffs on the northern margin of the eastern Snake River Plain, Idaho"

Undergraduate Honors Thesis students:

Stephanie Junior, B.A. May 2016 *magna cum laude*. PETROLOGICAL CONDITIONS SURROUNDING GOLD DEPOSITION AT BROWNS CREEK SKARN, AUSTRALIA

Jeremy Ross, B.A. May 2015 *magna cum laude*. "Petrochemistry of the Silver Plume group St Vrian batholith in the area of the Rusty Copper Rare-earth-element deposit, Jamestown, Colorado"

Stewart Ray, B.A. May 2015 *magna cum laude*. "Petrochemistry of West Spanish Peaks pluton and dikes"

Mike Guido, B.A. May 2015 *summa cum laude*. "Icelandic and Valles caldera rhyolites"

Ian Contrares, B.A. 2014; *cum laude*, Dept Geol Sci Mentorship and UROP supported project "Cognate gabbroic xenoliths from Spanish Peak dikes, Colorado; petrology and petrogenesis"

Travis Johnson, B.A. 2014; *cum laude*, Dept Geol Sci Mentorship and UROP supported project "Miarolitic cavities in dikes from Spanish Peak dikes, Colorado; petrology and petrogenesis"

Michael Berger, B.A. 2012, *summa cum laude*, UROP supported honors thesis "Composition of monazites from the Mountain Pass REE-rich carbonatite complex, California"

Jesse Starr, B.A. 2000, *magna cum laude*, UROP supported honors thesis "Petrology and fluid inclusion study of a copper-rich breccia, El Teniente Mine, Central Chile"

Winston Seiler, B.A. 1999, *summa cum laude*, "Petrology of lamprophyric dikes in the Spanish Peaks Region, South-Central Colorado"

Jonathan Funk, B.A. 1997, *cum laude*, "Dating the Green Mountain Kimberlite, Boulder, Colorado"

Steven Quane, B.A. 1997, *cum laude*, "Petrology and geochemistry of the Two Buttes Mid-Tertiary intrusion, southeastern Colorado"

RESEARCH GRANTS:

REE-mineralization in pegmatites associated to the Pikes Peak Batholith in the South Platte district, Colorado (USA)" Collaborator with Dr. J Allaz; Swiss Academy of Sciences grant; \$80,000; 2019-2022

El volcanismo holocénico y su impacto sobre los ambientes y el proceso de poblamiento humano de la Cordillera Central y Sur de Mendoza"; Collaborator with Dr V Duran; PICTO-2016-0056; \$60,000 2017-2019

Núcleo de Estudios del Cuaternario del Sur de Chile (NECSur)". Collaborator with Dr. M Pino. La Dirección de Investigación y Desarrollo (DID) to the University Austral, Valdivia, Chile, \$100,000; 20156-2019

Investigation of rare REE-minerals occurrence near Jamestown, CO (USA): mineral characterization and genesis. Co-PI with J Allaz, MA Skewes, K Mahan and M Raschke on USGS Mineral Resources External Research Project grant G14AP00052, \$46,966 March 2014-16.

TRAMPAS NATURALES Y HUMEDALES: EXPLORANDO LA VARIABILIDAD DEL REGISTRO ARQUEOLOGICO Y TAFONOMICO DE PATAGONIA MEDIONAL. Co-PI with Alfredo Prieto on FONDECYT-Chile grant #7080233 for International Collaboration; \$10,000 for my travel and field expenses in conjunction with the \$90,000 from the FONDECYT Regular Grant #1070709; 2007-2010.

Colonizacion, manejo de recursos e interacciones en ambientes perilacustres cordilleranos de Patagonia Centro-meridional (11000/2500 anos A.P.). Collaborator with C.A. Aschero and M.T. Civalero (Instituto Nacional de Antropologia y Pensamiento Latinoamericano (INAPL), Buenos Aires, Argentina), 2004-2007, CONICET (Argentina) Proyecto No. 04-12262; \$90,000.

