

CURRICULUM VITAE

WALTER ALVAREZ

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RESEARCH INTERESTS

Stratigraphy and Earth history, focusing on comet and asteroid impacts and their role in causing mass extinctions and influencing the course of evolution of life; tectonics of the Mediterranean region; geology of the Quaternary Roman Volcanic Province and its implication for dating glacial cycles and for understanding Roman archeology; stratigraphy of pelagic limestones.

ACADEMIC BACKGROUND

1962 B.A. Carleton College, Northfield, Minnesota (Major: Geology).

1967 Ph.D. Princeton University, Princeton, New Jersey (Geology)

Thesis: "Geology of the Simarua and Carpintero areas, Guajira Peninsula, Colombia."

AWARDS & HONORS

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| 1983-84 | Guggenheim Fellow |
| 1984 | Fellow of the California Academy of Sciences |
| 1985 | G. K. Gilbert Award, Division of Planetary Geology, Geological Society of America |
| 1986 | Honorary Foreign Fellowship, European Union of Geosciences |
| 1986 | Honorary citizenship, Piobbico, Italy |
| 1986-87 | Miller Research Professor, University of California, Berkeley |
| 1988 | Minor planet "Alvarez" (1985 HC), discovered 1985 by C. S. Shoemaker and E. M. Shoemaker, named for L. W. Alvarez and W. Alvarez |
| 1989 | Fellow of the American Geophysical Union |
| 1991 | Rennie Taylor Award of the American Tentative Society (Science Journalists) |
| 1991 | Elected to the National Academy of Sciences |
| 1992 | Elected Foreign Member of the Royal Danish Academy of Sciences |
| 1993 | Elected to the American Academy of Arts and Sciences |
| 1993 | Honorary Doctorate of Humane Letters, Illinois Wesleyan University |
| 1994 | Honorary citizenship, Gubbio, Italy |
| 1998 | Journalism Award of the American Association of Petroleum Geologists |

PROFESSIONAL ACTIVITIES

- 1963-66 Four field seasons' work in Guajira Peninsula (Colombia, South America).
- 1966 Oceanographic cruise in the Caribbean on Scripps vessel Thomas Washington.
- 1967-68 Exploration geology and geophysics in North Sea area.
- 1968-70 Exploration studies of the regional geology of western Libya, Algeria, and Tunisia.
- 1968-71 Field study of volcanic stratigraphy north of Rome, Italy, in connection with archaeological excavations of the British School at Rome.
- 1972-present Extensive field work in Italy and nearby areas (Sardinia, the Alps, Corsica, Spain, Cyprus, Tunisia) on problems relating to Mediterranean tectonics, the pelagic stratigraphic record, and geomagnetic reversal history.
- 1977, 1979 Geological study of induced seismicity at Nurek Reservoir, Tadzhikistan, and Toktogul Reservoir, Kirghizia (Soviet Central Asia), as part of a US-USSR co-operative program in earthquake prediction.
- 1988-94 Geological-archaeological research in the Roman Forum.
- 1992-present Active in founding the Geological Observatory of Coldigioco (Italy).
- 1995-present Stratigraphic research in Utah.

SELECTED PUBLICATIONS

Ph.D. Thesis

Geology of the Simarua and Carpintero areas, Guajira Peninsula, Colombia: Ph.D. Thesis, Princeton University, 168 p., 1967.

Books

1. Geology and History of Sicily: Petroleum Exploration Society of Libya, Tripoli, 271 pp., 1970 (W. Alvarez and K.H.A. Gohrbandt, eds.).
2. T. rex and the Crater of Doom: Princeton, N.J., Princeton University Press, 185 p., 1997.
3. Earthrise (unpublished). Thirty-chapter introduction to Earth science in terms of a very broad conception of geology and geophysics in the context of science as a whole, of history, and of humanism. Roughly 3/4 written. Used as a text for Geology 10 at UC Berkeley since about 1990.

Scientific Publications

1. Estudios recientes en la Guajira: Geozóico (Bogotá), v. 1, no. 2, p. 2-4, 1965.
2. Geology and History of Sicily: Petroleum Exploration Society of Libya, Tripoli, 271 pp., 1970 (W. Alvarez and K.H.A. Gohrbandt, eds.).
3. Introduction to the geology of Sicily, in, Phillips, R.W. (ed.), Road log for Sicily field trip: Petroleum Exploration Society of Libya, Tripoli, p. 1-4, 1970.

4. Fragmented Andean belt of northern Colombia: Geological Society of America Memoir 130, p. 77-96, 1971.
5. Recent Italian research: *Geotimes*, v. 17, no. 2, p. 14-17, 1972.
6. Rotation of the Corsica-Sardinia microplate: *Nature Physical Science*, v. 235, p. 103-105, 1972 (LDGO no. 1758).
7. The Treia Valley north of Rome: volcanic stratigraphy, topographic evolution, and geological influences on human settlement: *Geologica Romana*, v. 11, p. 153-176, 1972 (LDGO no. 1786).
8. Uncoupled convection and subcrustal current ripples in the Western Mediterranean, in, Shagam, R. (ed.), *The H.H. Hess volume: Studies in Earth and Space Science: Geological Society of America Memoir 132*, p. 119-132, 1972.
9. The ancient course of the Tiber River near Rome: an introduction to the middle Pleistocene volcanic stratigraphy of Central Italy: *Geological Society of America Bulletin*, v. 84, p. 749-758, 1973 (LDGO no. 1838).
10. The application of plate tectonics to the Mediterranean region, in, Tarling, D.H. and Runcorn, S.K. (eds.), *Implications of continental drift to the earth sciences: Academic Press, London*, v. 2, p. 893-908, 1973 (LDGO no. 1793).
11. Palaeomagnetism of Plio-Pleistocene basalts from northwest Sardinia: *Nature Physical Science*, v. 243, p. 10-11, 1973 (W. Alvarez, S. Franks, and A.E.M. Nairn, LDGO no. 1937).
12. Base surge deposits in Pleistocene volcanic ash near Rome: *Bulletin Volcanologique*, v. 37, no. 4, p. 553-572, 1973 (P.H. Mattson and W. Alvarez, LDGO no. 2078).
13. Rotation of the Italian peninsula: *Nature*, v. 251, p. 285-288, 1974 (W. Lowrie and W. Alvarez, LDGO no. 2074).
14. Sardinia and Corsica: one microplate or two?: *Rendiconti del Seminario della Facoltà di Scienze, Università di Cagliari*, supplemento, p. 1-4, 1974 (LDGO no. 2038).
15. The tectonics of central-eastern Sardinia and the possible continuation of the Alpine chain to the south of Corsica: *Rendiconti del Seminario della Facoltà di Scienze, Università di Cagliari*, supplemento, p. 5-34, 1974 (W. Alvarez and T. Cocozza, LDGO no. 2056).
16. Fragmentation of the Alpine orogenic belt by microplate dispersal: *Nature*, v. 248, p. 309-312, 1974 (W. Alvarez, T. Cocozza, and F.C. Wezel, LDGO no. 2056).
17. Paleomagnetismo della scaglia rossa umbra e rotazione della penisola italiana: *Società Geologica Italiana, Bollettino*, v. 93, p. 883-891, 1974 (W. Alvarez and W. Lowrie, LDGO no. 2184).
18. The Pleistocene volcanoes north of Rome, in, Squyres, C. (ed.), *Geology of Italy: Earth Science Society of the Libyan Arab Republic, Tripoli*, p. 355-377, 1975 (LDGO no. 2196).