Description and analysis of the archaeological context of the oldest human bone remains in Patagonia -- Bano Nuevo Cave 1; Collaborator with Co-PI's F. Mena and V. Lucero, 2003-2005; FONDECYT (Chile) Proyecto 1030560; \$100,00

The identification of the source of green obsidian, its spatial distribution and implications for its archaeological context in southernmost Patagonia and Tierra del Fuego. Co-PI with A. Prieto, 2000-03, FONDECYT (Chile), Proyecto 1-10-0161, \$120,000.

The identification of the source of green obsidian, its spatial distribution and implications for its archaeological context in southernmost Patagonia and Tierra del Fuego. 2000-03, FONDECYT (Chile), Proyecto 1-10-0161 Supplement for International Collaboration, \$20,000.

Minority Ph.D. graduate student fellowship support. Co-PI with David Budd, Dena Smith and William Atkinson, 2001-2006, Alfred Sloan Foundation, \$120,000.

Postglacial explosive volcanism in the southern and austral Andes: recurrence and chronology. Co-PI with J.A. Naranjo, 1996-2001, FONDECYT (Chile), Proyecto 1-96-0186, \$60,000.

Sources and distribution of obsidian artifacts in southernmost Patagonia. 1996. National Geographic Research, NGS5610-96, \$12,090.

Tephrochronology along the Carretera Austral, between Chaiten (42°S) and Balmaceda (46°S) and implications for volcanic risks. Co-PI with J.A. Naranjo, 1994-1996, FONDECYT (Chile), Proyecto 1-94-0129, \$40,000.

Tephrochronology of southern Patagonia. 1992-93, National Geographic Society, NGS4889-92, \$16,000.

Identifying volcanic sources of tephra and obsidian artifacts in southern Patagonia. 1989-91, National Geographic Society, NGS4238-89, \$12,000.

Collaborative study of Pliocene Andean volcanism in the vicinity of Santiago, Chile. 1990-91, National Science Foundation, INT89-12820, \$11,900.

Petrochemical study of mantle and lower crustal xenoliths found in the Patagonian lavas of southernmost South America. 1988-91, National Science Foundation, EAR88-03958, \$86,000.

Acquisition of Electron Microprobe. Co-PI with J. Drexler, J. Smyth, J. Munoz, E. Larson, and D. Budd, 1988, National Science Foundation, EAR87-20962, \$250,300.

Tephrochronology of Patagonia. 1987, National Geographic Society, NGS3425--86, \$12,350.

Petrogenesis of late Cenozoic volcanism in central Anatolia, Turkey. Co-PI with H. Amini, 1986-87, National Science Foundation, INT85-21766, \$10,000.

Integrated structural and petrochemical investigation of a cross-section through the Himalayan fold/thrust belt in Garhwal, India. Co-PI with R. Kligfield, 1984-86, National Science Foundation, EAR84-16194, \$77,150.

Petrochemical investigation of the Patagonia plateau lavas of southernmost South America. 1983-86, National Science Foundation, EAR83-13884, \$85,000.

Acquisition of solid-source mass-spectrometer. Co-PI with L. Farmer 1986, National Science Foundation, EAR86-90744, \$113,675.

Study of the magmatic evolution of the Andes. Fulbright Fellowship, American Republics Research Program, 1985, \$14,000.

Structural and petrological studies of the Himalayas fold-thrust belt of Garwal, India. Co-PI with R. Kligfield, 1983-84, National Science Foundation, INT-83-O4O33, \$12,000.

Petrochemical investigation of recent orogenic volcanism in southernmost Chile, South America. 1980-82, National Science Foundation, EAR-80-20791, \$78,500.

Petrologic and geochemical studies of ultramafic and mafic xenoliths found in the Patagonian Plateau Basalts of southernmost South America. 1979-80, National Science Foundation EAR-79-11204, \$19,465.

A petrochemical study of recent calc-alkaline volcanics of Chile. Co-PI with W.I. Ridley, 1976-77, National Science Foundation, EAR-76-03816, \$16,500.