19. Paleomagnetic evidence for rotation of the Italian Peninsula: *Journal of Geophysical Research*, v. 80, p. 1579-1592, 1975 (W. Lowrie and W. Alvarez).
20. Eruptive source of the "Tufo rosso a scorie nere", a Pleistocene ignimbrite north of Rome: *Geologica Romana* (Rome), v. 14, p. 141-154, 1975 (W. Alvarez, A. Gordon, and E.P. Rashak, LDGO no. 2344).
21. A former continuation of the Alps: *Geological Society of America Bulletin*, v. 87, p. 891-896, 1976 (LDGO no. 2046).
22. Potassium-argon ages on pyroclastic rocks from the Pleistocene Sabatini Volcanic District, north of Rome: *Rendiconti della Società Italiana di Mineralogia e Petrologia*, v. 32, p. 147-152, 1976 (W. Alvarez, M. Nicoletti, and C. Petrucciani, LDGO no. 2326).
23. A propos des relations Corse-Sardaigne: *Bulletin de la Société Géologique de France*, ser. 7, v. 18, p. 1216, 1976.
24. Formation of spaced cleavage and folds in brittle limestone by dissolution: *Geology*, v. 4, p. 698-701, 1976 (W. Alvarez, T. Engelder, and W. Lowrie, LDGO no. 2377).
25. The tectonic significance of Mediterranean volcanoes: *Geologica Romana* (Rome), v. 15, p. 311-313, 1976.
26. Paleomagnetic studies of the Scaglia Rossa limestone in Umbria: *Proceedings of the Conference on Paleomagnetic Stratigraphy of Pelagic Carbonate Sediments*, Perugia, Italy, September, 1976, *Società Geologica Italiana, Memorie*, v. 15, p. 41-50, 1976 (W. Lowrie and W. Alvarez, LDGO no. 2431).
27. The role of calcium carbonate dissolution in deformation of the Scaglia Rossa limestone: *Proceedings of the Conference on Paleomagnetic Stratigraphy of Pelagic Carbonate Sediments*, Perugia, Italy, September, 1976, *Società Geologica Italiana, Memorie*, v. 15, p. 33-40, 1976 (W. Alvarez, T. Engelder, and W. Lowrie, LDGO no. 2442).
28. In Perugia -- Pelagic carbonates: *Geotimes*, v. 16, no. 4, p. 16-17, 1977.
29. Upper Cretaceous-Paleocene magnetic stratigraphy at Gubbio, Italy, III. Upper Cretaceous magnetic stratigraphy: *Geological Society America Bulletin*, v. 88, p. 374-377, 1977 (W. Lowrie and W. Alvarez, LDGO no. 2378).
30. Upper Cretaceous-Paleocene magnetic stratigraphy at Gubbio, Italy. V. Type section for the Late Cretaceous-Paleocene geomagnetic reversal time scale: *Geological Society America Bulletin*, v. 88, p. 383-389, 1977 (W. Alvarez, M.A. Arthur, A.G. Fischer, W. Lowrie, G. Napoleone, I. Premoli Silva, and W.M. Roggenthen, LDGO no. 2379).
- 30a. Paper 30, reprinted in Kennett, J.P., *Magnetic stratigraphy of sediments* (Benchmark Papers in Geology, v. 54): Dowden, Hutchinson and Ross, Stroudsburg, PA, p. 209-215, 1980.
31. History of the Earth's magnetic field recorded in the Italian Apennines: *Lamont-Doherty Geological Observatory of Columbia University, Yearbook 1975-1976*, p. 46-49, 1977 (W. Alvarez).

32. A former continuation of the Alps -- reply to discussion by G. Chabrier and G. Mascle: Geological Society America Bulletin, v. 77, p. 1695-1696, 1977 (W. Alvarez).
33. Late Cretaceous geomagnetic polarity sequence: detailed rock and paleomagnetic studies of the Scaglia Rossa limestone at Gubbio, Italy: Geophysical Journal, v. 51, p. 561-581, 1977 (W. Lowrie and W. Alvarez, LDGO no. 2571).
34. Paleomagnetism and tectonics in Umbria, Italy: Earth and Planetary Science Letters, v. 39, p. 199-210, 1978 (J.E.T. Channell, W. Lowrie, F. Medizza, and W. Alvarez).
35. Classification of solution cleavage in pelagic limestones: Geology, v. 6, p. 263-266, 1978 (W. Alvarez, T. Engelder, and P.A. Geiser, LDGO no. 2646).
36. Fold distortion: a new indicator of tectonic transport direction: Geology, v. 6, p. 657-660, 1978 (W. Alvarez).
37. Upper Cretaceous palaeomagnetic stratigraphy at Moria (Umbrian Apennines, Italy): verification of the Gubbio section: Royal Astronomical Society Geophysical Journal, v. 55, p. 1-17, 1978 (W. Alvarez and W. Lowrie).
38. A comment on: "Biostratigraphy and magnetostratigraphy of Paleocene terrestrial deposits, San Juan Basin, New Mexico", by E.H. Lindsay, L.L. Jacobs, and R.F. Butler: Geology, v. 7, p. 66-67, 1979 (W. Alvarez and D.W. Vann).
39. Paleomagnetism and rock magnetism of the Pliocene rhyolite at San Vincenzo, Tuscany, Italy: Journal of Geophysics, v. 45, p. 417-432, 1979 (W. Lowrie and W. Alvarez).
40. Anomalous iridium levels at the Cretaceous/Tertiary boundary at Gubbio, Italy: Negative results of tests for a supernova origin, in, Christensen, W.K., and Birkelund, T. (eds.), Cretaceous/Tertiary Boundary Events Symposium, University of Copenhagen, v. 2, p. 69, 1979 (W. Alvarez, L.W. Alvarez, F. Asaro, and H.V. Michel).
41. Extraterrestrial cause for the Cretaceous-Tertiary extinction: Experiment and theory: Lawrence Berkeley Laboratory Report, LBL-9666, 86 pp., 1979 (L.W. Alvarez, W. Alvarez, F. Asaro, and H.V. Michel).
42. Lower Cretaceous magnetic stratigraphy in Umbrian pelagic carbonate rocks: Royal Astronomical Society Geophysical Journal, v. 60, p. 263-281, 1980 (W. Lowrie, W. Alvarez, I. Premoli Silva, and S. Monechi).
43. Extraterrestrial cause for the Cretaceous-Tertiary extinction: Experimental results and theoretical interpretation: Science, v. 208, p. 1095-1108, 1980 (L.W. Alvarez, W. Alvarez, F. Asaro, and H.V. Michel).
44. A review of magnetic stratigraphy investigations in Cretaceous pelagic carbonate rocks: Journal of Geophysical Research, v. 85, p. 3597-3605 (Norman Watkins Memorial), 1980 (W. Lowrie, J.E.T. Channell, and W. Alvarez).

45. Franciscan-complex limestone deposited at 17° south paleolatitude: Geological Society of America Bulletin, Part I, v. 91, p. 476-484, 1980 (W. Alvarez, D.V. Kent, I. Premoli Silva, R.A. Schweickert, and R.L. Larson).
46. Stratigraphic evidence for crustal thickness changes on the southern Tethyan margin during the Alpine cycle: Geological Society America Bulletin, Part I, v. 91, p. 681-689; Part II, v. 91, p. 2558-2587, 1980 (B. D'Argenio, and W. Alvarez).
47. Asteroidal extinction hypothesis: Science, v. 211, p. 648-656, 1981 (comments on paper no. 43 by D.V. Kent; G.C. Reid; R.E. Brown; reply by L.W. Alvarez, W. Alvarez, F. Asaro, and H.V. Michel).
48. Penrose Conference Report -- Role of pressure solution and dissolution in geology: Geology, v. 9, p. 44-45, 1981 (T. Engelder, P.A. Geiser, W. Alvarez).
49. One hundred million years of geomagnetic polarity history: Geology, v. 9, p. 392-397, 1981 (W. Lowrie and W. Alvarez).
50. Structure and permeability: geologic controls on induced seismicity at Nurek reservoir, Tadzhikistan, USSR: Geology, v. 9, p. 440-444, 1981 (W. Leith, D.W. Simpson, W. Alvarez).
- 50a. Paper 50, reprinted in Spall, H., and Simpson, D.W. (eds.), The Soviet America exchange in earth-quake prediction: U.S. Geological Survey, Open-File Report 81-1150, p. 97-101, 1981.
51. Geochemical anomalies near the Eocene-Oligocene and Permian-Triassic boundaries, in, Papers presented to the Conference on large body impacts and terrestrial evolution: geological, climatological, and biological implications (October, 1981): Lunar and Planetary Institute, p. 2, 1981 (F. Asaro, L.W. Alvarez, W. Alvarez, and H.V. Michel).
52. Upper Cretaceous to Eocene pelagic limestones of the Scaglia Rossa are not Miocene turbidites: Nature, v. 294, p. 246-248, 1981 (W. Alvarez and W. Lowrie).
53. Distribution of iridium and other elements near the Cretaceous/Tertiary boundary in hole 465A: Preliminary results: Initial reports of the Deep Sea Drilling Project, v. 62, p. 847-849, 1981 (H.V. Michel, F. Asaro, W. Alvarez, and L.W. Alvarez).
54. Results of a dating attempt: Chemical and physical measurements relevant to the cause of the Cretaceous-Tertiary extinctions, in, Currie, L.A. (ed.), Nuclear and chemical dating techniques -- Interpreting and environmental record: American Chemical Society Symposium series, v. 176, p. 401-409, 1982 (F. Asaro, H.V. Michel, L.W. Alvarez, and W. Alvarez).
55. Iridium anomaly approximately synchronous with terminal Eocene extinctions: Science, v. 216, p. 886-888, 1982 (W. Alvarez, F. Asaro, H.V. Michel, and L.W. Alvarez).
56. Paleogene magnetic stratigraphy in Umbrian pelagic carbonate rocks: The Contessa sections, Gubbio: Geological Society of America Bulletin, v. 93, p. 414-432, 1982 (W. Lowrie, W. Alvarez, G. Napoleone, K. Perch-Nielsen, I. Premoli Silva, and M. Toumarkine).