A comprehensive geologic, petrologic and geochemical investigation of the margin of southern Chile. Co-PI with I.W.D. Dalziel and W.I. Ridley, 1977-79, National Science Foundation, EAR-76-82456, \$88,000.

A comprehensive geologic, petrologic and geochemical investigation of the margin of southern Chile. Co-PI with I.W.D. Dalziel and W.I. Ridley, 1975-77, National Science Foundation, EAR-75-04076, \$88,700.

PUBLICATIONS:

1. **Stern, C.R.** and P.J. Wyllie (1973). Water-saturated and undersaturated melting relations of granite to 35 kilobars. Earth and Planetary Science Letters, v. 18, p. 163-167.
2. **Stern, C.R.** and P.J. Wyllie (1973). Melting relation of basalt-andesite-rhyolite-H₂O and a pelagic red clay at 30 kilobars. Contributions to Mineralogy and Petrology, v. 42, p. 313-323.
3. **Stern, C.R.** (1974). Melting products of olivine tholeiite basalt in subduction zones. Geology, v. 2, p. 227-230.
4. **Stern, C.R.** and P.J. Wyllie (1975). Effect of iron absorption by noble-metal capsules on phase boundaries in rock melting experiments at 30 kilobars. American Mineralogist, v. 60, p. 681-689.
5. **Stern, C.R.**, W. L. Huang and P.J. Wyllie (1975). Basalt-andesite-rhyolite-H₂O: crystallization intervals with excess H₂O and H₂O-undersaturated liquidus surfaces to 35 kilobars, with implications for magma genesis. Earth and Planetary Science Letters, v. 28, p. 189-196.
6. Dalziel, I.W.D., M.J. de Wit and **C.R. Stern** (1975). Structural and petrologic studies in the Scotia Arc. Antarctic Journal of the U.S., v. 10, p. 180-182.
7. **Stern, C.R.**, M.A. Skewes and M. Duran (1976). Volcanismo orogenico en Chile austral. Actas Primer Congreso Geologico Chileno, Santiago, Chile, v. 2, p. 195-212.