57. Geological evidence for the geographical pattern of mantle return flow and the driving mechanism of plate tectonics: *Journal of Geophysical Research*, v. 87, p. 6697-6710, 1982 (W. Alvarez).
58. Mesoscopic fault array of the northern Umbrian Apennines fold belt, Italy: geometry of conjugate shear by pressure-solution slip: *Geological Society of America Bulletin*, v. 93, p. 1013-1022, 1982 (S. Marshak, P.A. Geiser, W. Alvarez, and T. Engelder).
59. Spaced cleavage of solution origin in the Scaglia Rossa, Italy: solution cleavage and estimates of shortening, Umbrian Apennines, in, Borradaile, G.J., Bayly, M.B., and Powell, C.McA. (eds.), *Atlas of deformational and metamorphic rock fabrics*: Berlin, Springer-Verlag, p. 176-179, 210-211, 1982 (W. Alvarez and T. Engelder).
60. Stylolitic solution cleavage from Silurian-Devonian limestones, Pennsylvania, in, Borradaile, G.J., Bayly, M.B., and Powell, C.McA. (eds.), *Atlas of deformational and metamorphic rock fabrics*: Berlin, Springer-Verlag, p. 206-207, 1982 (T. Engelder and W. Alvarez).
61. Iridium and other geochemical profiles near the Cretaceous-Tertiary boundary in a Brazos River section in Texas, in, Maddocks, R.F. (ed.), *Texas Ostracoda (Guidebook of excursions and related papers for the Eighth International Symposium on Ostracoda, 1982)*: Houston, Department of Geosciences, University of Houston, p. 238-241, 1982 (F. Asaro, H.V. Michel, W. Alvarez, L.W. Alvarez, R.F. Maddocks, and T. Bunch).
62. Geochemical anomalies near the Eocene-Oligocene and Permian-Triassic boundaries: *Geological Society of America Special Paper*, v. 190, p. 517-528, 1982 (F. Asaro, L.W. Alvarez, W. Alvarez, and H.V. Michel).
63. Current status of the impact theory for the terminal Cretaceous extinction: *Geological Society of America Special Paper*, v. 190, p. 305-315, 1982 (W. Alvarez, L.W. Alvarez, F. Asaro, H.V. Michel).
64. Magnetic polarity stratigraphy (in U.S. National Report to the International Union of Geodesy and Geophysics): *Reviews of Geophysics and Space Physics*, v. 21, p. 620-626, 1983 (L.S. Chan and W. Alvarez).
65. Spheroids at the Cretaceous-Tertiary boundary are altered impact droplets of basaltic composition: *Geology*, v. 11, p. 668-671, 1983 (A. Montanari, R.L. Hay, W. Alvarez, F. Asaro, H.V. Michel, L.W. Alvarez, and J. Smit).
- 65a. Reply to comment by Bruce Bohor on paper 65: *Geology*, v. 12, p. 696, 1984 (A. Montanari, R.L. Hay, W. Alvarez, F. Asaro, H.V. Michel, L. Alvarez, and J. Smit).
66. Abundance profiles of iridium and other elements near the Cretaceous/Tertiary boundary in Hole 516F of Deep Sea Drilling Project Leg 72: *Initial reports of the Deep Sea Drilling Project*, v. 72, p. 831-936, 1983 (H.V. Michel, F. Asaro, W. Alvarez, L.W. Alvarez, and D.A. Johnson).
67. Impact theory of mass extinctions and the invertebrate fossil record: *Science*, v. 223, p. 1135-1141, 1984 (W. Alvarez, E.G. Kauffman, F. Surlyk, L.W. Alvarez, F. Asaro, and H.V. Michel).

68. The end of the Cretaceous: sharp boundary of gradual transition?: *Science*, v. 223, p. 1183-1186, 1984 (W. Alvarez, L.W. Alvarez, F. Asaro, and H.V. Michel).
69. Magnetic stratigraphy applied to synsedimentary slumps, turbidites, and basin analysis: the Scaglia Limestone at Furlo (Italy): *Geological Society of America Bulletin*, v. 95, p. 324-336, 1984 (W. Alvarez and W. Lowrie).
70. Evidence from crater ages for periodic impacts on the Earth: *Nature*, v. 308, p. 718-720, 1984 (W. Alvarez and R.A. Muller).
- 70a. Reply to comments on paper 70: *Nature*, v. 312, p. 380, 1984 (R.A. Muller, P. Hut, M. Davis, W. Alvarez).
71. The precursor of the Cretaceous-Tertiary boundary clays at Stevns Klint, Denmark, and DSDP Hole 465A: *Science*, v. 226, p. 137-143, 1984 (M. Kastner, F. Asaro, H.V. Michel, W. Alvarez, and L.W. Alvarez).
72. Lower Cretaceous magnetic stratigraphy in Umbrian pelagic limestone sections: *Earth Planetary Science Letters*, v. 71, p. 315-328, 1984 (W. Lowrie and W. Alvarez).
73. The possible influences of sudden events on biological radiations and extinctions, in, Holland, H.D., and Trendall, A.F. (eds.), *Patterns of change in earth evolution: Dahlem Workshop Reports -- Physical, Chemical, and Earth Sciences Research Report*, v. 5, 432 p., p. 77-102, 1984 (K. Padian, Rapporteur, W. Alvarez, T. Birkelund, D.K. Fütterer, K.J. Hsü, J.H. Lipps, D.J. McLaren, D.M. Raup, E.M. Shoemaker, J. Smit, O.B. Toon, and A. Wetzel).
74. Structure of the Vakhsh fold-and-thrust belt, Tadjik S.S.R.: geologic mapping on a Landsat image base: *Geological Society of America Bulletin*, v. 96, p. 875-900, 1985 (W. Leith and W. Alvarez).
- 74a. Reply to comment by E.A. Silver and N. Breen on paper 74: *Geological Society of America Bulletin*, v. 97, p. 906-909, 1986 (W. Leith and W. Alvarez).
75. Radiometric time scale for the upper Eocene and Oligocene based on K/Ar and Rb/Sr dating of volcanic biotites from the pelagic sequence of Gubbio, Italy: *Geology*, v. 13, p. 596-599, 1985 (A. Montanari, R. Drake, D.M. Bice, W. Alvarez, G.H. Curtis, B.D. Turrin, and D.J. DePaolo).
76. Magnetic stratigraphy of the Scaglia Rossa: implications for syndepositional tectonics of the Umbria-Marche Basin: *Rivista Italiana di Paleontologia e Stratigrafia*, v. 91, p. 219-258, 1985 (L.S. Chan, A. Montanari, and W. Alvarez).
77. Paleolatitudes of Franciscan limestones: *Geology*, v. 13, p. 741, 1985 (J.A. Tarduno and W. Alvarez).
78. Synsedimentary slides and bedding formation in Apennine pelagic limestones: *Journal of Sedimentary Petrology*, v. 55, p. 720-734, 1985 (W. Alvarez, R. Colacicchi, and A. Montanari).
79. Elemental profile of iridium and other elements near the Cretaceous/Tertiary boundary in Hole 577B: *Initial Reports of the Deep Sea Drilling Project*, v. 86, p. 533-538, 1985 (H.V. Michel, F. Asaro, W. Alvarez, and L.W. Alvarez).