8. **Stern, C.R.**, M.J. de Wit and J.R. Lawrence (1976). Igneous and metamorphic processes associated with the formation of Chilean ophiolites and their implication for ocean floor metamorphism, seismic layering, and magnetism. Journal of Geophysical Research, v. 81, p. 4370-4380.
9. Wyllie, P.J., W.L. Huang, **C.R. Stern** and S. Maaloe (1976). Granite magmas: possible and impossible sources, water contents, and crystallization sequences. Canadian Journal of Earth Sciences, v. 13, p. 1007-1019.
10. Bonatti, E., M.B. Honnorez-Guerstein, J. Honnorez and **C.R. Stern** (1976). Hydrothermal pyrite concretions from the Romanche trench (equatorial Atlantic): Metallogensis in oceanic fracture zones. Earth and Planetary Science Letters, v. 32, p. 1-10.
11. de Wit, M.J. and **C.R. Stern** (1976). A model for ocean-floor metamorphism, seismic layering and magnetism. Nature, v. 264, p. 615-619.
12. de Wit, M.J., S. Dutch, R. Kligfield, R. Allen and **C.R. Stern** (1977). Deformation, serpentinization, and emplacement of a dunite complex, Gibbs Island, South Shetland Islands: Possible fracture zone tectonics. Journal of Geology, v. 85, p. 745-762.
13. de Wit, M.J. and **C.R. Stern** (1978). Pillow talk. Journal of Volcanology and Geothermal Research, v. 4, p. 55-80.
14. Bruhn, R.L., **C.R. Stern** and M.J. de Wit (1978). Field and geochemical data bearing on the development of a Mesozoic volcano-tectonic rift zone and back-arc basin in southern-most South America. Earth and Planetary Science Letters, v. 41, p. 32-46.
15. **Stern, C.R.** and P.J. Wyllie (1978). Phase compositions through the crystallization intervals of basalt-andesite-H₂O at 30 kbars with implications for subduction zone magmas. American Mineralogist, v. 63, p. 641-663.
16. Elthon, D.L. and **C.R. Stern** (1978). Metamorphic petrology of the Sarmiento ophiolite complex, Chile. Geology, v. 6, p. 464-468.
17. **Stern, C.R.** and D.L. Elthon (1979). Vertical variations in the effects of hydrothermal metamorphism in Chilean ophiolites: their implications for ocean floor metamorphism. Tectonophysics, v. 55, p. 179-213.
18. **Stern, C.R.** (1979). Open and closed system igneous fractionation within two Chilean ophiolites and the tectonic implications. Contributions to Mineralogy and Petrology, v. 68, p. 243-258.
19. Saunders, A.D., J. Tarney, **C.R. Stern** and I.W.D. Dalziel (1979). Geochemistry of Mesozoic marginal basin floor igneous rocks from southern Chile. Geological Society of America Bulletin, v. 90, p. 237-258.
20. Skewes, M.A. and **C.R. Stern** (1979). Petrology and geochemistry of alkali basalts and ultramafic inclusions from the Pali-Aike volcanic field in southern Chile and the origin of the Patagonian plateau lavas. Journal of Volcanology and Geothermal Research, v. 6, p. 3-25.
21. Bonatti, E., V. Kolla and **C.R. Stern** (1979). Metallogensis in marginal basins: Fe-rich basal deposits from the Philippine Sea. Marine Geology, v. 32, p. 21-37.
22. **Stern, C.R.** and M.J. de Wit (1980). The role of spreading center magma chambers in the formation of Phanerozoic oceanic crust: evidence from Chilean ophiolites. In "Ophiolites" Proceedings International Ophiolite Symposium, Cyprus, 1979, (A. Panayiotou, ed.), Printco, Cyprus, p. 497-506.
23. **Stern, C.R.** (1980). Geochemistry of Chilean ophiolites: evidence for the compositional evolution of the mantle source of back-arc basin basalts. Journal of Geophysical Research, v. 85, p. 955-966.

24. **Stern, C.R.** and P.J. Wyllie (1981). Phase relationships of I-type granite with H₂O to 35 kilobars: The Dinkey Lakes biotite granite from the Sierra Nevada Batholith. Journal of Geophysical Research, v. 86, p. 10412-10422.
25. de Wit, M.J. and **C.R. Stern** (1981). Variations in the degree of crustal extension during the formation of a back-arc basin. Tectonophysics, v. 72, p. 229-260.
26. **Stern, C.R.** and J.B. Stroup (1982). The petrochemistry of the Patagonian batholith, Ultima Esperanza, Chile. In "Antarctic Geoscience" (C. Craddock, ed.), Univ. Wisconsin Press, Madison, Wisconsin, p. 135-142.
27. Godoy, E., M. Dobbs and **C.R. Stern** (1982). El volcan Hudson, primeros datos quimicos e isotopicos en coladas interglaciales. Comunicaciones del Departamento de Geologia de Universidad de Chile, No. 32, p. 1-9.
28. Selverstone, J.E. and **C.R. Stern** (1983). Petrochemistry and recrystallization of granulite xenoliths from the Pali-Aike volcanic field, Chile. American Mineralogist, v. 68, p. 1102-1112.
29. **Stern, C.R.**, K. Futa and K. Muehlenbachs (1984). Isotope and trace element data for the orogenic andesites from the austral Andes. In "Andean Magmatism: Chemical and Isotopic Constraints" (R. Harmon and B. Barreiro, editors), Shiva Press, Ltd., Chesire, England, p. 31-46.
30. **Stern, C.R.**, K. Futa, K. Muehlenbachs, F.M. Dobbs, J. Muñoz, E. Godoy, R. Charrier (1984). Sr, Nd, Pb and O isotopic composition of Late Cenozoic volcanics, the northernmost SVZ (33-34°S). In "Andean Magmatism: Chemical and Isotopic Constraints" (R. Harmon and B. Barreiro, editors), Shiva Press, Ltd., Chesire, England, p. 96-105.
31. Elthon, D., J. R. Lawrence, R.E. Hanson and **C.R. Stern** (1984). Modelling of oxygen isotope data from the Sarmiento ophiolite complex, Chile. In "Ophiolite and Oceanic Lithosphere" (I. Cass, S. Lippard & A. Shelton, editors), Blackwell Scientific Publications, London, p. 185-197.
32. **Stern, C.R.**, M.H. Amini, R.A. Charrier, E. Godoy, F. Herve and J. Varela (1985). Petrochemistry and age of rhyolitic pyroclastic flows which occur along the drainage valleys of the Rio Maipo and Rio Cachapoal (Chile) and the Rio Yaucha and Rio Papagayos (Argentina). Revista Geologica de Chile, v. 23, p. 39-52.
33. **Stern, C.R.**, K. Futa, S. Saul and M.A. Skewes (1985). Ultramafic xenoliths found in the Pali-Aike basalts: their implications for the nature of the mantle below southern South America. Actas Cuarto Congreso Geologico Chileno, Antofagasta, Chile, v. 3, p. 531-548.
34. Muñoz, J. and **C.R. Stern** (1985). El complejo volcanico Pino Hachado en el sector nor-occidental de la Patagonia (38-35°S): volcanismo Plio-Cuaternario tras-arco en Sudamerica. Actas Cuarto Congreso Geologico Chileno, Antofagasta, Chile, v. 3, p. 380-412.
35. **Stern, C.R.**, K. Futa, S. Saul and M.A. Skewes (1986). Nature and evolution of the subcontinental mantle lithosphere below southern South America and the implications for Andean magma genesis. Revista Geologica de Chile, v. 27, p. 41-53.
36. Douglas, B.J., S.L. Saul and **C.R. Stern** (1987). Rheology of the upper mantle beneath southernmost South America inferred from peridotite xenoliths. Journal of Geology, v. 95, p. 241-254.
37. Budding, K., C.G. Cunningham, R.A. Zielinski, T.A. Stevens and **C.R. Stern** (1987). Petrology and Chemistry of the Joe Lott Tuff Member of the Mt. Belknap Volcanics, Marysvale volcanic field, West-Central Utah. U.S.G.S. Professional Paper, No. 1354, 47 p.
38. Futa, K. and **C.R. Stern** (1988). Sr and Nd isotopic and trace element compositions of orogenic Quaternary volcanic centers of the southern Andes. Earth and Planetary Science Letters, v. 88, p. 253-262.