80. Radiometric dating of the Eocene-Oligocene boundary at Gubbio, Italy, in, Ch. Pomerol and I. Premoli Silva (eds.), "Terminal Eocene Events", Elsevier, Amsterdam, p. 41-47, 1986 (A. Montanari, R. Drake, D.M. Bice, W. Alvarez, G.H. Curtis, B.D. Turrin, and D.J. DePaolo).
81. Toward a theory of impact crises: EOS, v. 67, no. 35 (2 September), p. 649-658, 1986 (W. Alvarez).
82. Acceptance of the G.K. Gilbert Award, from the Planetary Geology Division, Geological Society of America: Geological Society of America Bulletin, v. 97, p. 1407-1408, 1986 (W. Alvarez).
83. Comet showers as a cause of mass extinctions: Nature, v. 329, p. 118-126, 1987 (P. Hut, W. Alvarez, W.P. Elder, T. Hansen, E.G. Kauffman, G. Keller, and E.M. Shoemaker).
84. The Scaglia limestones (Late Cretaceous-Oligocene) in the northeastern Apennines carbonate sequence: stratigraphic context and geological significance, in, I. Premoli Silva, R. Coccioni and A. Montanari (eds.), "The Eocene-Oligocene boundary in the Marche-Umbria Basin (Italy)", International Union of Geological Sciences, Ancona, p. 13-30, 1988 (W. Alvarez and A. Montanari).
85. Small Late Eocene iridium anomalies in the Contessa Highway III section, in, I. Premoli Silva, R. Coccioni and A. Montanari (eds.), "The Eocene-Oligocene boundary in the Marche-Umbria Basin (Italy)", International Union of Geological Sciences, Ancona, p. 187-188, 1988 (F. Asaro, W. Alvarez, A. Montanari, H. V. Michel, and L.W. Alvarez).
86. Radioisotopic dating of the Eocene-Oligocene boundary in the pelagic sequence of the Northern Apennines, in, I. Premoli Silva, R. Coccioni and A. Montanari (eds.), "The Eocene-Oligocene boundary in the Marche-Umbria Basin (Italy)", International Union of Geological Sciences, Ancona, p. 195-208, 1988 (A. Montanari, A. L. Deino, R.E. Drake, B.D. Turrin, D.J. DePaolo, G.S. Odin, G.H. Curtis, W. Alvarez, and D.M. Bice).
87. Luis W. Alvarez, 1911-1988, Professor of Physics, Emeritus, Berkeley, in University of California, In Memoriam, p. 1-5, 1988 (R.D. Watt, W.P. Trower, M.L. Stevenson, R.A. Muller, and W. Alvarez).
88. Synsedimentary tectonics in Late Cretaceous-Early Tertiary pelagic basin of the Northern Apennines: SEPM Special Publication, v. 44, p. 379-399, 1989 (A. Montanari, L. S. Chan, and W. Alvarez).
89. Evolution of the Monte Nerone seamount in the Umbria-Marche Apennines: 1. Jurassic-Tertiary stratigraphy: Società Geologica Italiana, Bollettino, v. 108, p. 3-21, 1989 (W. Alvarez).
90. Evolution of the Monte Nerone seamount in the Umbria-Marche Apennines: 2. Tectonic control of the seamount-basin transition: Società Geologica Italiana, Bollettino, v. 108, p. 23-29, 1989 (W. Alvarez).
91. Uniformitarianism and the response of Earth scientists to the theory of impact crises, in S.V.M. Clube (ed.), "Catastrophes and evolution: astronomical foundations", Cambridge University Press, Cambridge, p. 13-24, 1989 (W. Alvarez, T. Hansen, P. Hut, E. G. Kauffman and E. M. Shoemaker).

92. Pattern of extensional faulting in pelagic carbonates of the Umbria-Marche Apennines of central Italy: *Geology*, v. 18, p. 407-410, 1990 (W. Alvarez).
93. Jurassic-Early Cretaceous stratigraphy and tectonics of Monte Nerone (Umbria-Marche Apennines), in G. Pallini, F. Cecca, S. Cresta and M. Santantonio (eds.), "Atti del Secondo Convegno Internazionale — Fossili, Evoluzione, Ambiente", Comitato Centenario Raffaele Piccinini, Pergola, p. 13-17, 1990 (W. Alvarez).
94. The origin of the white beds below the Cretaceous -Tertiary boundary in the Gubbio section, Italy: *Earth and Planetary Science Letters*, v. 98, p. 303-312, 1990 (W. Lowrie, W. Alvarez and F. Asaro).
95. No relative rotation detected between Corsica and Sardinia: *Earth and Planetary Science Letters*, v. 98, p. 313-318, 1990 (L. Vigliotti, W. Alvarez and M. McWilliams).
96. Geochemical studies of the Cretaceous-Tertiary boundary in ODP Holes 689B and 690C, in P. F. Barker and J. P. Kennett (eds.), "Proceedings of the Ocean Drilling Program, Scientific Results", v. 113, p.159-168, 1990 (H. V. Michel, F. Asaro, W. Alvarez and L. W. Alvarez).
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