39. **Stern, C.R.** (1988). Source region versus intra-crustal contamination in the petrogenesis of the Quaternary volcanic centers at the northern end (33-34°S) of the Southern Volcanic Zone of the Andes. Actas Quinto Congreso Geologico Chileno, v. 3, p. 29-43.
40. Muñoz, J. and **C.R. Stern** (1988). The Quaternary volcanic belt of the southern continental margin of South America: Transverse structural and petrochemical variations across the segment between 38°S and 39°S. Journal of South American Earth Sciences, v. 1, p. 147-161.
41. Muñoz, J. and **C.R. Stern** (1989). Alkaline magmatism within the segment 38-39°S of the Plio-Quaternary volcanic belt of the southern South American continental margin. Journal of Geophysical Research, v. 94, p. 4545-4560.
42. **Stern, C.R.**, R. Kligfield, D. Schelling, Z. Peterman, K. Futa, H. Amini and N.S. Virde (1989). The Bhagirathi leucogranite of the High Himalaya: age petrogenesis and tectonic implications. In "Tectonics of the Western Himalayas" (L.L. Malinconico, Jr. and R. Lillis, editors), Geological Society of America Special Paper, No. 232, p. 33-45.
43. **Stern, C.R.**, M.A. Skewes, S. Saul and K. Futa (1989). Garnet peridotite xenoliths from the Pali-Aike alkali basalts of southernmost South America. In "Kimberlites and Related Rocks - Their Mantle and Crustal Setting" Geological Society of Australia Special Publication, No. 14, v. 2, p. 735-744.
44. **Stern, C.R.** (1989). Pliocene to recent migration of the volcanic front, Andean southern volcanic zone. Revista Geologica de Chile, v. 16, no. 2, p. 145-162.
45. **Stern, C.R.** (1989). Sr isotopic composition of mantle xenolith bearing basalts of the Patagonian plateau lavas. Revista de la Asociacion Geologica de Argentina, v. 44, p. 402-407.
46. Muñoz, J., **C.R. Stern**, M. Dobbs, A. Bermudez, D. Delpino and F. Frey (1989). El volcanismo Plio-Cuaternario a traves de los 34-39°S de los Andes. Revista de la Asociacion Geologico de Argentina, v. 44, p. 270-286.
47. **Stern, C.R.** (1990). The tephrochronology of southernmost Patagonia. National Geographic Research, v. 6. p. 110-126.
48. **Stern, C.R.**, F.A. Frey, K. Futa, R.E. Zartman, Z. Peng and T.K. Kyser (1990). Trace-element and Sr, Nd, Pb, and O isotopic composition of Pliocene and Quaternary alkali basalts of the Patagonian plateau lavas of southernmost South America. Contributions to Mineralogy and Petrology, v. 104, p. 294-308.
49. **Stern, C.R.** (1990). Comment on "A geochemical traverse across the northern Chilean Andes: evidence for crust generation from the mantle" by G. Rogers and C. Hawkesworth. Earth and Planetary Science Letters, v. 101, p. 129-133.
50. **Stern, C.R.** (1991). Role of subduction erosion in the generation of Andean magmas. Geology, v. 19, p. 78-81.
51. **Stern, C.R.** (1991). Isotopic composition of late Jurassic-early Cretaceous mafic igneous rocks from the southernmost Andes. Revista Geologica de Chile, v. 18, p. 15-23.
52. **Stern, C.R.** (1991). Comment on "Crustal contributions to arc magmatism in the Andes of central Chile," by W. Hildreth and S. Moorbath. Contributions to Mineralogy and Petrology, v. 108 p. 241-246.
53. **Stern, C.R.** (1991). A mid-Holocene tephra on Tierra del Fuego derived from the Hudson volcano (46°S): Evidence for a large explosive eruption. Revista Geologica de Chile, v. 18, p. 139-146.
54. **Stern, C.R.** (1991). Reply to comment by Jon Davidson on "Role of subduction erosion in the generation of Andean magmas." Geology, v. 19, p. 1055-1056.

55. **Stern, C.R.**, P. Mosheni and R. Fuenzalida (1991). Petrochemistry and tectonic significance of early Cretaceous Barros Arana Formation basalts, southernmost Chilean Andes. Journal of South American Earth Sciences, v. 4, No. 4, p. 226-239.
56. **Stern, C.R.** (1992). Tephrochronology of Magallanes: new data and implications. Anales del Instituto de la Patagonia, v. 21, p. 129-139.
57. **Stern, C.R.** (1992). Implications of tephrochronology for the age of the human occupation of Tierra del Fuego. National Geographic Research, v. 8, p. 239-240.
58. **Stern, C.R.** and A. Prieto (1992). Origin of the green obsidian of Magallanes. Anales del Instituto de la Patagonia, v. 20, p. 89-97.
59. **Stern, C.R.** and C. Porter (1992). Origin of the grey to translucent obsidian of Chiloe and the Gran Gualteca Islands. Anales del Instituto de la Patagonia, v. 20, p. 97-102.
60. **Stern, C.R.**, S. Mukasa and R. Fuenzalida (1992). Age and origin of silicic rocks in the Sarmiento complex of the Rocas Verdes ophiolites, southernmost Chile. Journal of South American Earth Sciences, v. 6, p. 32-40.
61. **Stern, C.R.** and M. Vergera (1992). New age for the rhyolitic pyroclastic flows near Ancud, Chiloe, Chile. Revista Geologica de Chile, v. 19, p. 227-230.
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